

Southeast Florida Coral Reef Ecosystem Conservation Area

SEACAR Habitat Analyses

Last compiled on 08 January, 2025

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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	m^-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

<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*

Dissolved Oxygen - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

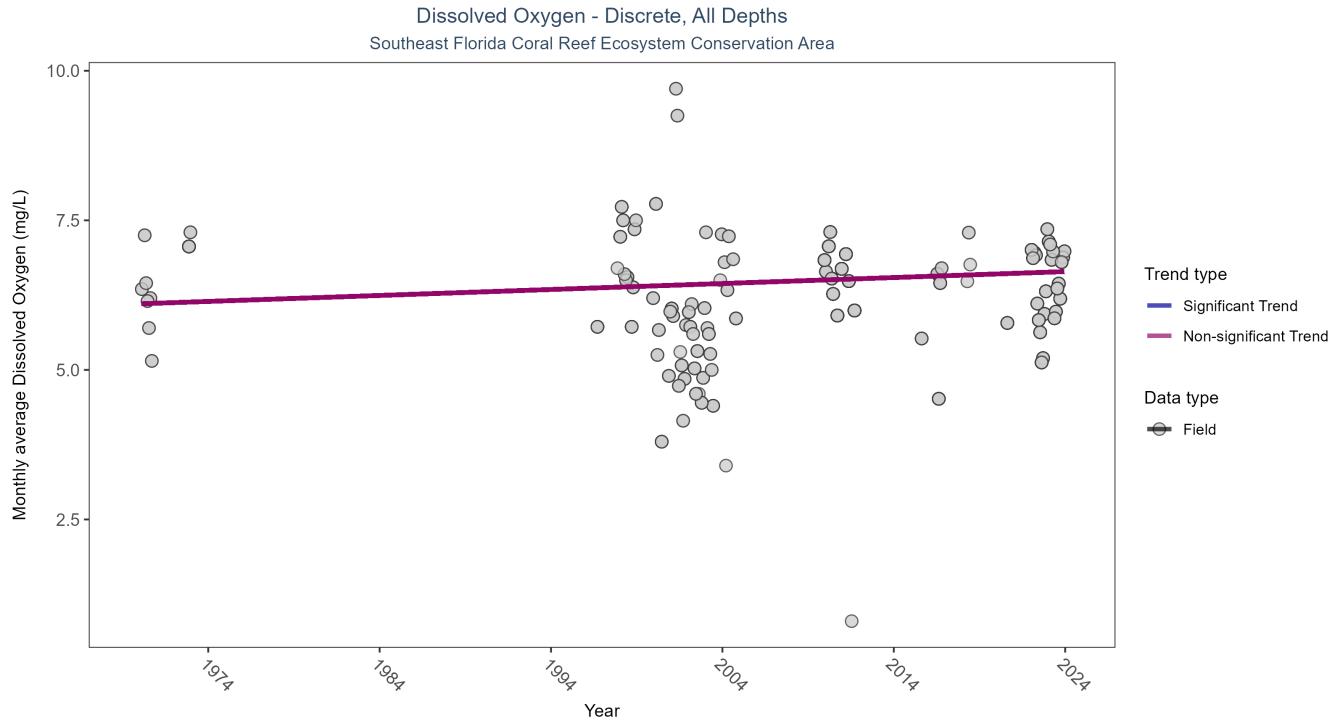


Figure 1: Seasonal Kendall-Tau Results for Dissolved Oxygen - Discrete

Table 6: Seasonal Kendall-Tau Trend Analysis for Dissolved Oxygen

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	742	20	6.49	TRUE	0.0958	0.3066	0.01	6.1046	4.9688	0.9327	0

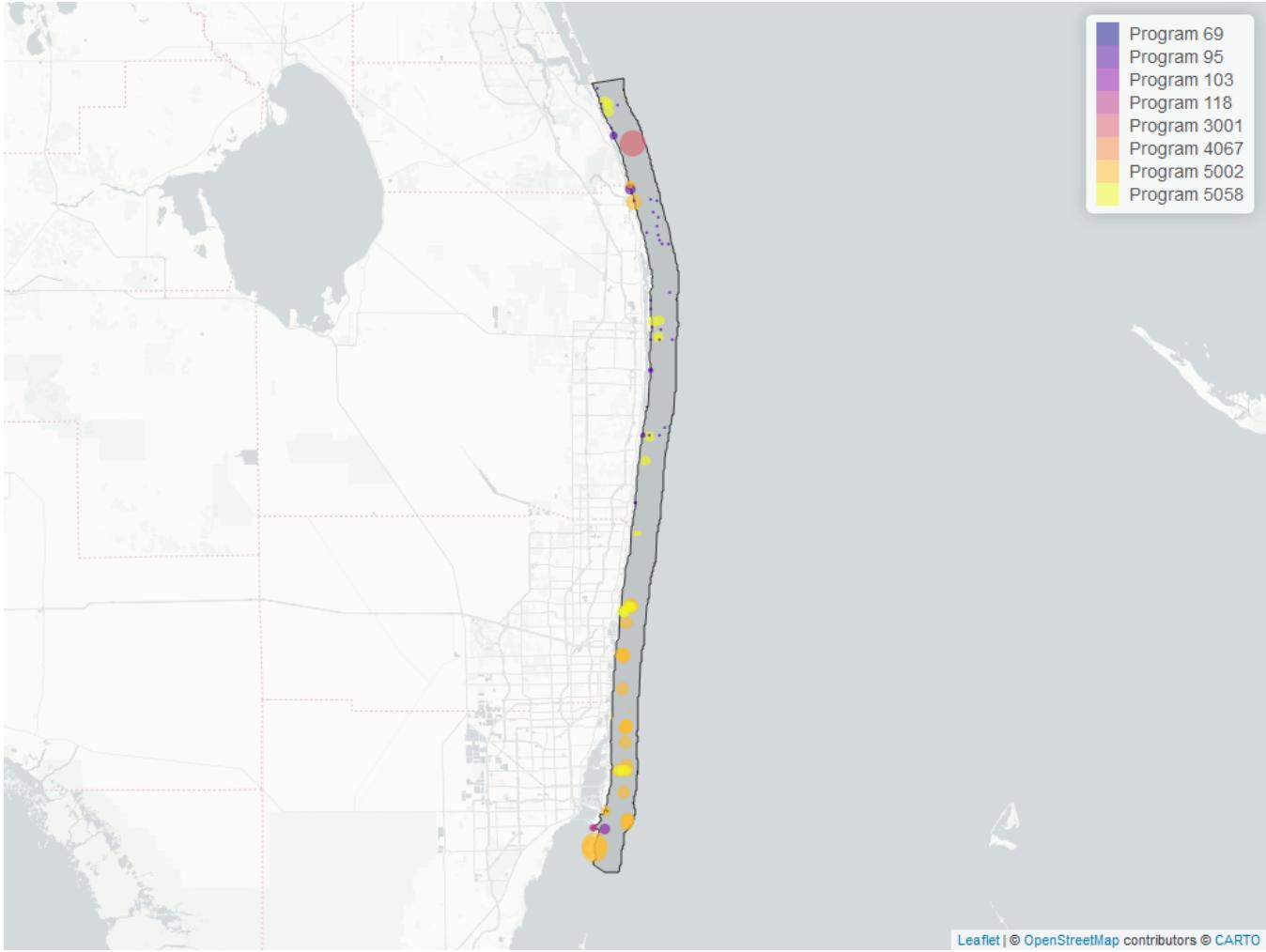


Figure 2: Map showing location of Discrete sampling sites for Dissolved Oxygen. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 7: Programs contributing data for Dissolved Oxygen

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5002	805	1996	2023
5058	266	2009	2011
3001	98	1999	2003
95	71	1972	2018
103	14	1970	1970
118	14	2015	2020
69	2	1998	1998

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program¹

95 - Harmful Algal Bloom Marine Observation Network²

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX³

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment⁴

3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵

5002 - Florida STORET / WIN⁶

5058 - Southeast Florida Coral Reef Initiative (SEFCRI) Water Quality Monitoring Report⁷

Dissolved Oxygen Saturation - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

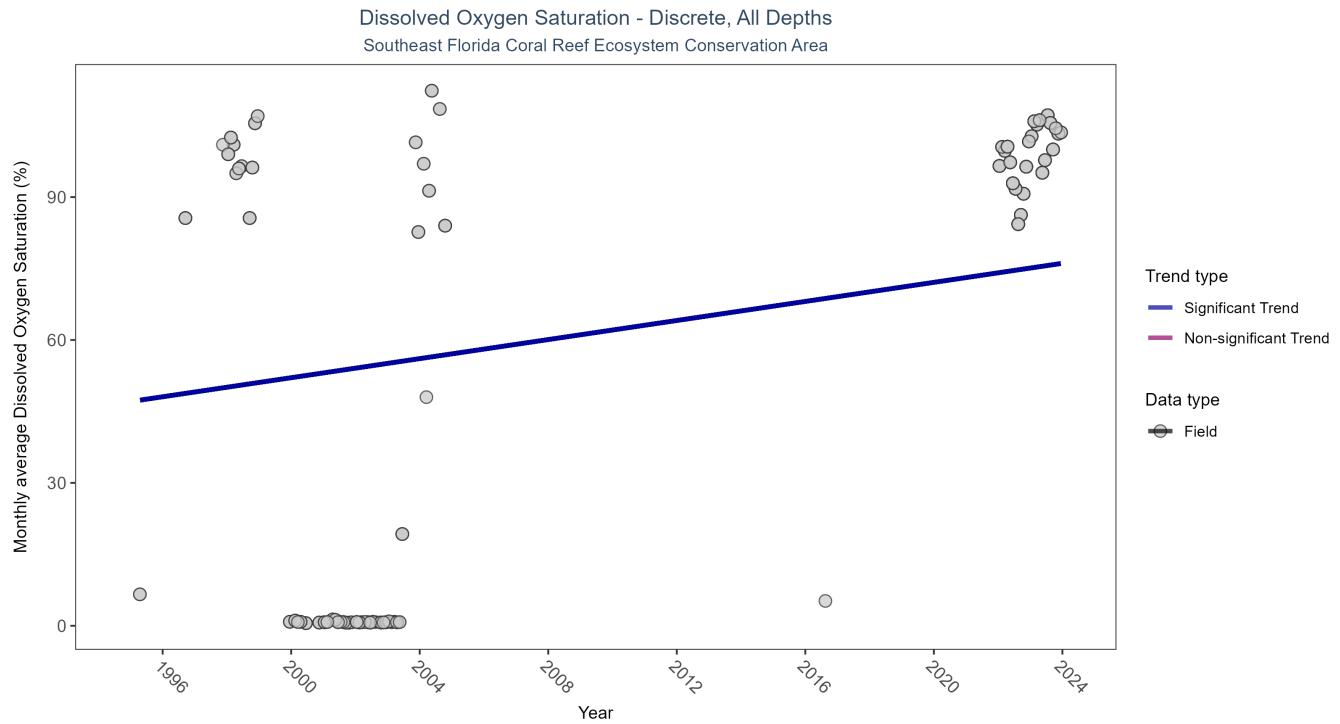


Figure 3: Seasonal Kendall-Tau Results for Dissolved Oxygen Saturation - Discrete

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

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	378	13	97.85	TRUE	0.3286	0.0019	1.0009	47.077	2.0046	0.9985	1

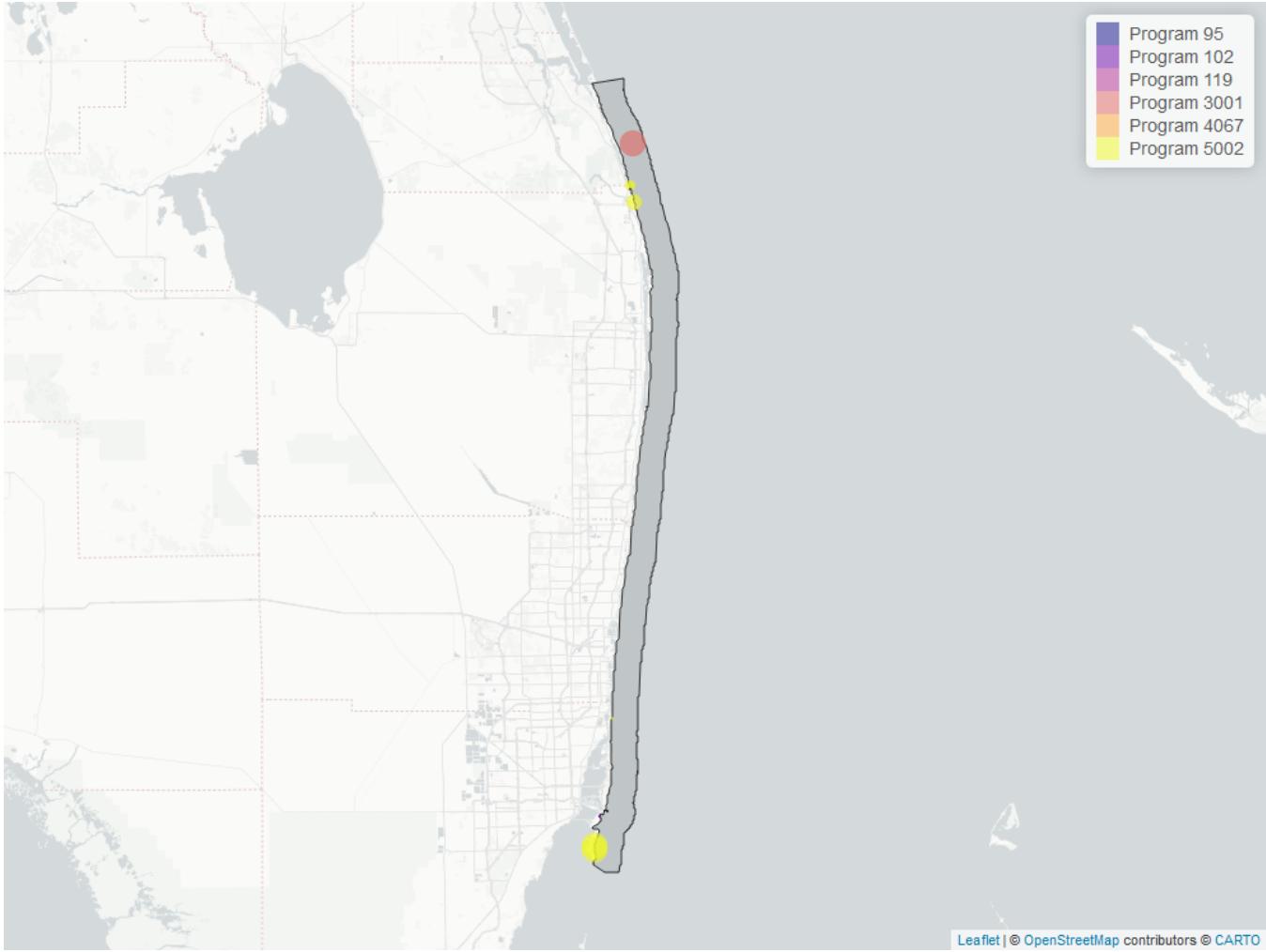


Figure 4: Map showing location of Discrete sampling sites for Dissolved Oxygen Saturation. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 9: Programs contributing data for Dissolved Oxygen Saturation

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5002	277	1996	2023
3001	98	1999	2003
102	2	1995	1995
95	1	2016	2016

Program names:

95 - Harmful Algal Bloom Marine Observation Network²

102 - National Status and Trends Mussel Watch⁸

3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵

5002 - Florida STORET / WIN⁶

pH - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

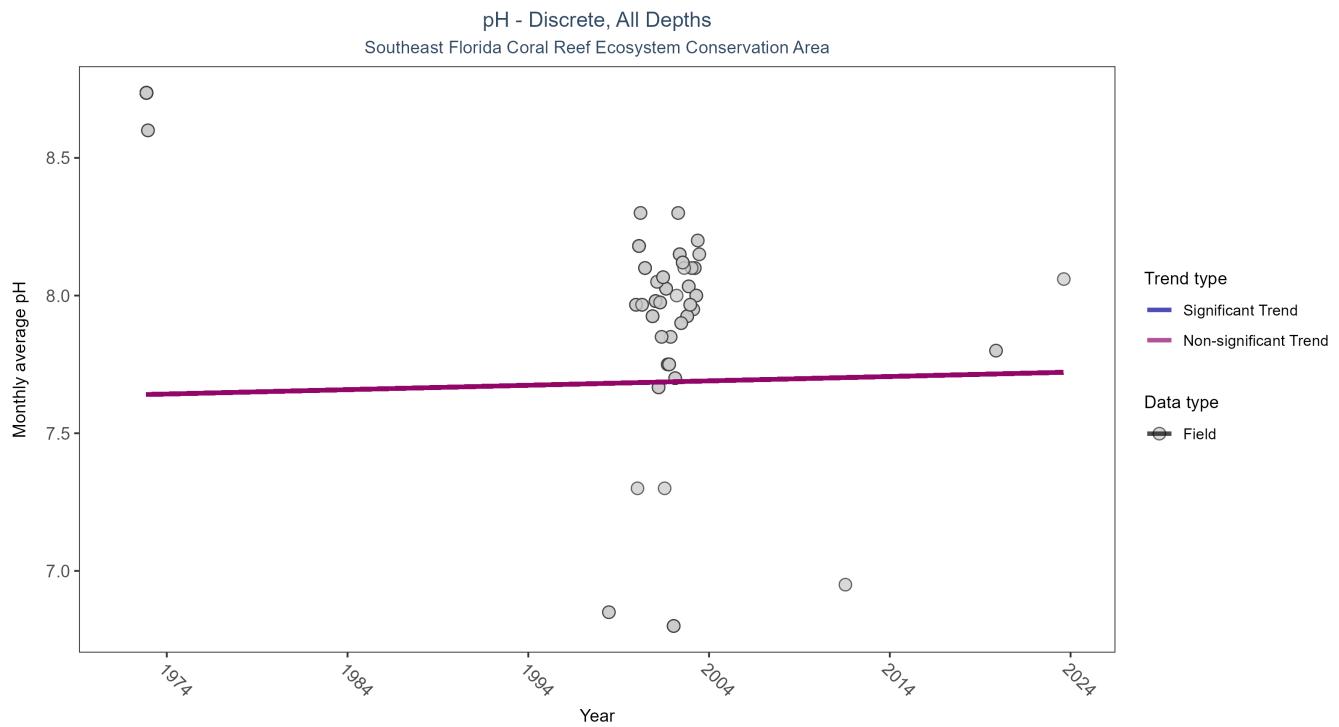


Figure 5: Seasonal Kendall-Tau Results for pH - Discrete

Table 10: Seasonal Kendall-Tau Trend Analysis for pH

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	172	10	8.2	TRUE	0.0833	0.9124	0.0016	7.6392	12.5606	0.2493	0

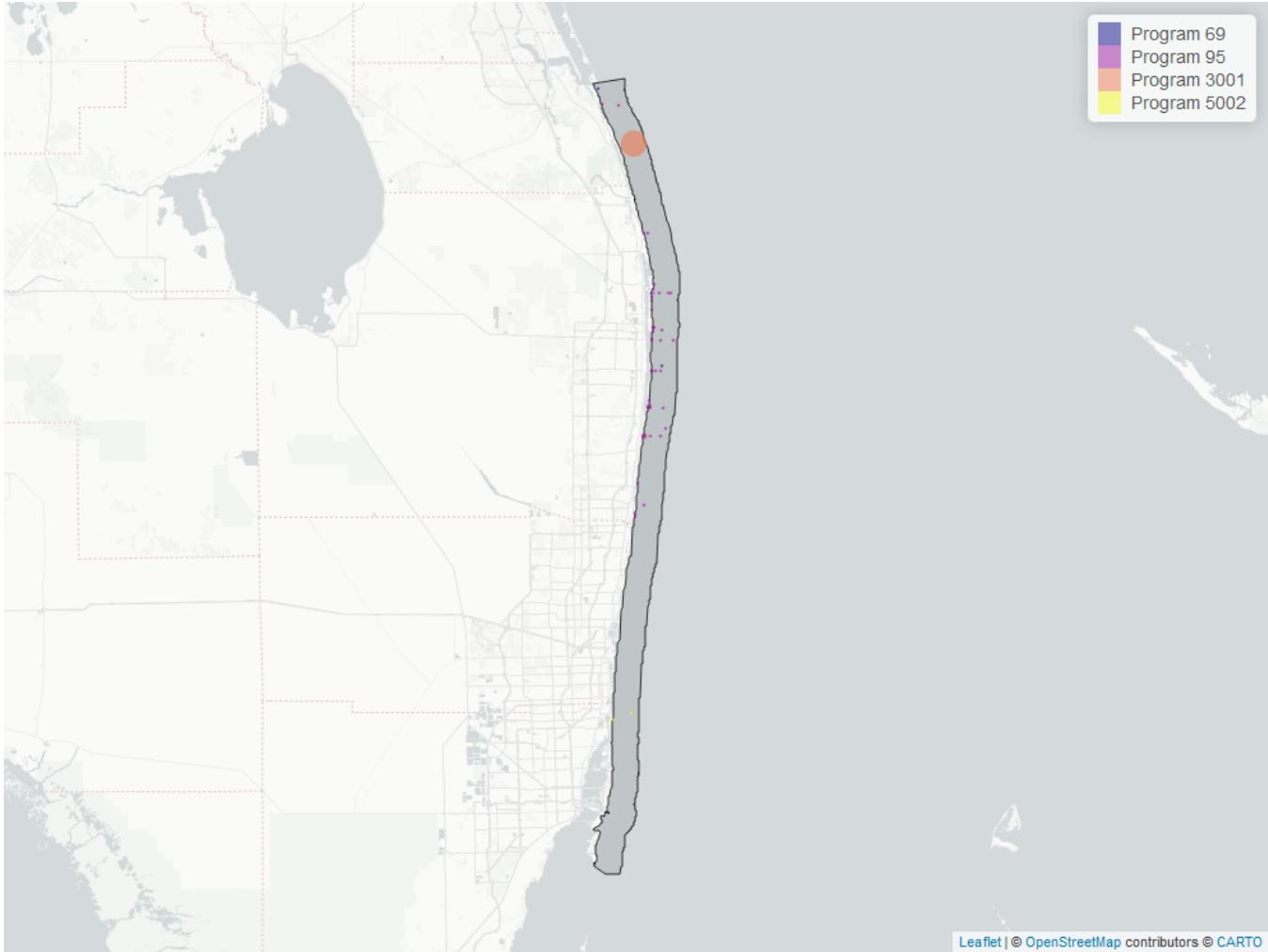


Figure 6: Map showing location of Discrete sampling sites for pH. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 11: Programs contributing data for pH

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
3001	103	1999	2003
95	65	1972	1972
69	4	1998	2019
5002	2	2011	2023

Program names:

- 69 - Fisheries-Independent Monitoring (FIM) Program¹
- 95 - Harmful Algal Bloom Marine Observation Network²
- 3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵
- 5002 - Florida STORET / WIN⁶

Salinity - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

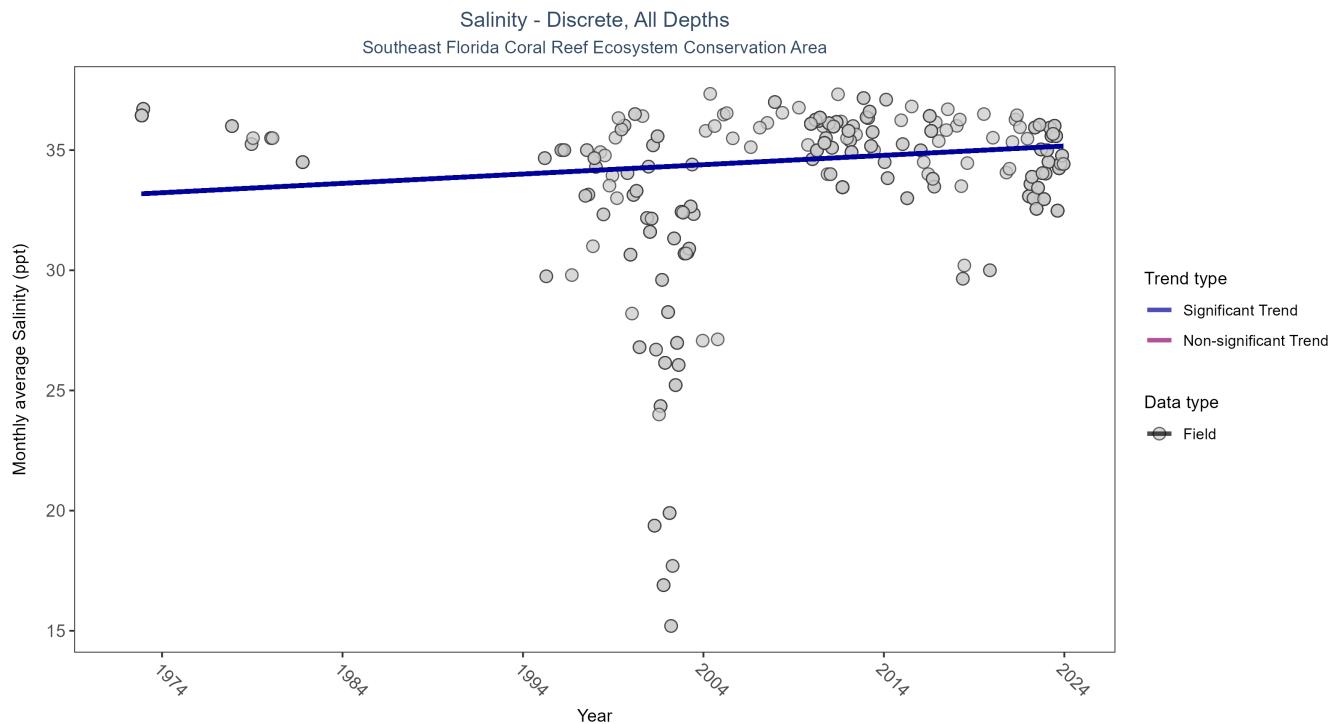


Figure 7: Seasonal Kendall-Tau Results for Salinity - Discrete

Table 12: Seasonal Kendall-Tau Trend Analysis for Salinity

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	987	35	35.6	TRUE	0.1527	0.0088	0.0389	33.1496	2.5004	0.9958	1

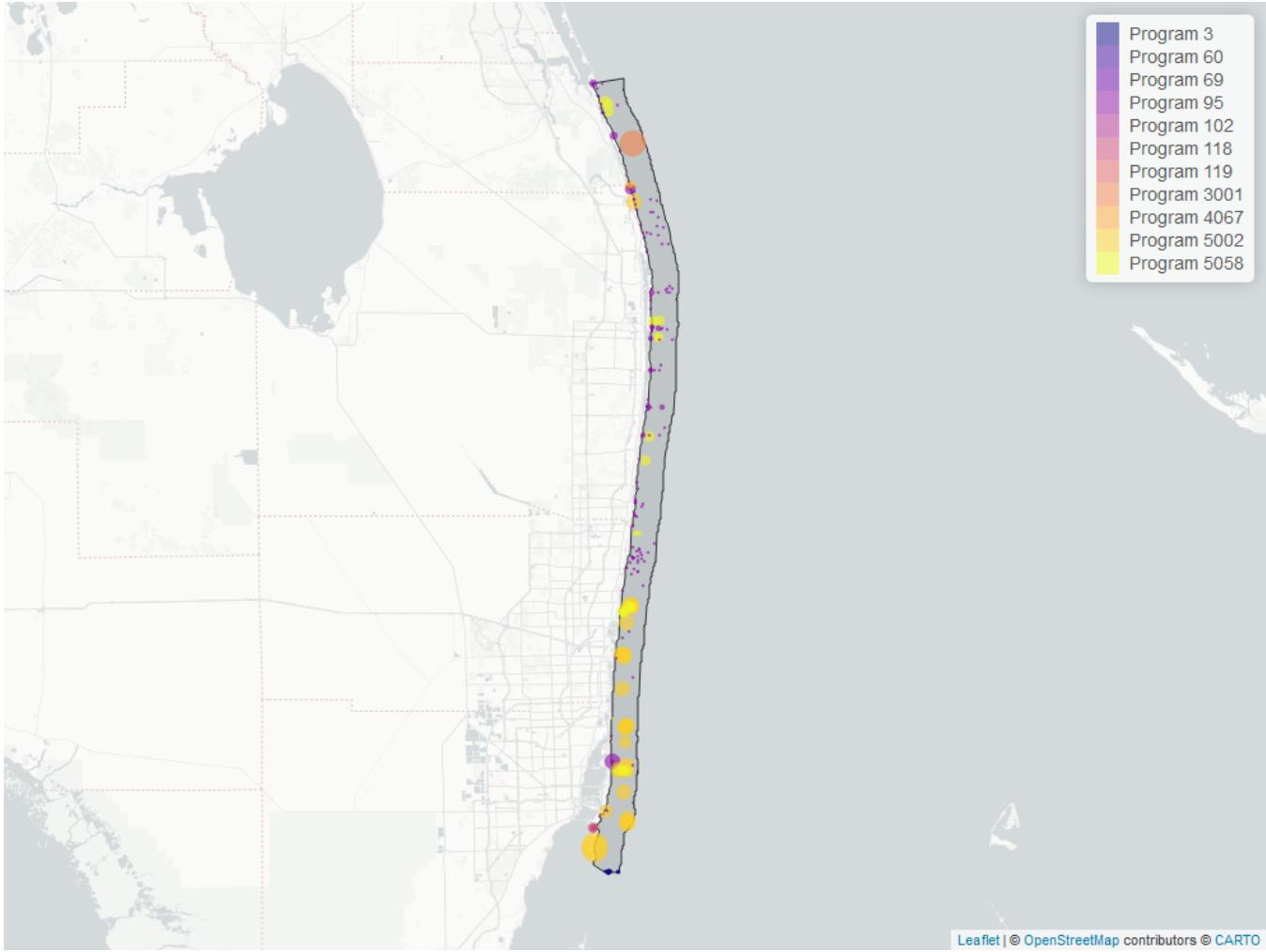


Figure 8: Map showing location of Discrete sampling sites for Salinity. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 13: Programs contributing data for Salinity

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5002	922	1996	2023
5058	266	2009	2011
95	230	1972	2018
3001	102	1999	2003
3	79	1998	2023
118	23	2015	2020
69	10	1997	2019
102	2	1995	1995

Program names:

3 - Atlantic Oceanographic and Meteorological Laboratory (AOML) South Florida Program Synoptic Shipboard Surveys⁹

69 - Fisheries-Independent Monitoring (FIM) Program¹

95 - Harmful Algal Bloom Marine Observation Network²

102 - National Status and Trends Mussel Watch⁸

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment⁴

3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵

5002 - Florida STORET / WIN⁶

5058 - Southeast Florida Coral Reef Initiative (SEFCRI) Water Quality Monitoring Report⁷

Secchi Depth - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

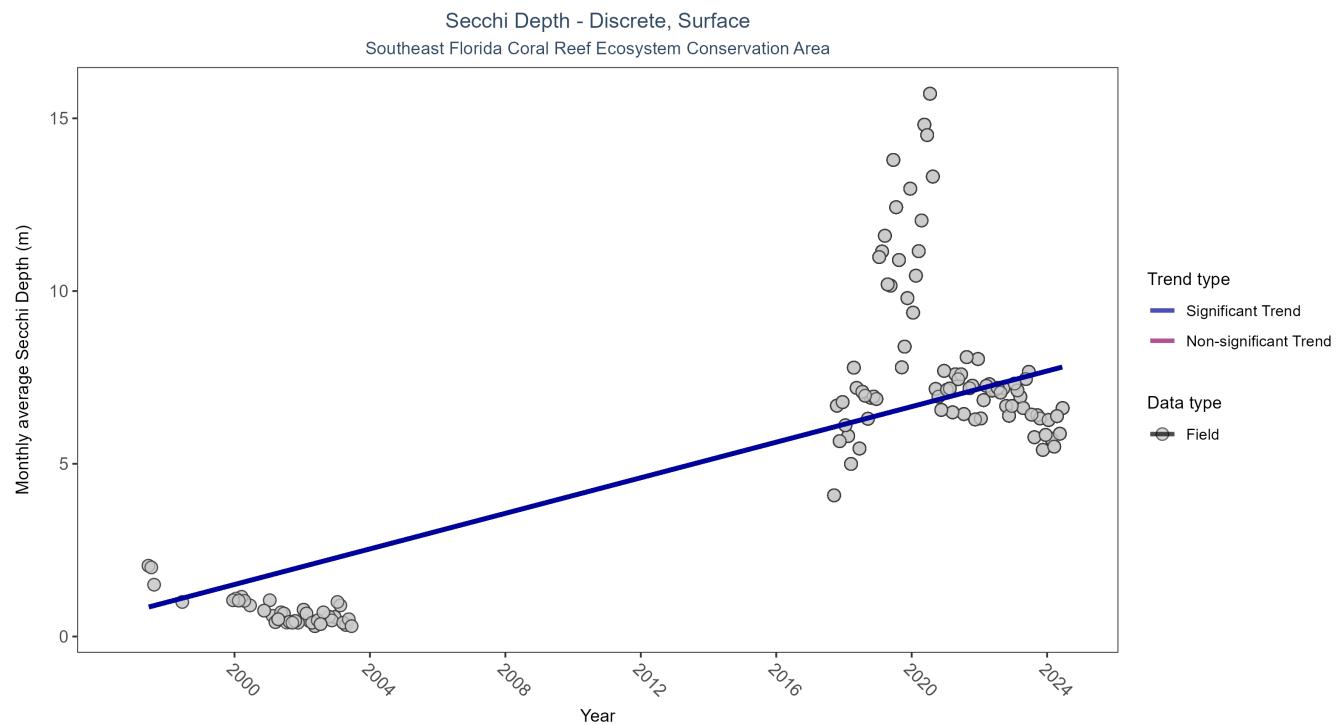


Figure 9: Seasonal Kendall-Tau Results for Secchi Depth - Discrete

Table 14: Seasonal Kendall-Tau Trend Analysis for Secchi Depth

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
Surface	8962	15	6.1	TRUE	0.2976	0	0.2575	0.7336	1.0025	0.9999	1

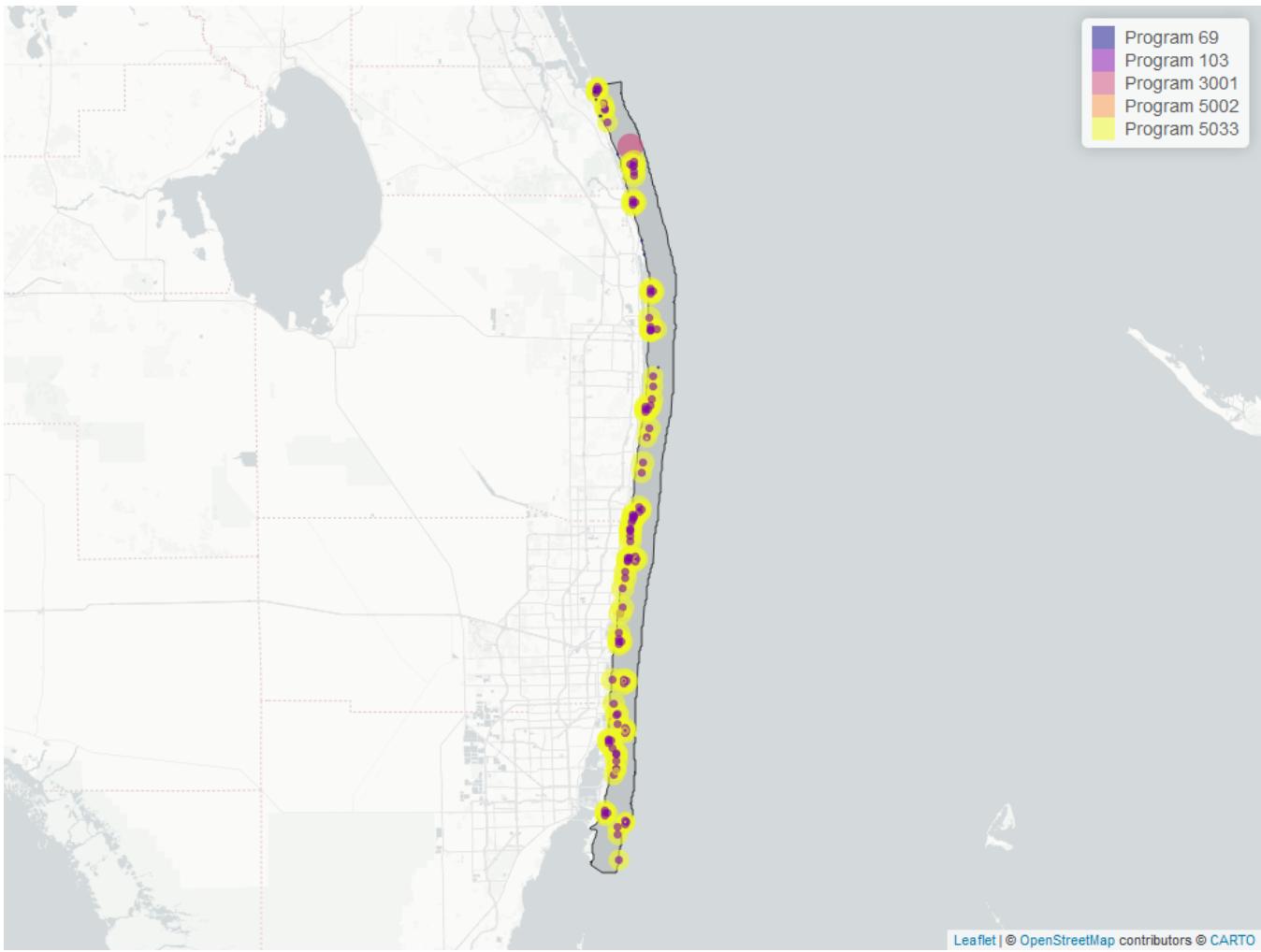


Figure 10: Map showing location of Discrete sampling sites for Secchi Depth. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 15: Programs contributing data for Secchi Depth

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5033	7903	2017	2024
103	961	2020	2021
3001	99	1999	2003
69	10	1997	2019
5002	1	2023	2023

Program names:

- 69 - Fisheries-Independent Monitoring (FIM) Program¹
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX³
- 3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵
- 5002 - Florida STORET / WIN⁶
- 5033 - Southeast Florida Water Quality Assessment Survey¹⁰

Total Phosphorus - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

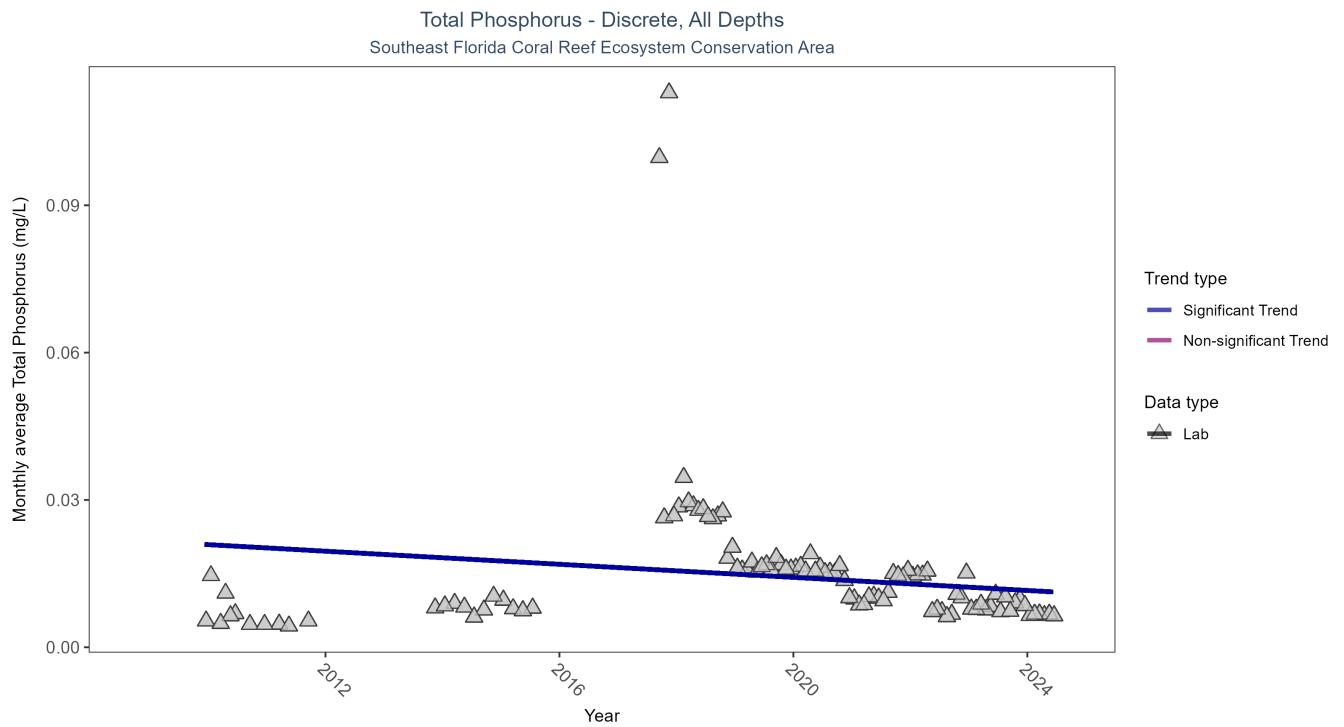


Figure 11: Seasonal Kendall-Tau Results for Total Phosphorus - Discrete

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	17322	14	0.014	TRUE	-0.294	0.0034	-0.0007	0.0216	14.416	0.2108	-1

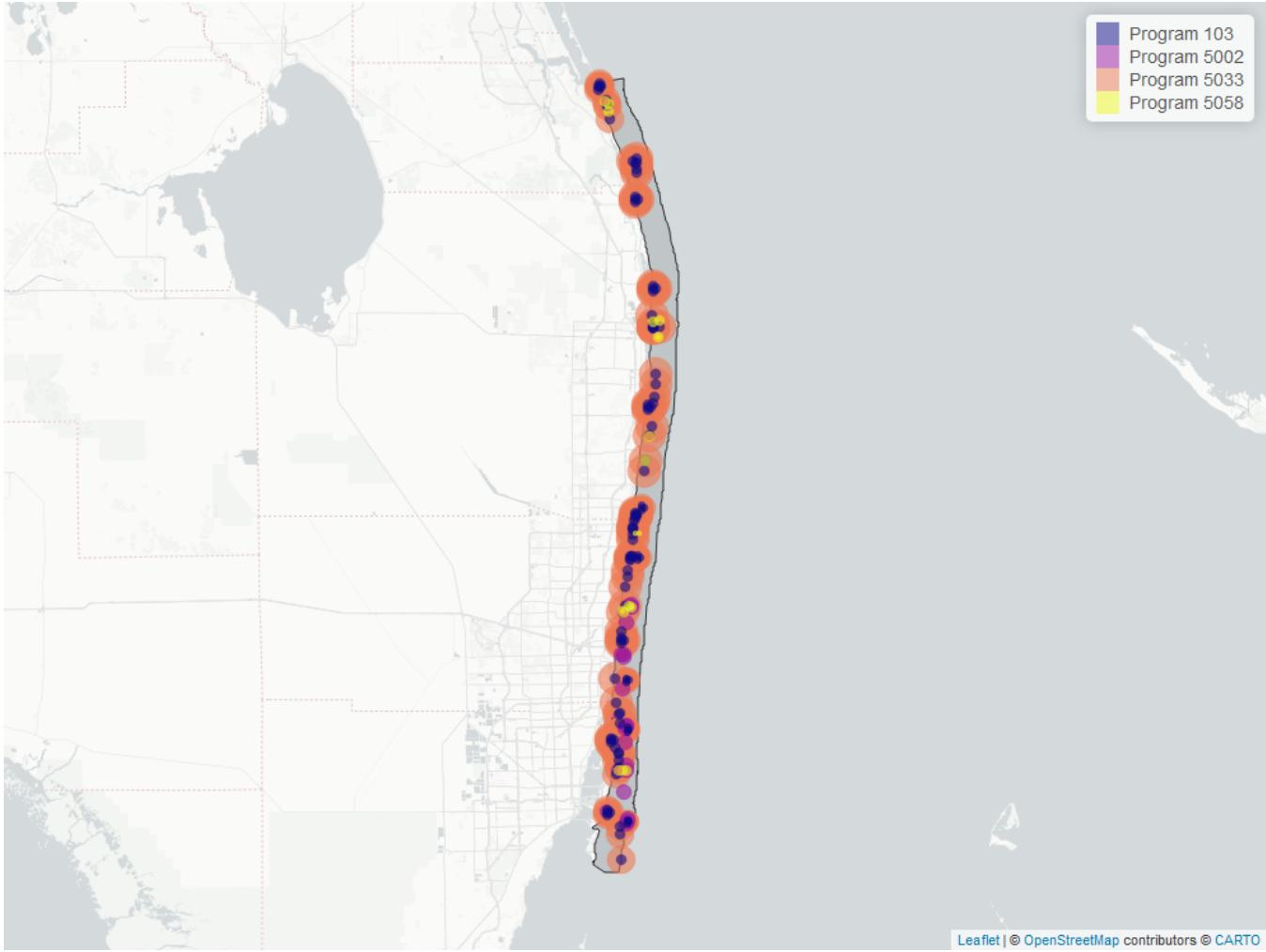


Figure 12: Map showing location of Discrete sampling sites for Total Phosphorus. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 17: Programs contributing data for Total Phosphorus

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5033	15486	2017	2024
103	1846	2020	2021
5002	665	2013	2023
5058	268	2009	2011

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX³

5002 - Florida STORET / WIN⁶

5033 - Southeast Florida Water Quality Assessment Survey¹⁰

5058 - Southeast Florida Coral Reef Initiative (SEFCRI) Water Quality Monitoring Report⁷

Turbidity - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

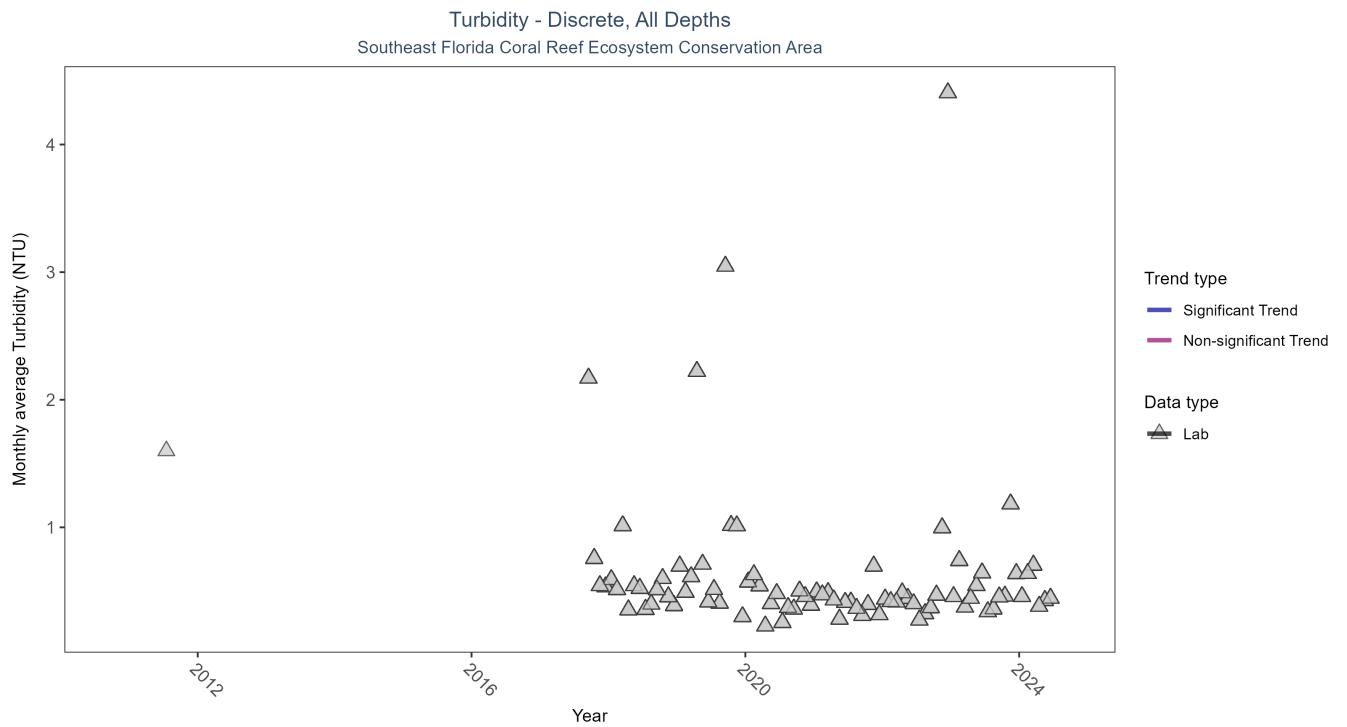


Figure 13: Seasonal Kendall-Tau Results for Turbidity - Discrete

Table 18: Seasonal Kendall-Tau Trend Analysis for Turbidity

RelativeDepth	N-Data	N-Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	15580	9	0.3	-	-	-	-	-	-	-	-

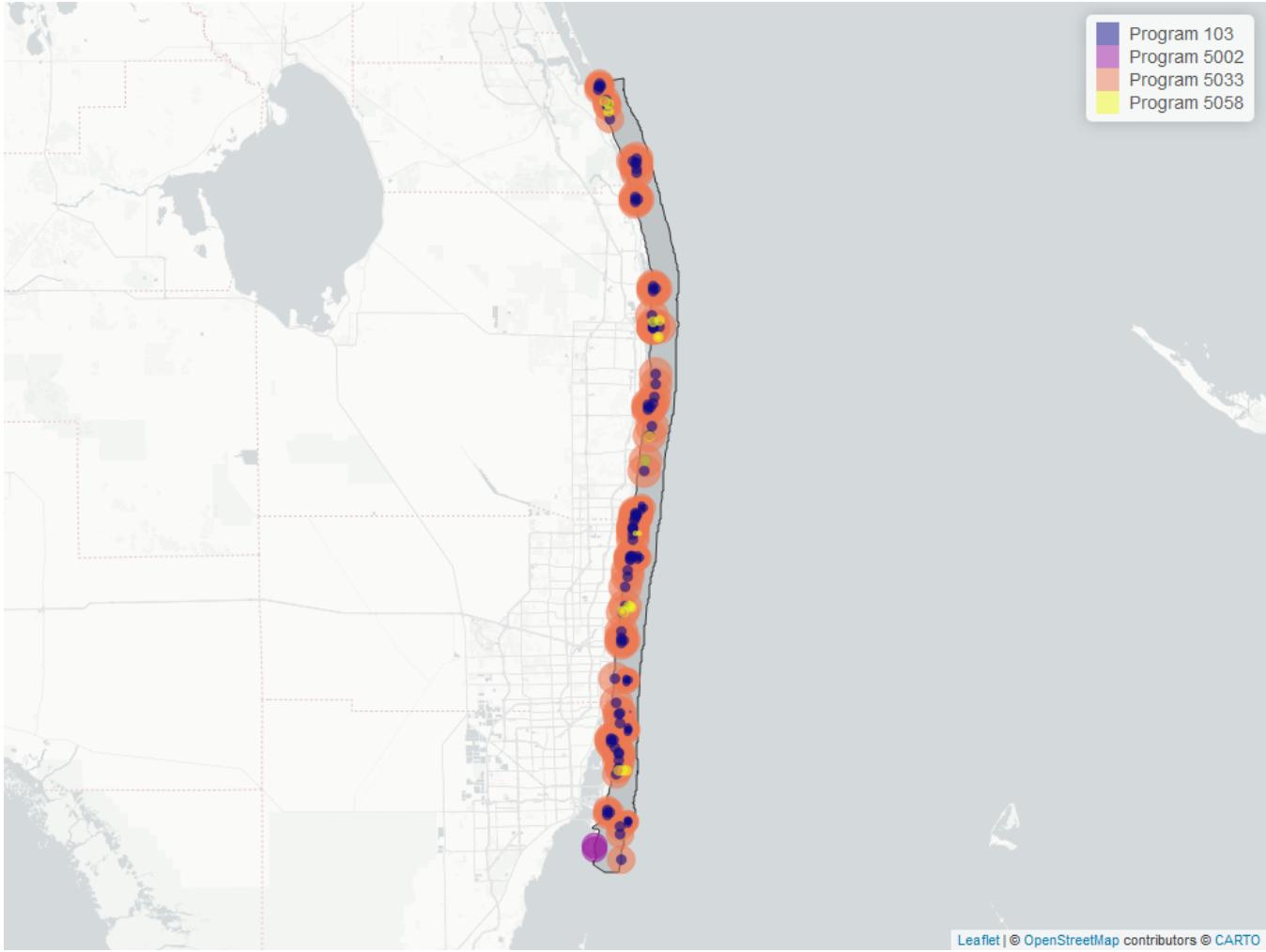


Figure 14: Map showing location of Discrete sampling sites for Turbidity. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 19: Programs contributing data for Turbidity

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5033	15603	2017	2024
103	1846	2020	2021
5058	264	2009	2011
5002	210	2011	2023

Program names:

103 - EPA STOrage and RETrieval Data Warehouse (STORET)/WQX³

5002 - Florida STORET / WIN⁶

5033 - Southeast Florida Water Quality Assessment Survey¹⁰

5058 - Southeast Florida Coral Reef Initiative (SEFCRI) Water Quality Monitoring Report⁷

Water Temperature - Discrete Water Quality

Seasonal Kendall-Tau Trend Analysis

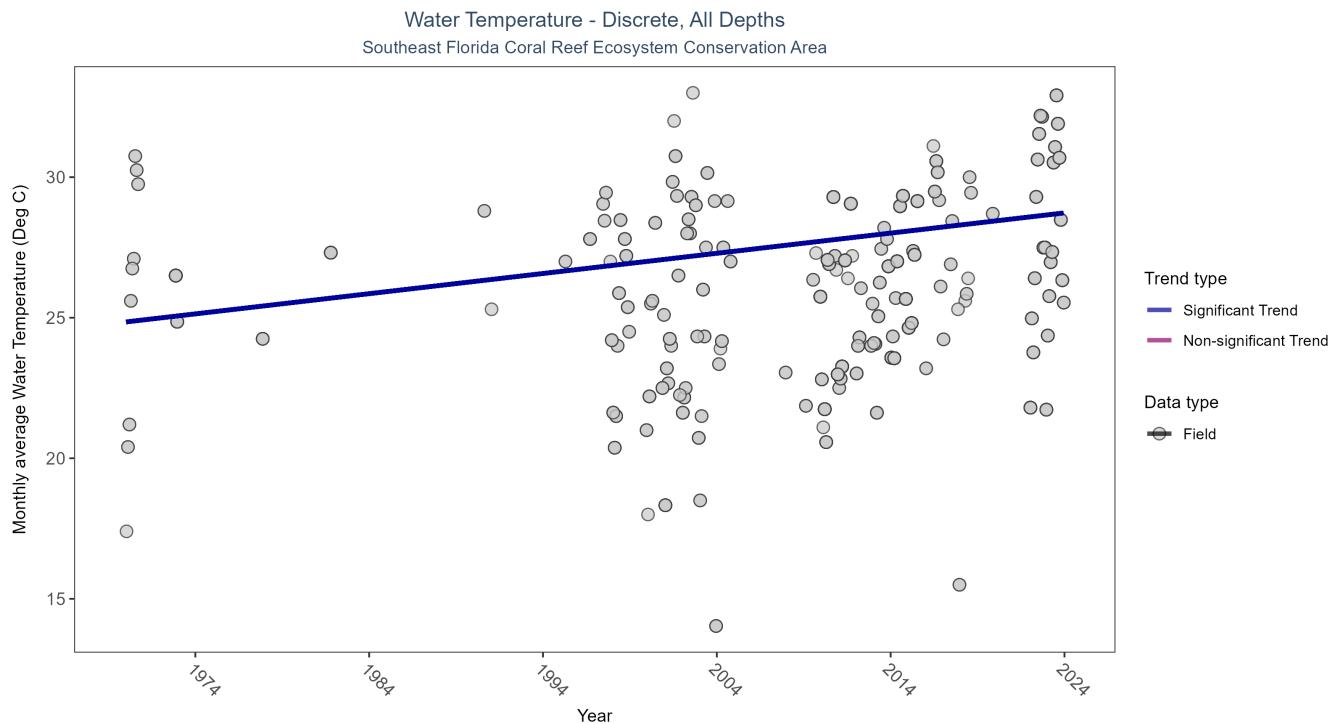


Figure 15: Seasonal Kendall-Tau Results for Water Temperature - Discrete

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	1580	30	26.5824	TRUE	0.2894	0	0.0718	24.8491	10.3726	0.4972	1

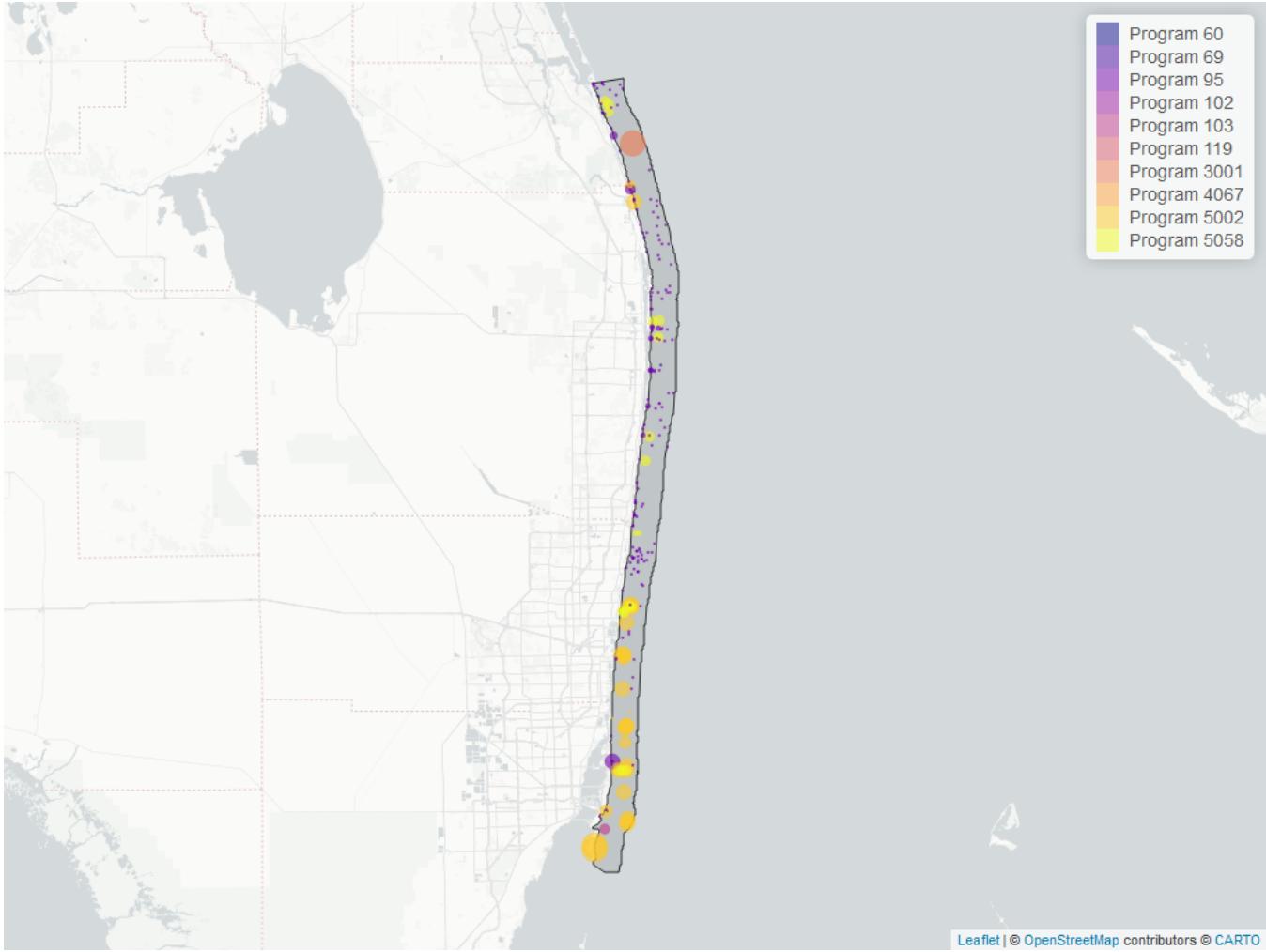


Figure 16: Map showing location of Discrete sampling sites for Water Temperature. The bubble size on the maps below reflect the amount of data available at each sampling site.

Table 21: Programs contributing data for Water Temperature

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
5002	926	1996	2023
5058	266	2009	2011
95	258	1972	2018
3001	104	1999	2003
103	17	1970	1970
69	10	1997	2019
102	2	1995	1995

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program¹

95 - Harmful Algal Bloom Marine Observation Network²

102 - National Status and Trends Mussel Watch⁸

103 - EPA STORET and RETrieval Data Warehouse (STORET)/WQX³

3001 - Lagoon Watch (Formerly Marine Discovery Center)⁵

5002 - Florida STORET / WIN⁶

5058 - Southeast Florida Coral Reef Initiative (SEFCRI) Water Quality Monitoring Report⁷

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 Southeast Florida Coral Reef Ecosystem Conservation Area

Table 22: National Data Buoy Center (5)

<i>ProgramLocationID</i>	<i>Years of Data</i>	<i>Use in Analysis</i>	<i>Parameters</i>
LKWF1	41	TRUE	TempW

Table 23: Water Temperature on Coral Reefs in the Florida Keys (986)

<i>ProgramLocationID</i>	<i>Years of Data</i>	<i>Use in Analysis</i>	<i>Parameters</i>
1	10	TRUE	TempW
2	10	TRUE	TempW
3	10	TRUE	TempW
4	10	TRUE	TempW
5	10	TRUE	TempW
6	10	TRUE	TempW
84	16	TRUE	TempW
85	16	TRUE	TempW
86	16	TRUE	TempW
87	16	TRUE	TempW
88	16	TRUE	TempW
89	16	TRUE	TempW
90	16	TRUE	TempW
91	16	TRUE	TempW
92	16	TRUE	TempW
93	16	TRUE	TempW
94	16	TRUE	TempW
95	16	TRUE	TempW
96	6	TRUE	TempW
97	13	TRUE	TempW
98	13	TRUE	TempW

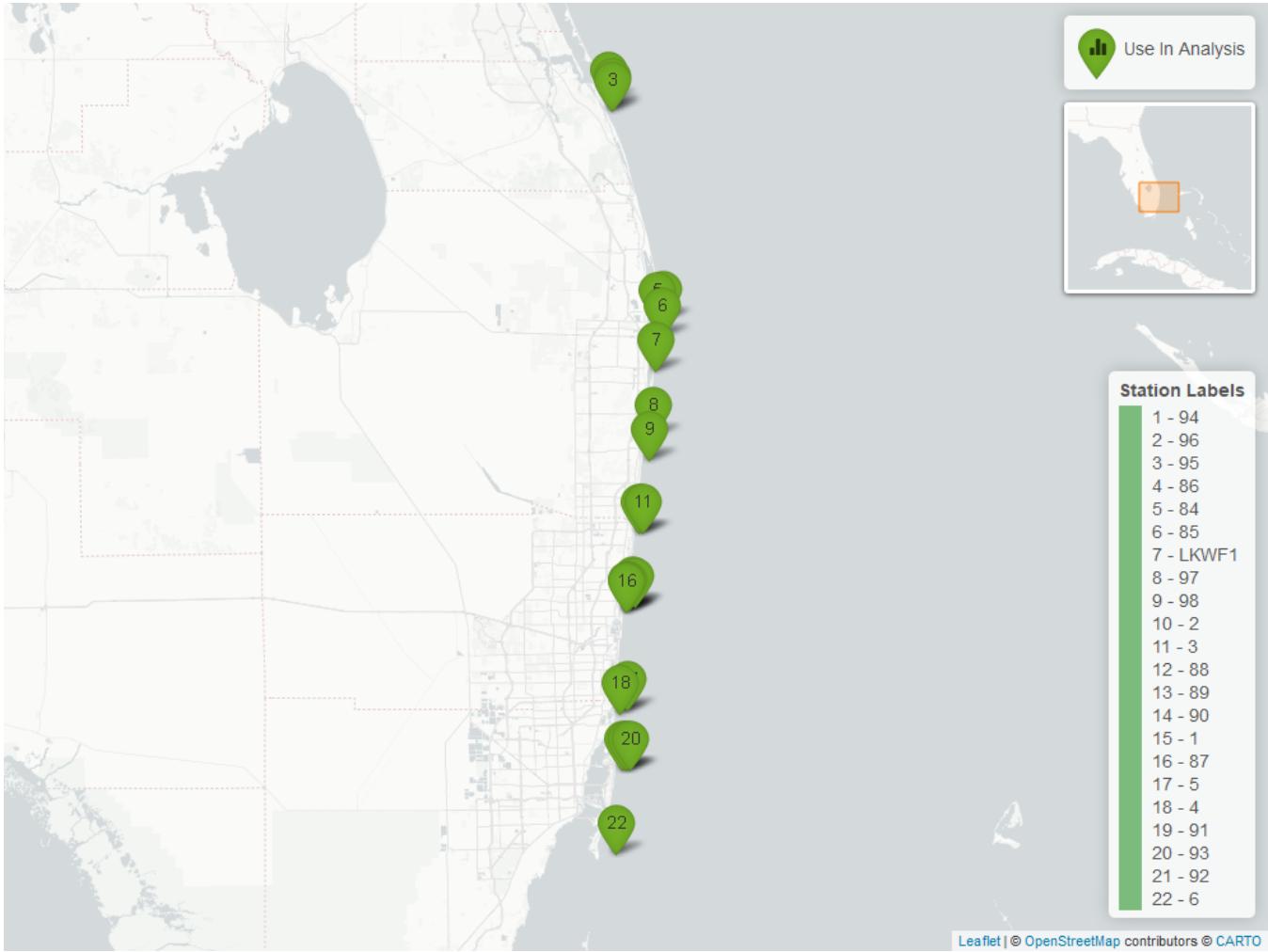


Figure 17: Map showing Continuous Water Quality Monitoring sampling locations within the boundaries of Southeast Florida Coral Reef Ecosystem Conservation Area. Sites marked as *Use In Analysis* are featured in this report.

Water Temperature - All Stations Combined by Program

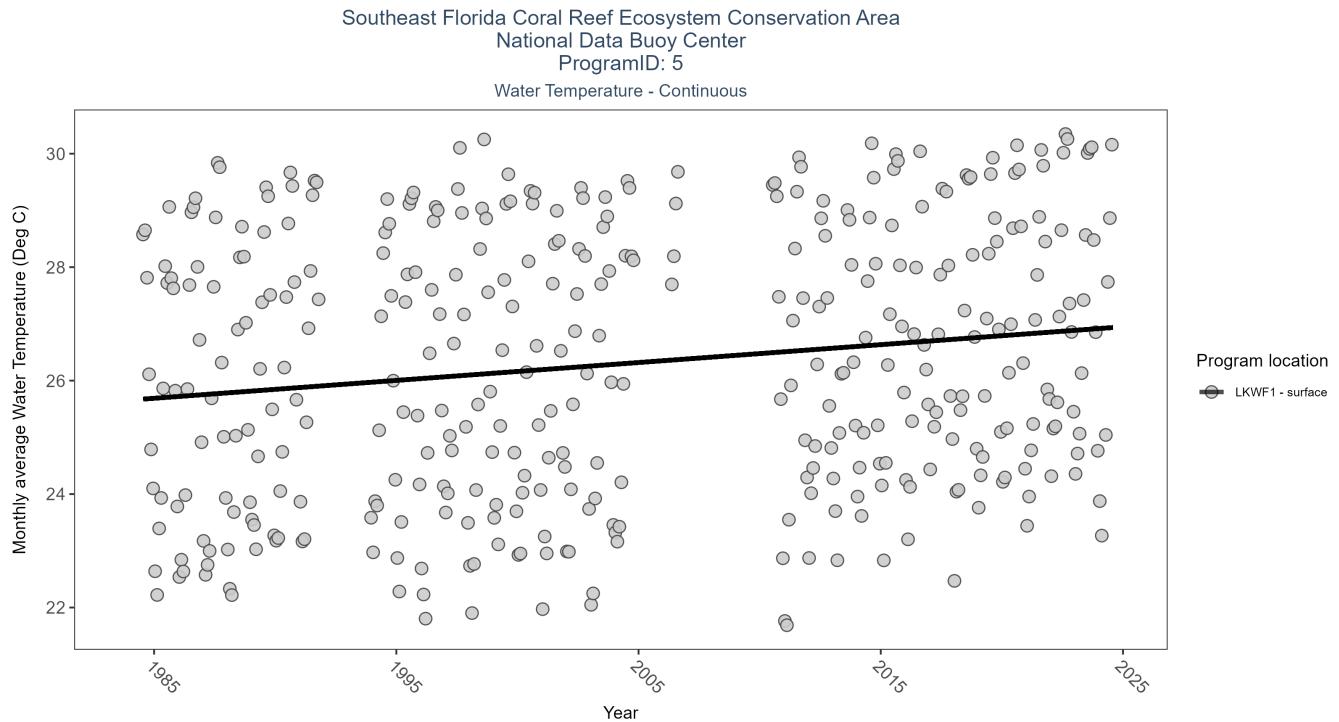


Figure 18: Figure for Water Temperature - Continuous - Program 5

Table 24: Seasonal Kendall-Tau Results for All Stations - Water Temperature

Station	N_Data	N_Years	Period of Record	Median	tau	SennIntercept	SennSlope	p
LKWF1	1254716	36	1984 - 2024	26.5	0.41	25.66	0.03	0.0000

Water Temperature - All Stations Combined by Program

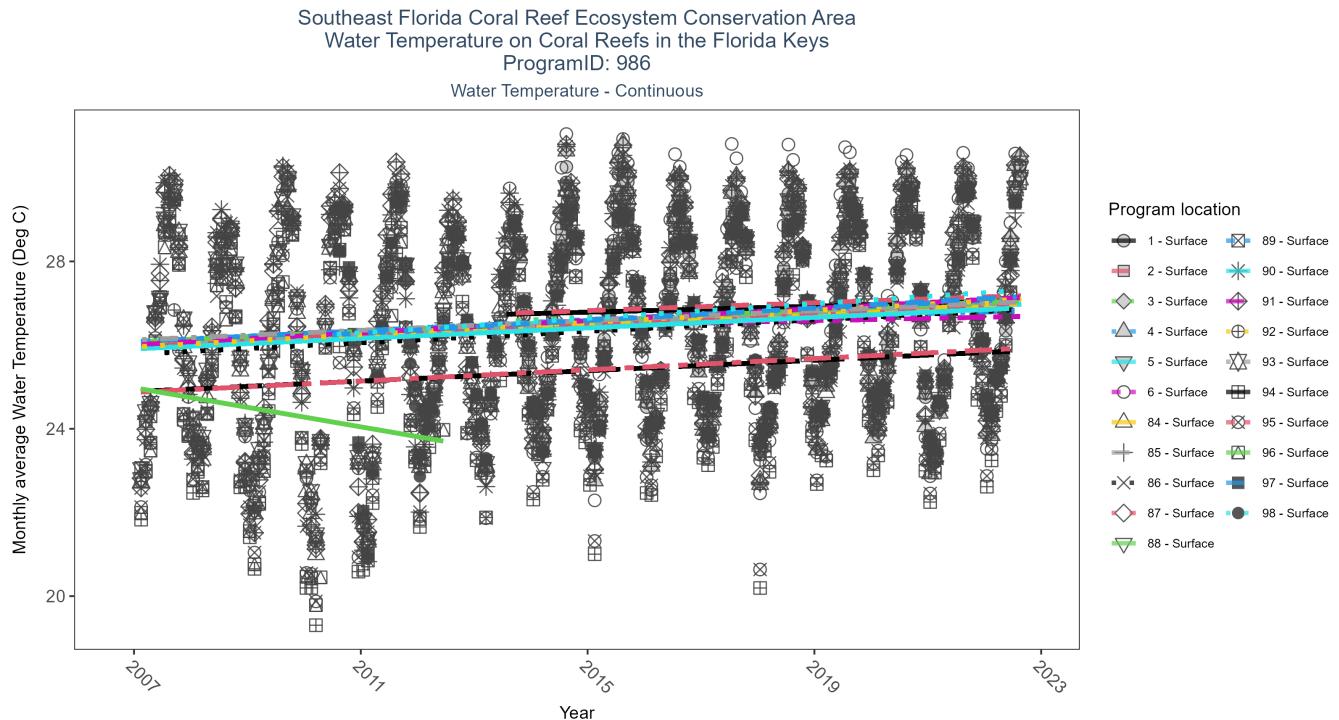


Figure 19: Figure for Water Temperature - Continuous - Program 986

Table 25: Seasonal Kendall-Tau Results for All Stations - Water Temperature

Station	N_Data	N_Years	Period of Record	Median	tau	SennIntercept	SennSlope	p
90	97006	16	2007 - 2022	26.43	0.33	25.91	0.06	0.0000
1	65108	10	2013 - 2022	26.40	0.13	26.72	0.04	0.1158
85	114214	16	2007 - 2022	26.26	0.34	25.99	0.07	0.0000
92	111826	16	2007 - 2022	26.45	0.37	25.96	0.07	0.0000
97	97533	13	2010 - 2022	26.45	0.38	26.21	0.08	0.0000
88	115305	16	2007 - 2022	26.35	0.34	26.08	0.06	0.0000
89	113809	16	2007 - 2022	26.28	0.35	26.08	0.07	0.0000
87	108339	16	2007 - 2022	26.44	0.31	25.99	0.06	0.0000
94	90265	16	2007 - 2022	25.55	0.28	24.89	0.06	0.0000
86	104767	16	2007 - 2022	26.16	0.36	25.78	0.07	0.0000
95	102279	16	2007 - 2022	25.58	0.30	24.87	0.07	0.0000
91	102406	16	2007 - 2022	26.54	0.33	26.01	0.07	0.0000
84	111153	16	2007 - 2022	26.32	0.36	25.94	0.07	0.0000
5	51977	10	2013 - 2022	26.62	0.22	26.46	0.05	0.0067
3	60887	10	2013 - 2022	26.65	0.25	26.54	0.06	0.0010
4	68937	10	2013 - 2022	26.59	0.17	26.46	0.04	0.0305
93	106903	16	2007 - 2022	26.47	0.35	26.12	0.06	0.0000
98	87973	13	2010 - 2022	26.40	0.39	26.21	0.09	0.0000
2	64486	10	2013 - 2022	26.72	0.26	26.73	0.05	0.0007
6	63582	10	2013 - 2022	26.77	0.09	26.42	0.03	0.2598
96	25550	6	2007 - 2012	24.87	-0.25	24.98	-0.23	0.0801

Coral Reef

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

Percent Cover

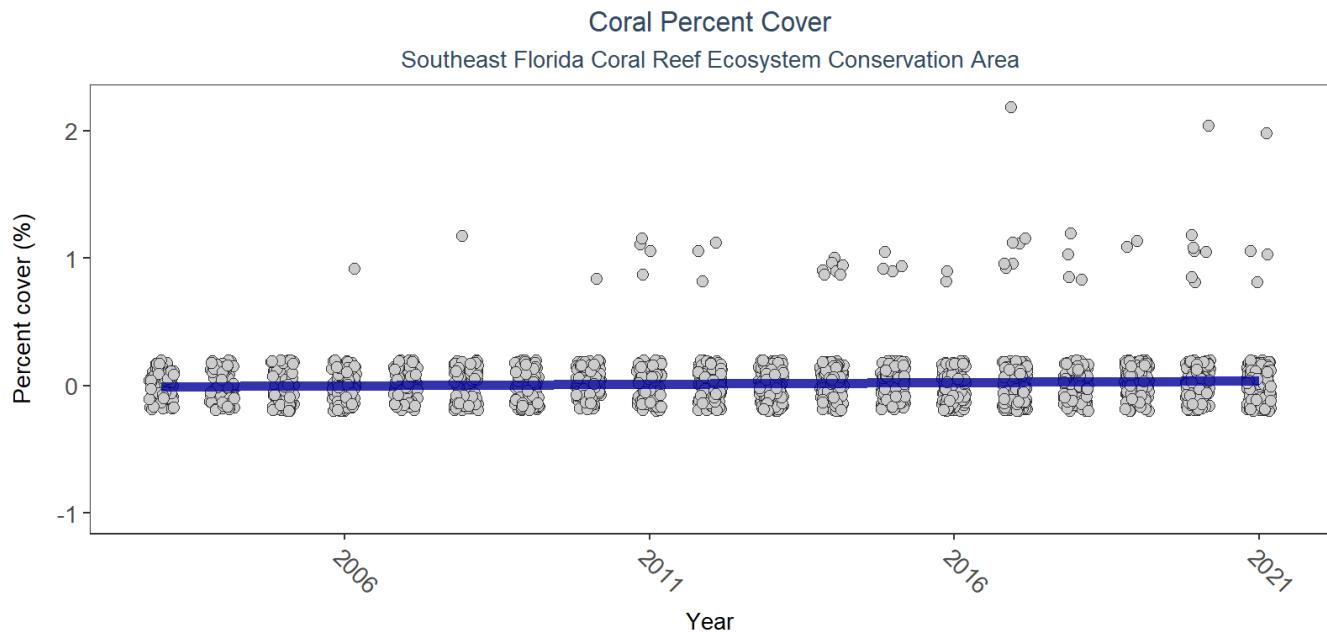


Figure 20: Figure for Coral Percent Cover in Southeast Florida Coral Reef Ecosystem Conservation Area

Table 26: Coral Percent Cover

N-Years	SufficientData	EarliestYear	LatestYear	N-Data	Min	Max	Median	Mean	StDev	LME-Intercept	LME-Slope	LME-p
19	TRUE	2003	2021	2320	0	2	0	0.02	0.15	-5.21	0	0

Species Richness

Grazers and Reef-Dependent Species Richness
 Southeast Florida Coral Reef Ecosystem Conservation Area

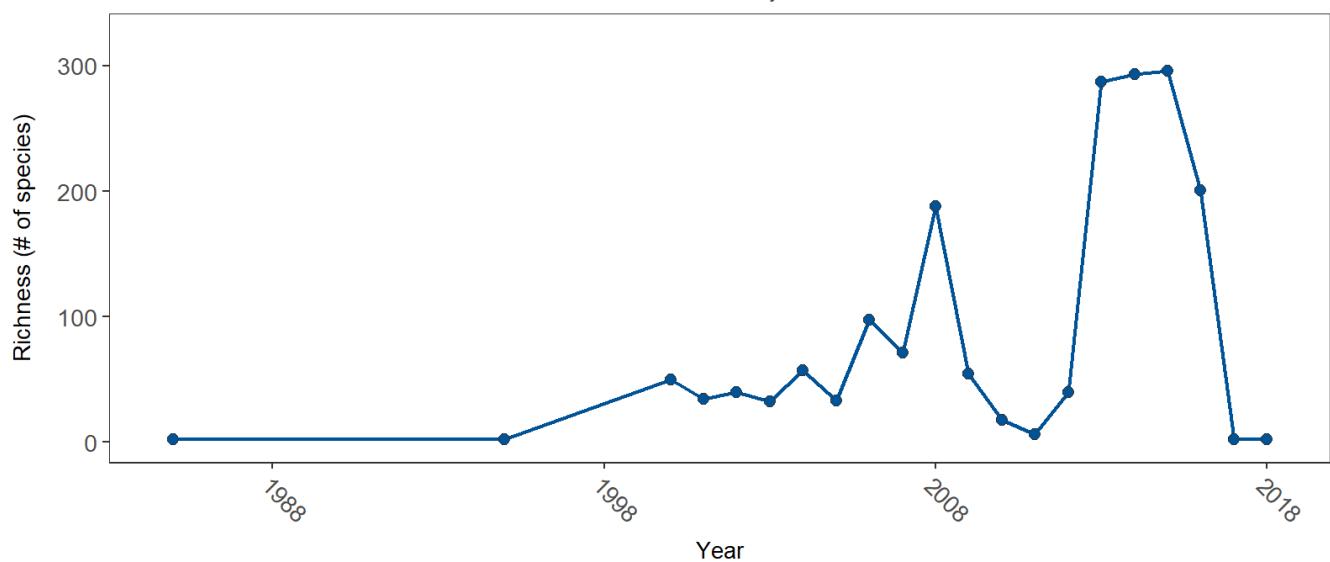


Figure 21: Figure for Coral Species Richness in Southeast Florida Coral Reef Ecosystem Conservation Area

Table 27: Coral Species Richness

N-Years	EarliestYear	LatestYear	N-Data	Min	Max	Median	Mean	StDev	Year-MinRichness	Year-MaxRichness
21	1985	2018	3025	2	302	294	228.04	108.84	1985	2015

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