Nature Coast Aquatic Preserve

SEACAR Habitat Analyses

Last compiled on 08 October, 2025

Contents

Funding & Acknowledgements

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Threshold Filtering

Threshold filters, following the guidance of Florida Department of Environmental Protection's (*FDEP*) Division of Environmental Assessment and Restoration (*DEAR*) are used to exclude specific results values from the SEACAR Analysis. Based on the threshold filters, Quality Assurance / Quality Control (*QAQC*) Flags are inserted into the *SEACAR_QAQCFlagCode* and *SEACAR_QAQC_Description* columns of the export data. The *Include* column indicates whether the *QAQC* Flag will also indicate that data are excluded from analysis. No data are excluded from the data export, but the analysis scripts can use the *Include* column to exclude data (1 to include, 0 to exclude).

Table 1: Continuous Water Quality threshold values

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Dissolved Oxygen	mg/L	-0.000001	50
Dissolved Oxygen Saturation	%	-0.000001	500
Salinity	ppt	-0.000001	70
Turbidity	NTU	-0.000001	4000
Water Temperature	Degrees C	-5.000000	45
pH	None	2.000000	14

Table 2: Discrete Water Quality threshold values

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Ammonia, Un-ionized (NH3)	mg/L	-	-
Ammonium, Filtered (NH4)	mg/L	-	-
Chlorophyll a, Corrected for Pheophytin	ug/L	-	-
Chlorophyll a, Uncorrected for Pheophytin	ug/L	-	-
Colored Dissolved Organic Matter	PCU	-	-

Parameter Name	*Units*	*Low Threshold*	*High Threshold*
Dissolved Oxygen	mg/L	-0.000001	25
Dissolved Oxygen Saturation	%	-0.000001	310
Fluorescent Dissolved Organic Matter	QSE	-	-
Light Extinction Coefficient	mˆ-1	-	-
NO2+3, Filtered	mg/L	-	-
Nitrate (NO3)	mg/L	-	-
Nitrite (NO2)	mg/L	-	-
Nitrogen, organic	mg/L	-	-
Phosphate, Filtered (PO4)	mg/L	-	-
Salinity	ppt	-0.000001	70
Secchi Depth	m	0.000001	50
Specific Conductivity	mS/cm	0.005000	100
Total Kjeldahl Nitrogen	mg/L	-	-
Total Nitrogen	mg/L	-	-
Total Nitrogen	mg/L	-	-
Total Phosphorus	mg/L	-	-
Total Suspended Solids	mg/L	-	-
Turbidity	NTU	-	-
Water Temperature	Degrees C	3.000000	40
pH	None	2.000000	13

Table 3: Quality Assurance Flags inserted based on threshold checks listed in Table 1 and 2

SEACAR QAQC Description	*Include*	*SEACAR QAQCFlagCode*
Exceeds maximum threshold	0	2Q
Below minimum threshold	0	4Q
Within threshold tolerance	1	6Q
No defined thresholds for this parameter	1	7Q

Value Qualifiers

Value qualifier codes included within the data are used to exclude certain results from the analysis. The data are retained in the data export files, but the analysis uses the *Include* column to filter the results.

STORET and WIN value qualifier codes

Value qualifier codes from *STORET* and *WIN* data are examined with the database and used to populate the *Include* column in data exports.

Table 4: Value Qualifier codes excluded from analysis

Qualifier Source	*Value Qualifier*	*Include*	*MDL*	*Description*
STORET-WIN	H	0	0	Value based on field kit determination; results may not be accurate
STORET-WIN	J	0	0	Estimated value
STORET-WIN	V	0	0	Analyte was detected at or above method detection limit
STORET-WIN	Y	0	0	Lab analysis from an improperly preserved sample; data may be inaccurate

Discrete Water Quality Value Qualifiers

The following value qualifiers are highlighted in the Discrete Water Quality section of this report. An exception is made for **Program 476** - *Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network* and data flagged with Value Qualifier **H** are included for this program only.

H - Value based on field kit determiniation; results may not be accurate. This code shall be used if a field screening test (e.g., field gas chromatograph data, immunoassay, or vendor-supplied field kit) was used to generate the value and the field kit or method has not been recognized by the Department as equivalent to laboratory methods.

I - The reported value is greater than or equal to the laboratory method detection limit but less than the laboratory practical quantitation limit.

Q - Sample held beyond the accepted holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis.

S - Secchi disk visible to bottom of waterbody. The value reported is the depth of the waterbody at the location of the Secchi disk measurement.

U - Indicates that the compound was analyzed for but not detected. This symbol shall be used to indicate that the specified component was not detected. The value associated with the qualifier shall be the laboratory method detection limit. Unless requested by the client, less than the method detection limit values shall not be reported

Systemwide Monitoring Program (SWMP) value qualifier codes

Value qualifier codes from the *SWMP* continuous program are examined with the database and used to populate the *Include* column in data exports. *SWMP* Qualifier Codes are indicated by *QualifierSource=SWMP*.

Table 5: SWMP Value Qualifier codes

Qualifier Source	*Value Qualifier*	*Include*	*Description*
SWMP	-1	1	Optional parameter not collected
SWMP	-2	0	Missing data
SWMP	-3	0	Data rejected due to QA/QC
SWMP	-4	0	Outside low sensor range
SWMP	-5	0	Outside high sensor range
SWMP	0	1	Passed initial QA/QC checks
SWMP	1	0	Suspect data
SWMP	2	1	Reserved for future use
SWMP	3	1	Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
SWMP	4	1	Historical: Pre-auto QA/QC
SWMP	5	1	Corrected data

Water Column

The water column habitat extends from the water's surface to the bottom sediments, and it's where fish, dolphins, crabs and people swim! So much life makes its home in the water column that the health of marine and coastal ecosystems, as well as human economies, depend on the condition of this vulnerable habitat. Local patterns of rainfall, temperature, winds and currents can rapidly change the condition of the water column, while global influences such as El Niño/La Niña, large-scale fluctuation in sea temperatures and climate change can have long-term effects. Inputs from the prosperity of our day-to-day lives including farming, mining and forestry, and emissions from power generation, automobiles and water treatment can also alter the health of the water column. Acting alone or together, each input can have complex and lasting effects on habitats and ecosystems.

SEACAR evaluates water column health with several essential parameters. These include nutrient surveys of nitrogen and phosphorus, and water quality assessments of salinity, dissolved oxygen, pH, and water temperature. Water clarity is evaluated with Secchi depth, turbidity, levels of chlorophyll a, total suspended solids, and colored dissolved organic matter. Additionally, the richness of nekton is indicated by the abundance of free-swimming fishes and macroinvertebrates like crabs and shrimps.

Seasonal Kendall-Tau Analysis

Indicators must have a minimum of five to ten years, depending on the habitat, of data within the geographic range of the analysis to be included in the analysis. Ten years of data are required for discrete parameters, and five years of data are required for continuous parameters. If there are insufficient years of data, the number of years of data available will be noted and labeled as "insufficient data to conduct analysis". Further, for the preferred Seasonal Kendall-Tau test, there must be data from at least two months in common across at least two consecutive years within the RCP managed area being analyzed. Values that pass both of these tests will be included in the analysis and be labeled as *Use_In_Analysis* = **TRUE**. Any that fail either test will be excluded from the analyses and labeled as *Use_In_Analysis* = **FALSE**. The points for all Water Column plots displayed in this section are monthly averages. Trend significance will be denoted as "Significant Trend" (when $p < 0.05$), or "Non-significant Trend" (when $p >= 0.05$). Any parameters with insufficient data to perform Seasonal Kendall-Tau test will have their monthly averages plotted without a corresponding trend line.

Water Quality - Discrete

The following files were used in the discrete analysis:

- *Combined_WQ_WC_NUT_Chlorophyll_a_corrected_for_pheophytin-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Chlorophyll_a_uncorrected_for_pheophytin-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Colored_dissolved_organic_matter_CDOM-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen_Saturation-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_pH-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Salinity-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Secchi_Depth-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Total_Nitrogen-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Total_Phosphorus-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Total_Suspended_Solids_TSS-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Turbidity-2025-Sep-04.txt*
- *Combined_WQ_WC_NUT_Water_Temperature-2025-Sep-04.txt*

Chlorophyll a, Corrected for Pheophytin - Discrete

Seasonal Kendall-Tau Trend Analysis

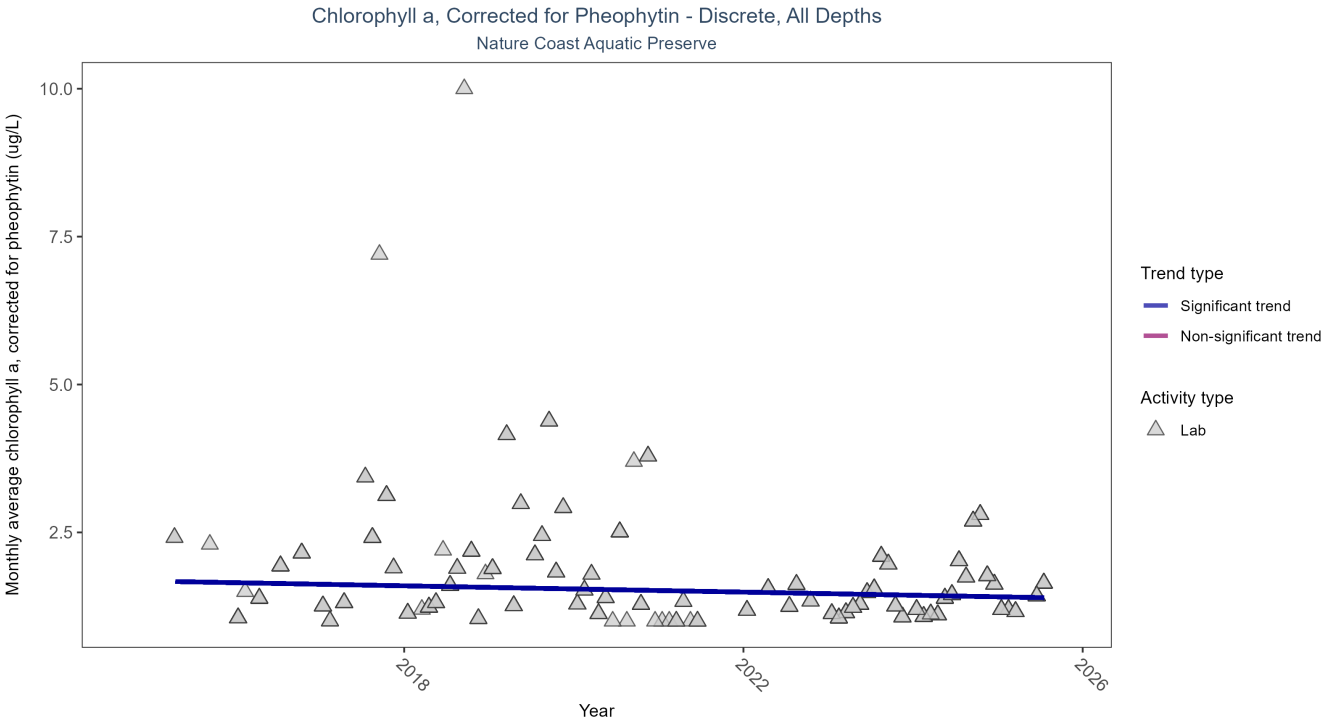

Figure 1: Scatter plot of monthly average levels of chlorophyll a, corrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 6: Seasonal Kendall-Tau Trend Analysis for Chlorophyll a, Corrected for Pheophytin

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	Significantly decreasing trend	2805	11	2015 - 2025	1	-0.203	1.6769	-0.0266	0.0253

Monthly average chlorophyll a, corrected for pheophytin, decreased by 0.03 µg/L per year, indicating an increase in water clarity.

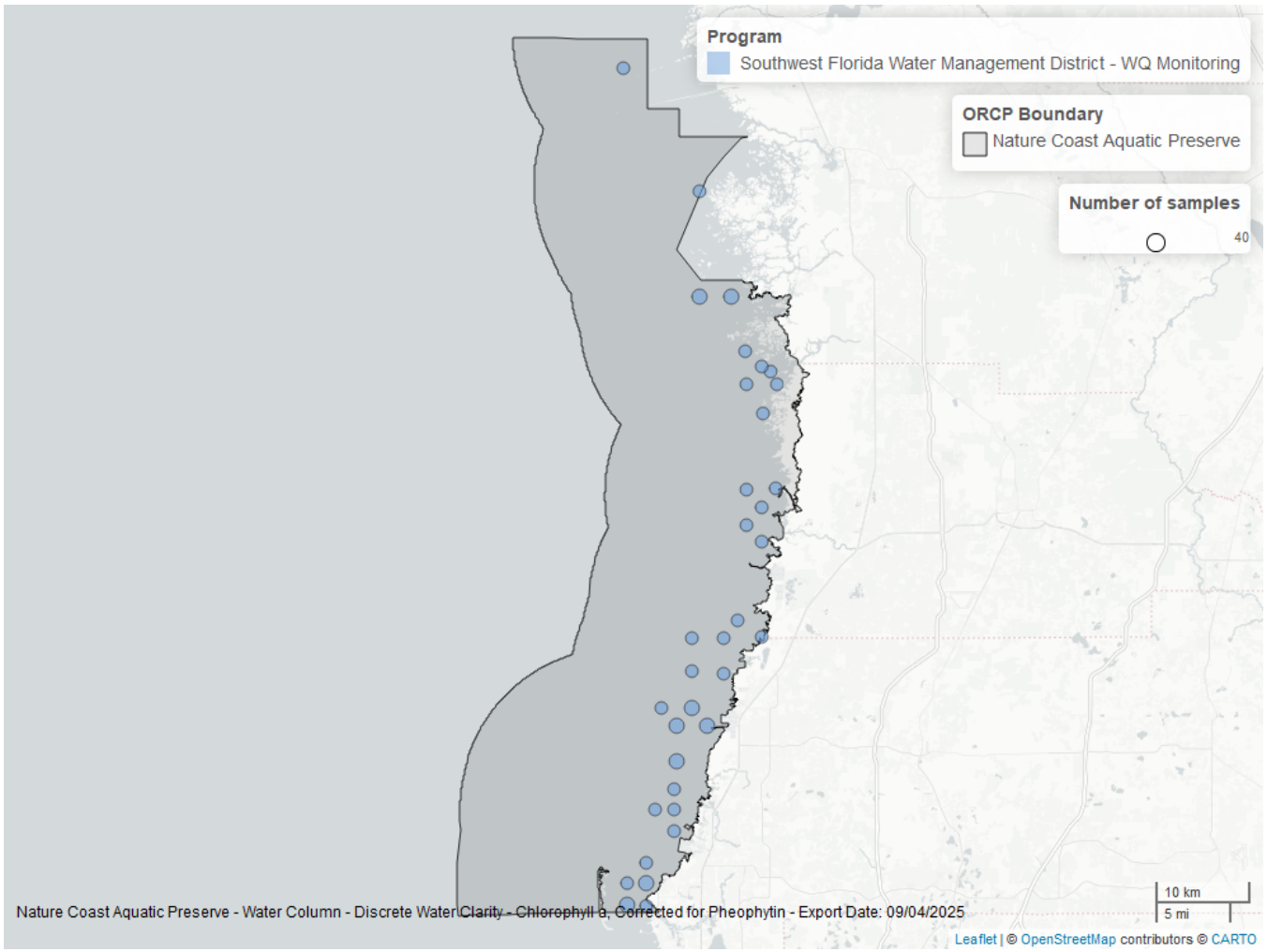

Figure 2: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 7: Programs contributing data for Chlorophyll a, Corrected for Pheophytin

ProgramID	*N_Data*	*YearMin*	*YearMax*
5008	1585	2021	2025
479	1157	2016	2024
5002	82	2015	2024
514	19	2020	2024
540	7	2017	2019

Program names:

479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Chlorophyll a, Uncorrected for Pheophytin - Discrete

Seasonal Kendall-Tau Trend Analysis

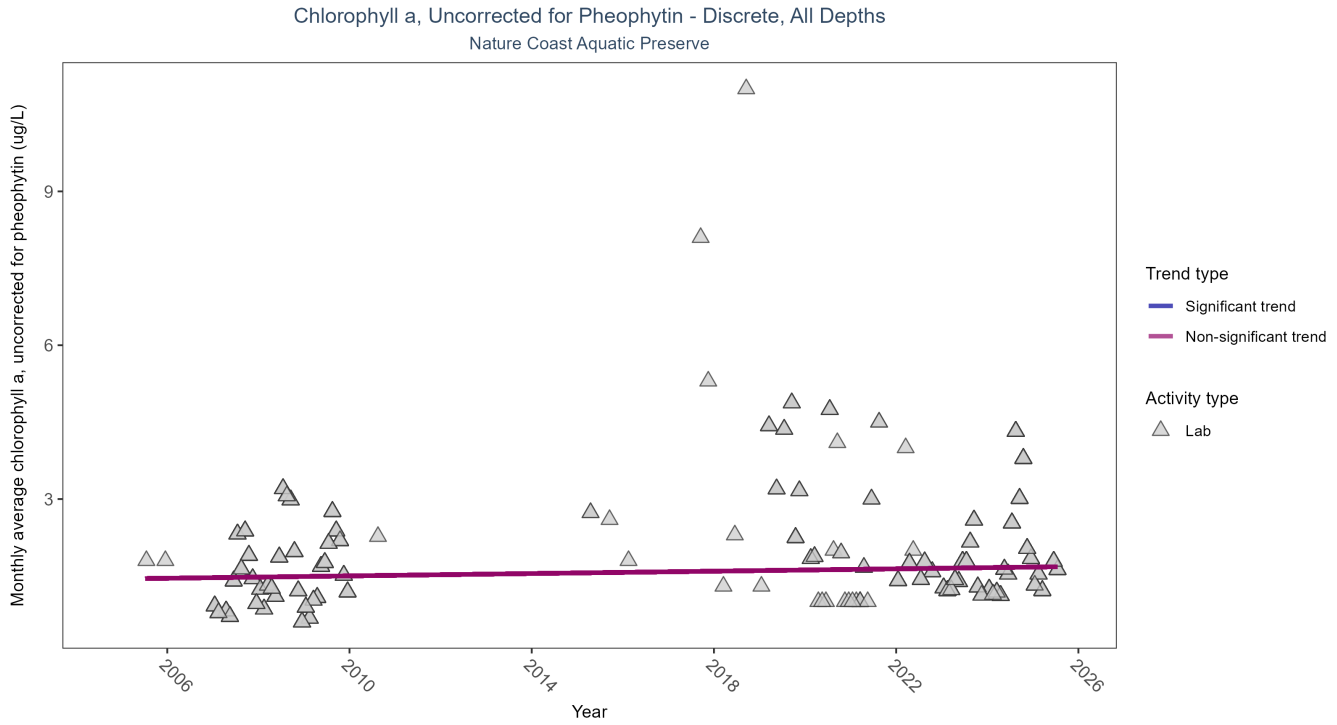

Figure 3: Scatter plot of monthly average levels of chlorophyll a, uncorrected for pheophytin, over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed chlorophyll a (triangles) is included in the plot.

Table 8: Seasonal Kendall-Tau Trend Analysis for Chlorophyll a, Uncorrected for Pheophytin

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	No significant trend	3188	16	2005 - 2025	1	0.116	1.4438	0.0115	0.1892

Chlorophyll a, uncorrected for pheophytin, showed no detectable trend between 2005 and 2025.

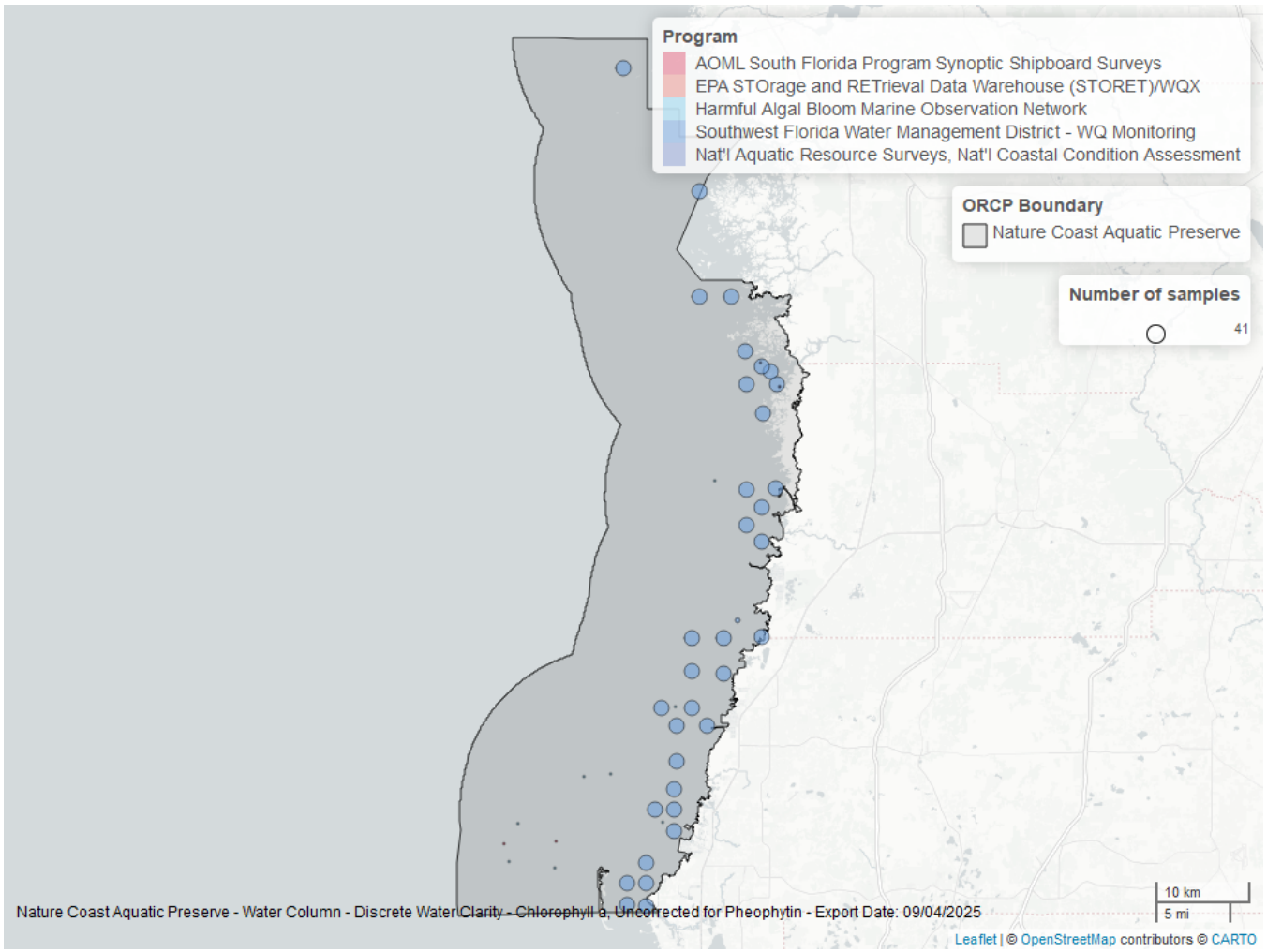

Figure 4: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 9: Programs contributing data for Chlorophyll a, Uncorrected for Pheophytin

ProgramID	*N_Data*	*YearMin*	*YearMax*
5008	1592	2021	2025
479	1494	2007	2022
5002	84	2015	2024
514	19	2020	2024
95	12	2003	2016
540	8	2017	2019
60	7	1993	2015
3	3	2024	2024
118	2	2005	2010
103	1	2005	2005

Program names:

3 - Atlantic Oceanographic and Meteorological Laboratory (AOML) South Florida Program Synoptic Shipboard Surveys[6]
60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer

Shrimp/Groundfish Survey[7]
95 - Harmful Algal Bloom Marine Observation Network[8]
103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX[9]
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment[10]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Colored Dissolved Organic Matter - Discrete

Seasonal Kendall-Tau Trend Analysis

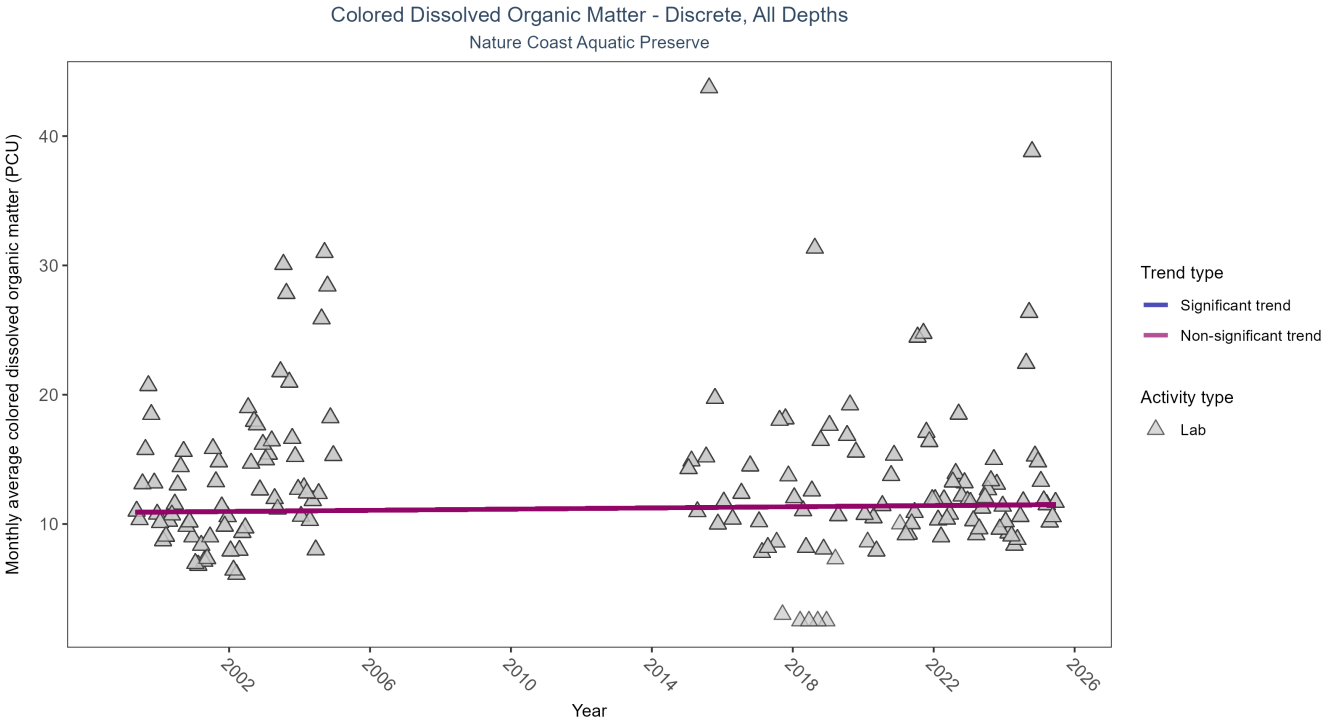

Figure 5: Scatter plot of monthly average colored dissolved organic matter (CDOM) over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only laboratory-analyzed CDOM (triangles) is included in the plot.

Table 10: Seasonal Kendall-Tau Trend Analysis for Colored Dissolved Organic Matter

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	No significant trend	6450	17	1999 - 2025	10.426	0.0728	10.8988	0.0229	0.2808

Colored dissolved organic matter showed no detectable trend between 1999 and 2025.

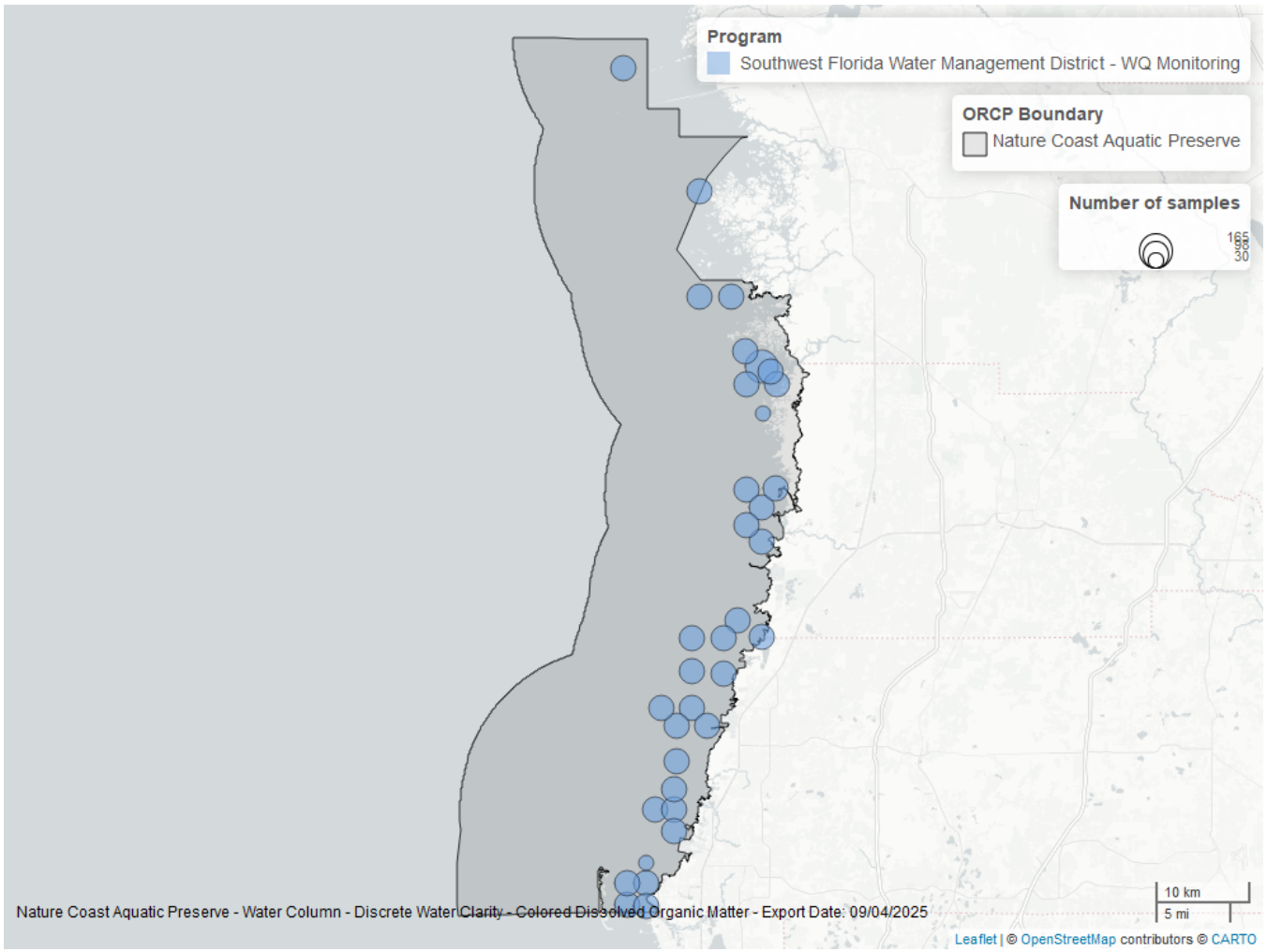

Figure 6: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 11: Programs contributing data for Colored Dissolved Organic Matter

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	3653	1999	2024
5008	2803	2021	2025
5002	18	2024	2024
514	7	2020	2024
540	7	2017	2019

Program names:

479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Dissolved Oxygen - Discrete

Seasonal Kendall-Tau Trend Analysis

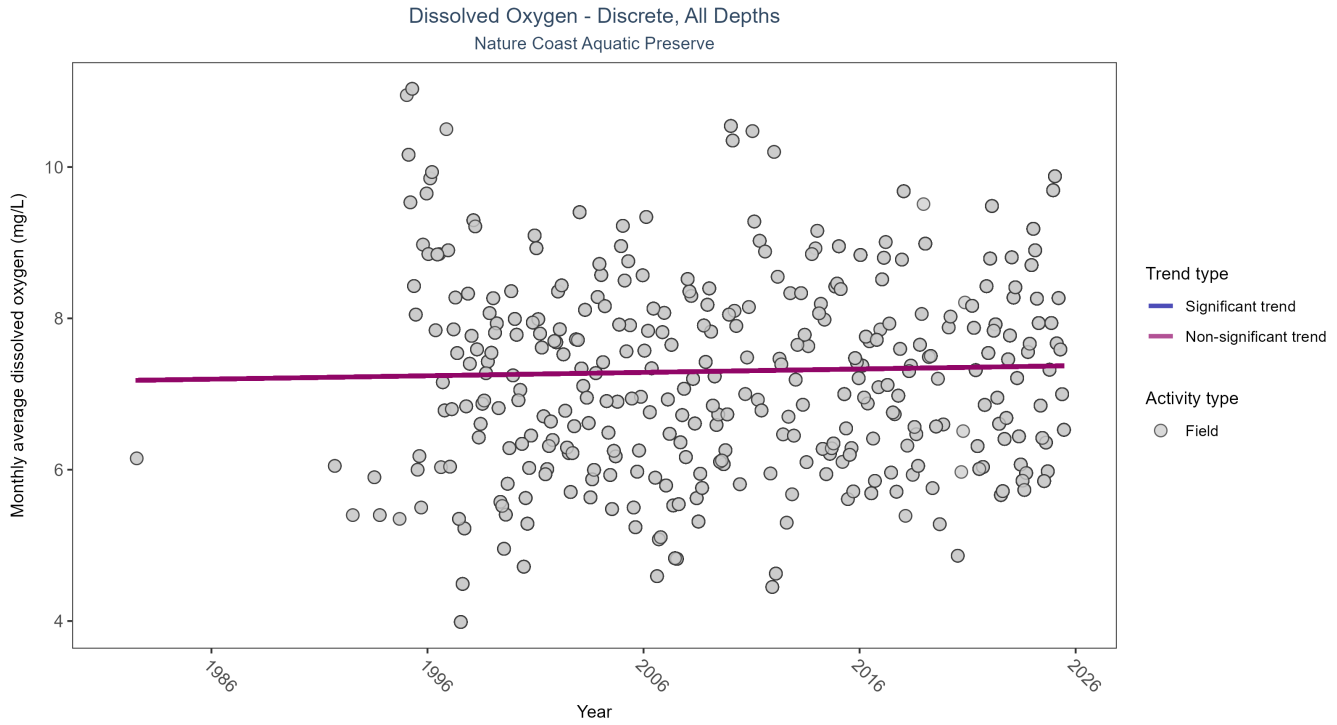

Figure 7: Scatter plot of monthly average dissolved oxygen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen values measured in the field (circles) are included in the plot.

Table 12: Seasonal Kendall-Tau Trend Analysis for Dissolved Oxygen

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Field	No significant trend	10418	36	1982 - 2025	7.2	0.0367	7.1788	0.0045	0.3497

Dissolved oxygen showed no detectable trend between 1982 and 2025.

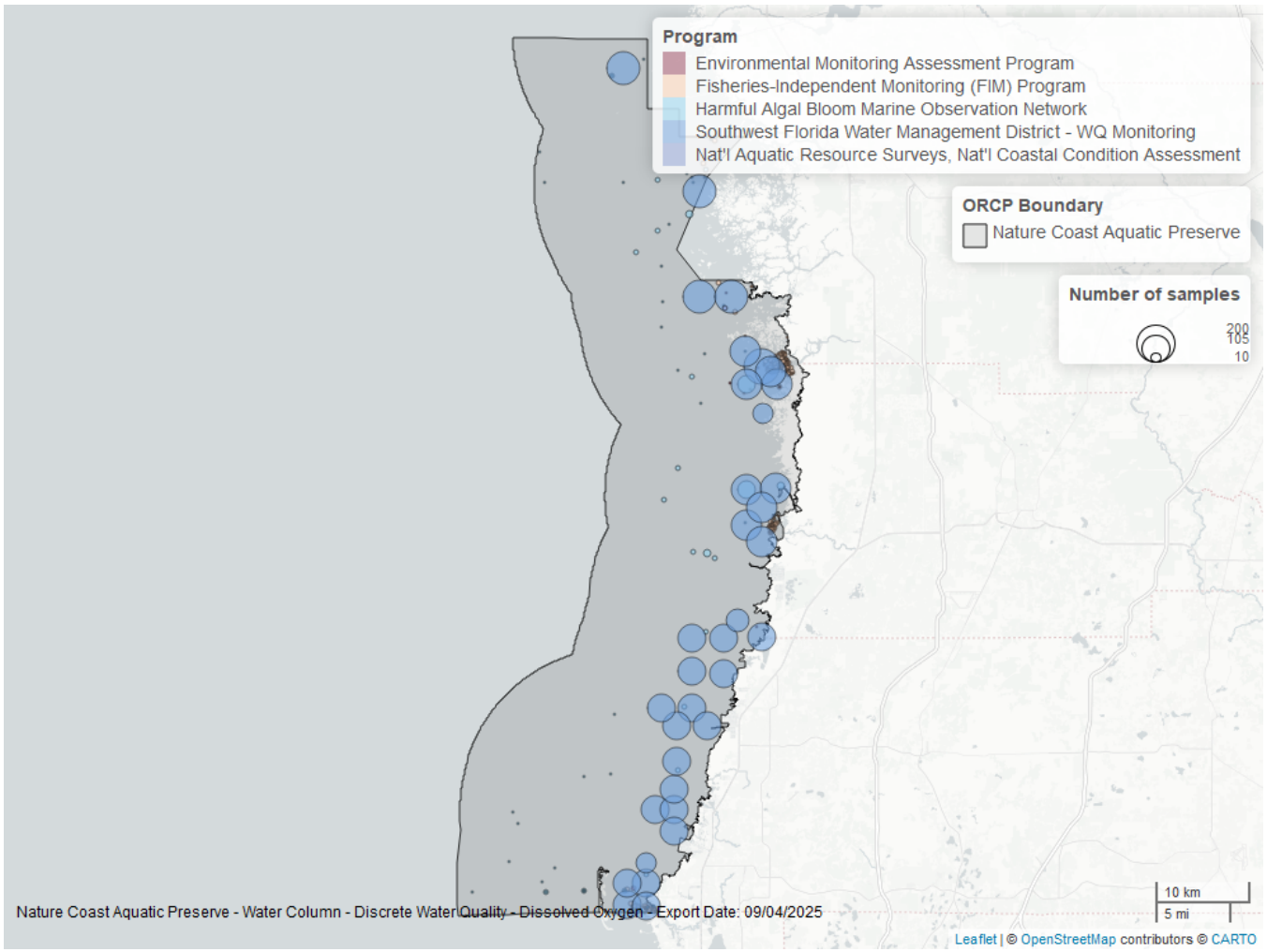

Figure 8: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 13: Programs contributing data for Dissolved Oxygen

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	5091	1996	2024
5008	2800	2021	2025
5002	1830	1995	2025
69	428	2003	2009
95	225	1982	2018
60	19	1993	2015
115	12	1991	1994
540	7	2017	2019
118	6	2005	2021

Program names:

60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey[7]
69 - Fisheries-Independent Monitoring (FIM) Program[11]
95 - Harmful Algal Bloom Marine Observation Network[8]

115 - Environmental Monitoring Assessment Program[12]
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment[10]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Dissolved Oxygen Saturation - Discrete

Seasonal Kendall-Tau Trend Analysis

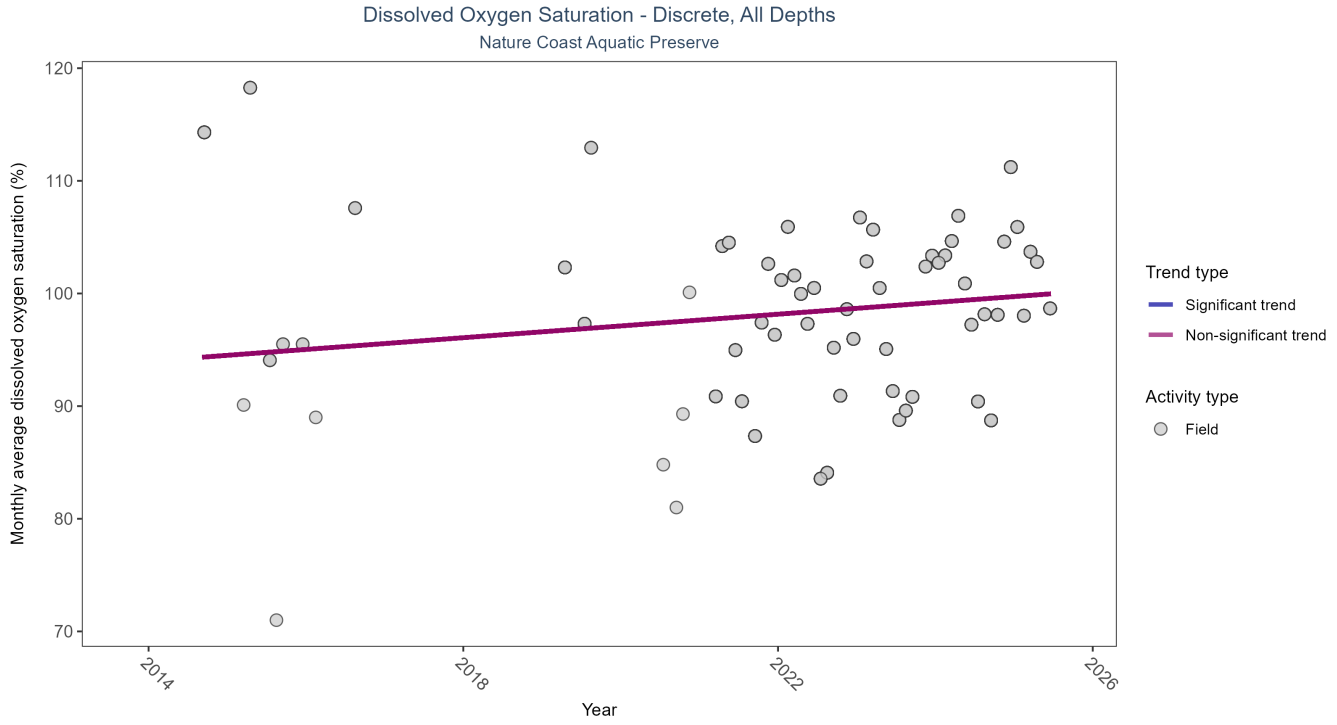

Figure 9: Scatter plot of monthly average dissolved oxygen saturation over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only dissolved oxygen saturation values measured in the field (circles)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

Table 14: Seasonal Kendall-Tau Trend Analysis for Dissolved Oxygen Saturation

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Field	No significant trend	3010	10	2014 - 2025	100.2	0.1354	93.9886	0.5214	0.4751

Dissolved oxygen saturation showed no detectable trend between 2014 and 2025.

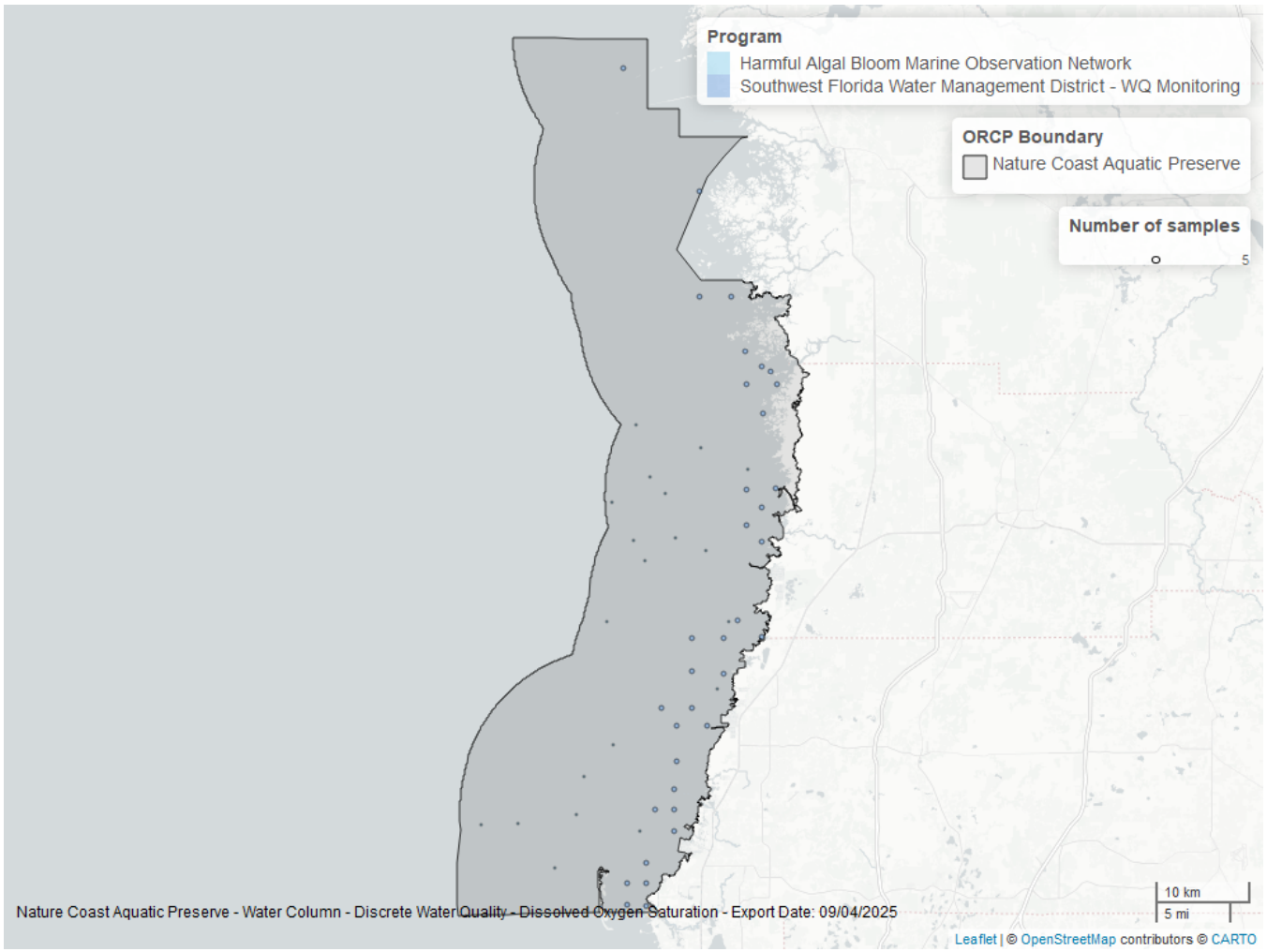

Figure 10: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 15: Programs contributing data for Dissolved Oxygen Saturation

ProgramID	*N_Data*	*YearMin*	*YearMax*
5008	2744	2021	2025
479	178	2019	2024
5002	50	2015	2025
95	38	2014	2016

Program names:

95 - Harmful Algal Bloom Marine Observation Network[8]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

pH - Discrete

Seasonal Kendall-Tau Trend Analysis

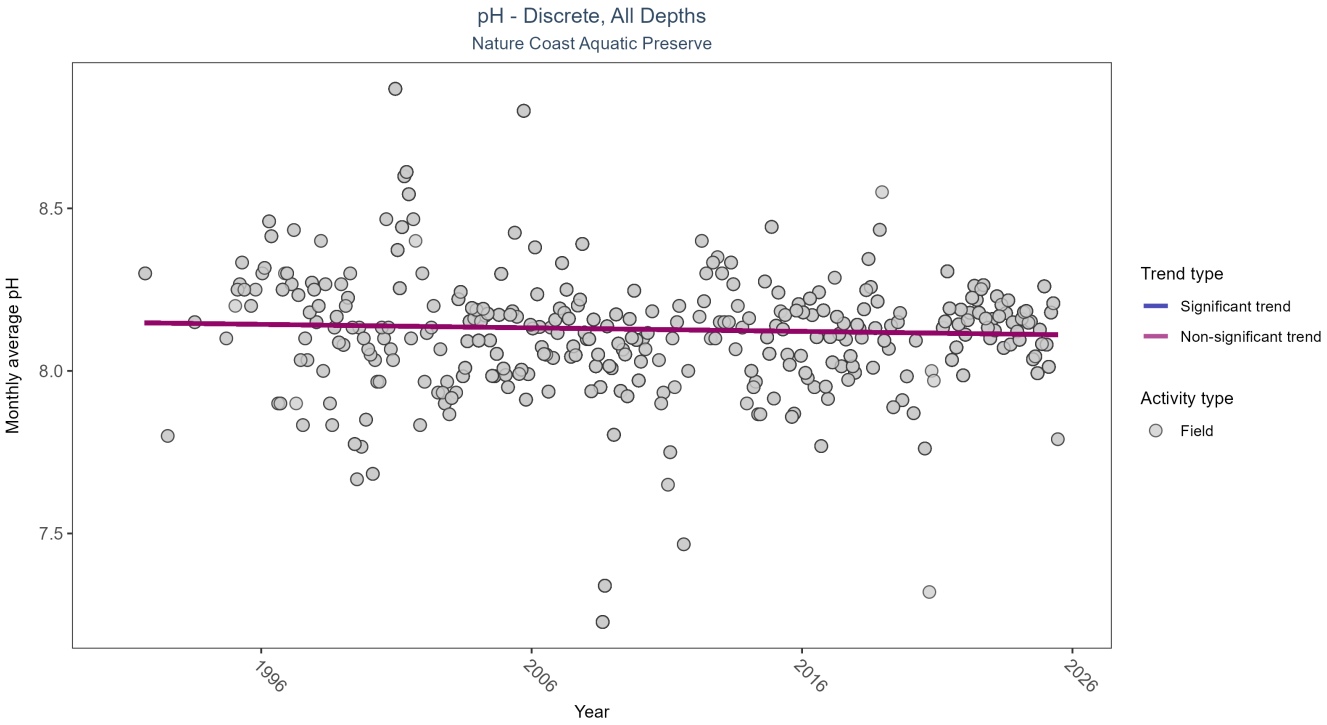

Figure 11: Scatter plot of monthly average pH over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only pH values measured in the field (circles) are included in the plot.

Table 16: Seasonal Kendall-Tau Trend Analysis for pH

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Field	No significant trend	7734	35	1991 - 2025	8.15	-0.0446	8.1486	-0.0011	0.2415

pH showed no detectable trend between 1991 and 2025.

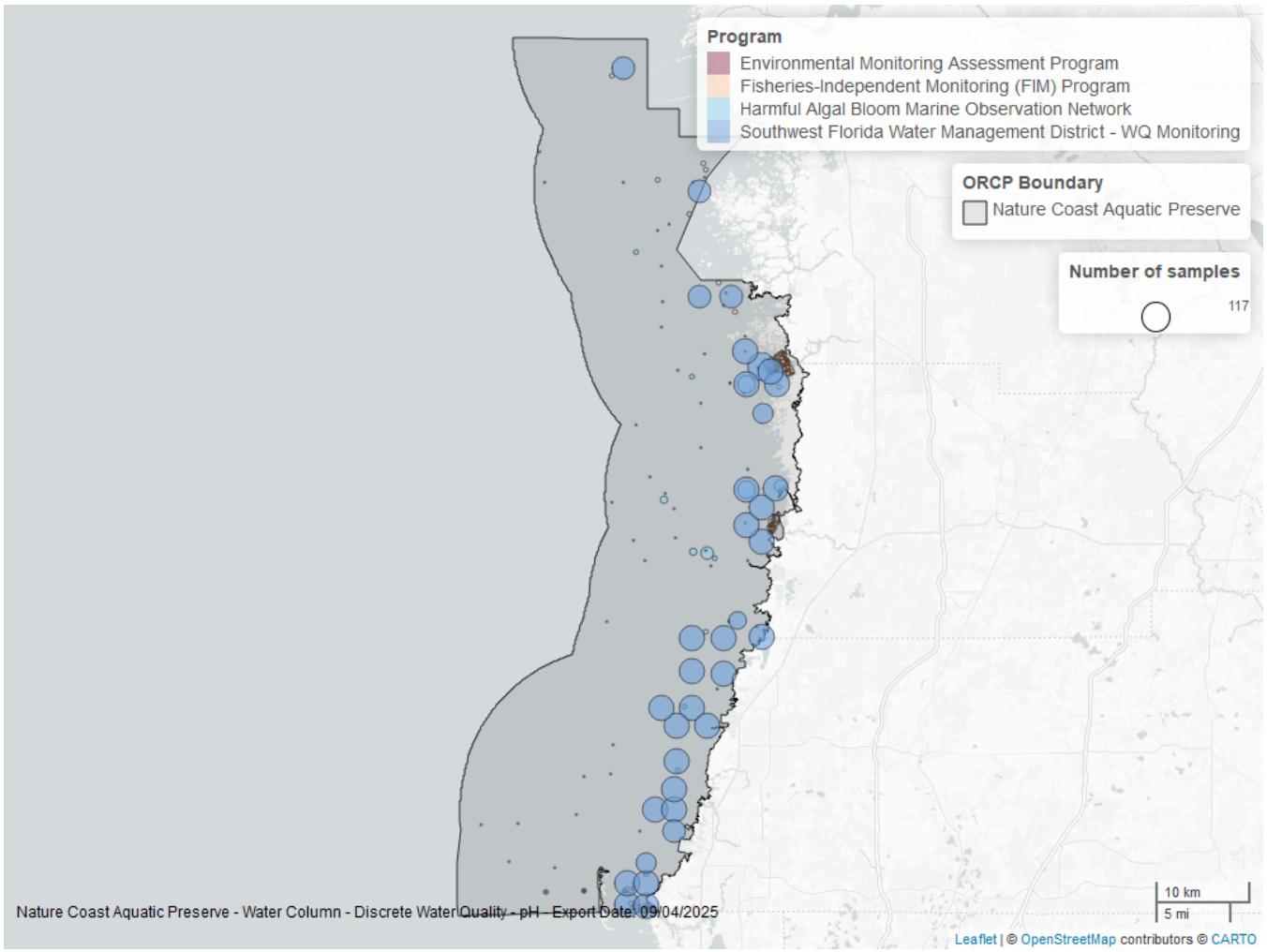

Figure 12: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 17: Programs contributing data for pH

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	3373	2000	2024
5008	2688	2021	2025
5002	961	1995	2025
69	428	2003	2009
95	276	2003	2018
115	12	1991	1994
540	3	2017	2018

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program[11]
95 - Harmful Algal Bloom Marine Observation Network[8]
115 - Environmental Monitoring Assessment Program[12]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
540 - Shellfish Harvest Area Classification Program[3]

5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Salinity - Discrete

Seasonal Kendall-Tau Trend Analysis

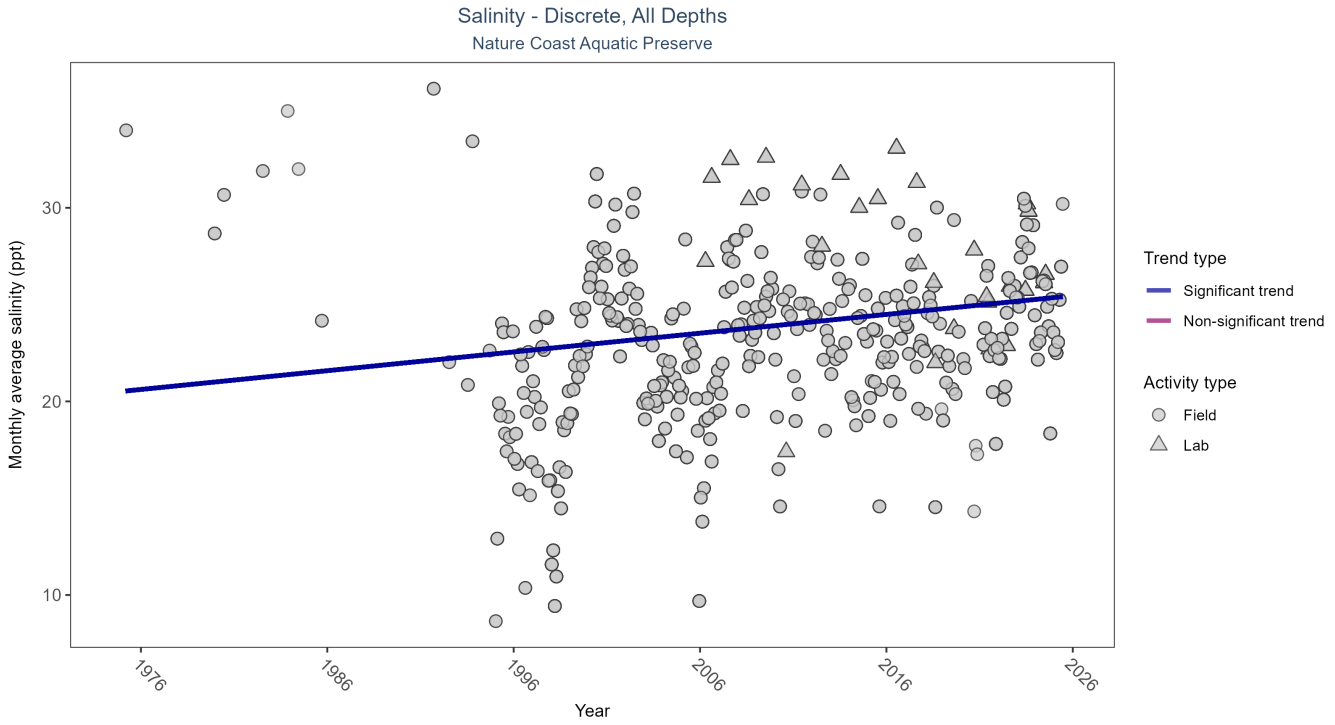

Figure 13: Scatter plot of monthly average salinity over time. If the time series included ten or more years of discrete observations, significant (blue) or non-significant (magenta) trend lines are also shown. Discrete salinity values derived from grab samples analyzed in the field (circles) or the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

Table 18: Seasonal Kendall-Tau Trend Analysis for Salinity

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
All	Significantly increasing trend	11396	42	1975 - 2025	24.2	0.1582	20.5198	0.0969	0

Monthly average salinity increased by 0.1 ppt per year.

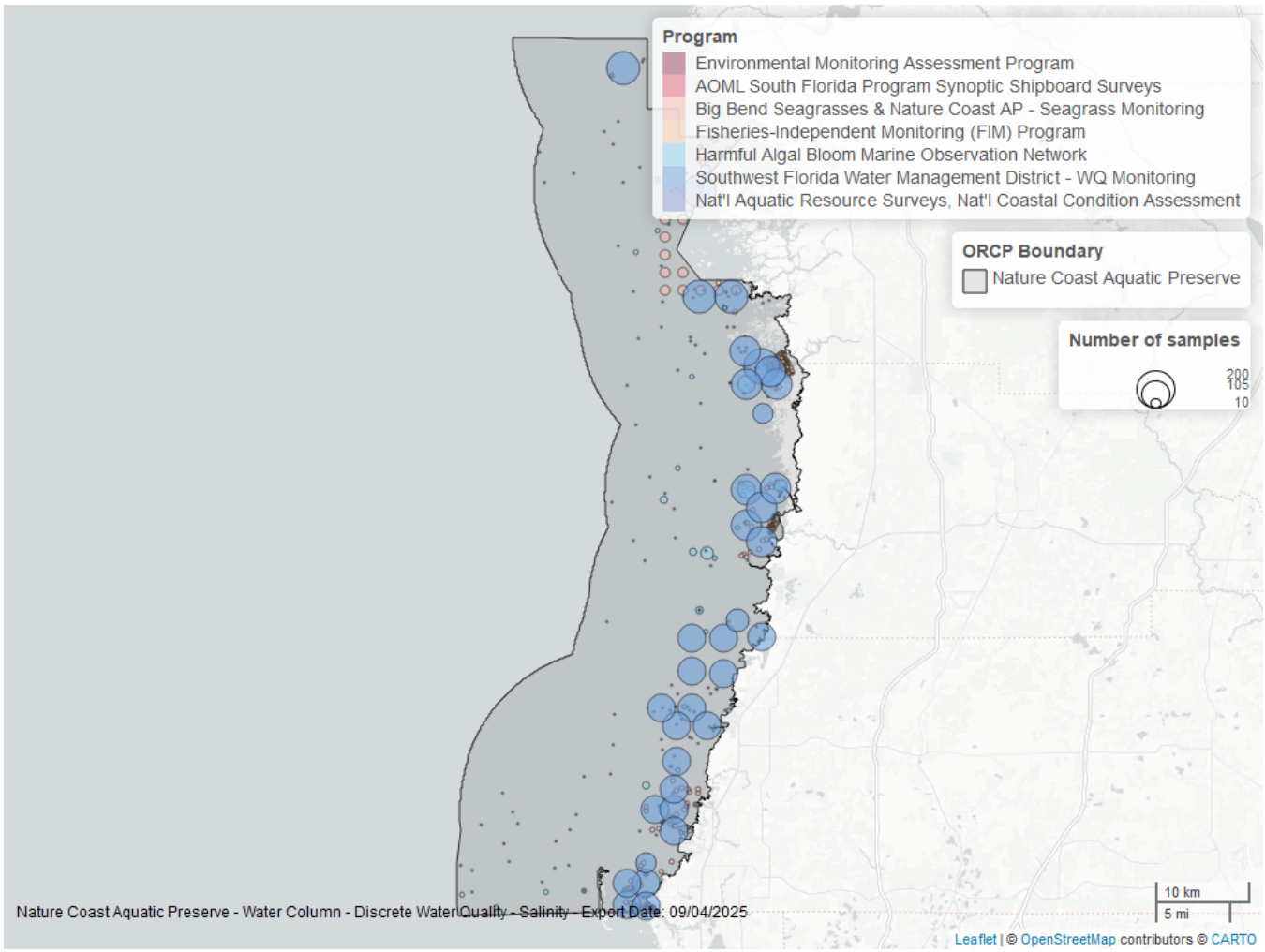

Figure 14: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 19: Programs contributing data for Salinity

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	5120	1996	2024
5008	2854	2021	2025
5002	1977	1995	2025
560	580	2006	2024
69	428	2003	2009
95	403	1975	2018
60	16	1993	2015
115	12	1991	1994
540	7	2017	2019
118	5	2021	2021
3	3	2024	2024

Program names:

3 - Atlantic Oceanographic and Meteorological Laboratory (AOML) South Florida Program Synoptic Shipboard Surveys[6]

60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey[7]
69 - Fisheries-Independent Monitoring (FIM) Program[11]
95 - Harmful Algal Bloom Marine Observation Network[8]
115 - Environmental Monitoring Assessment Program[12]
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment[10]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
540 - Shellfish Harvest Area Classification Program[3]
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring[13]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Secchi Depth - Discrete

Seasonal Kendall-Tau Trend Analysis

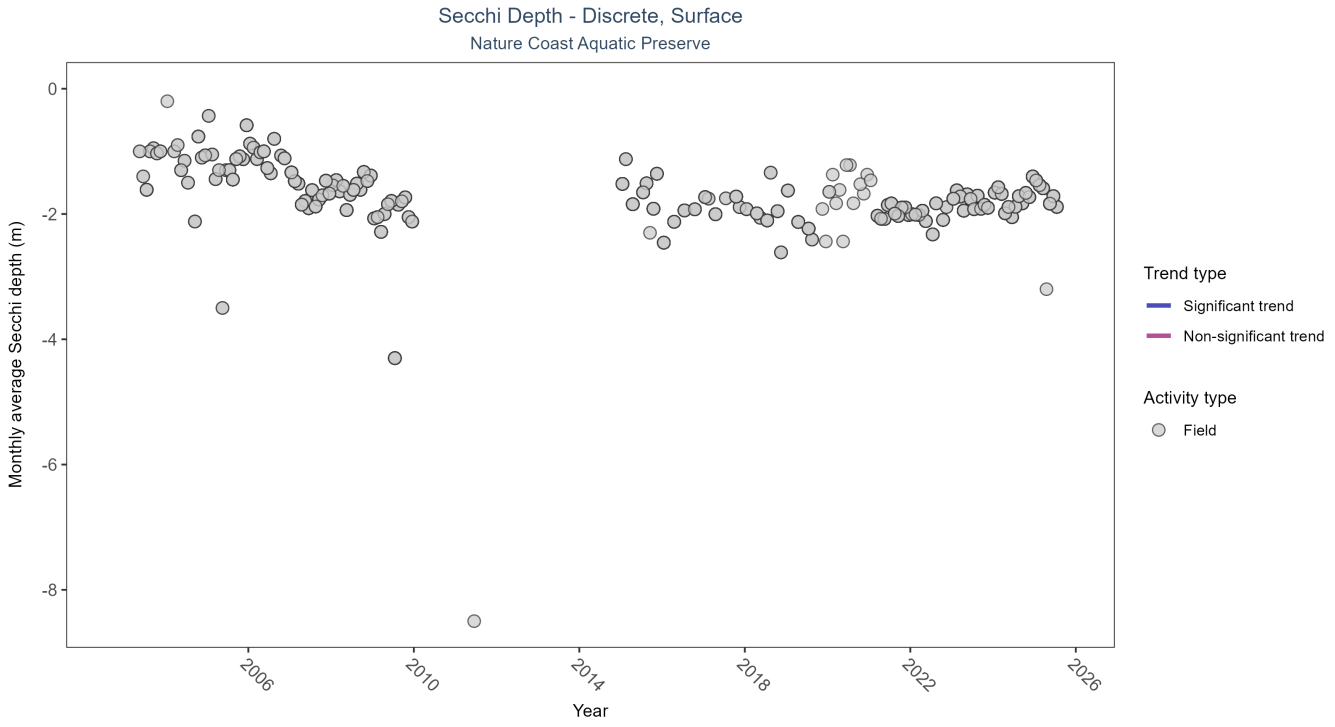

Figure 15: Scatter plot of monthly average Secchi depth over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Secchi depth is only measured in the field (circles).

Table 20: Seasonal Kendall-Tau Trend Analysis for Secchi Depth

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Field	Significantly decreasing trend	5226	23	1991 - 2025	-1.595	-0.3196	-1.0651	-0.0199	0

Monthly average Secchi depth became deeper by 0.02 m per year, indicating an increase in water clarity.

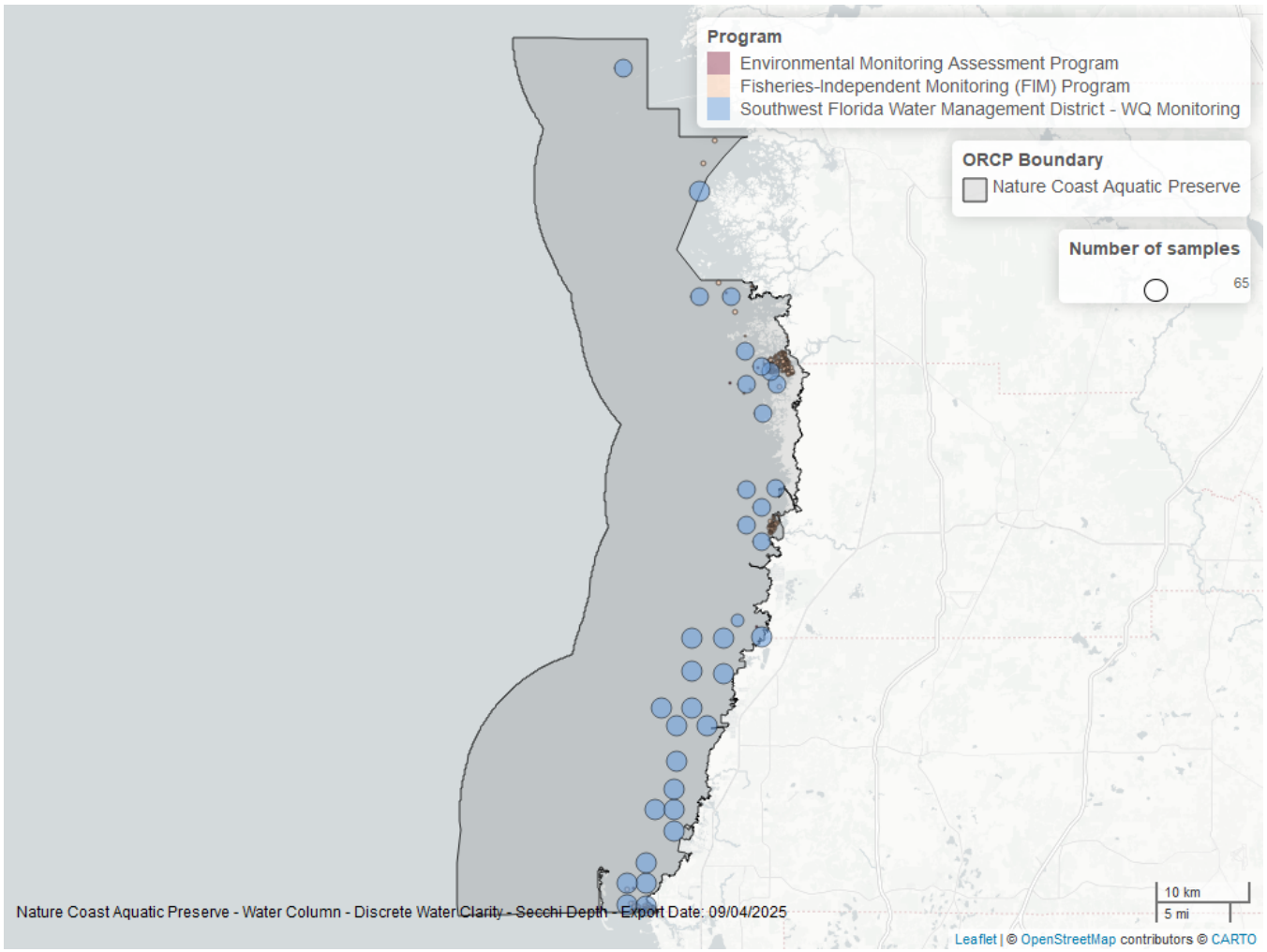

Figure 16: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 21: Programs contributing data for Secchi Depth

ProgramID	*N_Data*	*YearMin*	*YearMax*
5008	2474	2021	2025
479	2256	2007	2024
69	428	2003	2009
5002	36	2015	2025
514	23	2019	2024
115	6	1991	1994
60	3	2004	2015

Program names:

60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey[7]
69 - Fisheries-Independent Monitoring (FIM) Program[11]
115 - Environmental Monitoring Assessment Program[12]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]

5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Total Nitrogen - Discrete

Total Nitrogen Calculation:

The logic for calculated Total Nitrogen was provided by Kevin O'Donnell and colleagues at FDEP (with the help of Jay Silvanima, Watershed Monitoring Section). The following logic is used, in this order, based on the availability of specific nitrogen components.

1) TN = TKN + NO3O2;
2) TN = TKN + NO3 + NO2;
3) TN = ORGN + NH4 + NO3O2;
4) TN = ORGN + NH4 + NO2 + NO3;
5) TN = TKN + NO3;
6) TN = ORGN + NH4 + NO3;

Additional Information:

- Rules for use of sample fraction:
  - Florida Department of Environmental Protection (FDEP) report that if both "Total" and "Dissolved" components are reported, only "Total" is used. If the total is not reported, then the dissolved components are used as a best available replacement.
  - Total nitrogen calculations are done using nitrogen components with the same sample fraction, nitrogen components with mixed total/dissolved sample fractions are not used. In other words, total nitrogen can be calculated when TKN and NO3O2 are both total sample fractions, or when both are dissolved sample fractions. *Future calculations of total nitrogen values may be based on components with mixed sample fractions.*
- Values inserted into data:
  - ParameterName = "Total Nitrogen"
  - SEACAR_QAQCFlagCode = "1Q"
  - SEACAR_QAQC_Description = "SEACAR Calculated"

Seasonal Kendall-Tau Trend Analysis

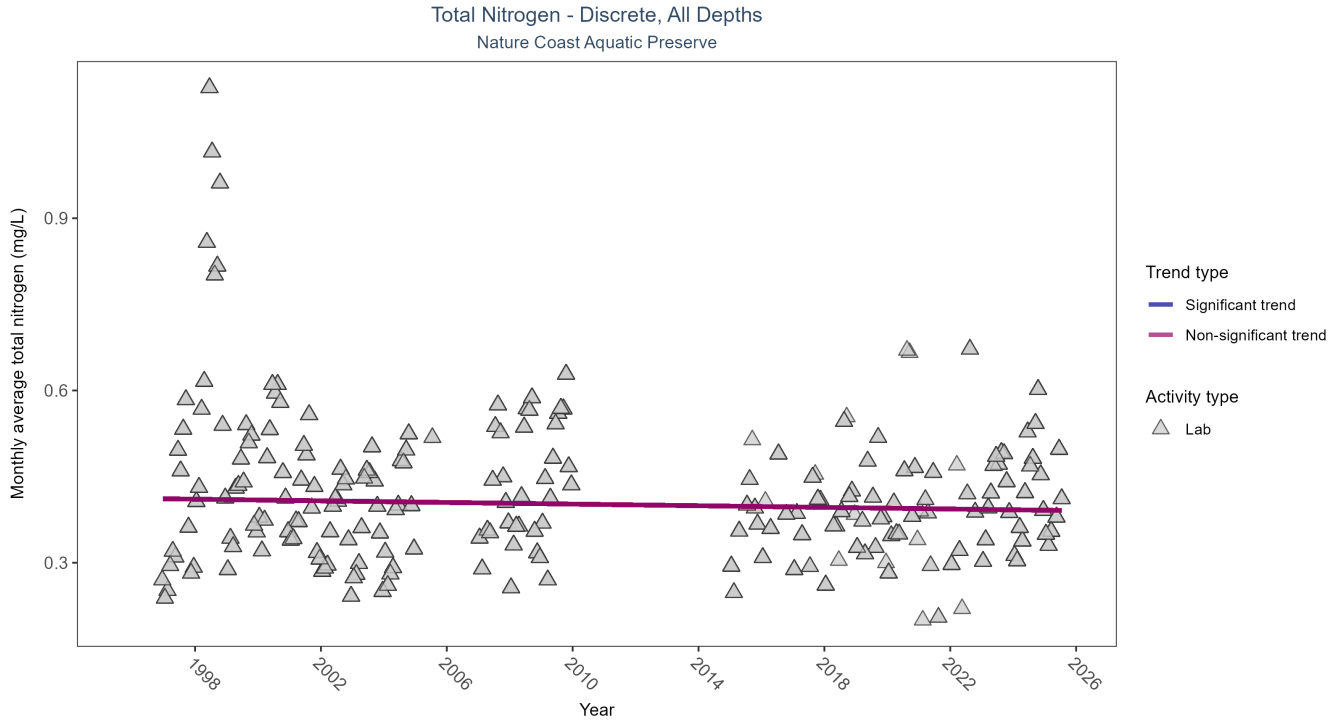

Figure 17: Scatter plot of monthly average total nitrogen over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only nitrogen values obtained from laboratory analyses (triangles) are included in the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

Table 22: Seasonal Kendall-Tau Trend Analysis for Total Nitrogen

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	No significant trend	7068	24	1996 - 2025	0.39	-0.0488	0.4121	-0.0007	0.2353

Total nitrogen showed no detectable trend between 1996 and 2025.

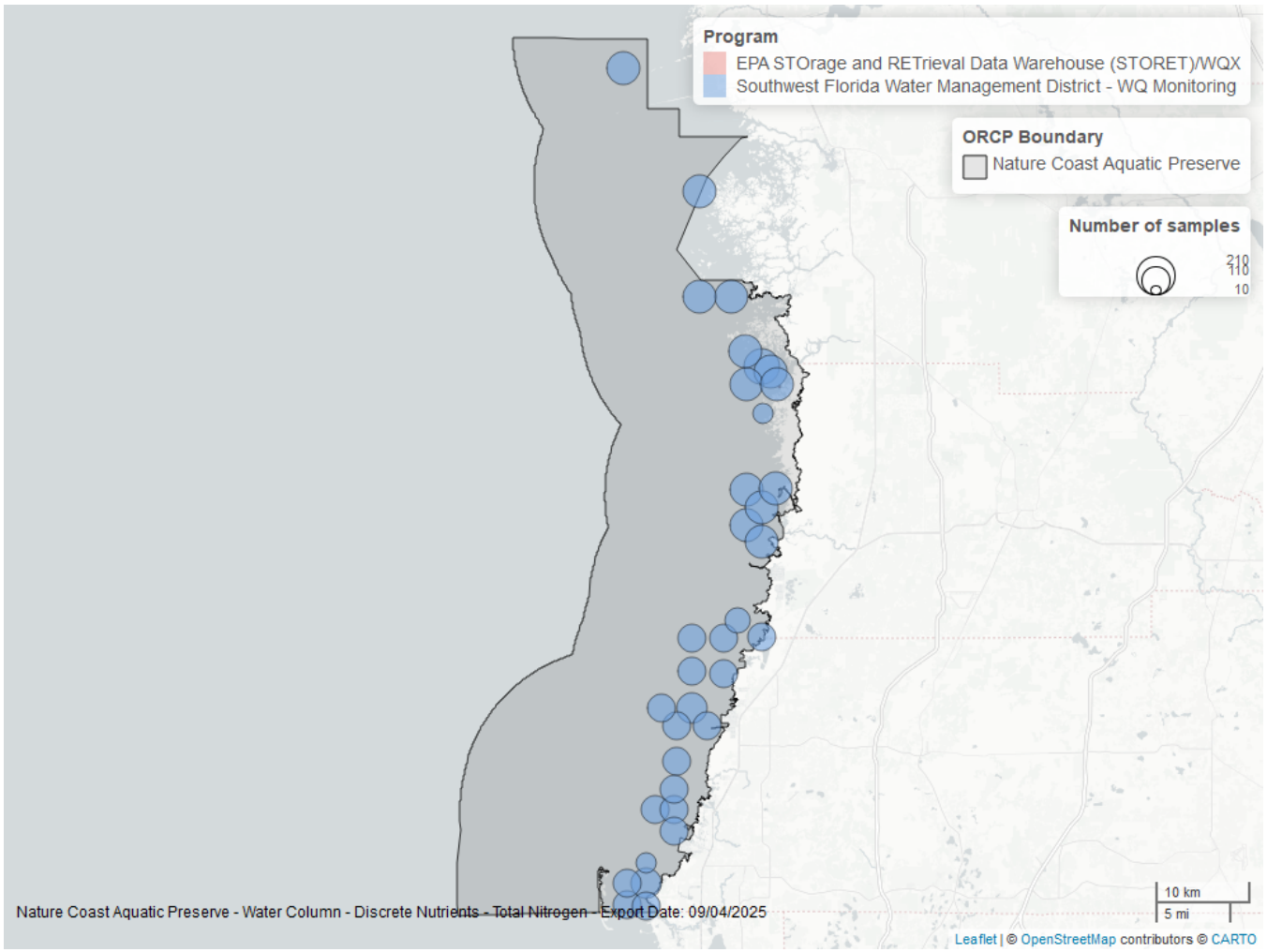

Figure 18: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 23: Programs contributing data for Total Nitrogen

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	5349	1996	2024
5008	1659	2021	2025
5002	79	2015	2024
514	21	2019	2024
540	6	2017	2019
103	2	2005	2005

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX[9]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Total Phosphorus - Discrete

Seasonal Kendall-Tau Trend Analysis

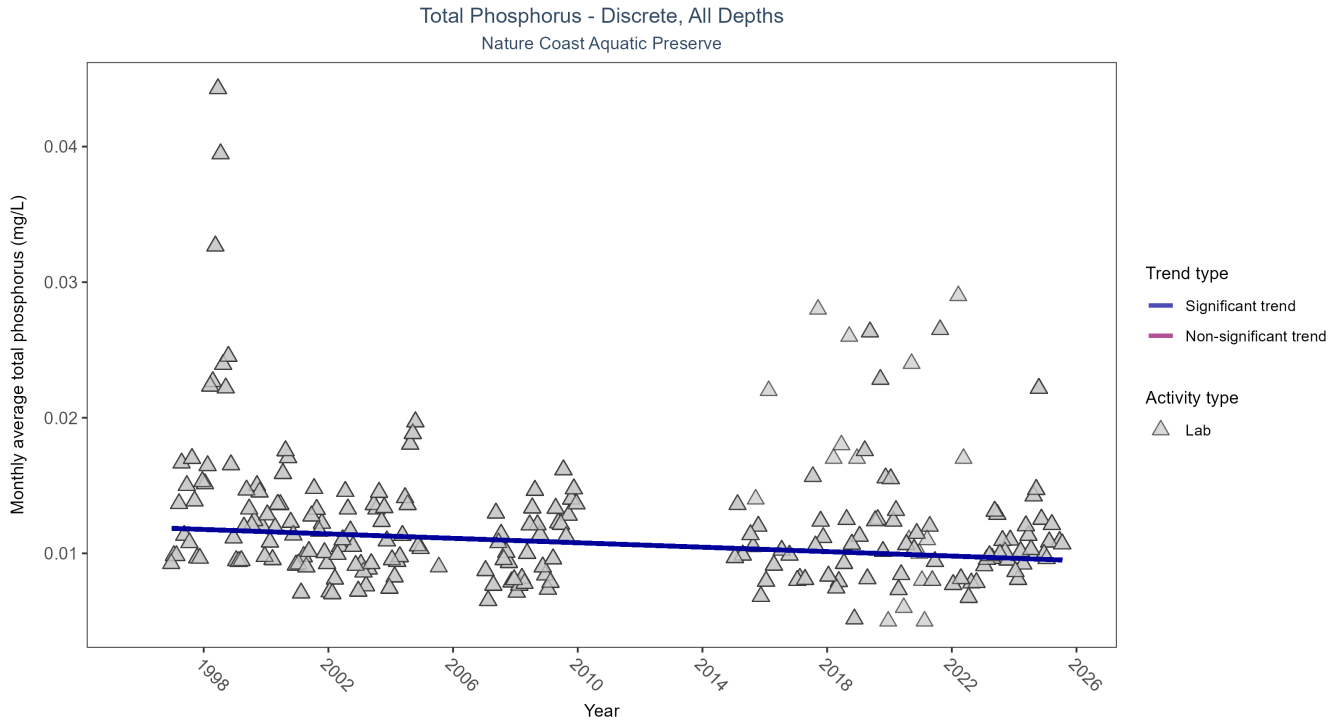

Figure 19: Scatter plot of monthly average total phosphorus over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only phosphorus values obtained from laboratory analyses (triangles) are included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

Table 24: Seasonal Kendall-Tau Trend Analysis for Total Phosphorus

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	Significantly decreasing trend	7060	24	1996 - 2025	0.009	-0.1563	0.0119	-0.0001	0.0007

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

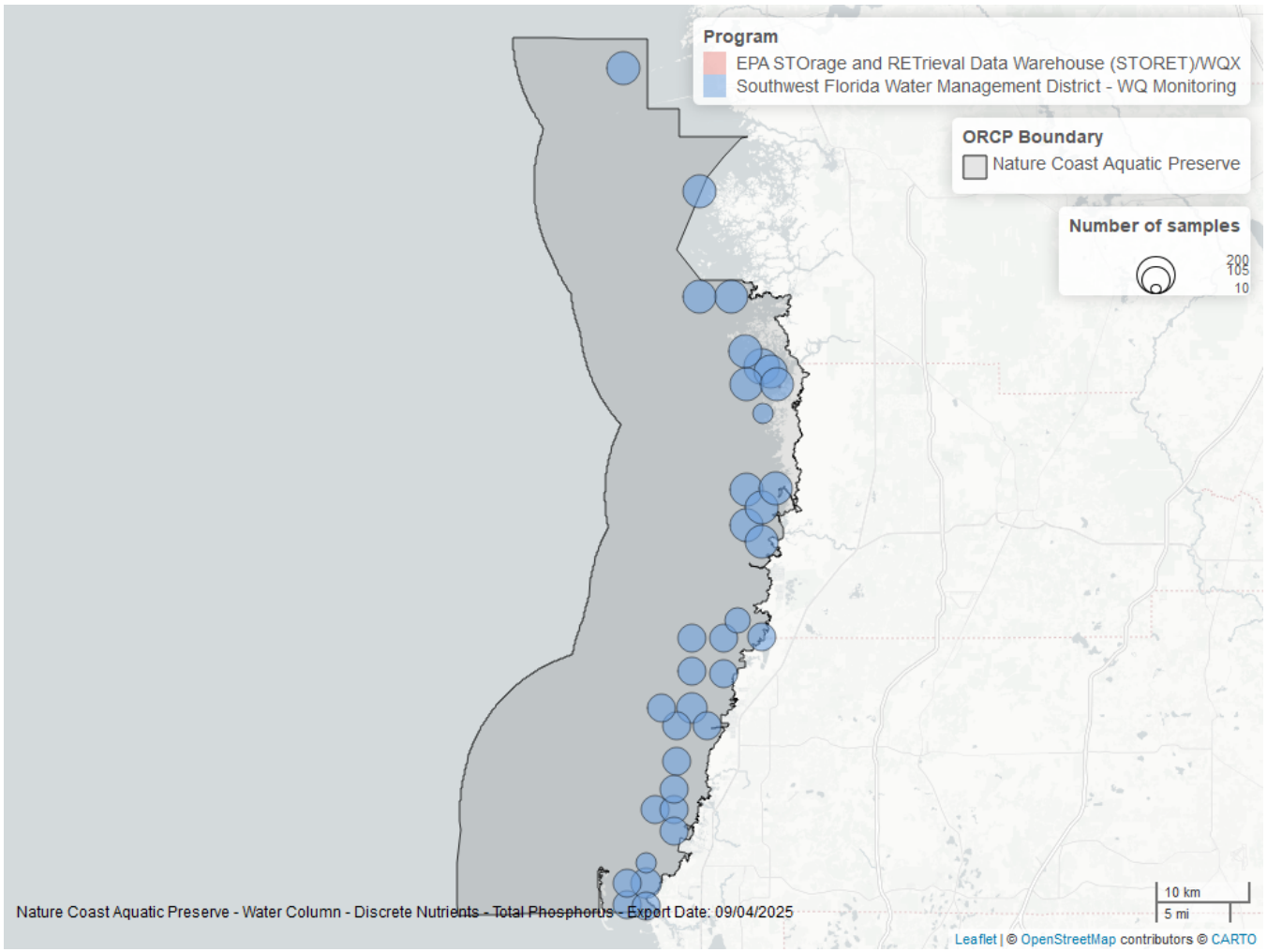

Figure 20: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 25: Programs contributing data for Total Phosphorus

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	5351	1996	2024
5008	1603	2021	2025
5002	79	2015	2024
514	21	2019	2024
540	7	2017	2019
103	2	2005	2005

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX[9]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
514 - Florida LAKEWATCH Program[2]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Turbidity - Discrete

Seasonal Kendall-Tau Trend Analysis

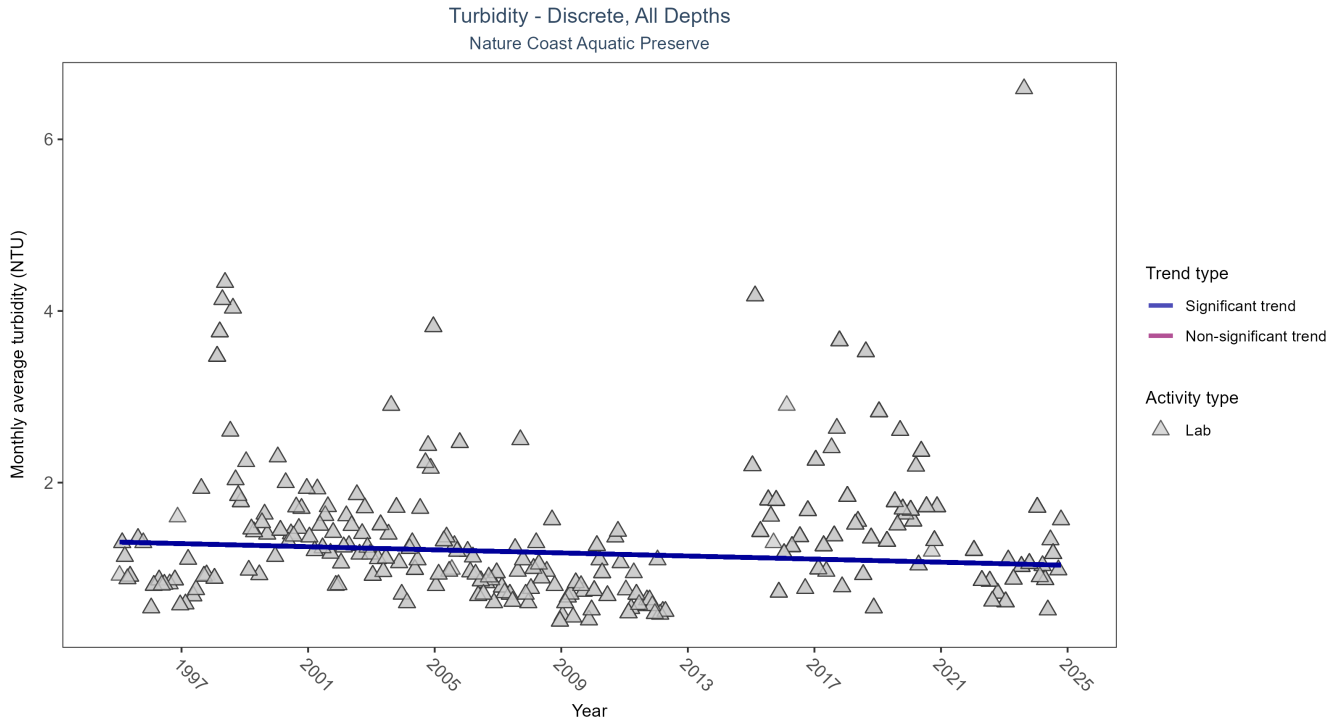

Figure 21: Scatter plot of monthly average turbidity over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only turbidity values measured in the laboratory (triangles) are included in the plot.

Table 26: Seasonal Kendall-Tau Trend Analysis for Turbidity

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Lab	Significantly decreasing trend	2071	27	1995 - 2024	0.97	-0.1281	1.3072	-0.009	0.0204

Monthly average turbidity decreased by 0.01 NTU per year, indicating an increase in water clarity.

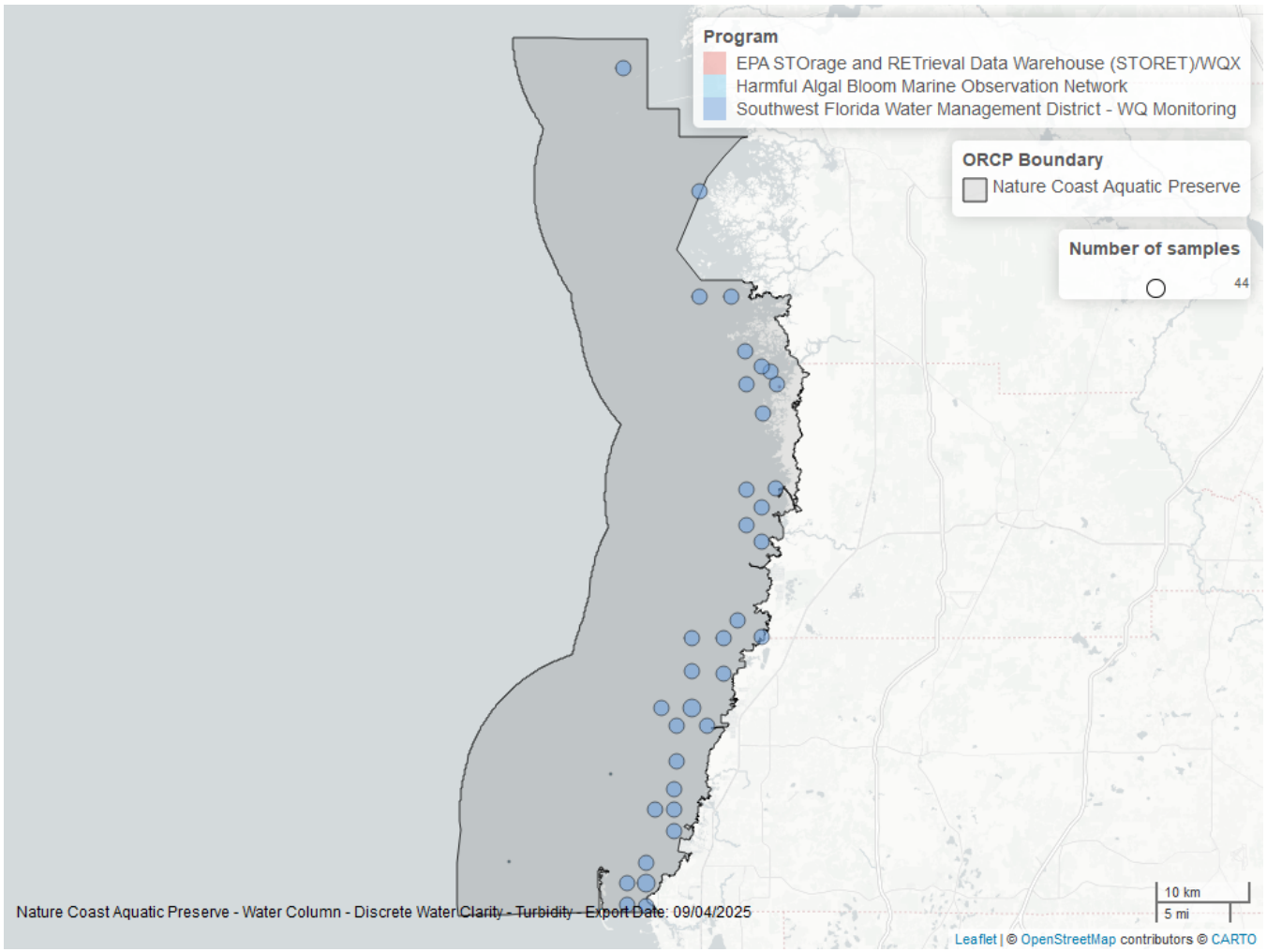

Figure 22: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 27: Programs contributing data for Turbidity

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	1310	2015	2024
5002	761	1995	2024
95	4	2003	2003
103	1	2005	2005

Program names:

95 - Harmful Algal Bloom Marine Observation Network[8]
103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX[9]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
5002 - Florida STORET / WIN[4]

Water Temperature - Discrete

Seasonal Kendall-Tau Trend Analysis

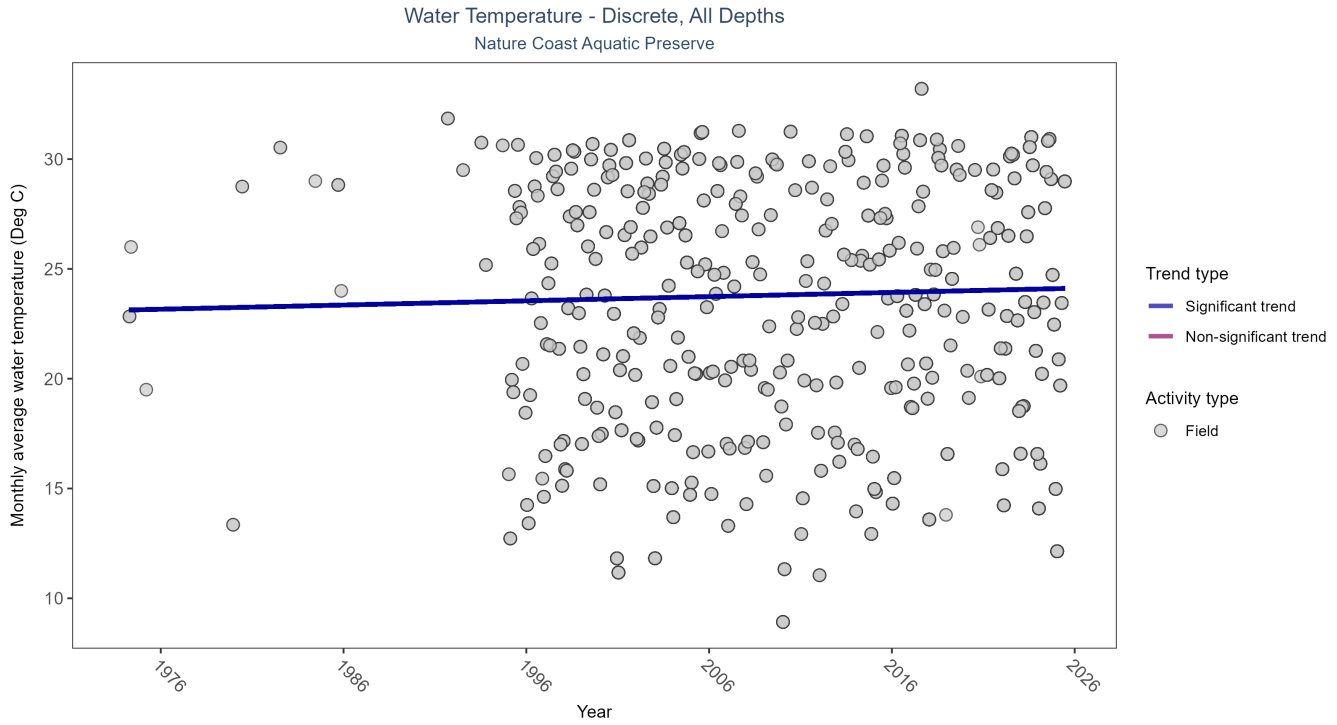

Figure 23: Scatter plot of monthly average water temperature over time. If the time series included ten or more years of discrete observations, a significant (blue) or non-significant (magenta) trend line is also shown. Only water temperature measurements taken in the field (circles) are included in the plot.

Table 28: Seasonal Kendall-Tau Trend Analysis for Water Temperature

Activity Type	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
Field	Significantly increasing trend	9393	42	1974 - 2025	24.2	0.085	23.1253	0.0191	0.0271

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

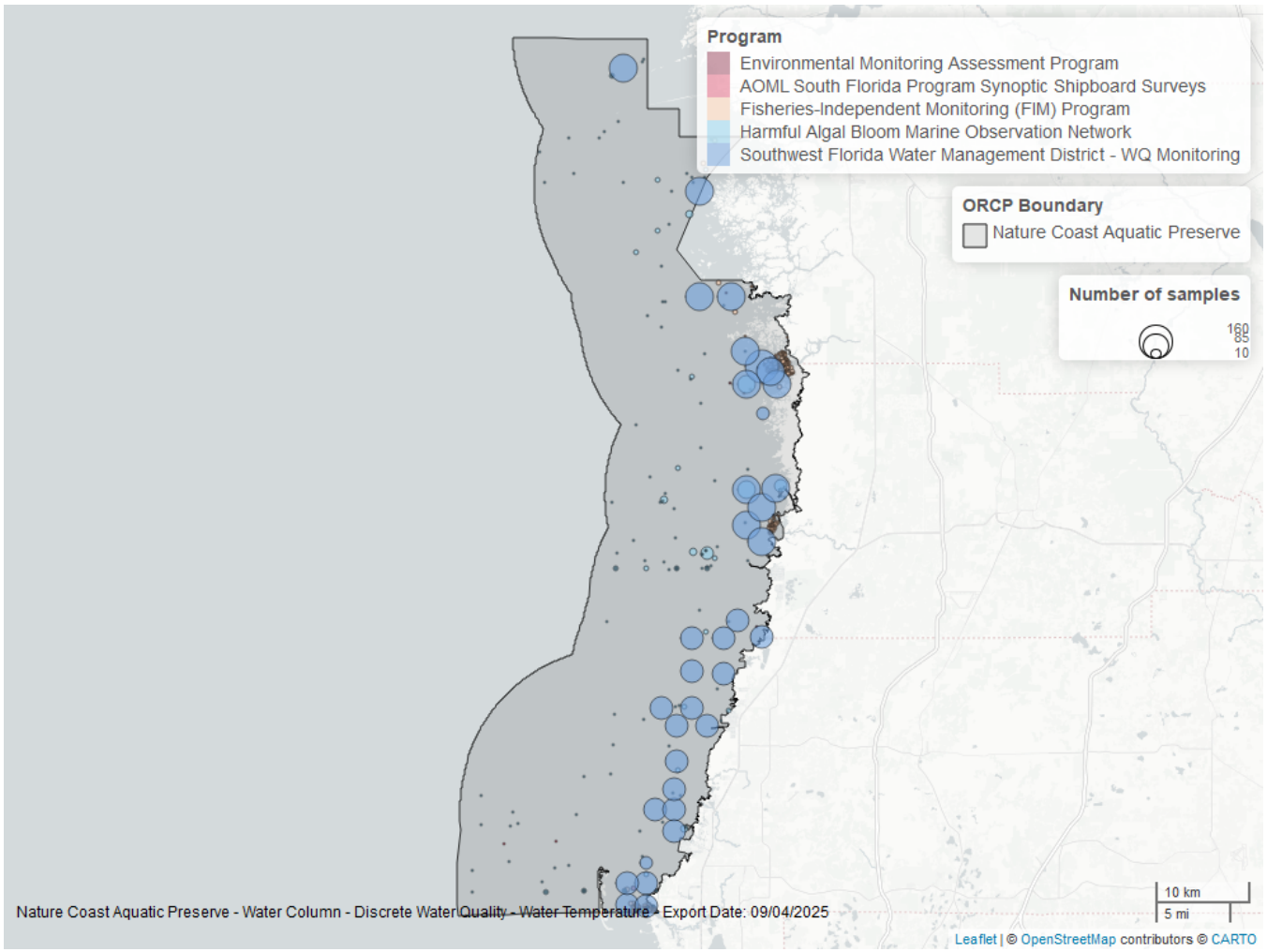

Figure 24: Map showing location of discrete water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Table 29: Programs contributing data for Water Temperature

ProgramID	*N_Data*	*YearMin*	*YearMax*
479	3789	1996	2024
5008	2744	2021	2025
5002	1985	1995	2025
69	428	2003	2009
95	408	1974	2018
60	17	1993	2015
115	12	1991	1994
540	7	2017	2019
3	3	2024	2024

Program names:

3 - Atlantic Oceanographic and Meteorological Laboratory (AOML) South Florida Program Synoptic Shipboard Surveys[6]
60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey[7]

69 - Fisheries-Independent Monitoring (FIM) Program[11]
95 - Harmful Algal Bloom Marine Observation Network[8]
115 - Environmental Monitoring Assessment Program[12]
479 - Southwest Florida Water Management District - Water Quality Monitoring[1]
540 - Shellfish Harvest Area Classification Program[3]
5002 - Florida STORET / WIN[4]
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region[5]

Water Quality - Continuous

The following files were used in the continuous analysis:

- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_NW-2025-Sep-19.txt*
- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_Saturation_NW-2025-Sep-19.txt*
- *Combined_WQ_WC_NUT_cont_pH_NW-2025-Sep-19.txt*
- *Combined_WQ_WC_NUT_cont_Salinity_NW-2025-Sep-19.txt*
- *Combined_WQ_WC_NUT_cont_Turbidity_NW-2025-Sep-19.txt*
- *Combined_WQ_WC_NUT_cont_Water_Temperature_NW-2025-Sep-19.txt*

Continuous monitoring locations in Nature Coast Aquatic Preserve

Table 30: Station overview for Continuous parameters by Program

ProgramID	*ProgramLocationID*	*Years of Data*	*Use in Analysis*	*Parameters*
7	283925082441201	2	FALSE	TempW
7	284506082435801	2	FALSE	TempW
471	BBSHS	1	FALSE	DO , DOS , pH , Turb
471	BBSHS	13	TRUE	Sal , TempW

Program names:

7 - National Water Information System[14]
471 - Big Bend Seagrasses Aquatic Preserves Continuous Water Quality Monitoring[15]

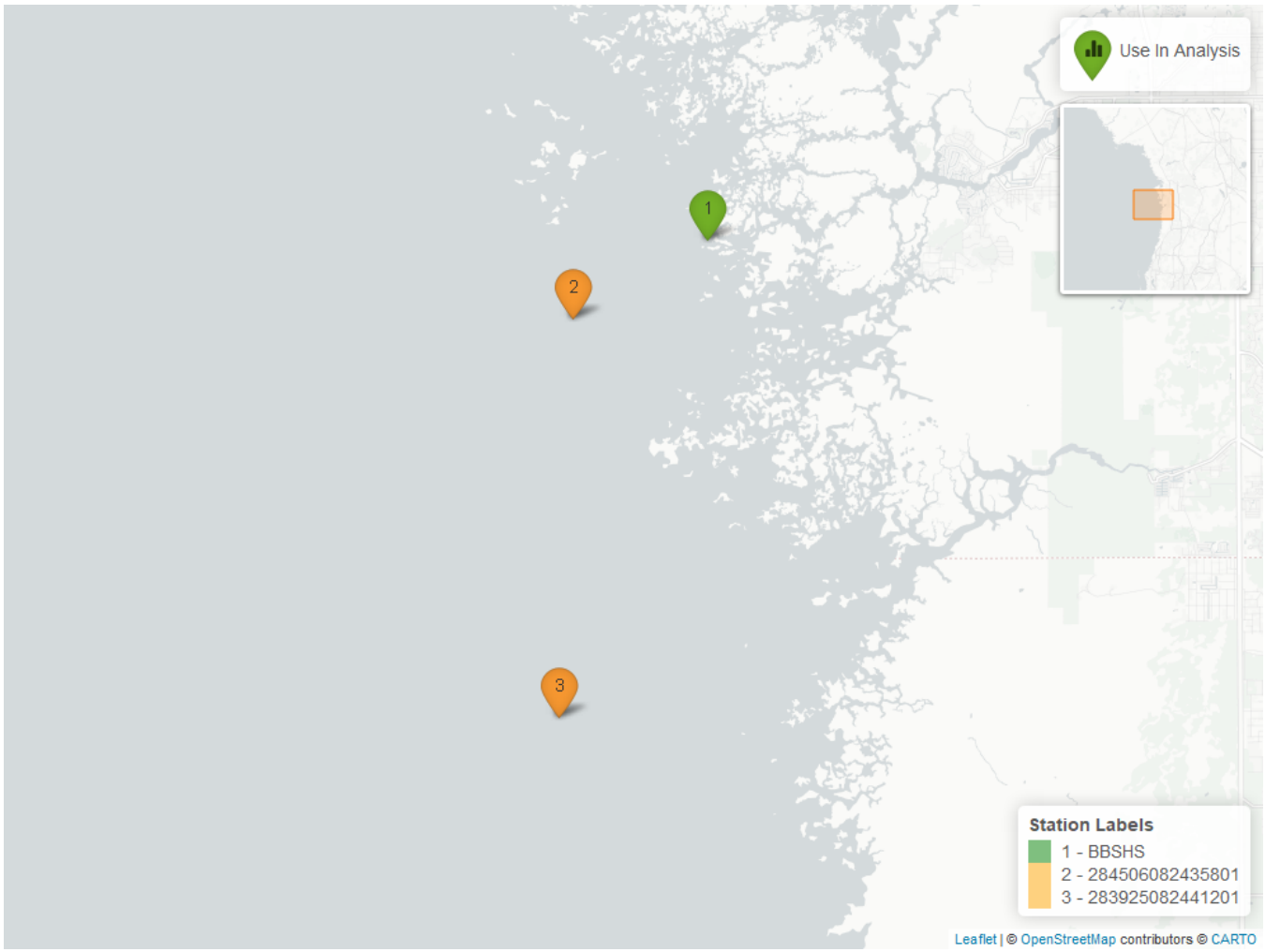

Figure 25: Map showing continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. Sites marked as *Use In Analysis* (green) are featured in this report.

Dissolved Oxygen - Continuous

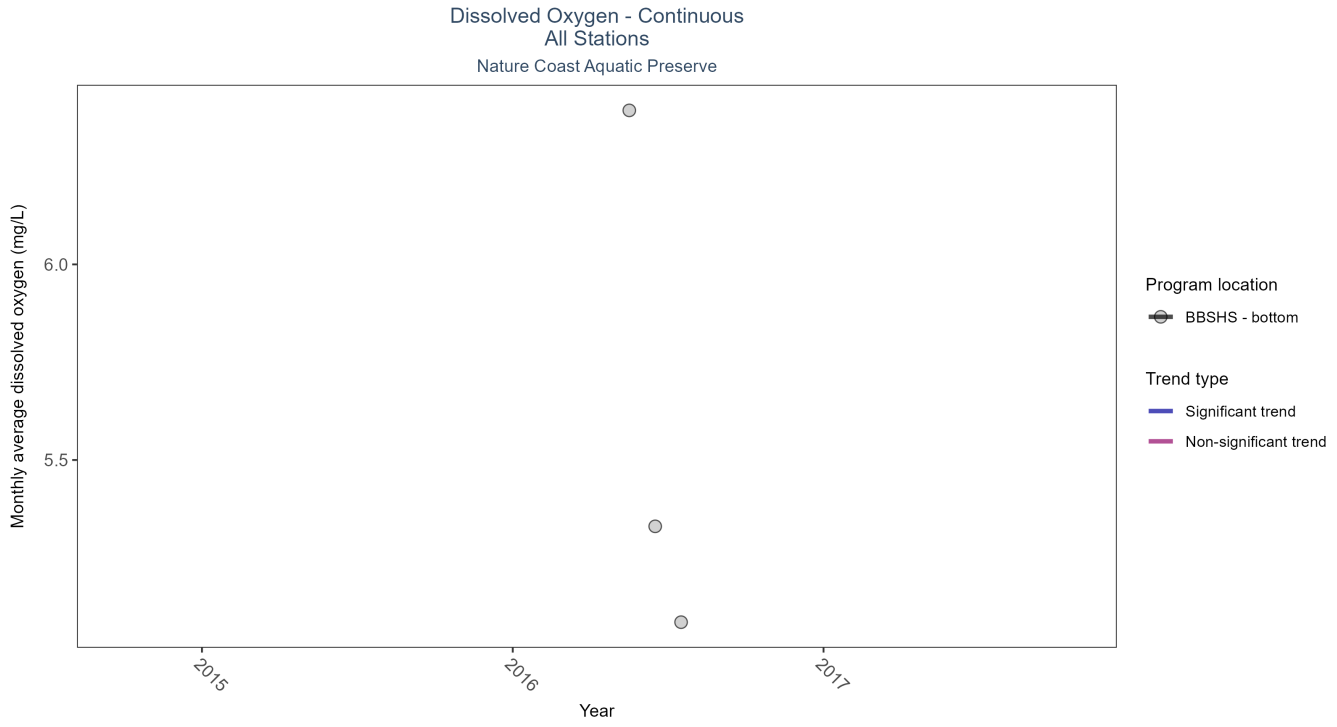

Figure 26: Scatter plot of monthly average dissolved oxygen over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 31: Seasonal Kendall-Tau Results for Dissolved Oxygen - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
BBSHS	Insufficient data to calculate trend	6555	1	2016 - 2016	5.7	-	-	-	-

There was insufficient data to fit a model for one location.

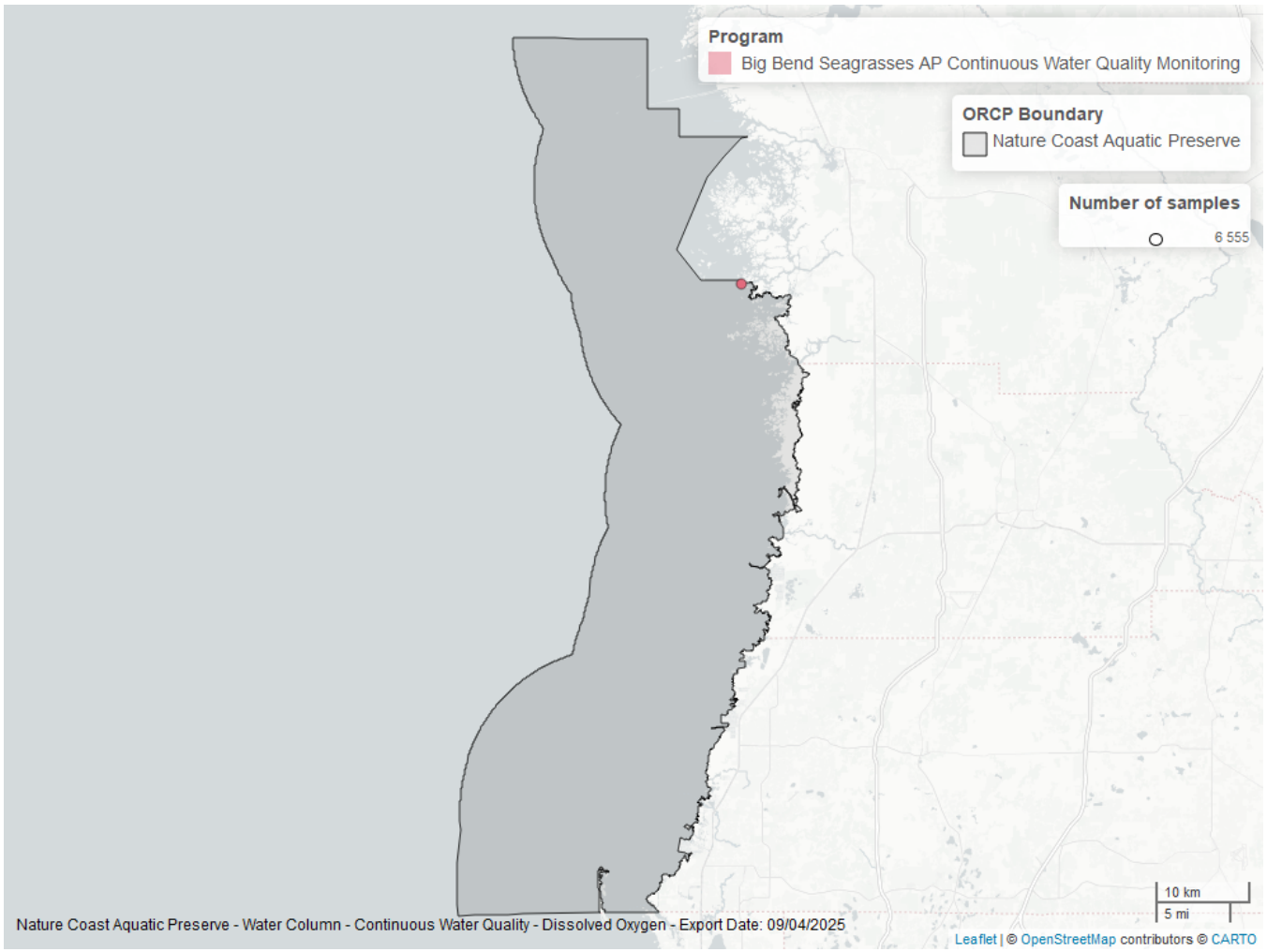

Figure 27: Map showing location of dissolved oxygen continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Dissolved Oxygen Saturation - Continuous

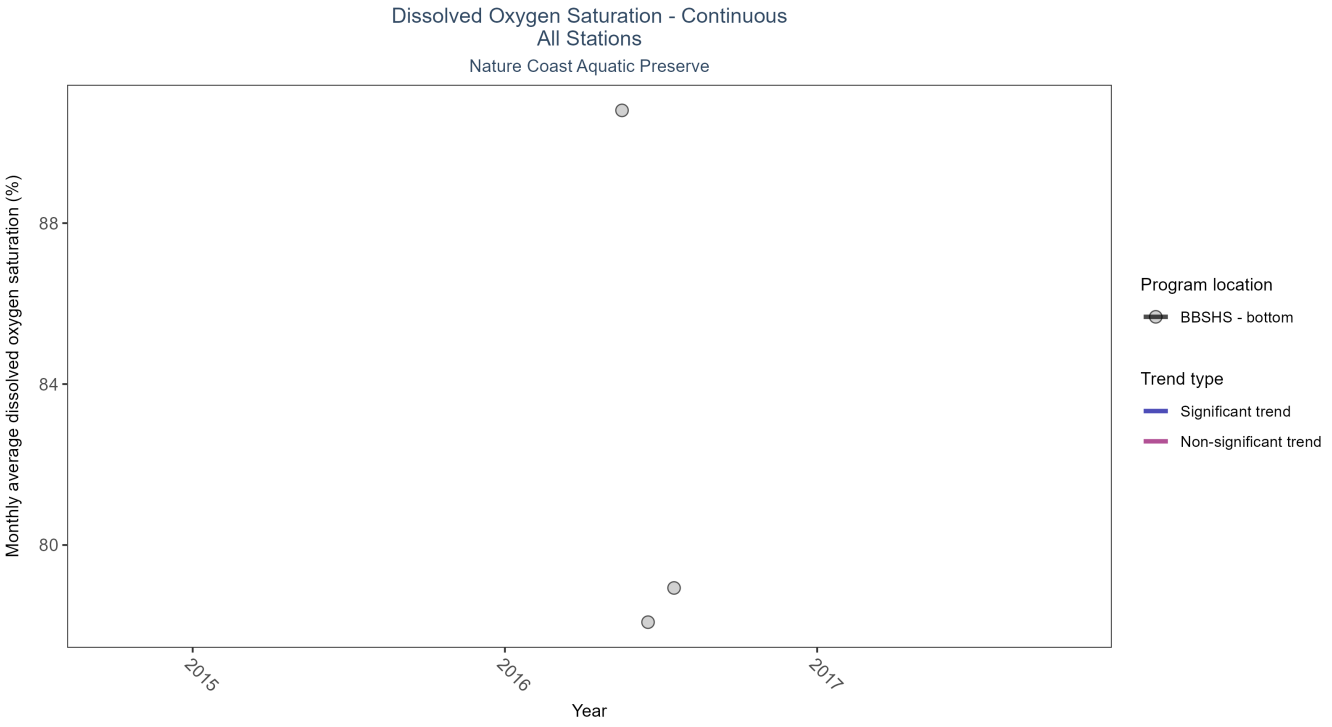

Figure 28: Scatter plot of monthly average dissolved oxygen saturation over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 32: Seasonal Kendall-Tau Results for Dissolved Oxygen Saturation - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
BBSHS	Insufficient data to calculate trend	6555	1	2016 - 2016	82.6	-	-	-	-

There was insufficient data to fit a model for one location.

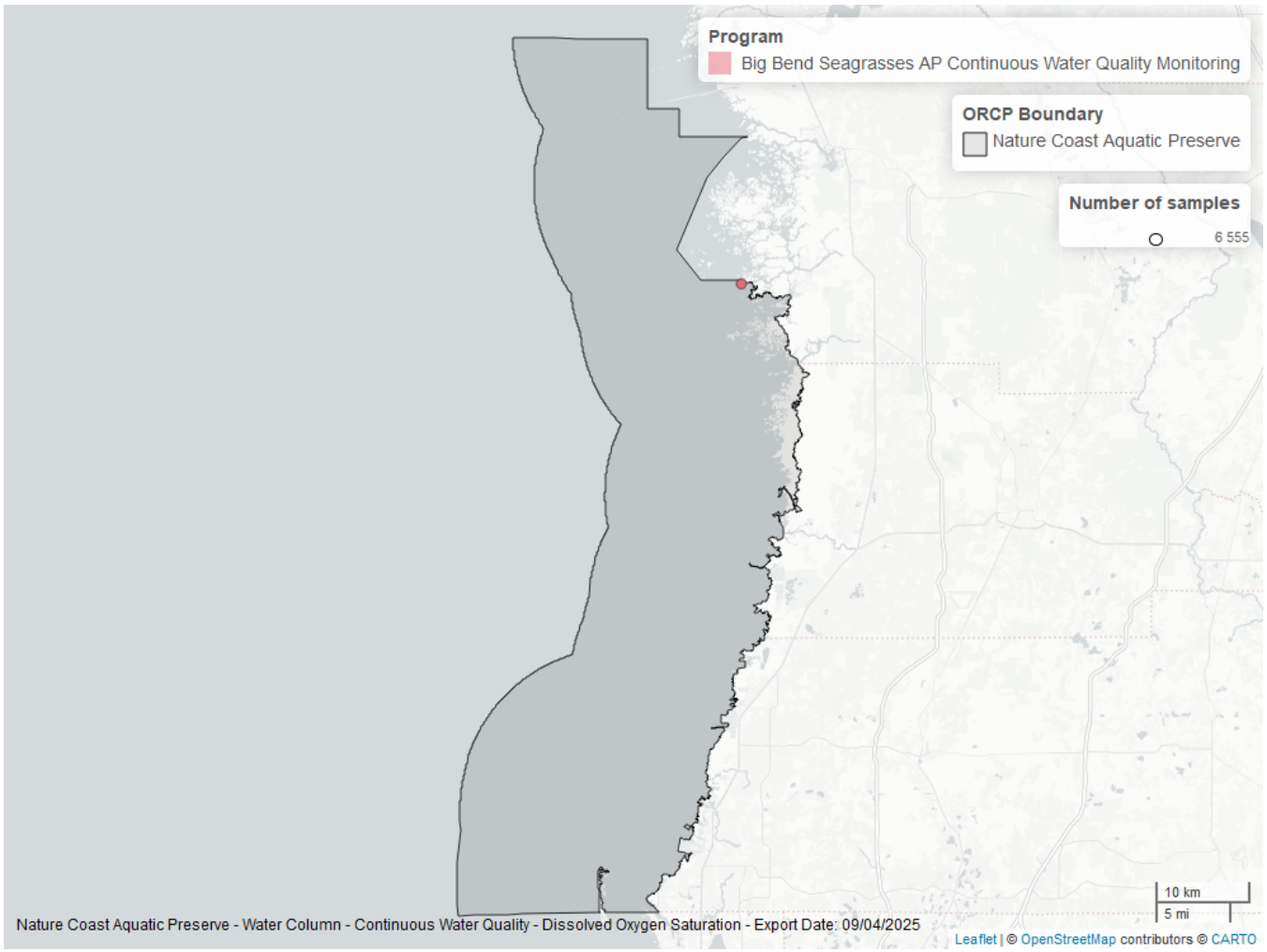

Figure 29: Map showing location of dissolved oxygen saturation continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

pH - Continuous

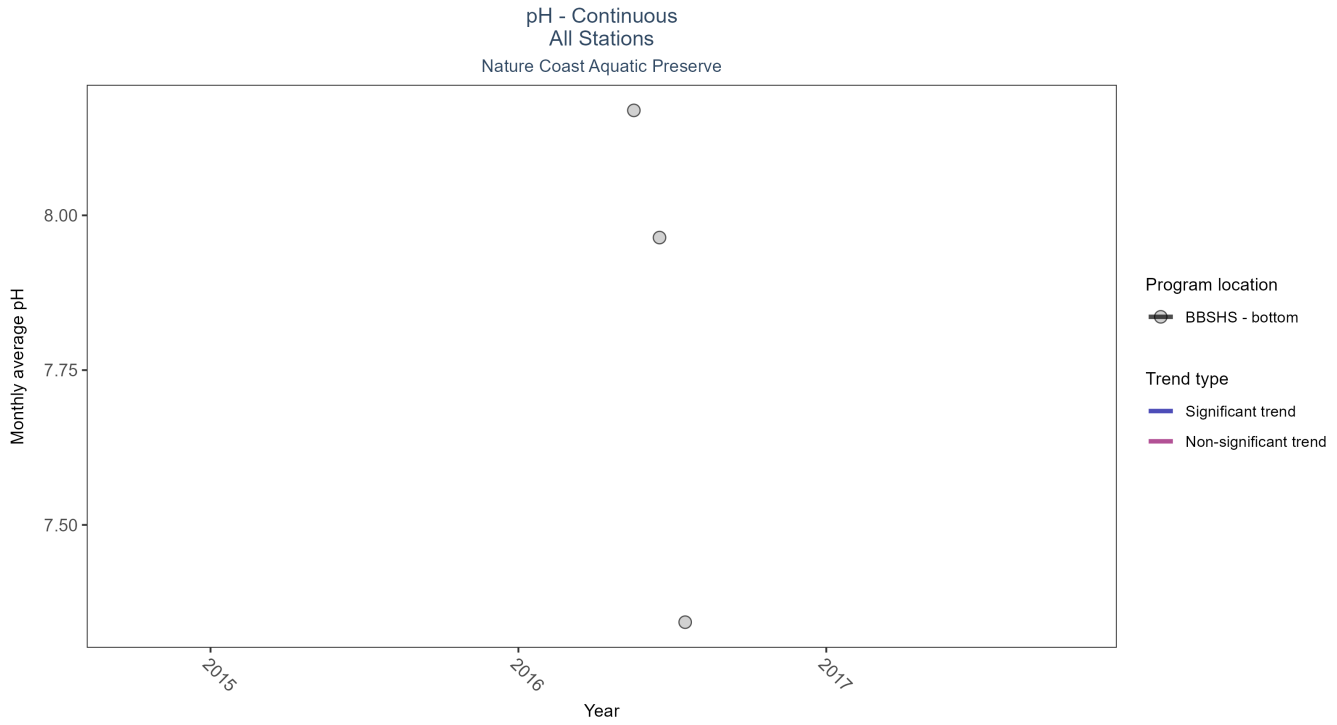

Figure 30: Scatter plot of monthly average pH over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 33: Seasonal Kendall-Tau Results for pH - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
BBSHS	Insufficient data to calculate trend	6555	1	2016 - 2016	8	-	-	-	-

There was insufficient data to fit a model for one location.

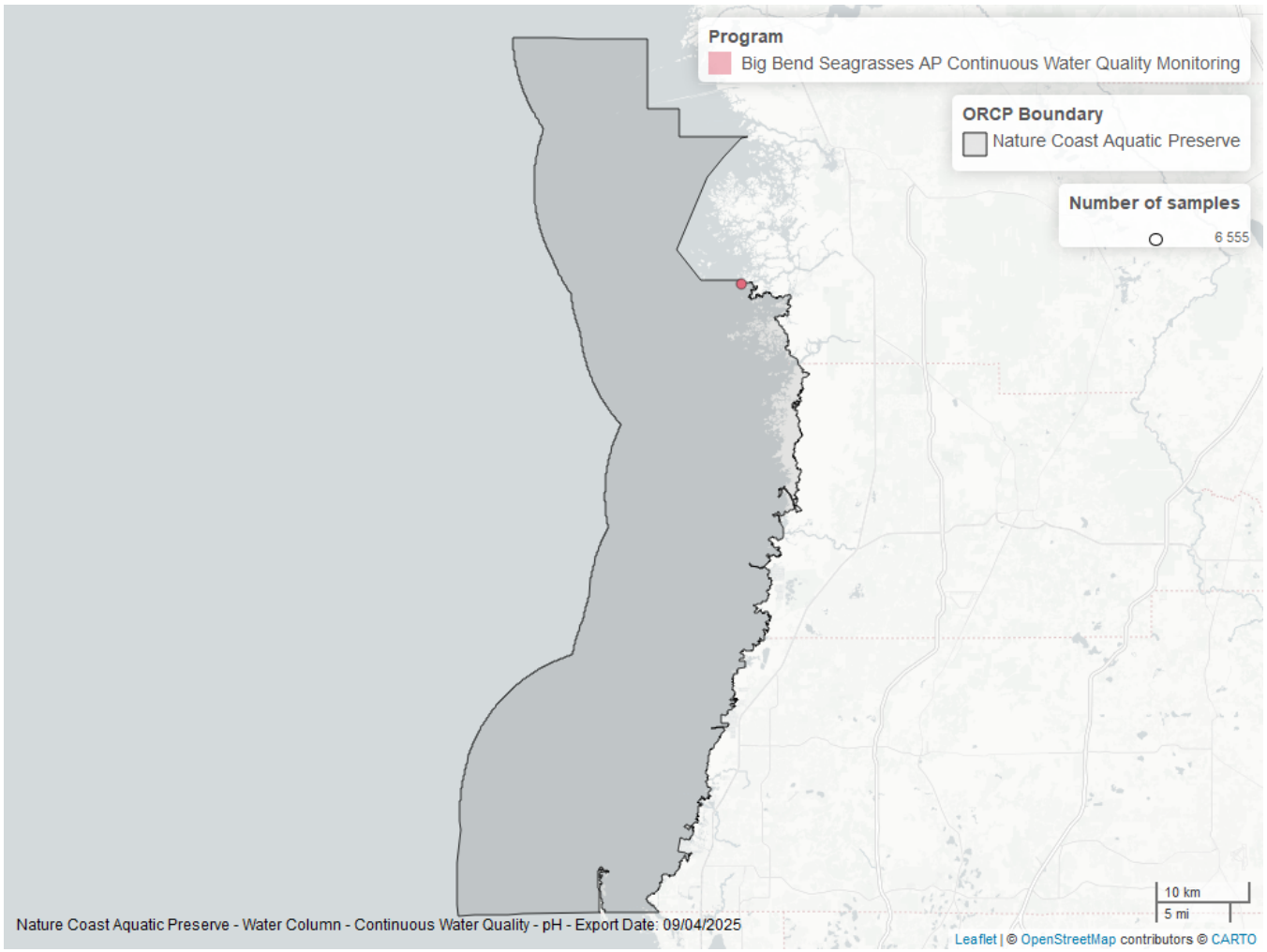

Figure 31: Map showing location of ph continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Salinity - Continuous

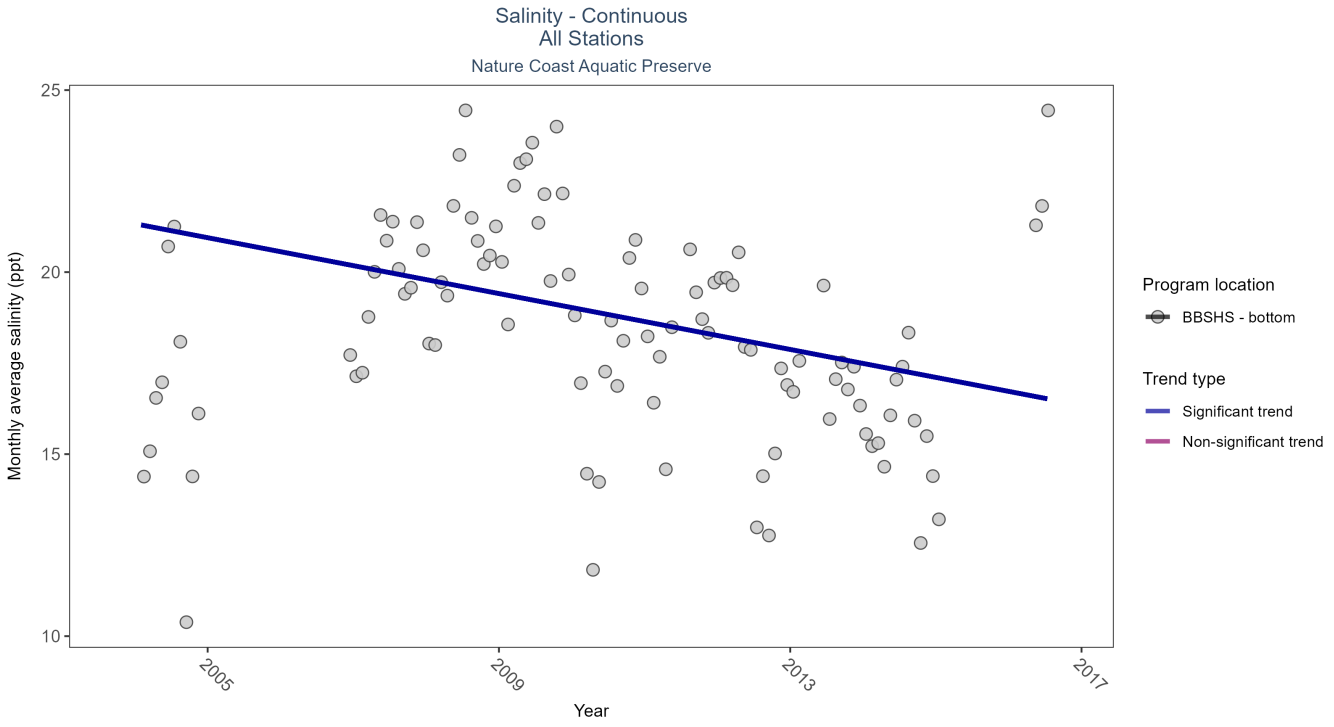

Figure 32: Scatter plot of monthly average salinity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 34: Seasonal Kendall-Tau Results for Salinity - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
BBSHS	Significantly decreasing trend	235670	12	2004 - 2016	18.4	-0.22	21.33	-0.38	0

At one program location, monthly average salinity decreased by 0.38 ppt per year.

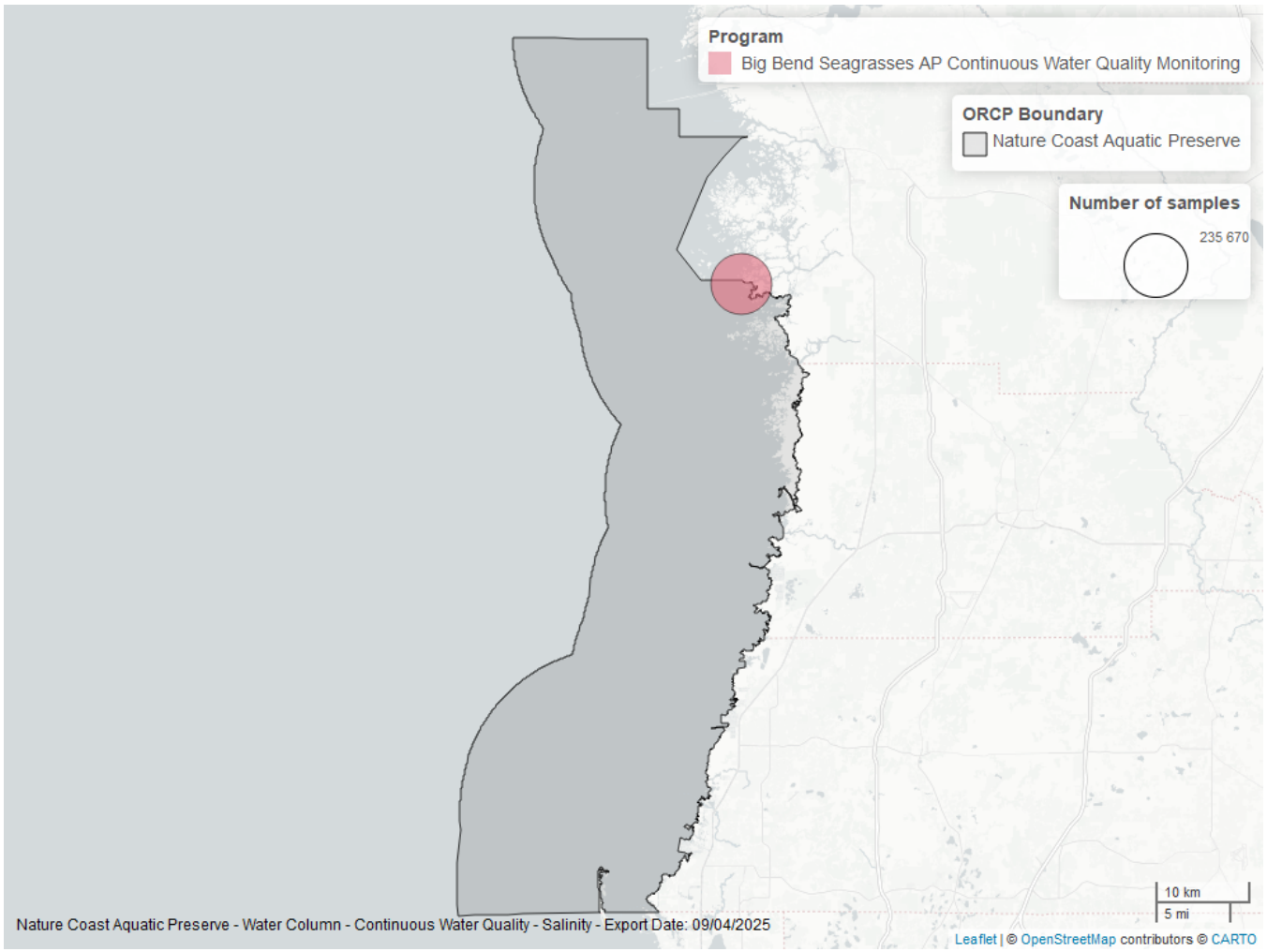

Figure 33: Map showing location of salinity continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Turbidity - Continuous

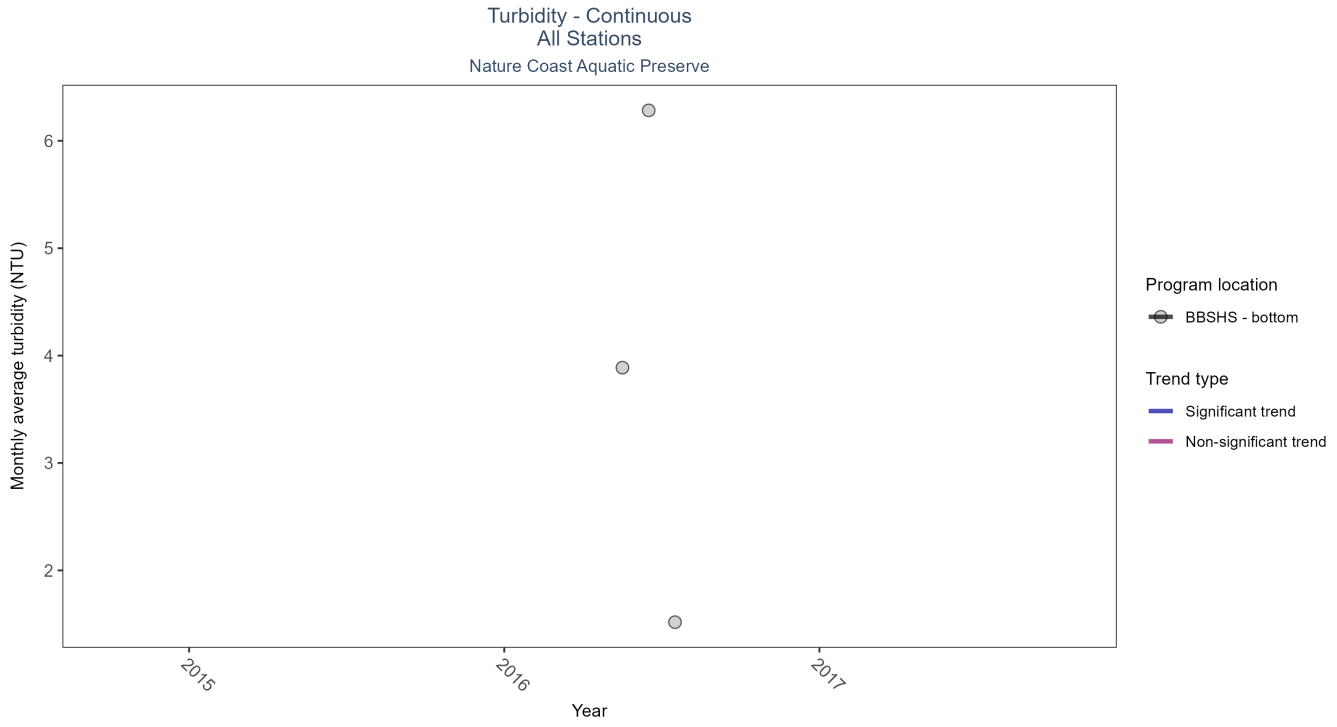

Figure 34: Scatter plot of monthly average turbidity over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 35: Seasonal Kendall-Tau Results for Turbidity - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
BBSHS	Insufficient data to calculate trend	6368	1	2016 - 2016	2	-	-	-	-

There was insufficient data to fit a model for one location.

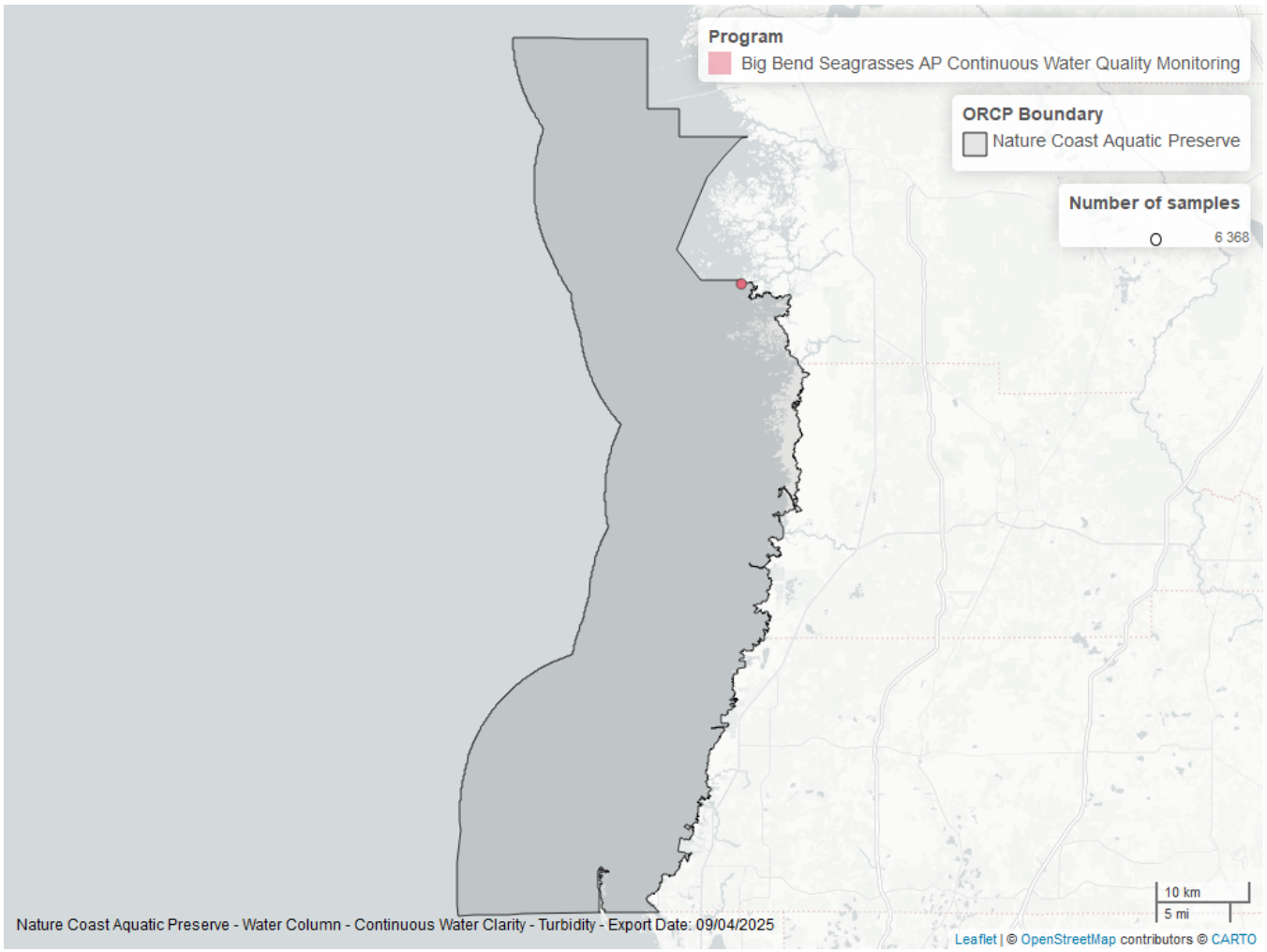

Figure 35: Map showing location of turbidity continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Water Temperature - Continuous

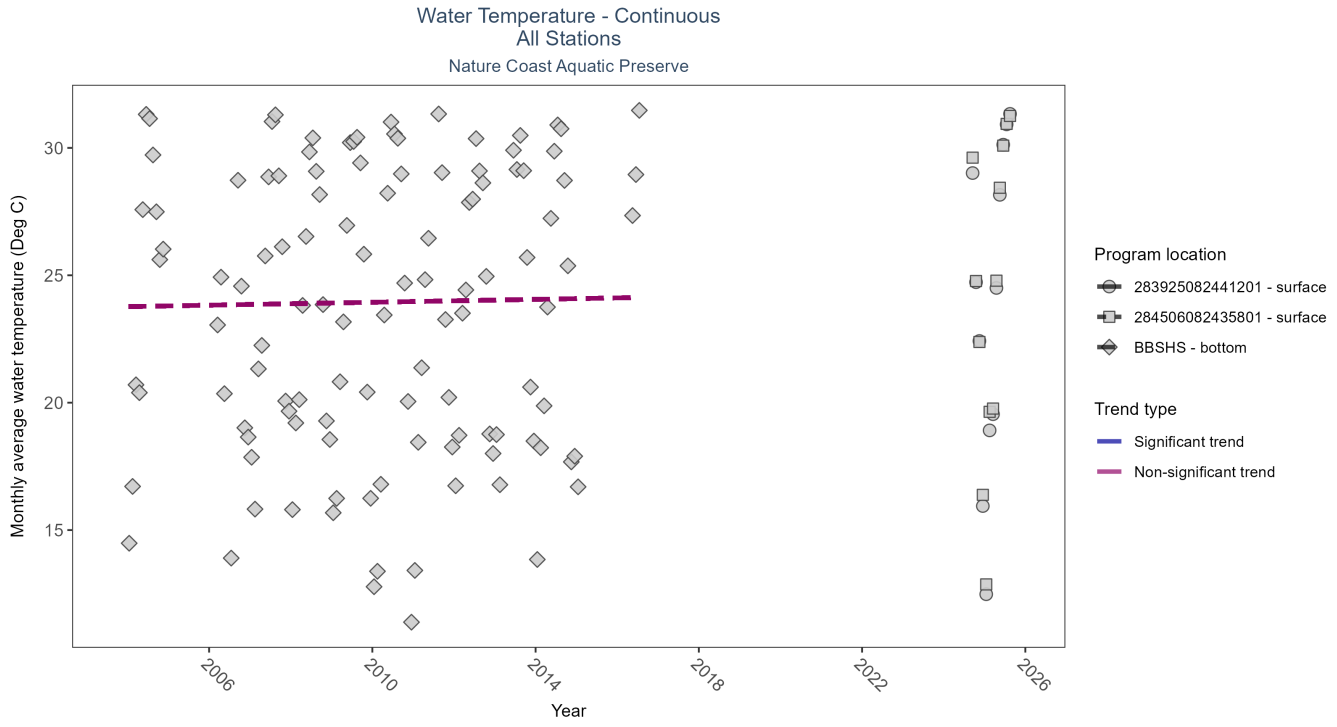

Figure 36: Scatter plot of monthly average water temperature over time at continuously monitored program locations. Each location is analyzed separately, with significant (blue) or non-significant (magenta) trend lines shown for time series that included five or more years of observations.

Table 36: Seasonal Kendall-Tau Results for Water Temperature - All Stations

Station	Statistical Trend	Sample Count	Years with Data	Period of Record	Median	tau	Sen Intercept	Sen Slope	p
283925082441201	Insufficient data to calculate trend	461	2	2024 - 2025	23.9	-	-	-	-
284506082435801	Insufficient data to calculate trend	480	2	2024 - 2025	24.4	-	-	-	-
BBSHS	No significant trend	244110	12	2004 - 2016	24.5	0.05	23.77	0.03	0.52

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

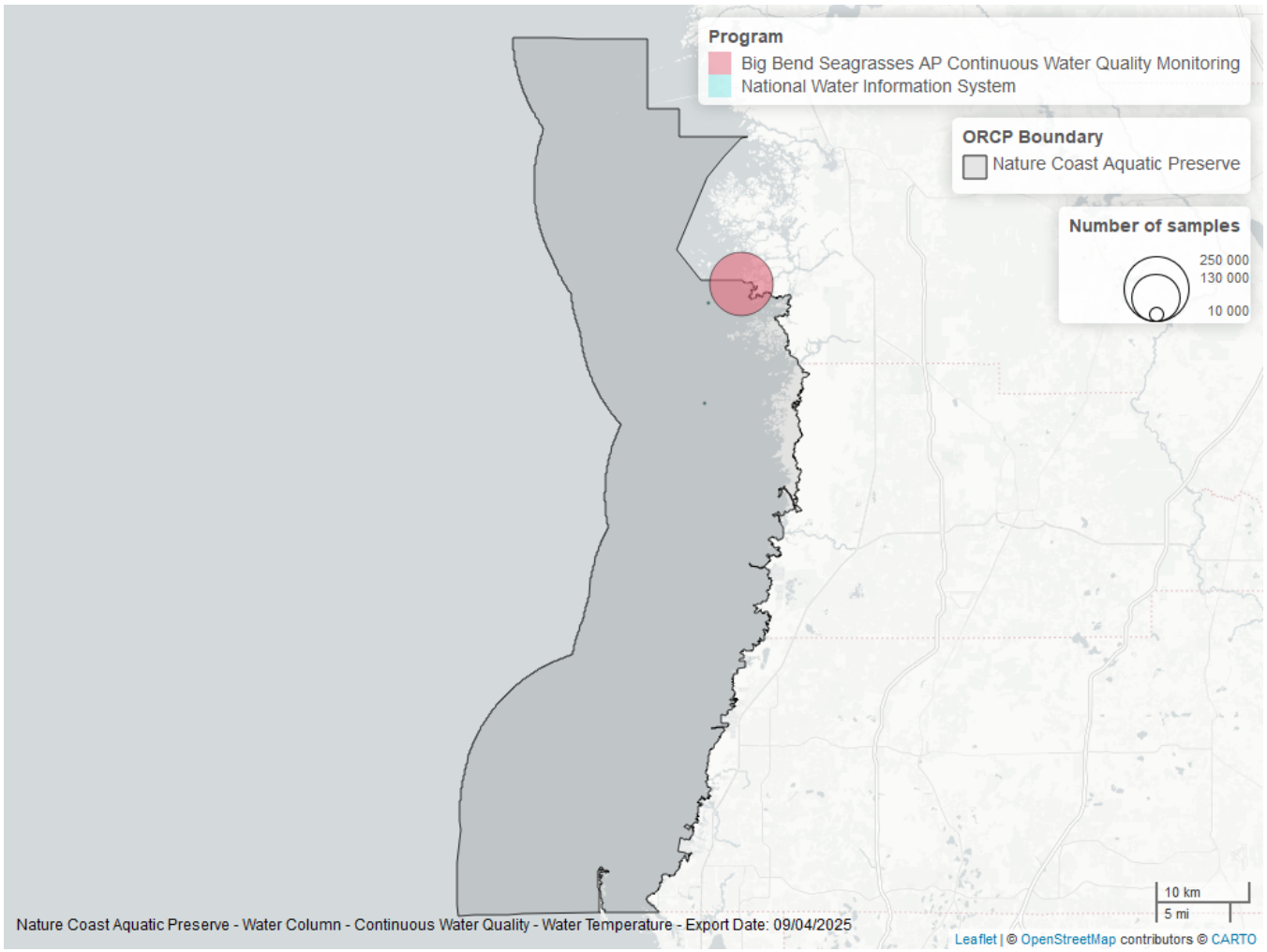

Figure 37: Map showing location of water temperature continuous water quality sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Submerged Aquatic Vegetation

The data file used is: **All_SAV_Parameters-2025-Sep-04.txt**

Submerged aquatic vegetation (*SAV*) refers to plants and plant-like macroalgae species that live entirely underwater. The two primary categories of *SAV* inhabiting Florida estuaries are *benthic macroalgae* and *seagrasses*. They often grow together in dense beds or meadows that carpet the seafloor. *Macroalgae* include multicellular species of green, red and brown algae that often live attached to the substrate by a holdfast. They tend to grow quickly and can tolerate relatively high nutrient levels, making them a threat to seagrasses and other benthic habitats in areas with poor water quality. In contrast, *seagrasses* are grass-like, vascular, flowering plants that are attached to the seafloor by extensive root systems. *Seagrasses* occur throughout the coastal areas of Florida, including protected bays and lagoons as well as deeper offshore waters on the continental shelf. *Seagrasses* have taken advantage of the broad, shallow shelf and clear water to produce two of the most extensive seagrass beds anywhere in continental North America.

Parameters

Percent Cover measures the fraction of an area of seafloor that is covered by SAV, usually estimated by evaluating multiple small areas of seafloor. Percent cover is often estimated for total SAV, individual types of vegetation (seagrass, attached algae, drift algae) and individual species.

Frequency of Occurrence was calculated as the number of times a taxon was observed in a year divided by the number of sampling events, multiplied by 100. Analysis is conducted at the quadrat level and is inclusive of all quadrats (i.e., quadrats evaluated using Braun-Blanquet, modified Braun-Blanquet, and percent cover."

Species

Turtle grass (*Thalassia testudinum*) is the largest of the Florida seagrasses, with longer, thicker blades and deeper root structures than any of the other seagrasses. It is considered a climax seagrass species.

Shoal grass (*Halodule wrightii*) is an early colonizer of vegetated areas and usually grows in water too shallow for other species except *widgeon grass*. It can often tolerate larger salinity ranges than other seagrass species. *Shoal grass* is characterized by thin, flat blades, that are narrower than *turtle grass* blades.

Manatee grass (*Syringodium filiforme*) is easily recognizable because its leaves are thin and cylindrical instead of the flat, ribbon-like form shared by many other seagrass species. The leaves can grow up to half a meter in length. *Manatee grass* is usually found in mixed seagrass beds or small, dense monospecific patches.

Widgeon grass (*Ruppia maritima*) grows in both fresh and salt water and is widely distributed throughout Florida's estuaries in less saline areas, particularly in inlets along the east coast. This species resembles *shoal grass* in certain environments but can be identified by the pointed tips of its leaves.

Three species of *Halophila spp.* are found in Florida - **Star grass** (*Halophila engelmannii*), **Paddle grass** (*Halophila decipiens*), and **Johnson's seagrass** (*Halophila johnsonii*). These are smaller, more fragile seagrasses than other Florida species and are considered ephemeral. They grow along a single long rhizome, with short blades. These species are not well-studied, although surveys are underway to define their ecological roles.

Notes

Star grass, *Paddle grass*, and *Johnson's seagrass* will be grouped together and listed as **Halophila spp.** in the following managed areas. This is because several surveys did not specify to the species level:

- Banana River Aquatic Preserve
- Indian River-Malabar to Vero Beach Aquatic Preserve
- Indian River-Vero Beach to Ft. Pierce Aquatic Preserve
- Jensen Beach to Jupiter Inlet Aquatic Preserve
- Loxahatchee River-Lake Worth Creek Aquatic Preserve
- Mosquito Lagoon Aquatic Preserve

- Biscayne Bay Aquatic Preserve
- Florida Keys National Marine Sanctuary

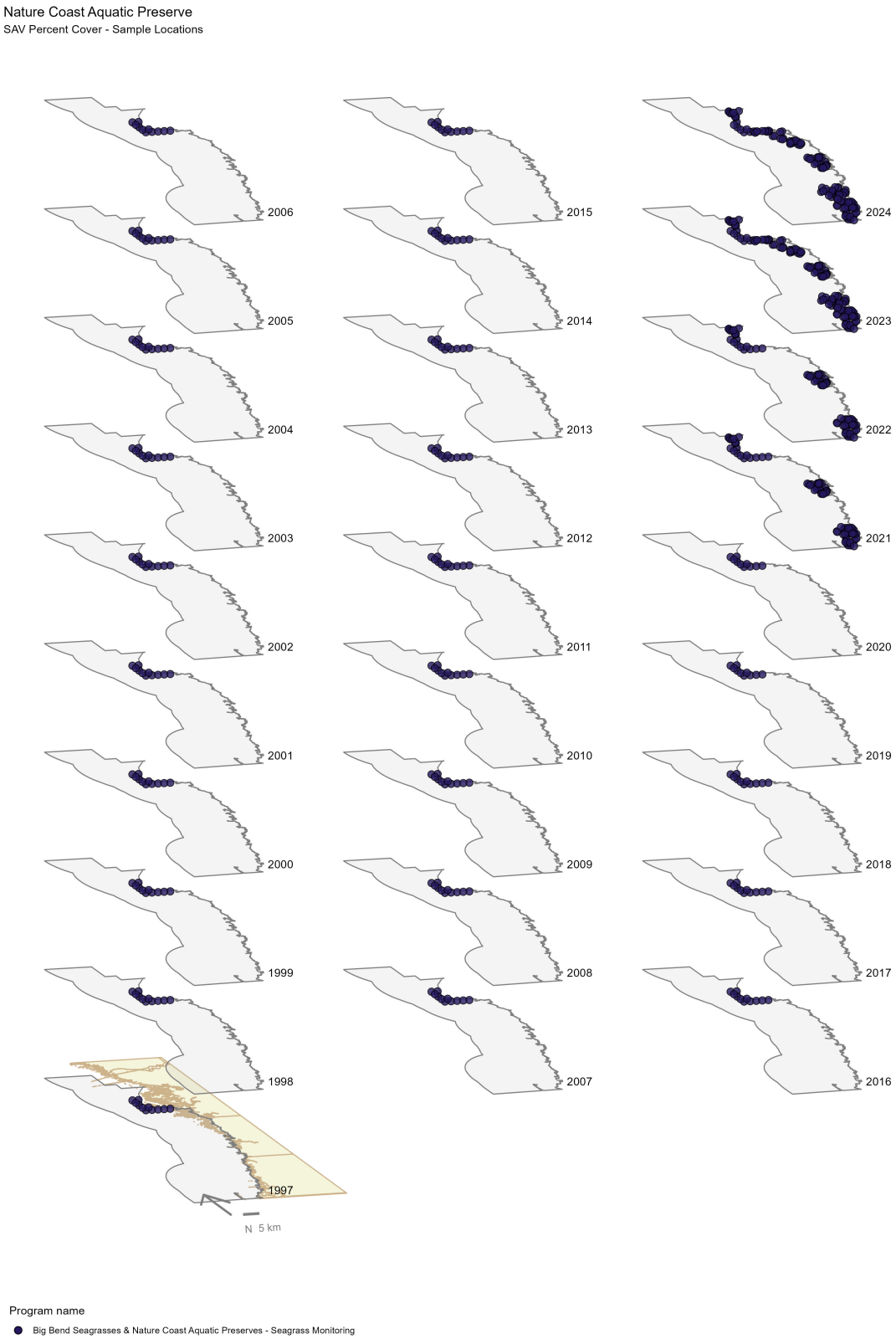

Figure 38: Maps showing the temporal scope of SAV sampling sites within the boundaries of *Nature Coast Aquatic Preserve* by Program name.

Click here to view spatio-temporal plots on GitHub.

Sampling locations by Program:

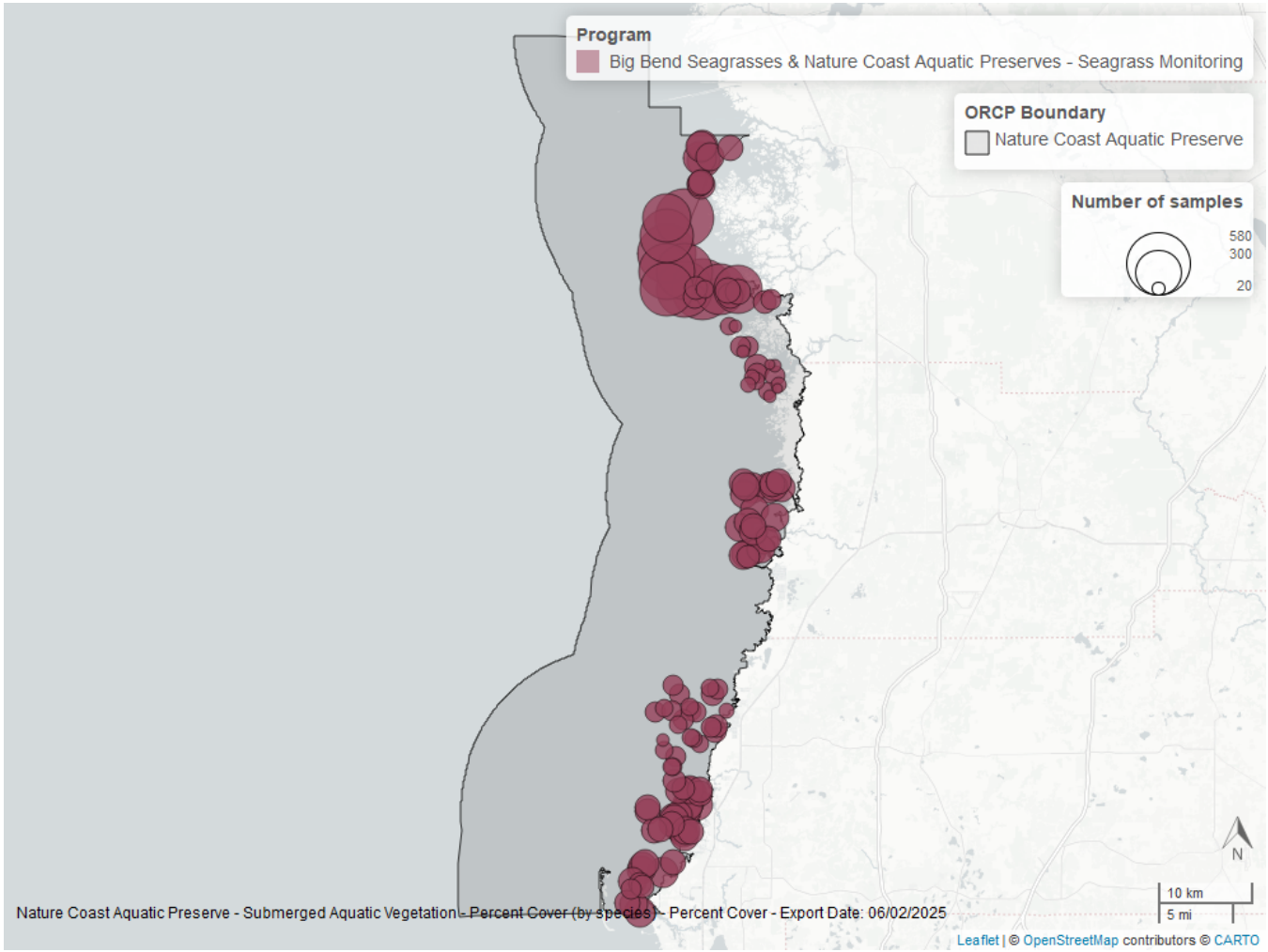

Figure 39: Map showing SAV sampling sites within the boundaries of *Nature Coast Aquatic Preserve*. The point size reflects the number of samples at a given sampling site.

Table 37: Program Information for Submerged Aquatic Vegetation

ProgramID	*N-Data*	*YearMin*	*YearMax*	*method*	*Sample Locations*
560	9545	1997	2024	Modified Braun Blanquet	129
560	6417	2021	2024	Percent Cover	129

Program names:

560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring[13]
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring[13]

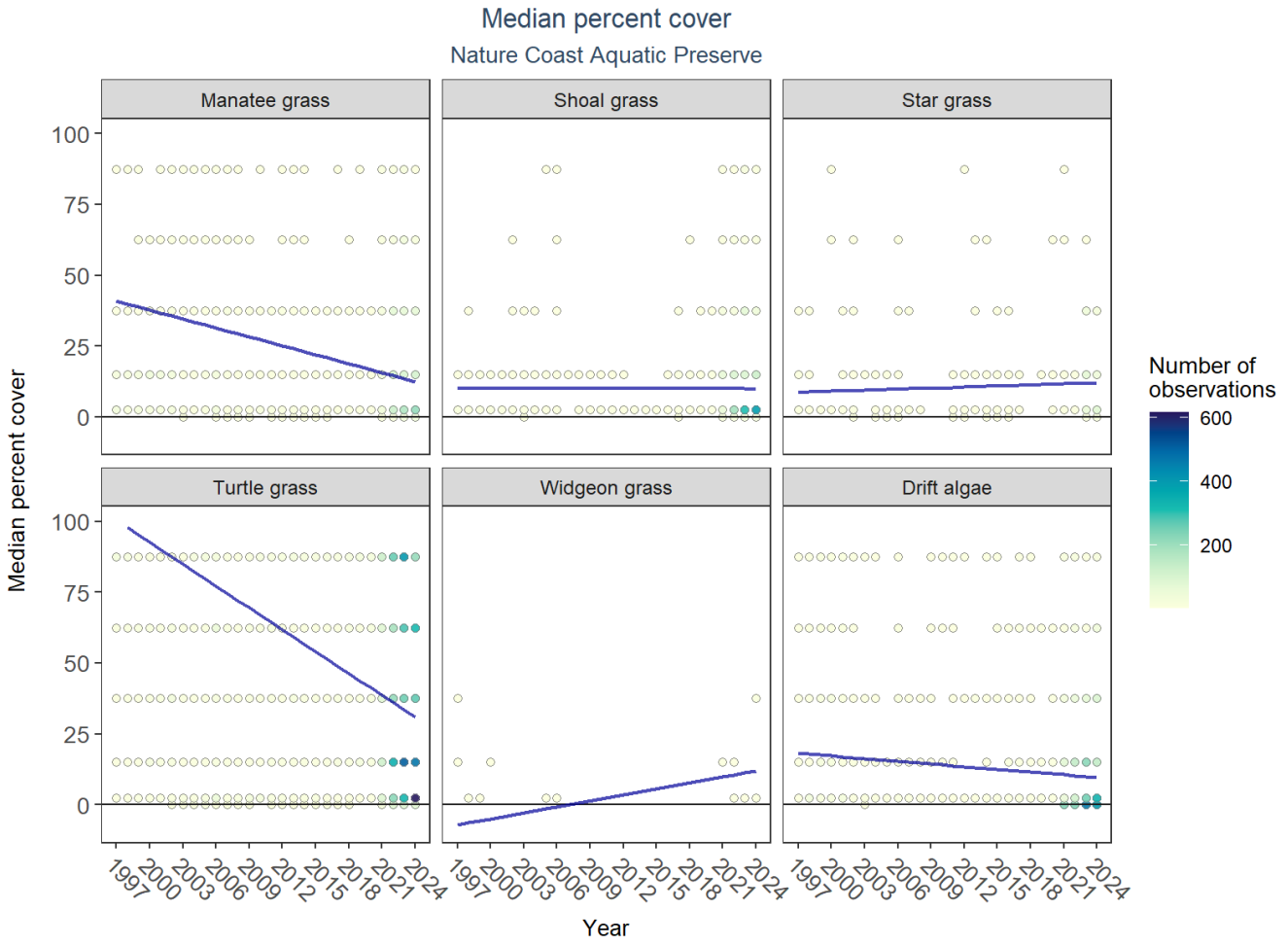

Figure 40: Scatter plots of median percent cover of submerged aquatic vegetation over time by group. Plots for time series that included five or more years of observations show the estimated trend as a blue line.

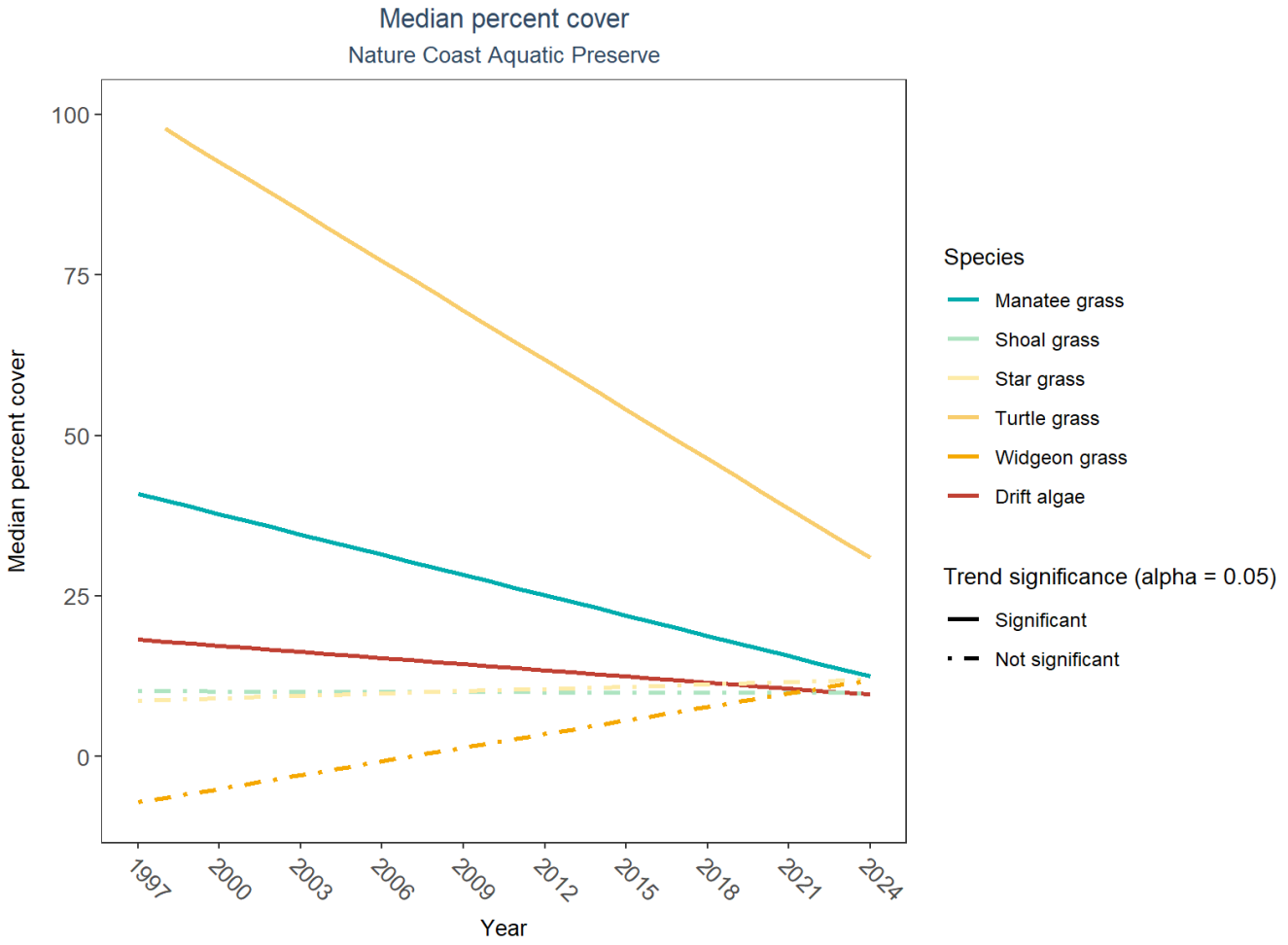

Figure 41: Trends in median percent cover for various seagrass species in Nature Coast Aquatic Preserve - simplified

Table 38: Percent Cover Trend Analysis for Nature Coast Aquatic Preserve

CommonName	*Trend Significance (0.05)*	*Period of Record*	*LME-Intercept*	*LME-Slope*	*p*
Drift algae	Significantly decreasing trend	1997 - 2024	19.149971	-0.3161658	0.0160055
Shoal grass	No significant trend	1997 - 2024	10.224288	-0.0105454	0.8700755
Star grass	No significant trend	1997 - 2024	8.345836	0.1223518	0.2948394
No grass in quadrat	Model did not fit the available data	1998 - 2024	-	-	-
Widgeon grass	No significant trend	1997 - 2024	-9.225165	0.7048255	0.7467311
Manatee grass	Significantly decreasing trend	1997 - 2024	44.073208	-1.0522525	0.0095644
Turtle grass	Significantly decreasing trend	1997 - 2024	108.013733	-2.5697397	0.0000000

Annual decreases in percent cover were observed for manatee grass (-1.0%), turtle grass (-2.6%), and drift algae (-0.3%). Shoal grass, star grass, and widgeon grass showed no detectable change in percent cover.

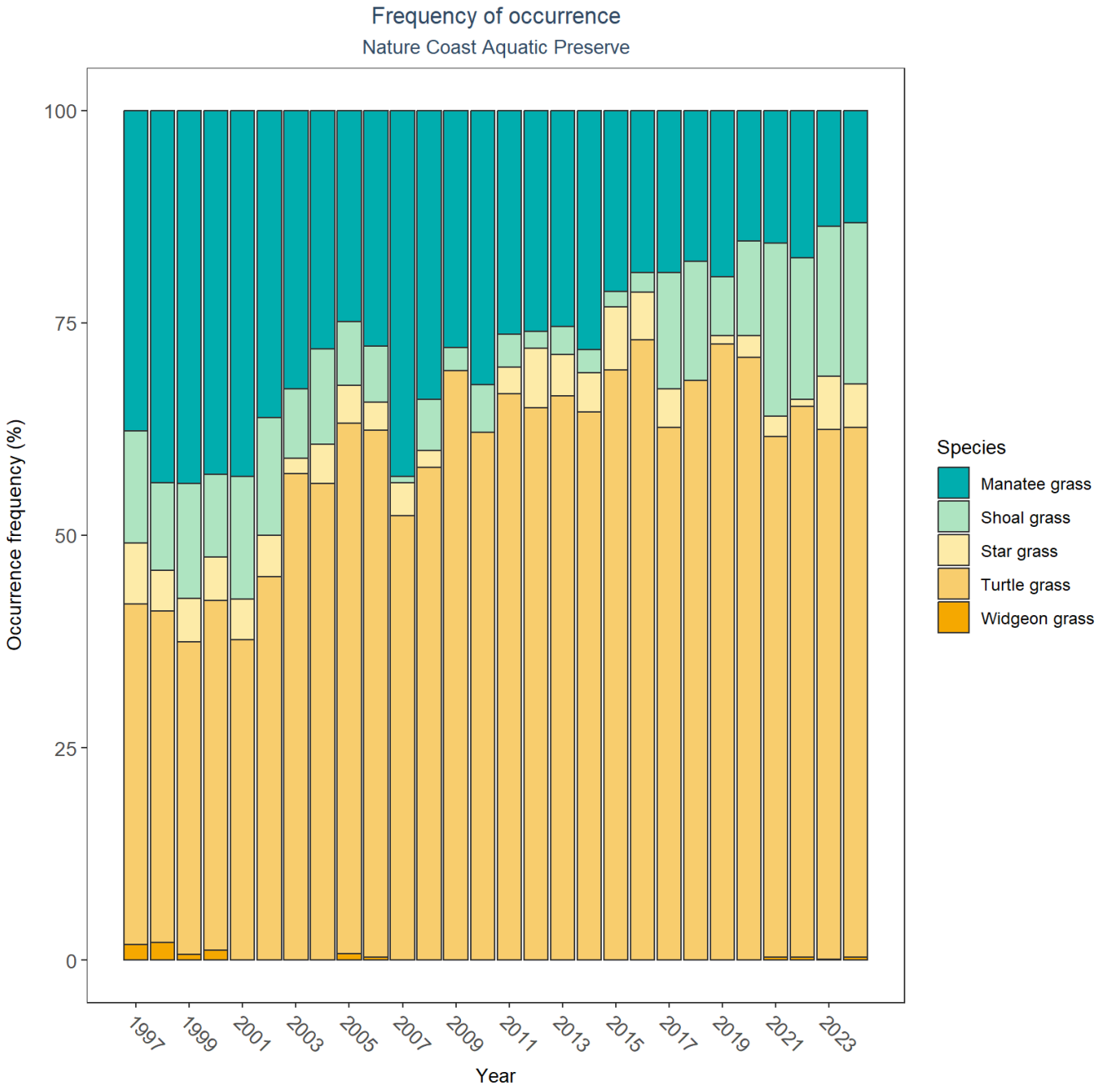

Figure 42: Frequency of occurrence for various seagrass species in Nature Coast Aquatic Preserve

SAV Water Column Analysis

The following parameters are available for Nature Coast Aquatic Preserve within the SAV_WC_Report:

- Colored Disolved Organic Matter
- Chlorophyll a
- Dissolved Oxygen
- Dissolved Oxygen Saturation
- pH
- Salinity

- Secchi Depth
- Water Temperature
- Total Nitrogen
- Turbidity

Access the reports here: DRAFT_SAV_WC_Report_2024-11-20.pdf

Nekton

The data file used is: **All_NEKTON_Parameters-2025-Sep-04.txt**

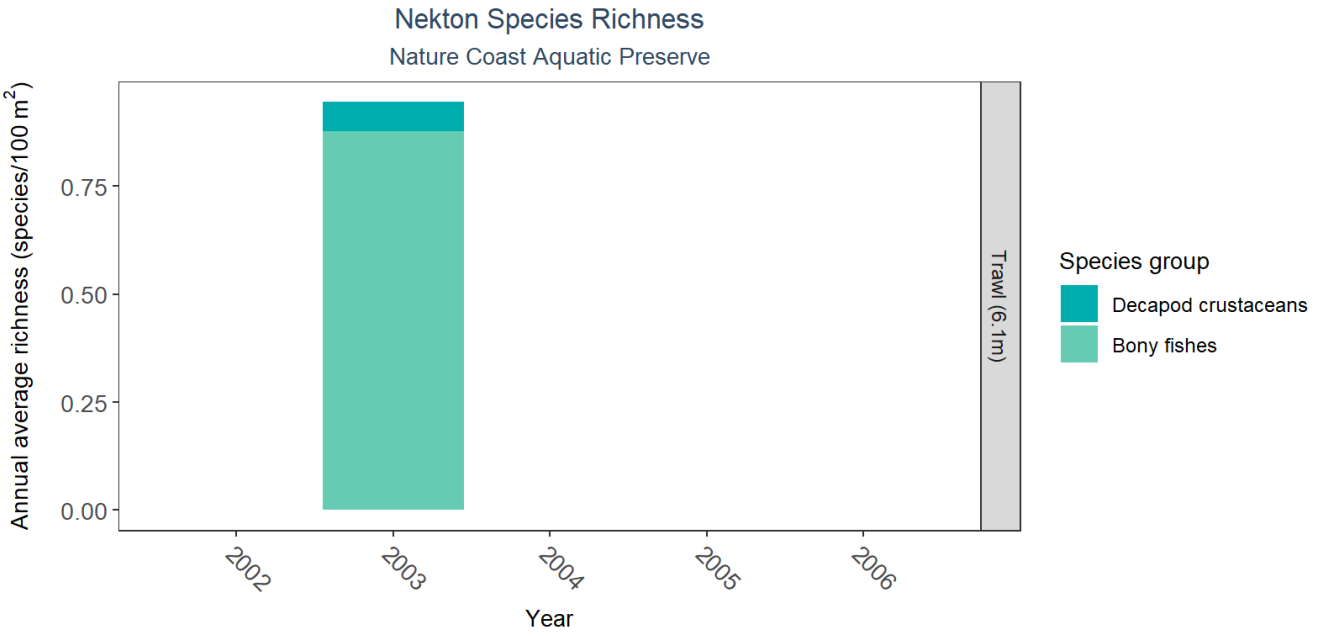

Figure 43: Bar graph(s) of annual average nekton richness over time for species groups occurring in at least 1% of samples. The bar colors represent species groups including bony fishes, cartilaginous fishes, decapod crustaceans (e.g., shrimps, crabs, and lobsters), and cephalopods (e.g., squid). Gear types and sizes are indicated in the panel label.

Table 39: Nekton Species Richness

Gear Type	*Sample Count*	*Number of Years*	*Period of Record*	*Median N of Taxa*	*Mean N of Taxa*
Trawl (6.1)	2	1	2003 - 2003	0.47	0.47

The median annual number of taxa was 0.47 based on 2 observations collected by 6.1-meter trawl between 2003 and 2003.

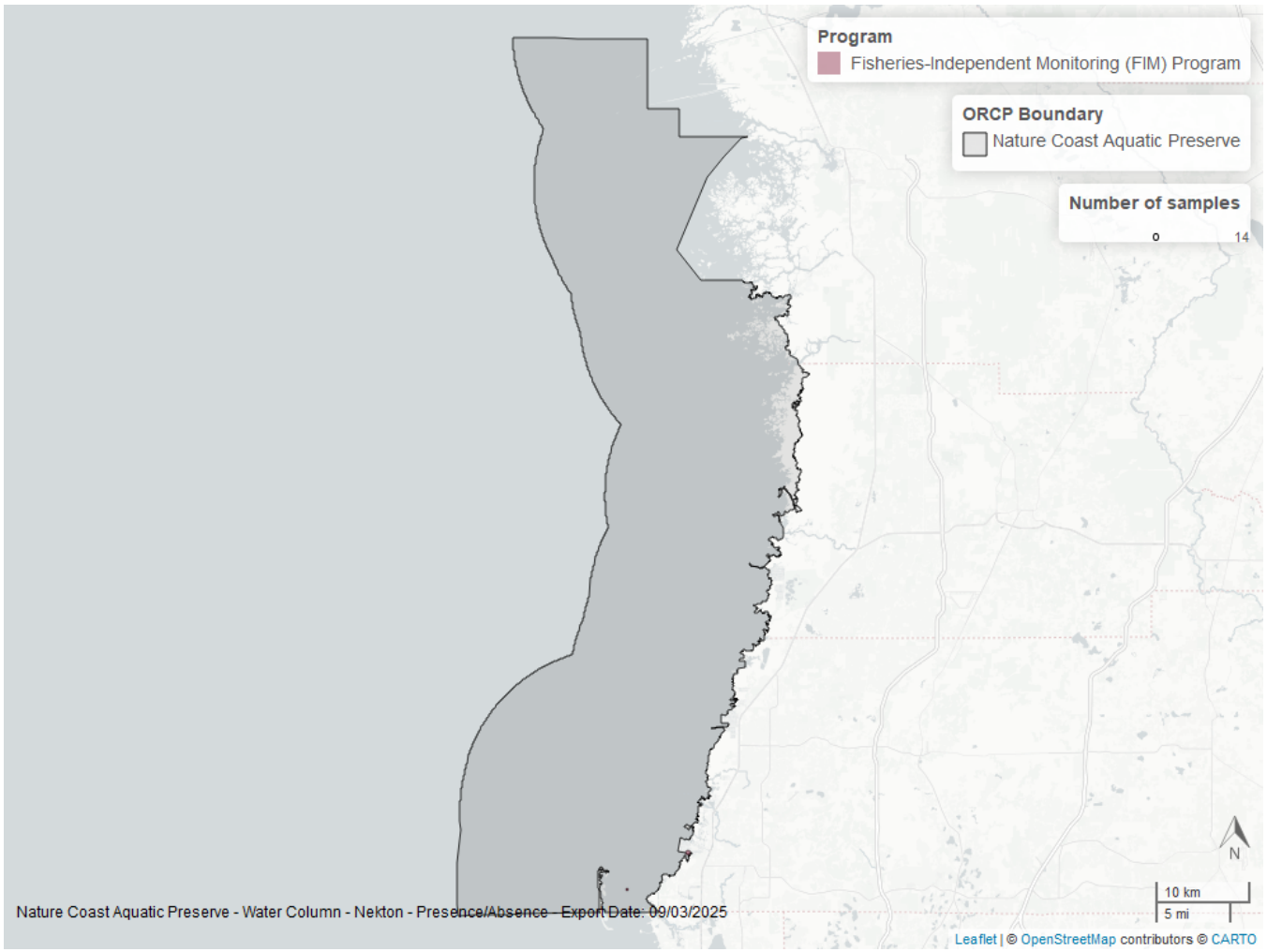

Figure 44: Map showing location of nekton sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Coastal Wetlands

The data file used is: **All_CW_Parameters-2025-Sep-04.txt**

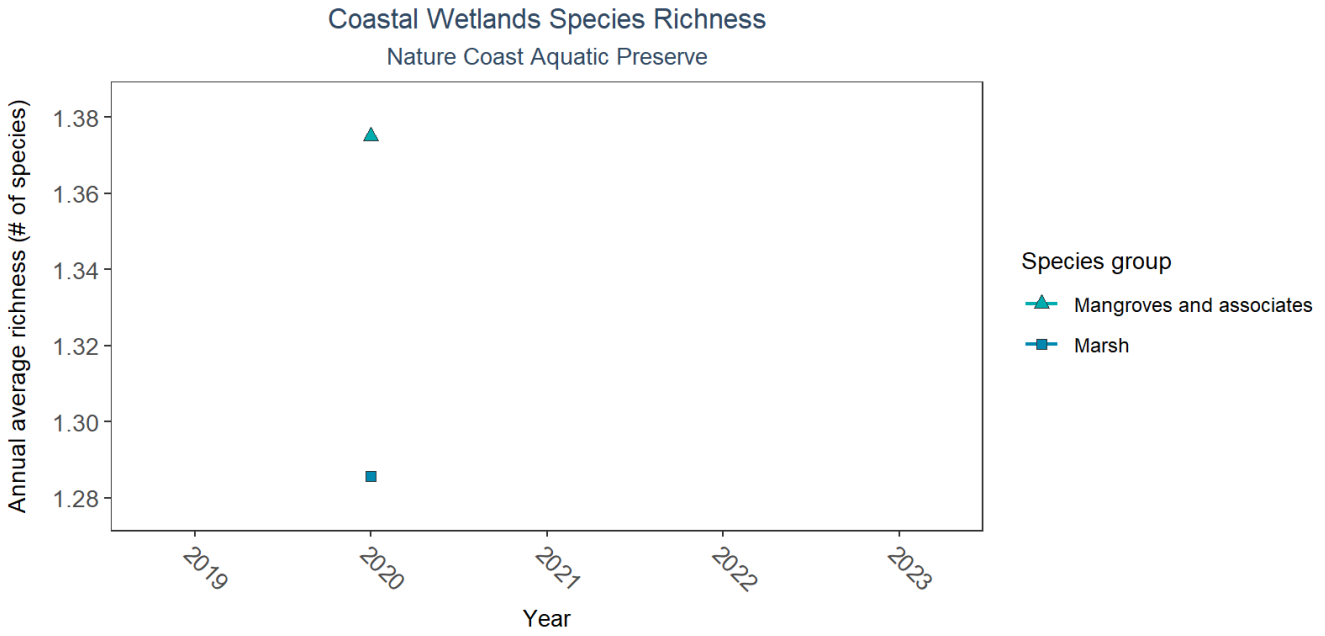

Figure 45: Line graph of annual average coastal wetlands species richness over time for mangroves and associates (triangles), marsh (squares), and marsh succulents (circles). If the time series by species group included more than one year of observations, a line connects data points for visualization.

Table 40: Coastal Wetlands Species Richness

Species Group	*Sample Count*	*Number of Years*	*Period of Record*	*Median N of Taxa*	*Mean N of Taxa*
Mangroves and associates	8	1	2020 - 2020	1	1.38
Marsh	14	1	2020 - 2020	1	1.29

In the year 2020, 1 species were observed for *mangroves and associates* based on 8 observations. In the year 2020, 1 species were observed for *marsh* based on 14 observations.

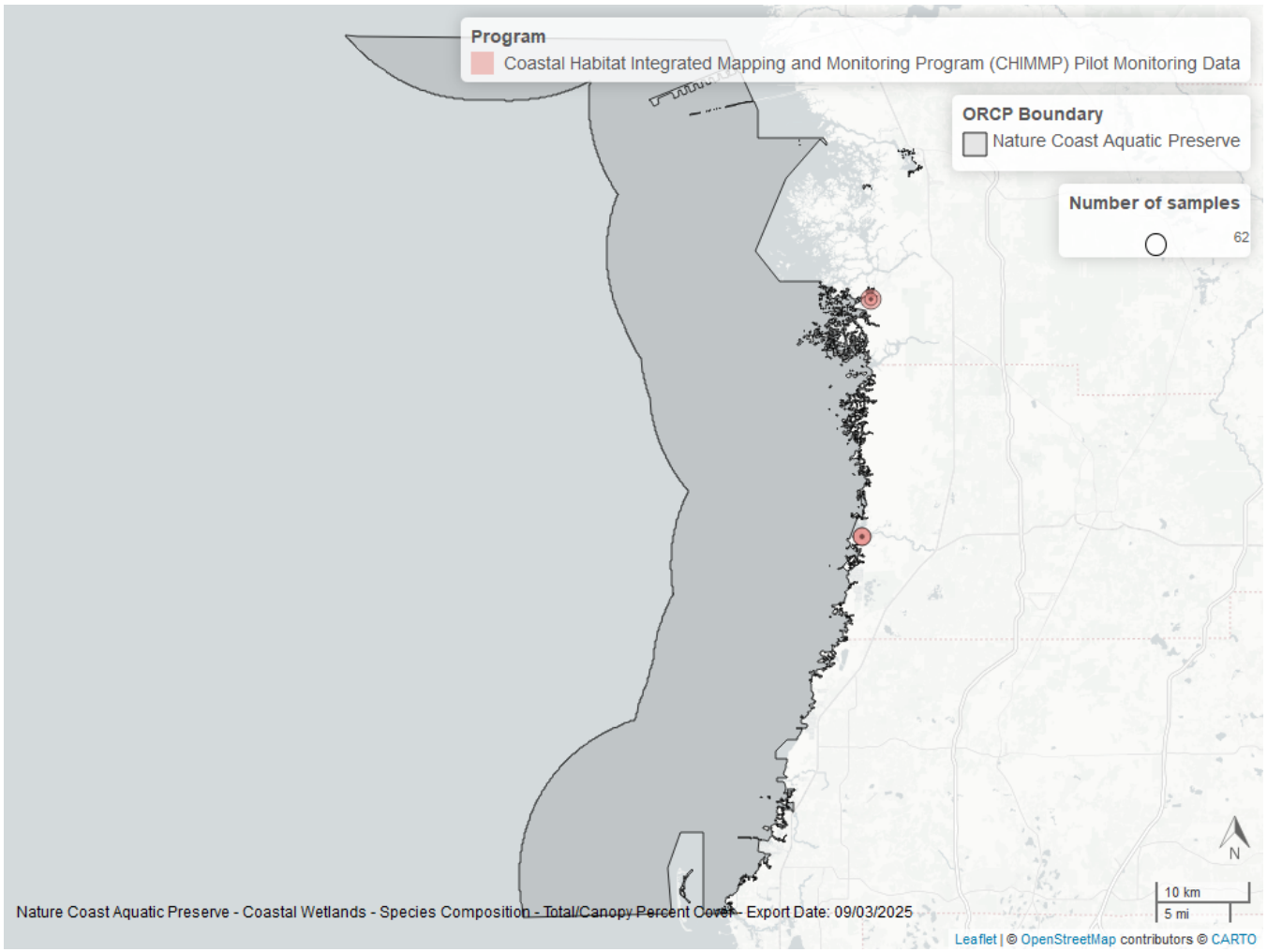

Figure 46: Map showing location of coastal wetlands sampling locations within the boundaries of *Nature Coast Aquatic Preserve*. The bubble size on the maps above reflect the amount of data available at each sampling site.

Species list

Acanthostracion quadricornis[3]	Eucinostomus gula[3]	Padina gymnospora[1]
Acetabularia crenulata[1]	Eucinostomus harengulus[3]	Paraclinus fasciatus[3]
Achirus lineatus[3]	Eucinostomus spp.[3]	Paralichthys albigutta[3]
Acrostichum danaeifolium	Forestiera segregata	Penicillus capitatus[1]
Anadyomene stellata[1]	Gobiosoma bosc[3]	Penicillus dumetosus[1]
Anarchopterus criniger[3]	Gobiosoma robustum[3]	Penicillus spp.[1]
Anchoa mitchilli[3]	Gobiosoma spp.[3]	Pneumatophore
Ancylopsetta quadrocellata[3]	Haemulon plumierii[3]	Pogonias cromis[3]
Archosargus probatocephalus[3]	Halimeda incrassata[1]	Prionotus scitulus[3]
Ariopsis felis[3]	Halodule wrightii[1]	Prionotus tribulus[3]
Avicennia germinans[2]	Halophila engelmannii[1]	Quercus virginiana
Avrainvillea levis[1]	Harengula jaguana[3]	Rhipocephalus phoenix[1]
Bairdiella chrysoura[3]	Hypleurochilus caudovittatus[3]	Rhizophora mangle[2]
Batophora oerstedii[1]	Ilex vomitoria	Ruppia maritima[1]
Callinectes sapidus[3]	Juncus roemerianus[2]	Sabal palmetto
Caulerpa ashmeadii[1]	Lachnolaimus maximus[3]	Sargassum sp.[1]
Caulerpa cupressoides[1]	Lactophrys spp.[3]	Schinus terebinthifolia
Caulerpa mexicana[1]	Lagodon rhomboides[3]	Scorpaena brasiliensis[3]
Caulerpa paspaloides[1]	Laguncularia racemosa[2]	Smilax bona-nox
Caulerpa prolifera[1]	Leiostomus xanthurus[3]	Spartina alterniflora[2]
Caulerpa racemosa[1]	Lepisosteus osseus[3]	Sphoeroides nephelus[3]
Caulerpa sertularioides[1]	Lucania parva[3]	Stenotaphrum secundatum
Centropristis striata[3]	Lutjanus griseus[3]	Symphurus plagiusa[3]
Chaetodipterus faber[3]	Lutjanus synagris[3]	Syngnathus floridae[3]
Chasmodes saburrae[3]	Lycium carolinianum	Syngnathus louisianae[3]
Chilomycterus schoepfii[3]	Menidia spp.[3]	Syngnathus scovelli[3]
Chloroscombrus chrysurus[3]	Microgobius gulosus[3]	Synodus foetens[3]
Cladium mariscus	Microgobius thalassinus[3]	Syringodium filiforme[1]
Cliona caribbaea	Monacanthus ciliatus[3]	Thalassia testudinum[1]
Codium isthmocladum[1]	Nicholsina usta[3]	Trinectes maculatus[3]
Cynoscion nebulosus[3]	No fish	Udotea flabellum[1]
Digenea simplex[1]	No grass in quadrat[1]	Udotea spp.[1]
Diplectrum formosum[3]	Ocyurus chrysurus[3]	Ulva sp.[1]
Diplodus holbrookii[3]	Ogcocephalus cubifrons[3]	Unidentified species
Distichlis spicata[2]	Ogcocephalus spp.[3]	Urophycis floridana[3]
Drift algae[1]	Opsanus beta[3]	Woody debris
Elops saurus[3]	Orthopristis chrysoptera[3]	Yucca aloifolia
Etropus crossotus[3]	Padina[1]	Acanthostracion quadricornis[3]

1 - Submerged Aquatic Vegetation, 2 - Coastal Wetlands, 3 - Nekton

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