

Coupon Bight Aquatic Preserve

SEACAR Habitat Analyses

Last compiled on 08 January, 2025

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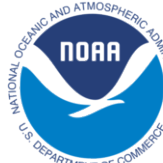
Funding & Acknowledgements

The data used in this analysis is from the Export Standardized Tables in the SEACAR Data Discovery Interface (DDI). Documents and information available through the SEACAR DDI are owned by the data provider(s) and users are expected to provide appropriate credit following accepted citation formats. Users are encouraged to access data to maximize utilization of gained knowledge, reducing redundant research and facilitating partnerships and scientific innovation.

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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

| <i>Parameter Name</i> | <i>Units</i> | <i>Low Threshold</i> | <i>High Threshold</i> |
|-----------------------------|--------------|----------------------|-----------------------|
| 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

| <i>Parameter Name</i> | <i>Units</i> | <i>Low Threshold</i> | <i>High Threshold</i> |
|---|--------------|----------------------|-----------------------|
| 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 | - | - |

| <i>Parameter Name</i> | <i>Units</i> | <i>Low Threshold</i> | <i>High Threshold</i> |
|---|-----------------|----------------------|-----------------------|
| Dissolved Oxygen | mg/L | -0.000001 | 25 |
| Dissolved Oxygen Saturation | % | -0.000001 | 310 |
| Fluorescent Dissolved Organic Matter | QSE | - | - |
| Light Extinction Coefficient | m ⁻¹ | - | - |
| NO ₂ + ₃ , Filtered | mg/L | - | - |
| Nitrate (NO ₃) | mg/L | - | - |
| Nitrite (NO ₂) | mg/L | - | - |
| Nitrogen, organic | mg/L | - | - |
| Phosphate, Filtered (PO ₄) | 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

| <i>SEACAR QAQC Description</i> | <i>Include</i> | <i>SEACAR QAQCFlagCode</i> |
|--|----------------|----------------------------|
| 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

| <i>Qualifier Source</i> | <i>Value Qualifier</i> | <i>Include</i> | <i>MDL</i> | <i>Description</i> |
|-------------------------|------------------------|----------------|------------|--|
| 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 determination; 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

| <i>Qualifier Source</i> | <i>Value Qualifier</i> | <i>Include</i> | <i>Description</i> |
|-------------------------|------------------------|----------------|--|
| SWMP | -1 | Yes | Optional parameter not collected |
| SWMP | -2 | No | Missing data |
| SWMP | -3 | No | Data rejected due to QA/QC |
| SWMP | -4 | No | Outside low sensor range |
| SWMP | -5 | No | Outside high sensor range |
| SWMP | 0 | Yes | Passed initial QA/QC checks |
| SWMP | 1 | No | Suspect data |
| SWMP | 2 | Yes | Reserved for future use |
| SWMP | 3 | Yes | Calculated data: non-vented depth/level sensor correction for changes in barometric pressure |
| SWMP | 4 | Yes | Historical: Pre-auto QA/QC |
| SWMP | 5 | Yes | 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 $p \geq 0.05$). 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-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Chlorophyll_a_uncorrected_for_pheophytin-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Colored_dissolved_organic_matter_CDOM-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen_Saturation-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_pH-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Salinity-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Secchi_Depth-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Total_Nitrogen-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Total_Phosphorus-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Total_Suspended_Solids_TSS-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Turbidity-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_Water_Temperature-2024-Dec-08.txt*

Chlorophyll a, Uncorrected for Pheophytin - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

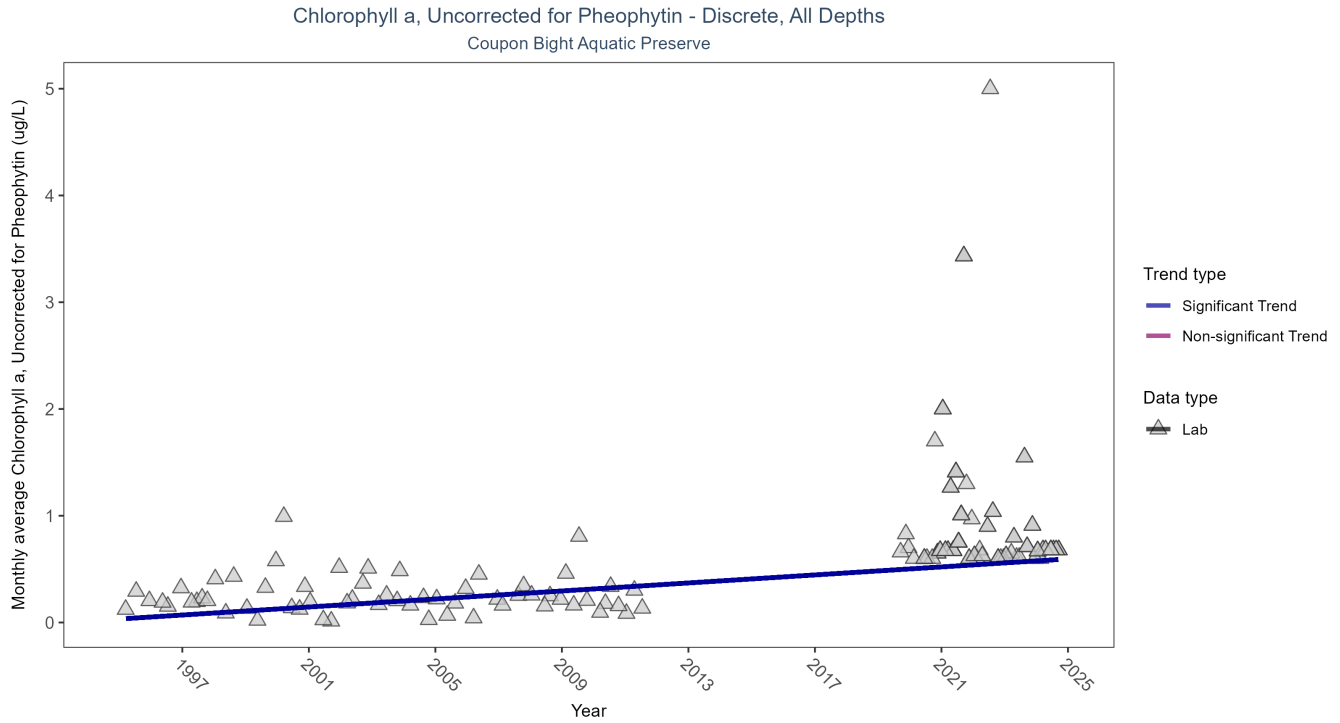


Figure 1: Seasonal Kendall-Tau Results for Chlorophyll a, Uncorrected for Pheophytin - Discrete

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

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|--------|---|-----------|---------------|------------|-------------|-------|
| All | 182 | 23 | 0.6 | TRUE | 0.4324 | 0 | 0.0188 | 0.0325 | 1.7976 | 0.9991 | 1 |

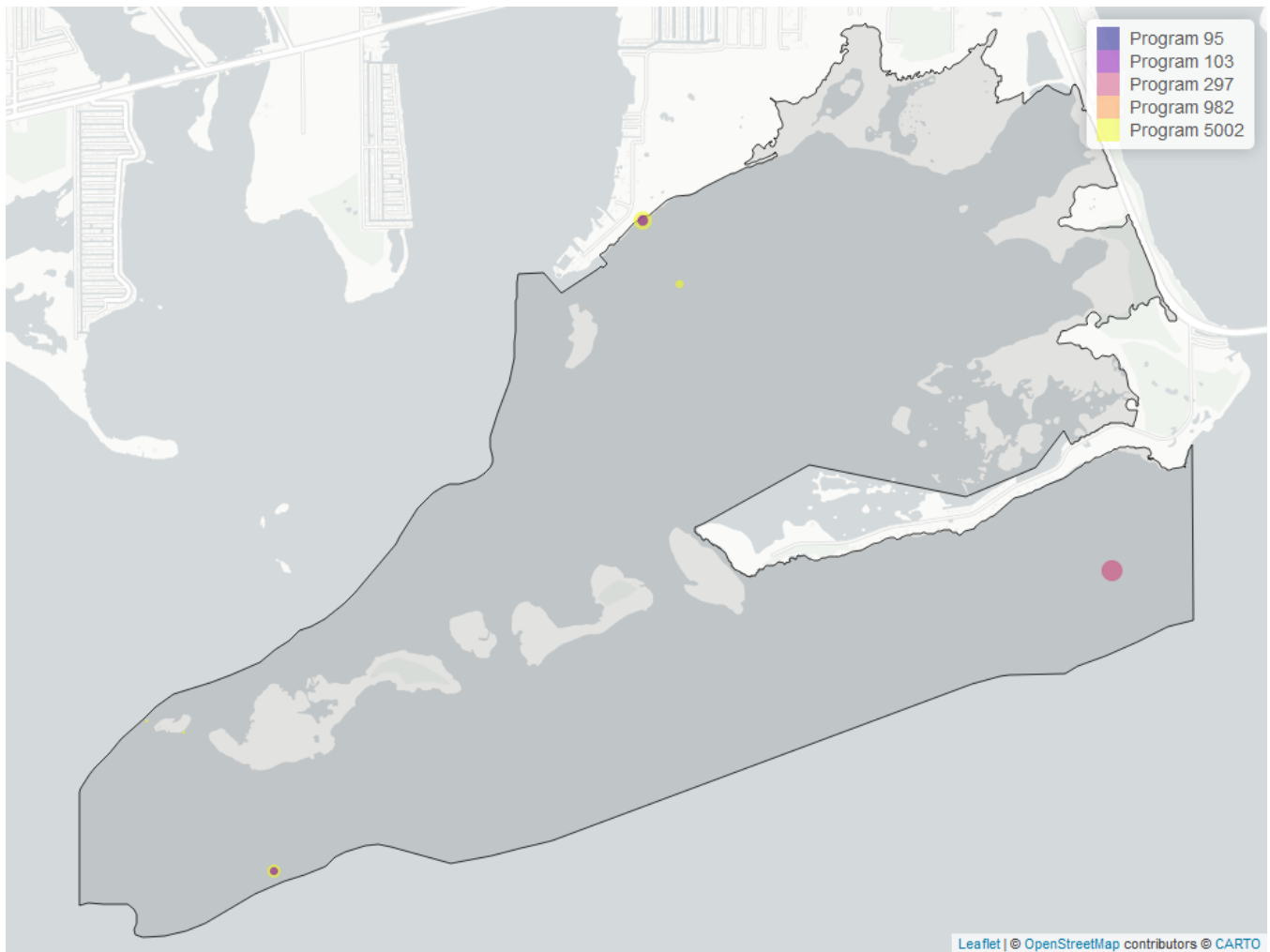


Figure 2: Map showing location of Discrete sampling sites for Chlorophyll a, Uncorrected for Pheophytin. The bubble size on the maps below reflect the amount of data available at each sampling site.

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

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 5002 | 91 | 2019 | 2024 |
| 297 | 61 | 1995 | 2011 |
| 103 | 32 | 2020 | 2021 |

Program names:

- 103 - EPA STORage and RETrieval Data Warehouse (STORET)/WQX¹
- 297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²
- 5002 - Florida STORET / WIN³

Dissolved Oxygen - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

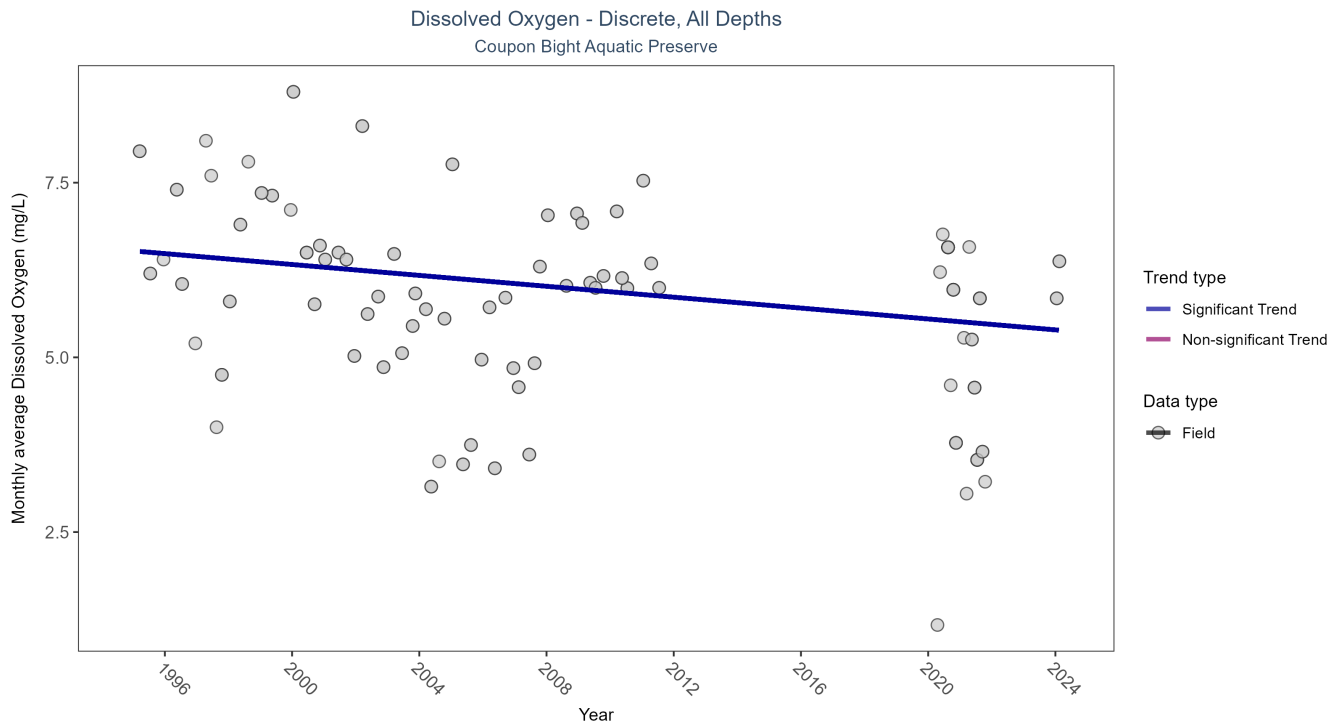


Figure 3: Seasonal Kendall-Tau Results for Dissolved Oxygen - Discrete

Table 8: Seasonal Kendall-Tau Trend Analysis for Dissolved Oxygen

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|---------|-------|-----------|---------------|------------|-------------|-------|
| All | 159 | 20 | 5.9905 | TRUE | -0.2504 | 0.022 | -0.039 | 6.5239 | 12.5321 | 0.325 | -1 |

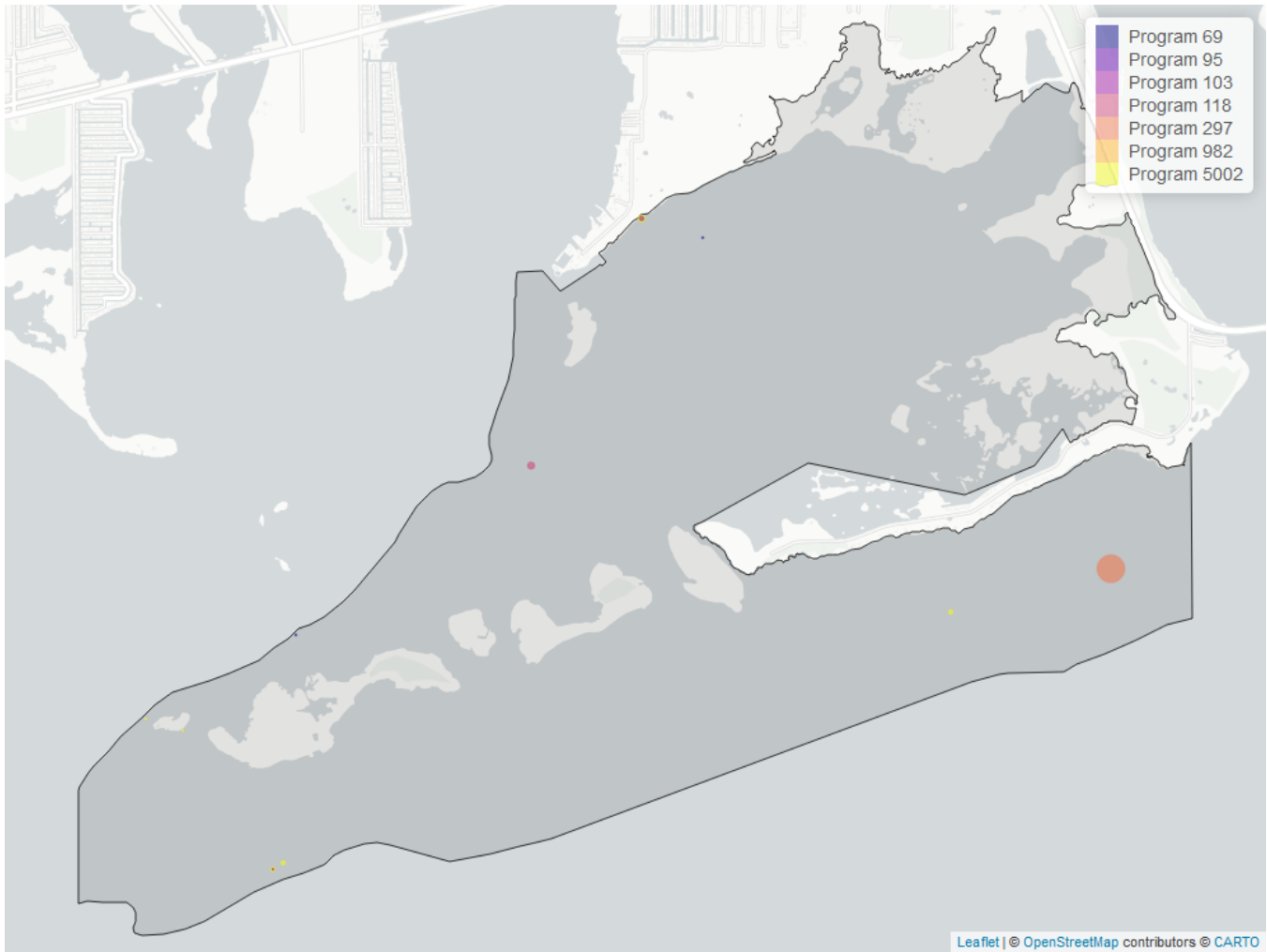


Figure 4: Map showing location of Discrete sampling sites for Dissolved Oxygen. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 9: Programs contributing data for Dissolved Oxygen

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 297 | 111 | 1995 | 2011 |
| 5002 | 33 | 2020 | 2024 |
| 118 | 7 | 2020 | 2020 |
| 103 | 4 | 2021 | 2021 |
| 69 | 4 | 2000 | 2000 |

Program names:

- 69 - Fisheries-Independent Monitoring (FIM) Program⁴
- 103 - EPA STORage and RETrieval Data Warehouse (STORET)/WQX¹
- 118 - National Aquatic Resource Surveys, National Coastal Condition Assessment⁵
- 297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²
- 5002 - Florida STORET / WIN³

Dissolved Oxygen Saturation - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

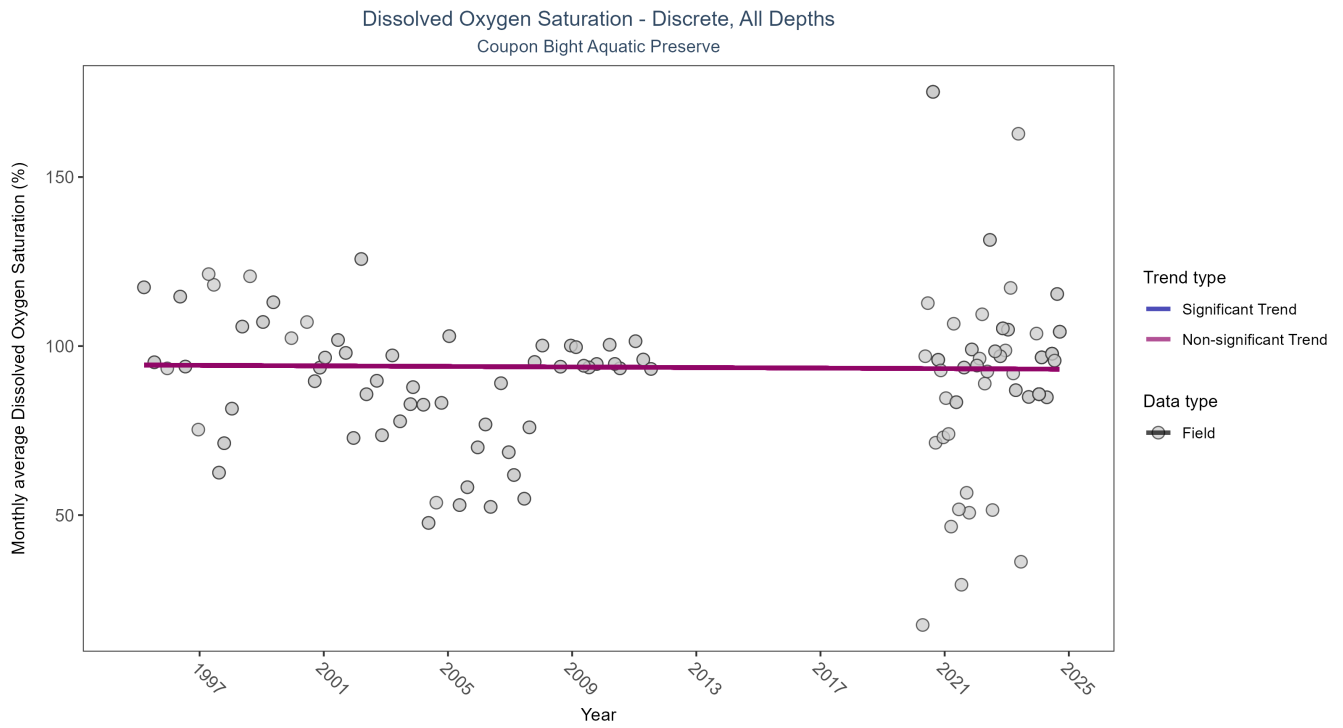


Figure 5: Seasonal Kendall-Tau Results for Dissolved Oxygen Saturation - Discrete

Table 10: Seasonal Kendall-Tau Trend Analysis for Dissolved Oxygen Saturation

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|---------|------|-----------|---------------|------------|-------------|-------|
| All | 190 | 22 | 93.65 | TRUE | -0.0039 | 0.86 | -0.041 | 94.3848 | 19.6127 | 0.0509 | 0 |

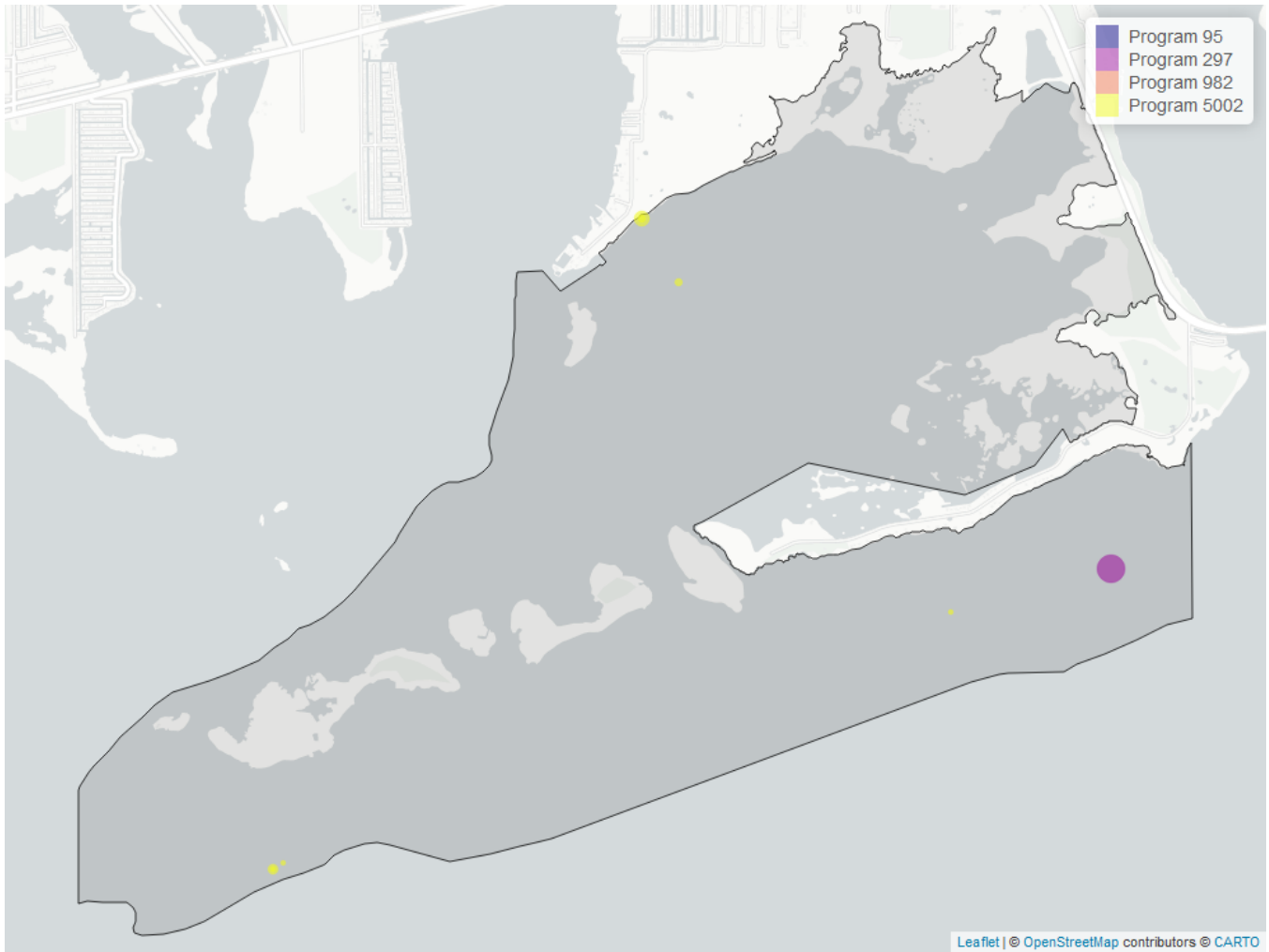


Figure 6: Map showing location of Discrete sampling sites for Dissolved Oxygen Saturation. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 11: Programs contributing data for Dissolved Oxygen Saturation

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 297 | 112 | 1995 | 2011 |
| 5002 | 83 | 2020 | 2024 |

Program names:

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

5002 - Florida STORET / WIN³

Salinity - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

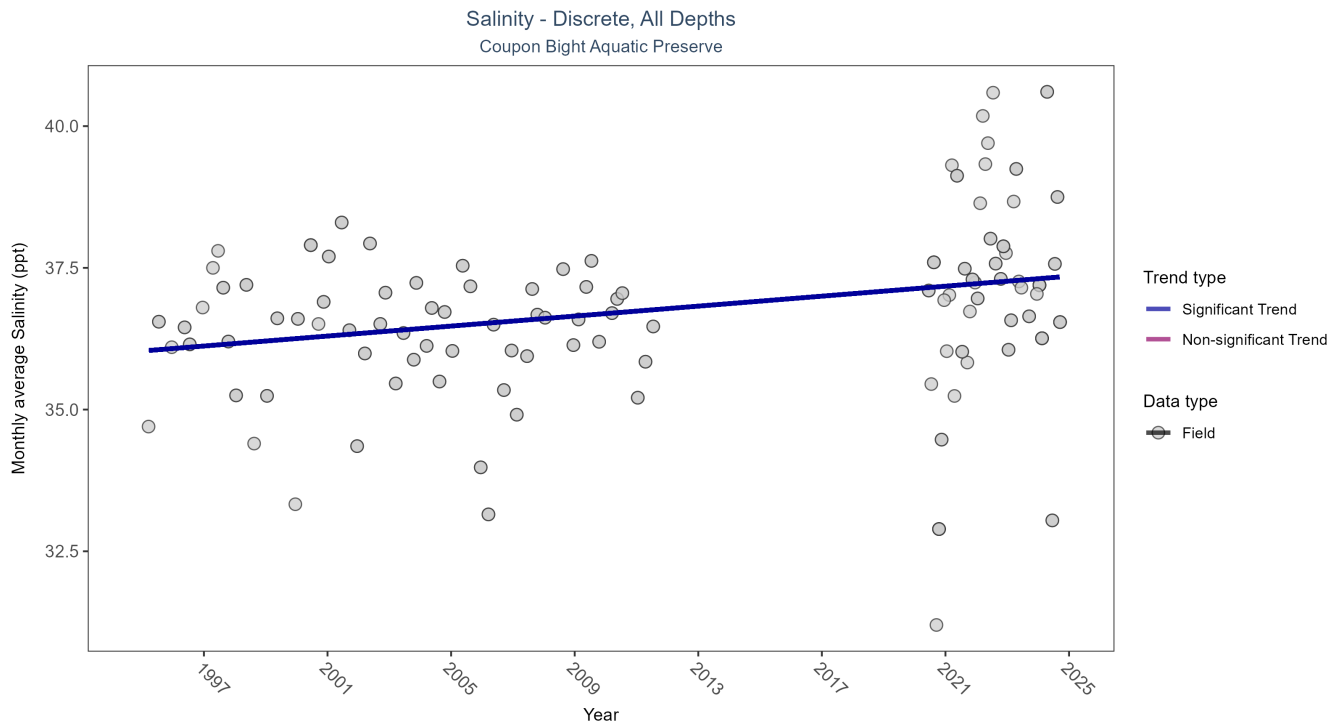


Figure 7: Seasonal Kendall-Tau Results for Salinity - Discrete

Table 12: Seasonal Kendall-Tau Trend Analysis for Salinity

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|--------|---|-----------|---------------|------------|-------------|-------|
| All | 200 | 22 | 36.7 | TRUE | 0.3305 | 0 | 0.044 | 36.0329 | 14.094 | 0.2278 | 1 |

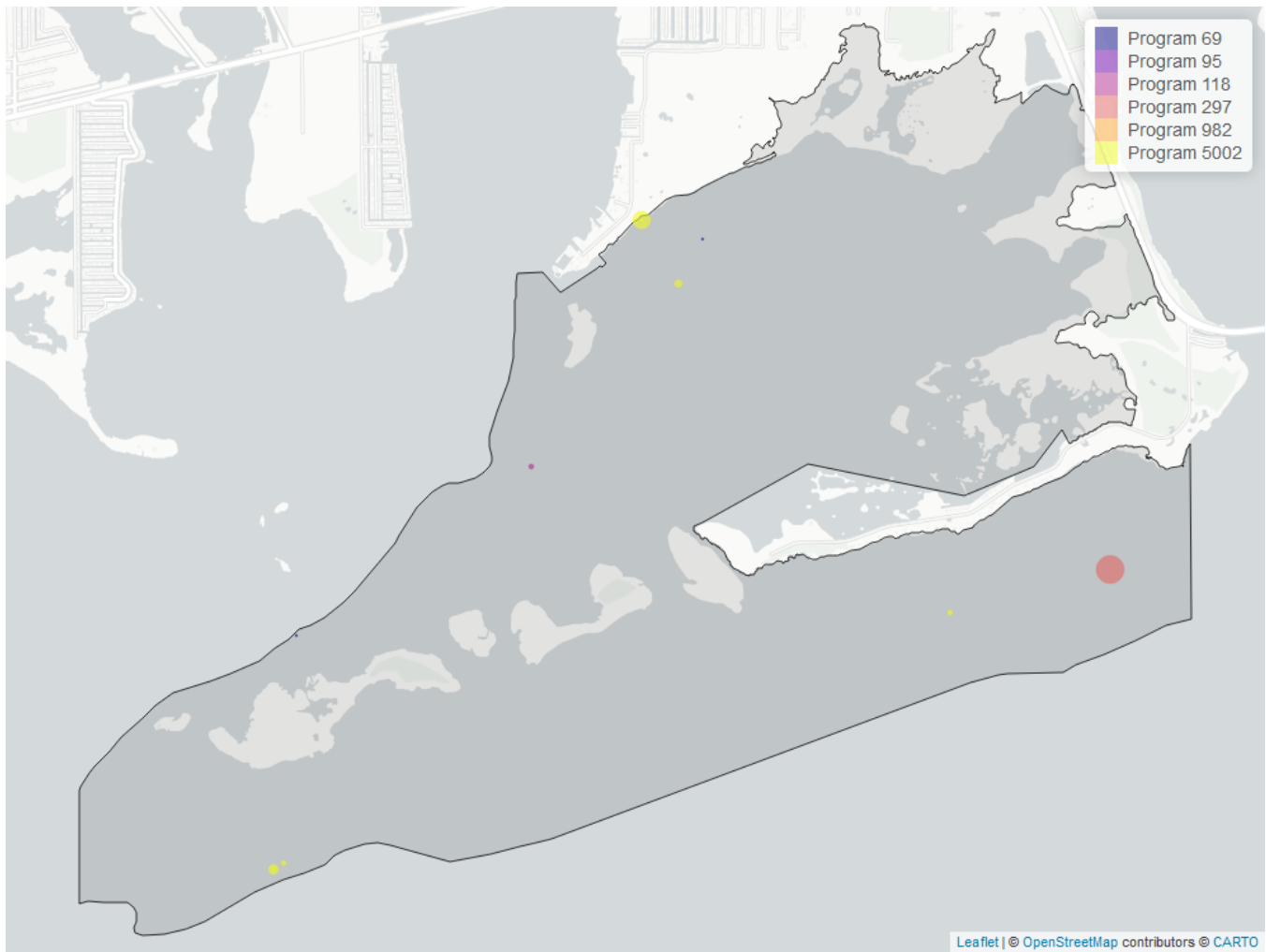


Figure 8: Map showing location of Discrete sampling sites for Salinity. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 13: Programs contributing data for Salinity

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 297 | 111 | 1995 | 2011 |
| 5002 | 84 | 2020 | 2024 |
| 118 | 6 | 2020 | 2020 |
| 69 | 4 | 2000 | 2000 |

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program⁴

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment⁵

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

5002 - Florida STORET / WIN³

Total Nitrogen - Discrete Water Quality

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) $TN = TKN + NO_3O_2$;
- 2) $TN = TKN + NO_3 + NO_2$;
- 3) $TN = ORGN + NH_4 + NO_3O_2$;
- 4) $TN = ORGN + NH_4 + NO_2 + NO_3$;
- 5) $TN = TKN + NO_3$;
- 6) $TN = ORGN + NH_4 + NO_3$;

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

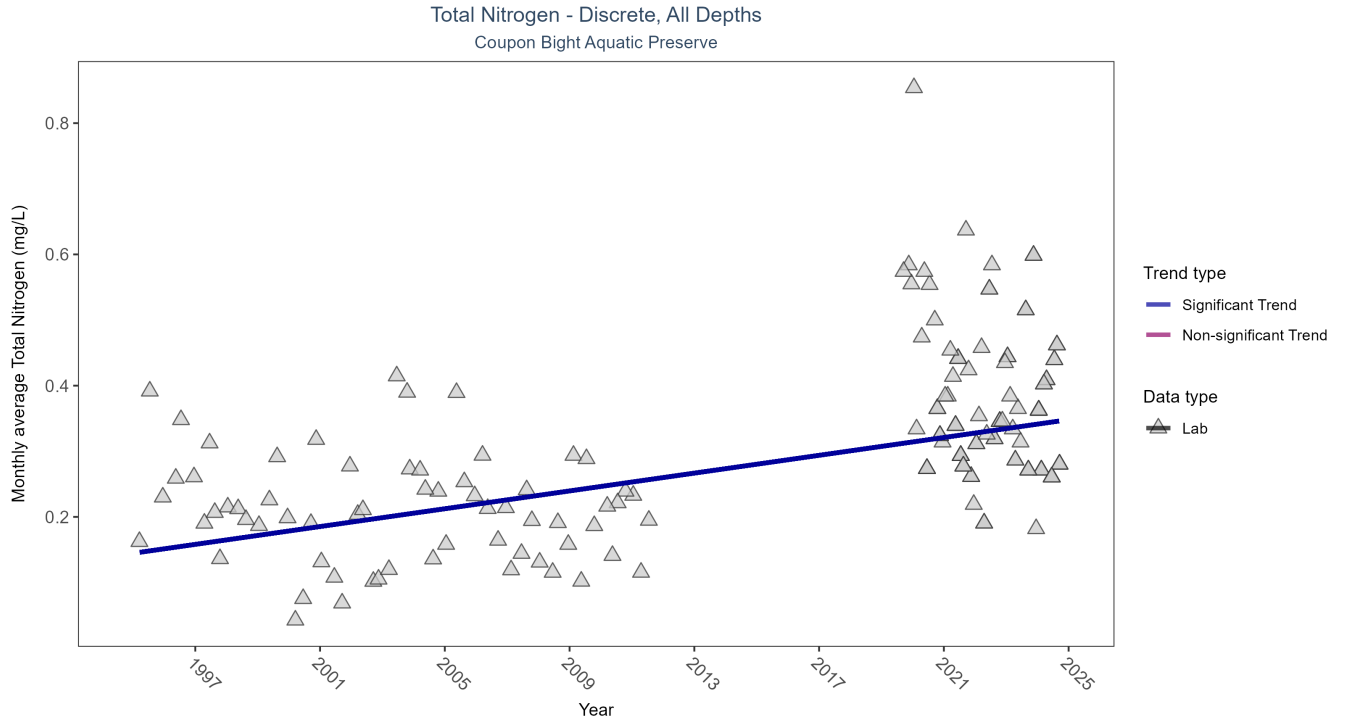


Figure 9: Seasonal Kendall-Tau Results for Total Nitrogen - Discrete

Table 14: Seasonal Kendall-Tau Trend Analysis for Total Nitrogen

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|--------|---|-----------|---------------|------------|-------------|-------|
| All | 161 | 23 | 0.285 | TRUE | 0.3474 | 0 | 0.0068 | 0.1446 | 5.7511 | 0.8894 | 1 |

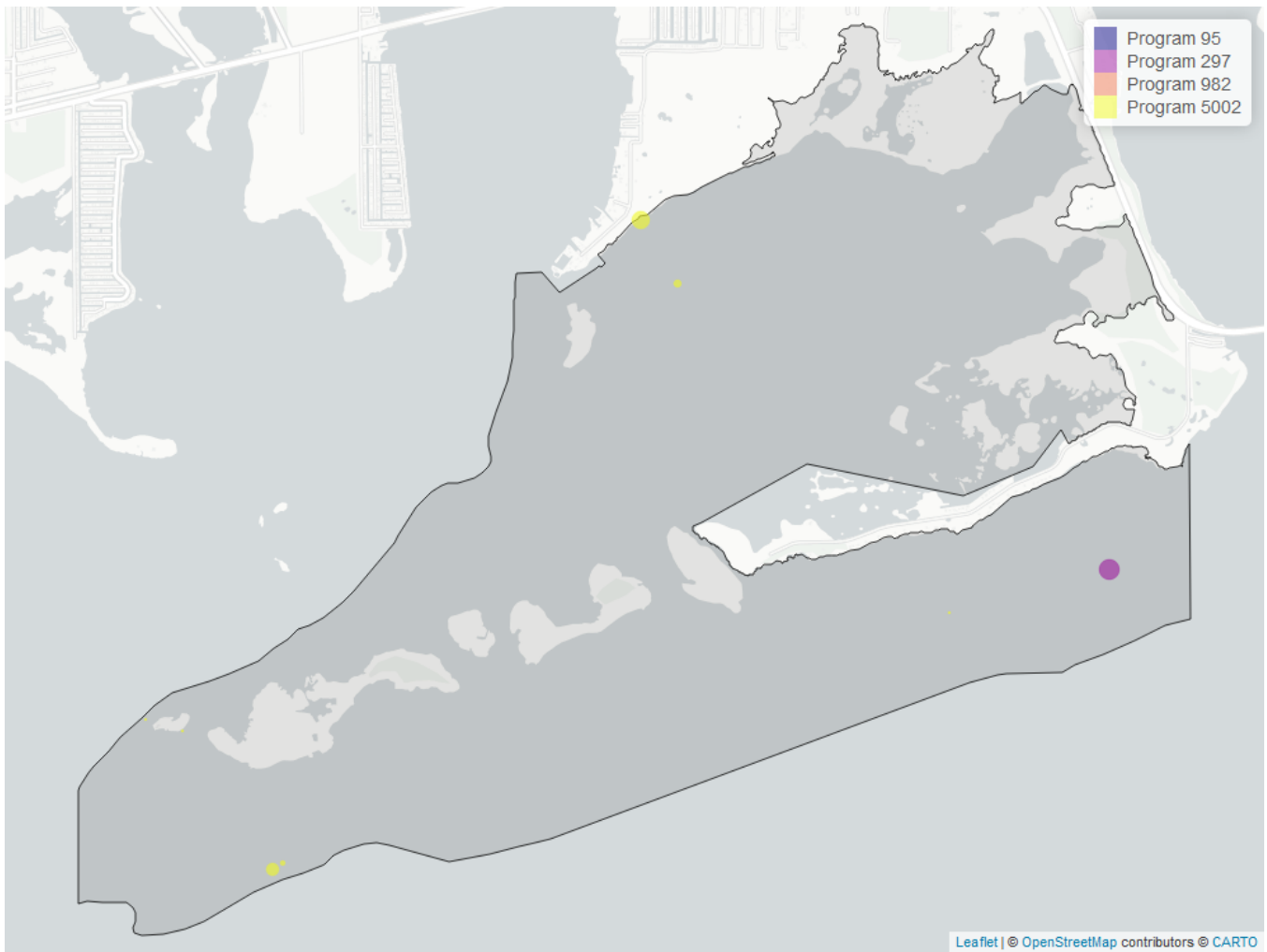


Figure 10: Map showing location of Discrete sampling sites for Total Nitrogen. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 15: Programs contributing data for Total Nitrogen

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 5002 | 97 | 2019 | 2024 |
| 297 | 64 | 1995 | 2011 |

Program names:

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

5002 - Florida STORET / WIN³

Total Phosphorus - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

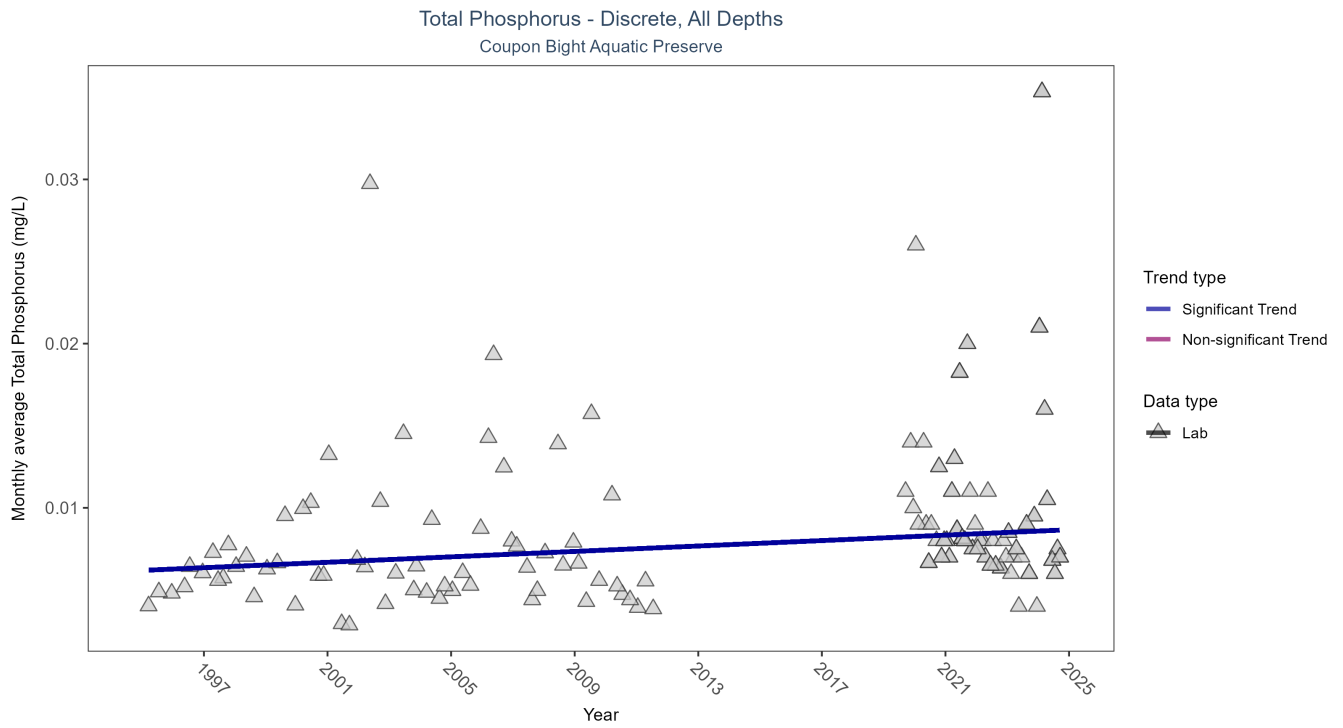


Figure 11: Seasonal Kendall-Tau Results for Total Phosphorus - Discrete

Table 16: Seasonal Kendall-Tau Trend Analysis for Total Phosphorus

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|--------|--------|-----------|---------------|------------|-------------|-------|
| All | 178 | 23 | 0.0071 | TRUE | 0.2168 | 0.0044 | 0.0001 | 0.0062 | 5.4067 | 0.9099 | 1 |

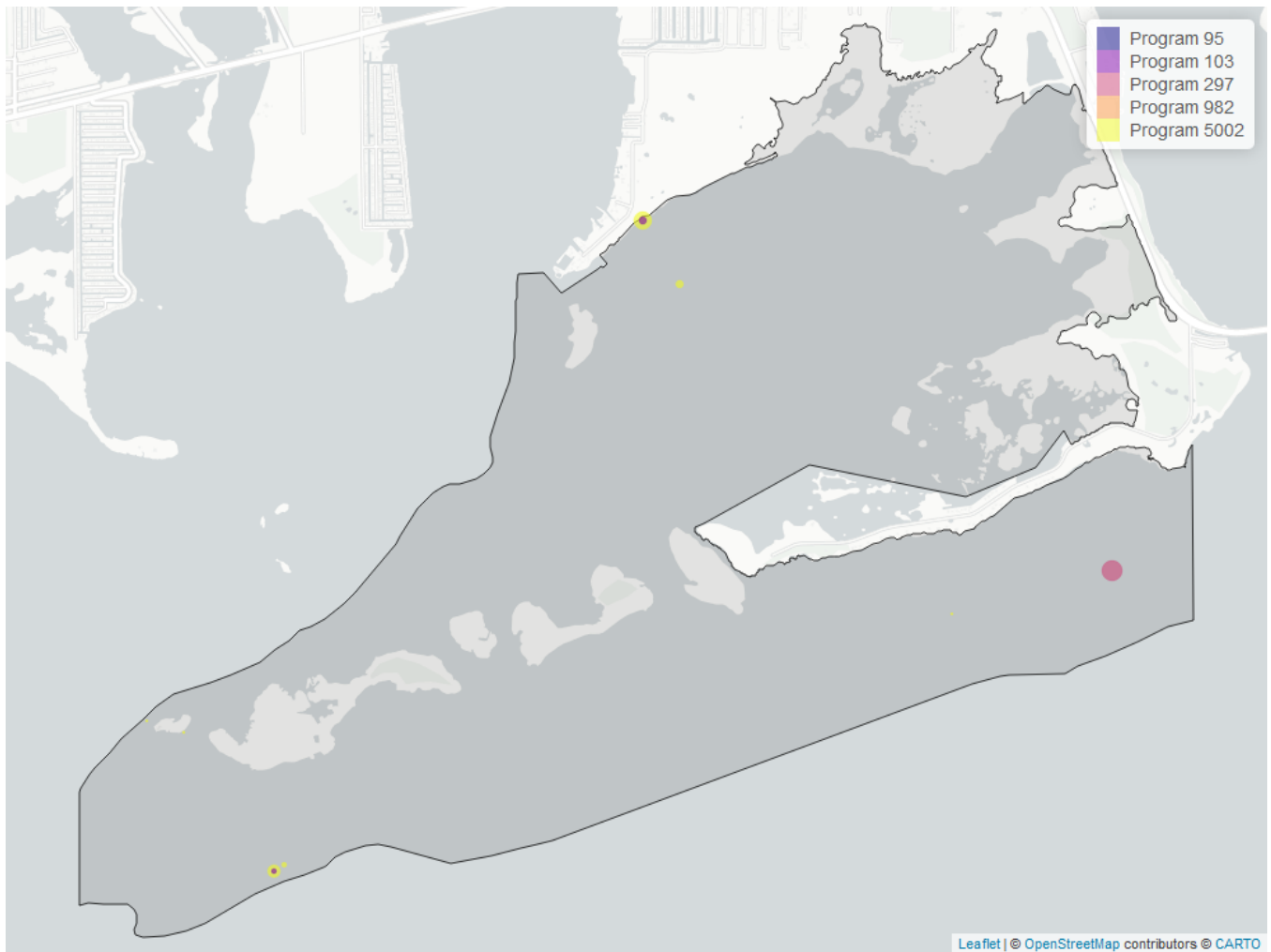


Figure 12: Map showing location of Discrete sampling sites for Total Phosphorus. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 17: Programs contributing data for Total Phosphorus

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 5002 | 100 | 2019 | 2024 |
| 297 | 64 | 1995 | 2011 |
| 103 | 16 | 2020 | 2021 |

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX¹

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

5002 - Florida STORET / WIN³

Turbidity - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

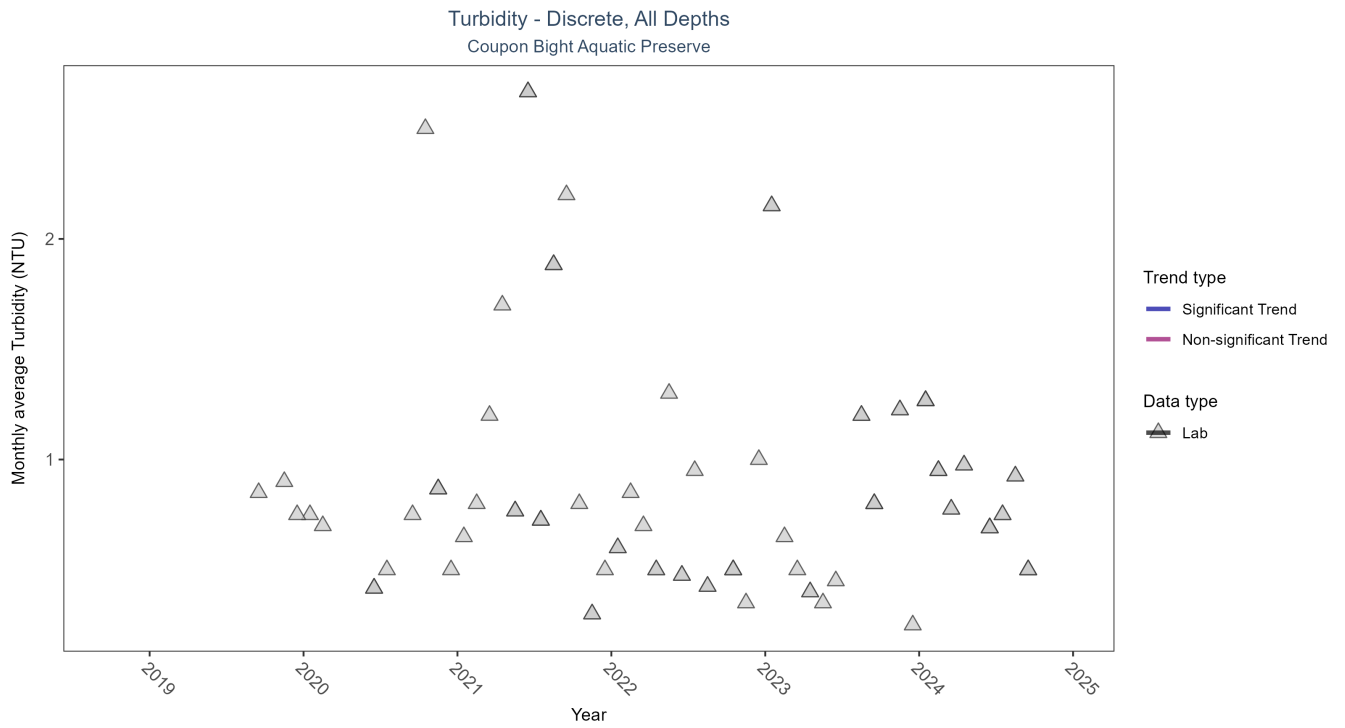


Figure 13: Seasonal Kendall-Tau Results for Turbidity - Discrete

Table 18: Seasonal Kendall-Tau Trend Analysis for Turbidity

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|--------|-------------|-----|---|-----------|---------------|------------|-------------|-------|
| All | 95 | 6 | 0.7 | - | - | - | - | - | - | - | - |

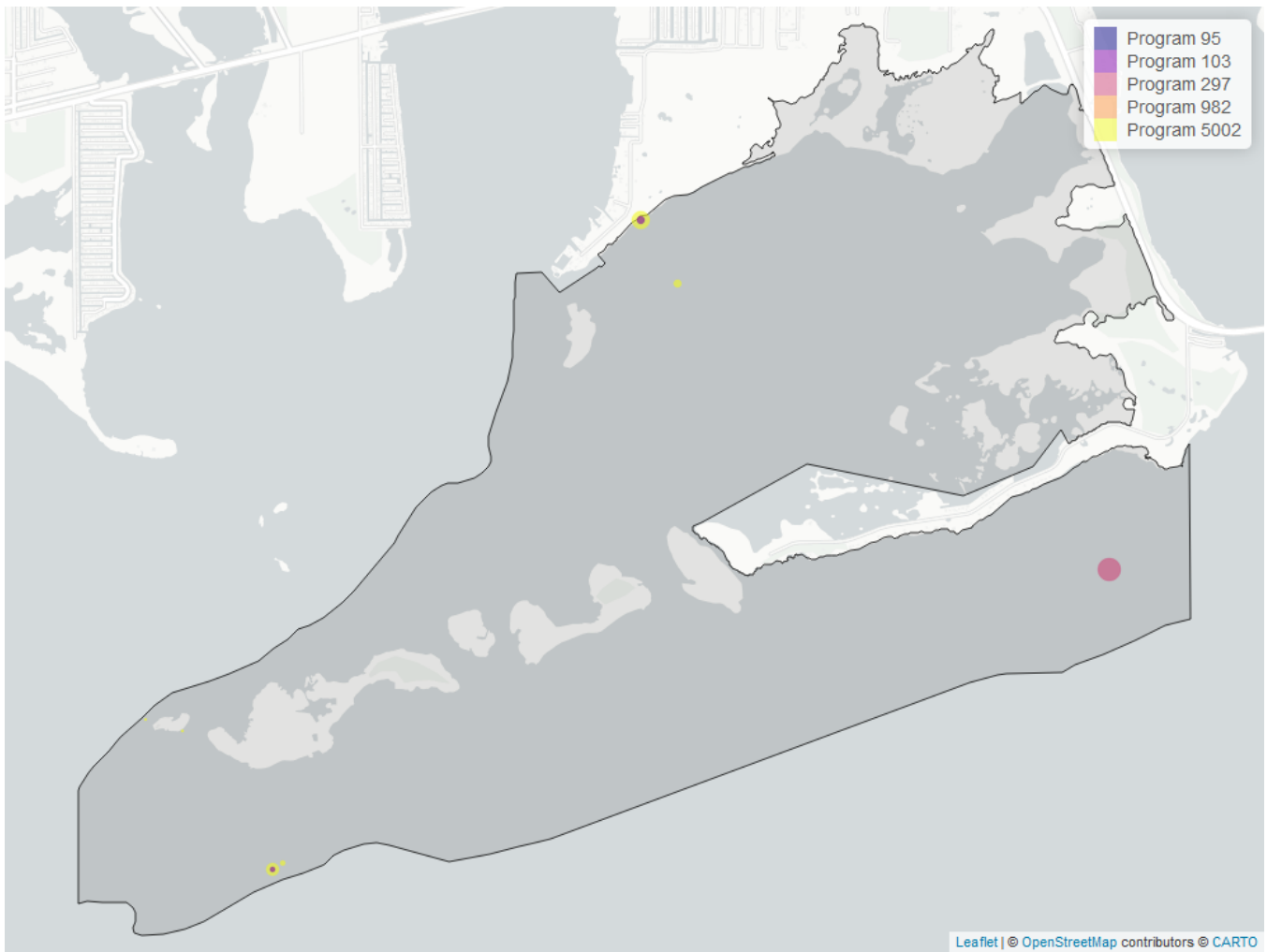


Figure 14: Map showing location of Discrete sampling sites for Turbidity. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 19: Programs contributing data for Turbidity

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 5002 | 97 | 2019 | 2024 |
| 297 | 74 | 1995 | 2011 |
| 103 | 16 | 2020 | 2021 |

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX¹

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

5002 - Florida STORET / WIN³

Water Temperature - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

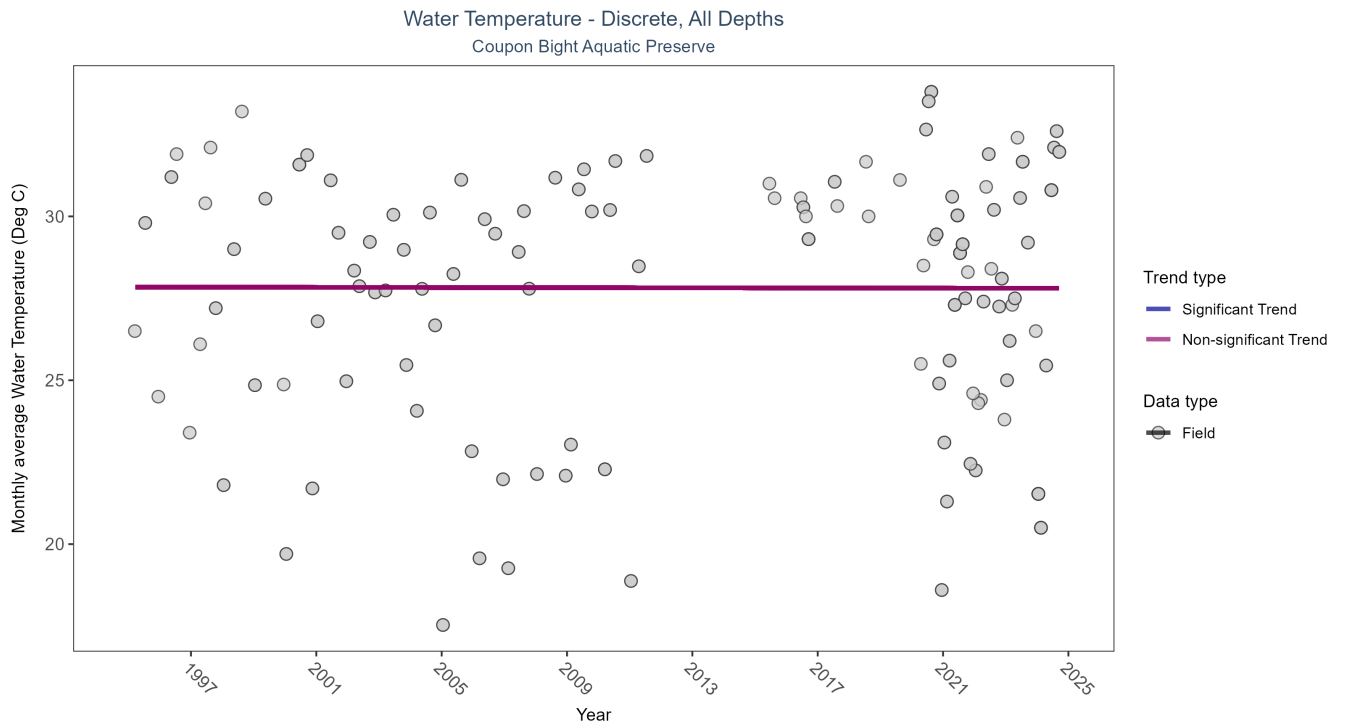


Figure 15: Seasonal Kendall-Tau Results for Water Temperature - Discrete

Table 20: Seasonal Kendall-Tau Trend Analysis for Water Temperature

| RelativeDepth | N-Data | N-Years | Median | Independent | tau | p | SennSlope | SennIntercept | ChiSquared | pChiSquared | Trend |
|---------------|--------|---------|---------|-------------|---------|-------|-----------|---------------|------------|-------------|-------|
| All | 240 | 27 | 28.4957 | TRUE | -0.0058 | 0.852 | -0.0013 | 27.8428 | 4.4587 | 0.9545 | 0 |

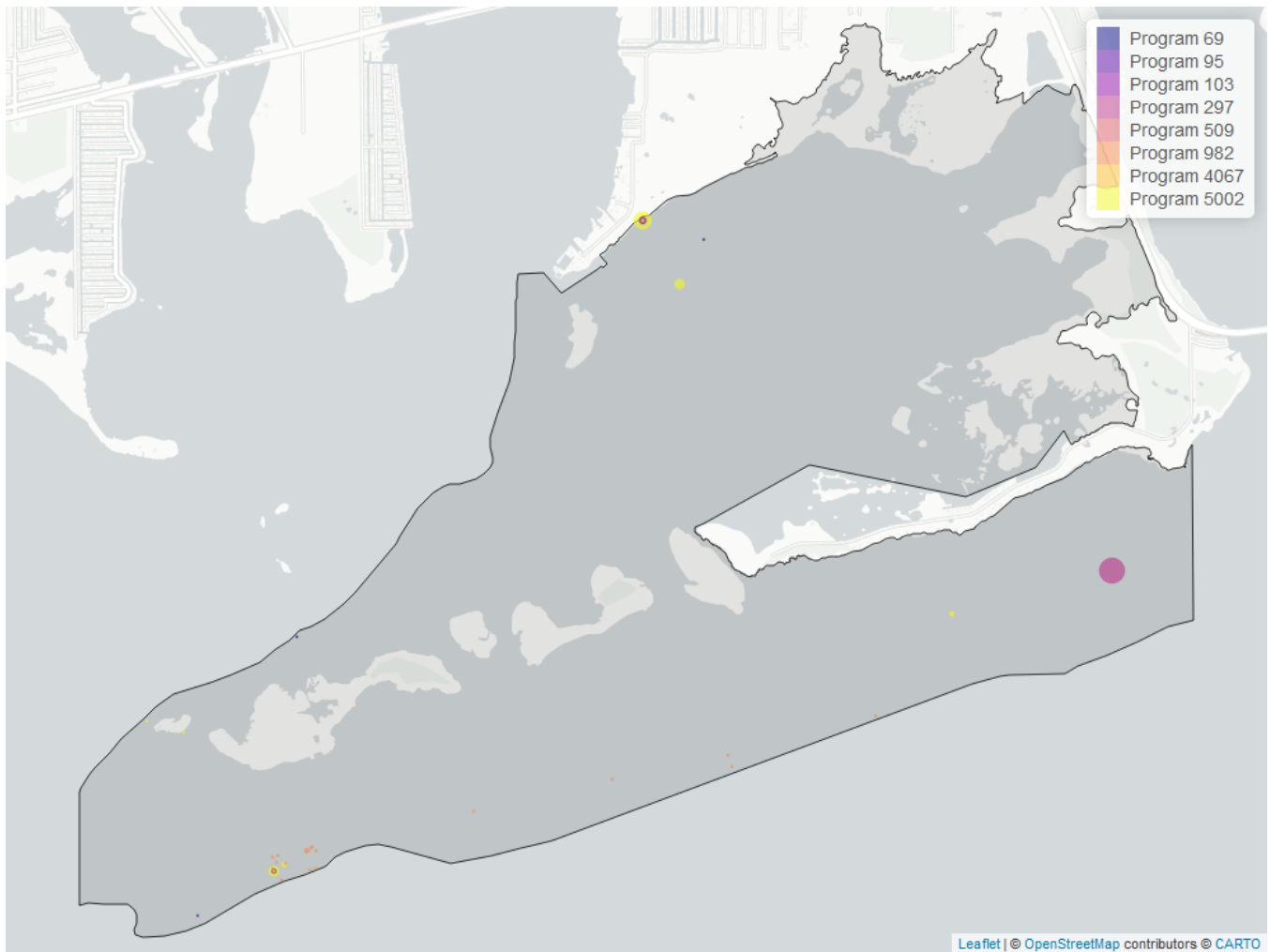


Figure 16: Map showing location of Discrete sampling sites for Water Temperature. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 21: Programs contributing data for Water Temperature

| <i>ProgramID</i> | <i>N_Data</i> | <i>YearMin</i> | <i>YearMax</i> |
|------------------|---------------|----------------|----------------|
| 297 | 110 | 1995 | 2011 |
| 5002 | 96 | 2020 | 2024 |
| 982 | 23 | 2015 | 2023 |
| 103 | 13 | 2020 | 2021 |
| 69 | 4 | 2000 | 2000 |
| 95 | 1 | 2010 | 2010 |

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program⁴

95 - Harmful Algal Bloom Marine Observation Network⁶

103 - EPA STORage and RETrieval Data Warehouse (STORET)/WQX¹

297 - Florida Keys National Marine Sanctuary Water Quality Monitoring Project²

982 - Florida Keys Bleach Watch⁷

5002 - Florida STORET / WIN³

Water Quality - Continuous

The following files were used in the continuous analysis:

- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_SE-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_Saturation_SE-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_cont_pH_SE-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_cont_Salinity_SE-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_cont_Turbidity_SE-2024-Dec-08.txt*
- *Combined_WQ_WC_NUT_cont_Water_Temperature_SE-2024-Dec-08.txt*

Continuous monitoring locations in Coupon Bight Aquatic Preserve

Table 22: Florida Keys Aquatic Preserves Continuous Water Quality Monitoring (10004)

| <i>ProgramLocationID</i> | <i>Years of Data</i> | <i>Use in Analysis</i> | <i>Parameters</i> |
|--------------------------|----------------------|------------------------|------------------------------------|
| FKCB | 1 | FALSE | DO , DOS , pH , Sal , Turb , TempW |

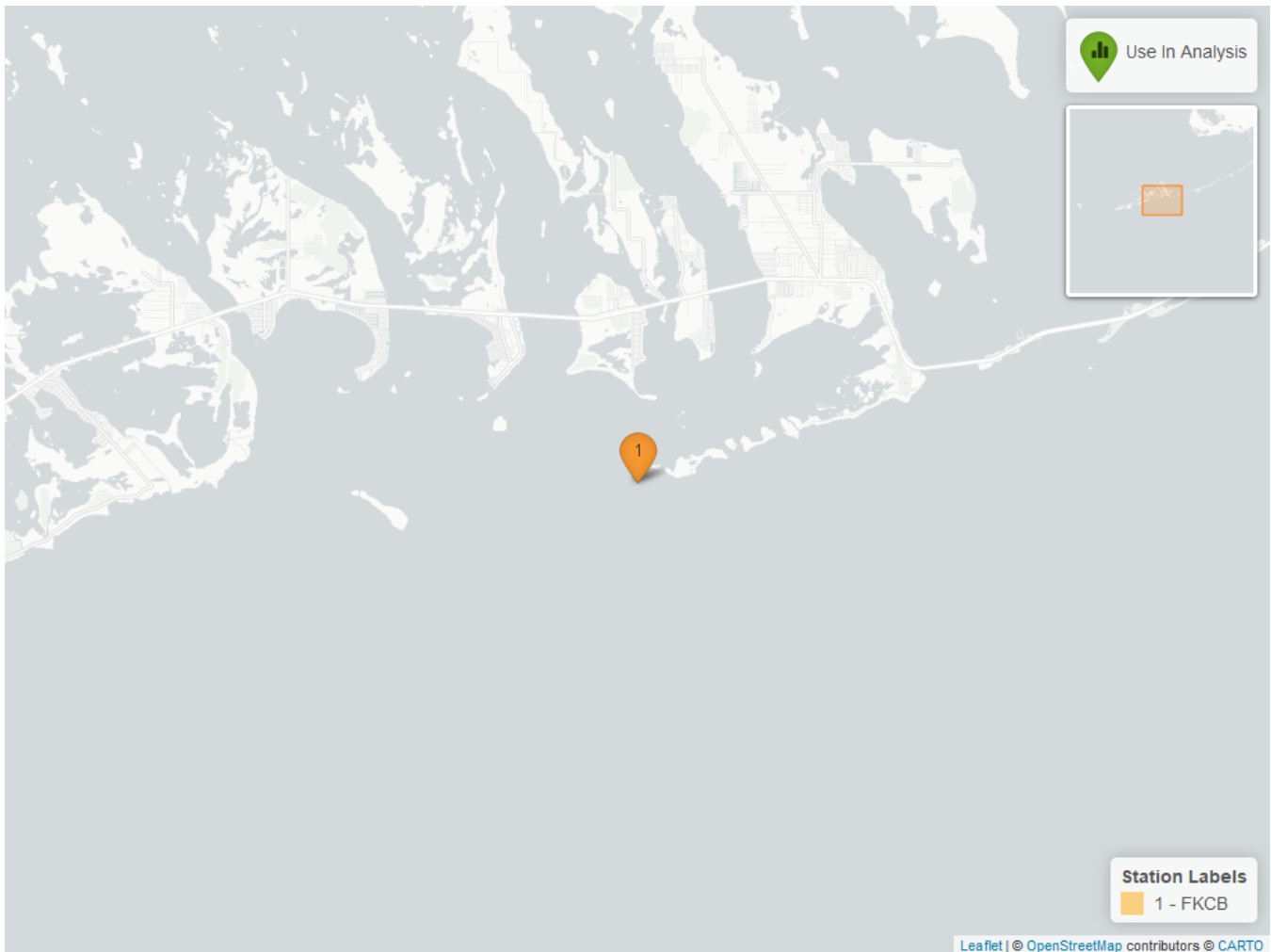


Figure 17: Map showing Continuous Water Quality Monitoring sampling locations within the boundaries of Coupon Bight Aquatic Preserve. Sites marked as *Use In Analysis* are featured in this report.

Coral Reef

The data file used is: **All_CORAL_Parameters-2024-Dec-08.txt**
Species Richness

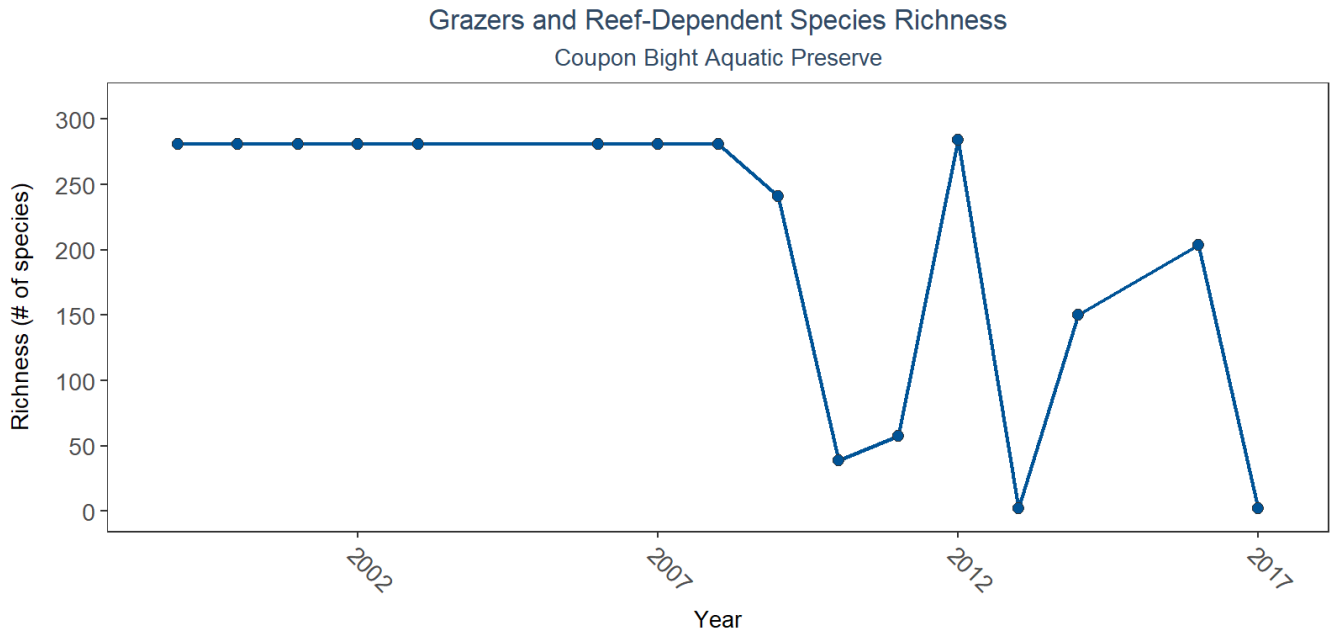


Figure 18: Figure for Coral Species Richness in Coupon Bight Aquatic Preserve

Table 23: Coral Species Richness

| <i>N-Years</i> | <i>EarliestYear</i> | <i>LatestYear</i> | <i>N-Data</i> | <i>Min</i> | <i>Max</i> | <i>Median</i> | <i>Mean</i> | <i>StDev</i> | <i>Year-MinRichness</i> | <i>Year-MaxRichness</i> |
|----------------|---------------------|-------------------|---------------|------------|------------|---------------|-------------|--------------|-------------------------|-------------------------|
| 16 | 1999 | 2017 | 72 | 2 | 284 | 281 | 182.12 | 126.81 | 2013 | 2012 |

References

1. U.S. Environmental Protection Agency (EPA). [EPA STORage and RETrieval Data Warehouse \(STORET\)/WQX](#). (2023).
2. Florida International University (FIU). [Florida Keys National Marine Sanctuary Water Quality Monitoring Project](#). (2023).
3. Florida Department of Environmental Protection (DEP). [Florida STORET / WIN](#). (2024).
4. Florida Fish and Wildlife Conservation Commission (FWC). [Fisheries-Independent Monitoring \(FIM\) Program](#). (2022).
5. U.S. Environmental Protection Agency (EPA); Office of Water; National Oceanic and Atmospheric Administration (NOAA); U.S. Geological Survey (USGS); U.S. Fish and Wildlife Service (USFWS); National Estuary Program (NEP); coastal states. [National Aquatic Resource Surveys, National Coastal Condition Assessment](#). (2021).
6. Florida Fish and Wildlife Conservation Commission (FWC); Florida Fish and Wildlife Research Institute (FWRI). [Harmful Algal Bloom Marine Observation Network](#). (2018).
7. Mote Marine Laboratory. [Florida Keys Bleach Watch](#). (2023).