Pine Island Sound Aquatic Preserve
SEACAR Habitat Analyses

Last compiled on 30 November, 2023

Contents

Threshold Filtering

Threshold filters, following Florida Department of Environmental Protection Division of Environmental Assessment and Restoration (DEAR) are used to exclude specific results values from the SEACAR Analysis. Based on the threshold filters, QAQC Flags are inserted into the SEACAR_QAQCFlagCode and SEACAR_QAQC_Description columns of the export data. The Include_YN 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_YN column to exclude data.

Table 1: Continuous Water Quality threshold values

Parameter Name	Units	Low Threshold	High Threshold	Sensor Type
Dissolved Oxygen	mg/L	0	50	YSI EXOs
Dissolved Oxygen	mg/L	0	50	Analysis Only - 2022-04-04
Dissolved Oxygen	mg/L	0	50	6600 Series
Salinity	ppt	0	70	6600 Series
Salinity	ppt	0	70	YSI EXOs
Salinity	ppt	0	70	Analysis Only - 2022-04-04
Water Temperature	Degrees C	-5	45	YSI EXOs
Water Temperature	Degrees C	-5	45	Analysis Only - 2022-04-04
Water Temperature	Degrees C	-5	45	6600 Series
pH		2	14	Analysis Only - 2022-04-04
pH		2	14	6600 Series
pH		2	14	YSI EXOs
Dissolved Oxygen Saturation	%	0	500	YSI EXOs
Dissolved Oxygen Saturation	%	0	500	6600 Series
Dissolved Oxygen Saturation	%	0	500	Analysis Only - 2022-04-04
Specific Conductivity	mS/cm	0	100	6600 Series
Specific Conductivity	mS/cm	0	200	YSI EXOs
Turbidity	NTU	0	4000	YSI EXOs
Turbidity	NTU	0	1000	6600 Series
Turbidity	NTU	0	4000	Analysis Only - 2022-04-04

Table 2: Discrete Water Quality threshold values

Parameter Name	Units	Low Threshold	High Threshold
Dissolved Oxygen	mg/L	>0	22
Salinity	ppt	0	70
Water Temperature	Degrees C	3	40
pH		2	13
Dissolved Oxygen Saturation	%	>0	310
Specific Conductivity	mS/cm	>0.005	100
Turbidity	NTU	0	
Total Suspended Solids (TSS)	mg/L	0	
Chlorophyll a uncorrected for pheophytin	ug/L	0	
Chlorophyll a corrected for pheophytin	ug/L	0	
Secchi Depth	m	0	50
Light Extinction Coefficient	m^1	0	
Colored dissolved organic matter, CDOM	PCU	0	
Fluorescent dissolved organic matter, FDOM	QSE	0	
Total Nitrogen	mg/L	0	
Total Kjeldahl Nitrogen TKN	mg/L	0	
NO2+3 Filtered	mg/L	0	
NH4 Filtered	mg/L	0	

Parameter Name	Units	Low Threshold	High Threshold
Total Phosphorus	mg/L	0	
PO4 Filtered	mg/L	0	
Ammonia- Un-ionized (NH3)	mg/L	0	
Nitrate (N)	mg/L	0	
Nitrite (N)	mg/L	0	
Nitrogen, organic	mg/L	0	

Table 3: QA Flags inserted based on threshold checks

SEACAR QAQC Description	Include YN	SEACAR QAQCFlagCode
Exceeds Maximum threshold. Not verified in raw data	N	2Q
Exceeds Maximum threshold. Verified in raw data	N	3Q
Below Minimum threshold. Not verified in raw data	N	4Q
Below Minimum threshold. Verified in raw data	N	5Q
Within threshold tolerance	Y	6Q
No defined thresholds for this parameter	Y	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_YN column in data exports.

Table 4: Value Qualifier codes excluded from analysis

Value Qualifier	Include YN/10	MDL YN/10	Qualifier Source
H	0	0	STORET-WIN
J	0	0	STORET-WIN
V	0	0	STORET-WIN
Y	0	0	STORET-WIN

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_YN column in data exports. SWMP Qualifier Codes are indicated by QualifierSource=SWMP.

Table 5: SWMP Value Qualifier codes

Qualifier Source	ValueQualifier	Include YN	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

Qualifier Source	ValueQualifier	Include YN	Description
SWMP	3	1	Calculated data: non-vented depth/level sensor correction for changes in bar
SWMP	4	1	Historical: Pre-auto QA/QC
SWMP	5	1	Corrected data

Water Quality - Discrete

The following files were used in the discrete analysis:

- *Combined_WQ_WC_NUT_Chlorophyll_a_corrected_for_pheophytin-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Chlorophyll_a_uncorrected_for_pheophytin-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Colored_dissolved_organic_matter_CDOM-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Dissolved_Oxygen-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Dissolved_Oxygen_Saturation-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_pH-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Salinity-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Secchi_Depth-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Total_Nitrogen-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Total_Phosphorus-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Total_Suspended_Solids_TSS-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Turbidity-2023-Oct-11.txt*

- *Combined_WQ_WC_NUT_Water_Temperature-2023-Oct-11.txt*

Chlorophyll a corrected for pheophytin
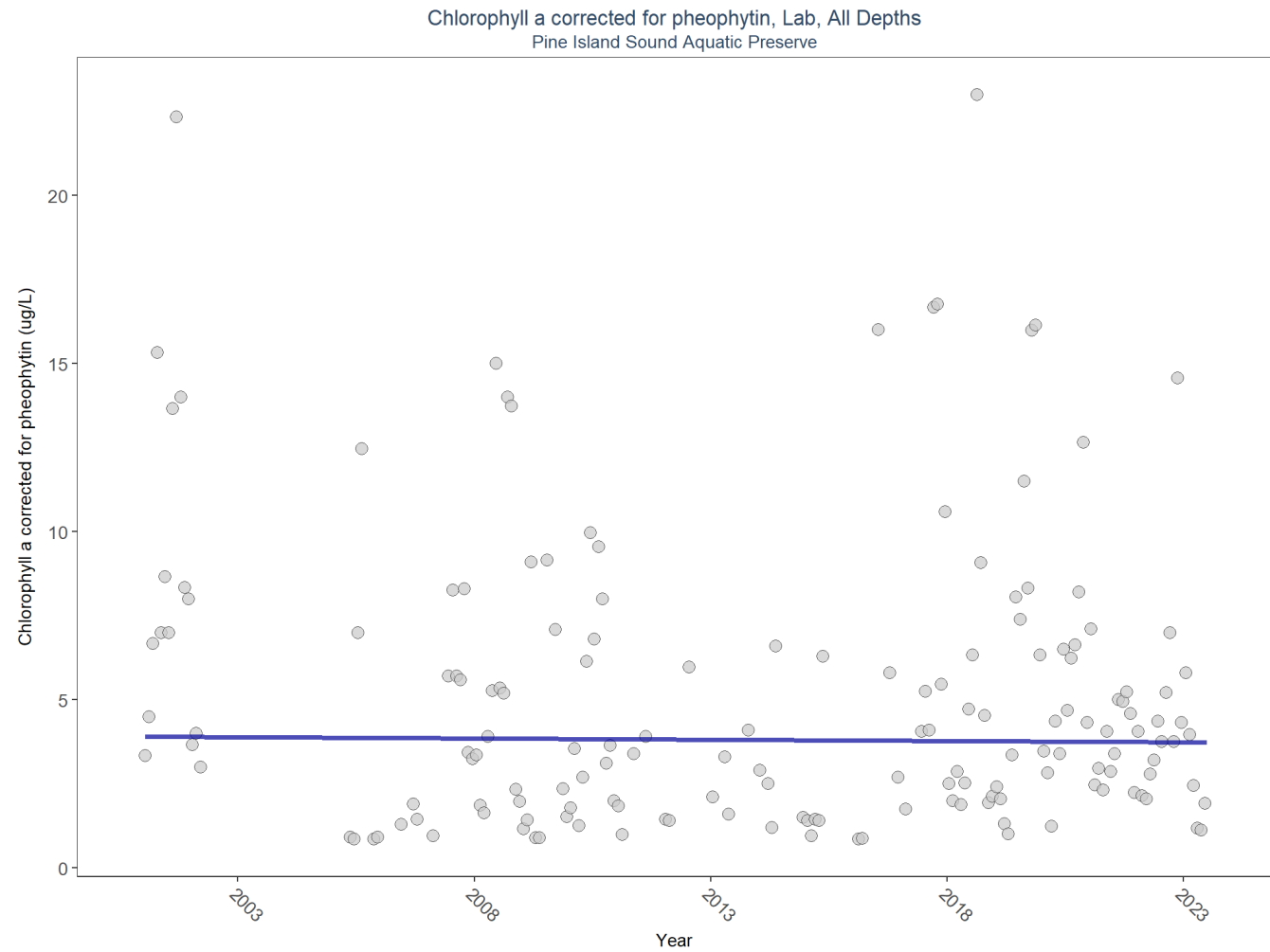
Discrete Seasonal Kendall-Tau Trend Analysis

Chlorophyll a corrected for pheophytin, Lab, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2120	21	3.3	TRUE	-0.03	0.7258	-0.007491866	3.900228	16.8183	0.1134	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 6: Programs contributing data for Chlorophyll a corrected for pheophytin

ProgramID	N_Data	YearMin	YearMax
5002	906	2001	2023
303	598	2019	2023
476	489	2008	2023
103	115	2020	2021
513	32	2006	2022

Program names:

5002 - Florida STORET / WIN
303 - River, Estuary and Coastal Observing Network

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
513 - Coastal Charlotte Harbor Monitoring Network

Table 7: Value Qualifiers for Chlorophyll a corrected for pheophytin

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
3	2005	28					20	71.4
4	2006	5	5	100.0				
5	2007	17	2	11.8	1	5.9		
6	2008	42	10	23.8				
7	2009	22	8	36.4	3	13.6	1	4.6
8	2010	39	11	28.2	6	15.4	1	2.6
9	2011	16	5	31.2	5	31.2		
10	2012	8	4	50.0	4	50.0		
11	2013	7	4	57.1				
12	2014	7	3	42.9	2	28.6		
13	2015	8	7	87.5				
14	2016	6	3	50.0				
15	2017	41	2	4.9			1	2.4
16	2018	195	59	30.3				
17	2019	368	78	21.2			3	0.8
18	2020	364	55	15.1	1	0.3	7	1.9
19	2021	487	94	19.3			6	1.2
20	2022	363	111	30.6	17	4.7	24	6.6
21	2023	73	27	37.0	1	1.4	9	12.3

Programs containing Value Qualified data:

5002 - Florida STORET / WIN
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
513 - Coastal Charlotte Harbor Monitoring Network
303 - River, Estuary and Coastal Observing Network

Value Qualifiers

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.

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

Chlorophyll a uncorrected for pheophytin

Discrete Seasonal Kendall-Tau Trend Analysis

Chlorophyll a uncorrected for pheophytin, Lab, All Depths
Pine Island Sound Aquatic Preserve
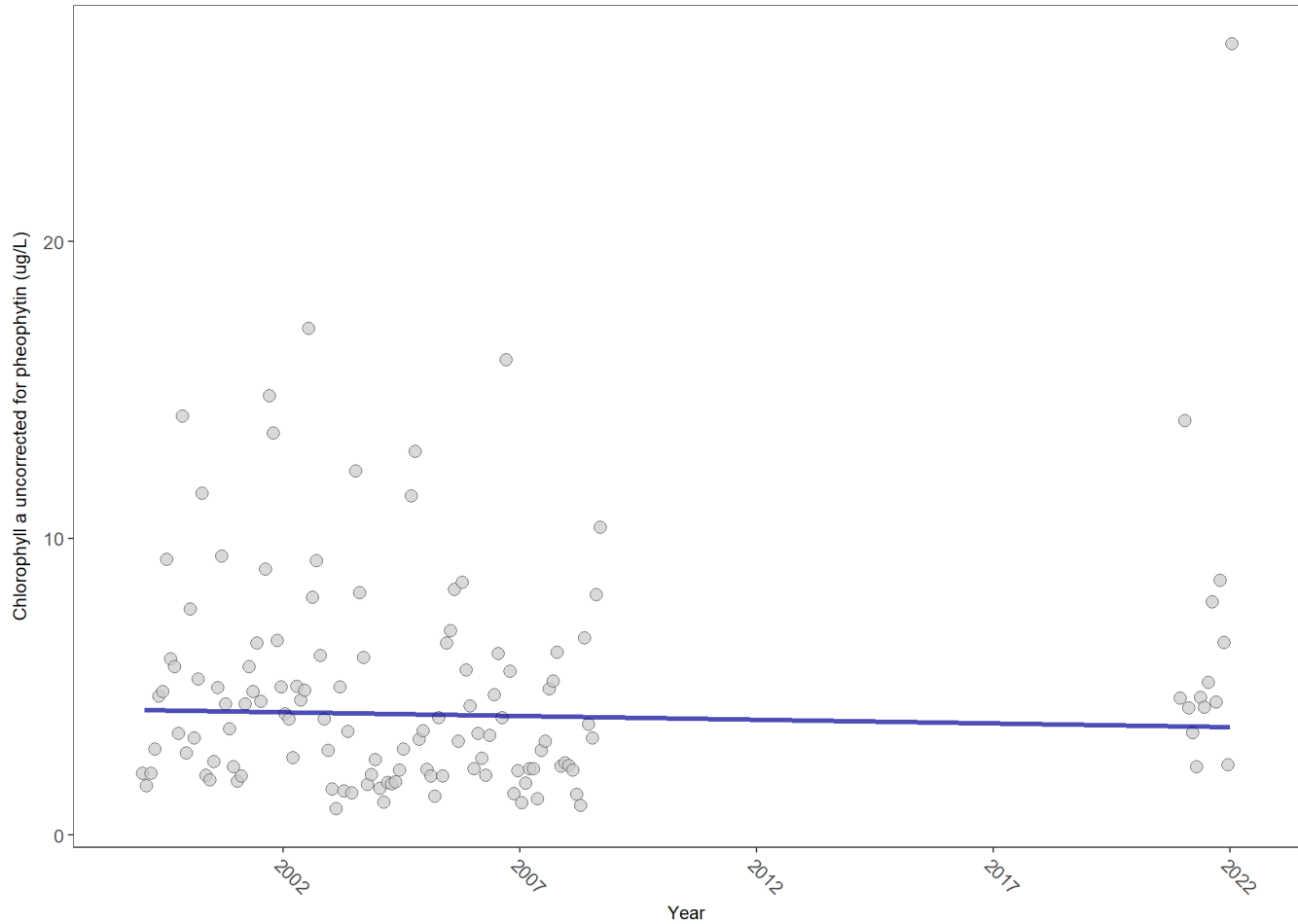
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	727	13	3.5	TRUE	-0.06	0.4098	-0.0244875	4.221122	9.2017	0.6033	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 8: Programs contributing data for Chlorophyll a uncorrected for pheophytin

ProgramID	N_Data	YearMin	YearMax
509	348	1999	2008
103	225	2002	2022
476	104	1999	2008
5002	69	2001	2008
115	4	2002	2004
118	1	2006	2006

Program names:

509 - SERC Water Quality Monitoring Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
5002 - Florida STORET / WIN
115 - Environmental Monitoring Assessment Program
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment

Table 9: Value Qualifiers for Chlorophyll a uncorrected for pheophytin

	Year	N_Total	N_I	perc_I	N_U	perc_U
1	1999	48			3	6.2
2	2000	51			2	3.9
3	2001	84			13	15.5
5	2003	42			4	9.5
6	2004	46	1	2.2	8	17.4
7	2005	51	4	7.8	8	15.7
8	2006	44			3	6.8
9	2007	67	24	35.8	2	3.0
10	2008	37	7	18.9	1	2.7

Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
*5002* - Florida STORET / WIN

Value Qualifiers

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

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

Colored dissolved organic matter, CDOM

Discrete Seasonal Kendall-Tau Trend Analysis
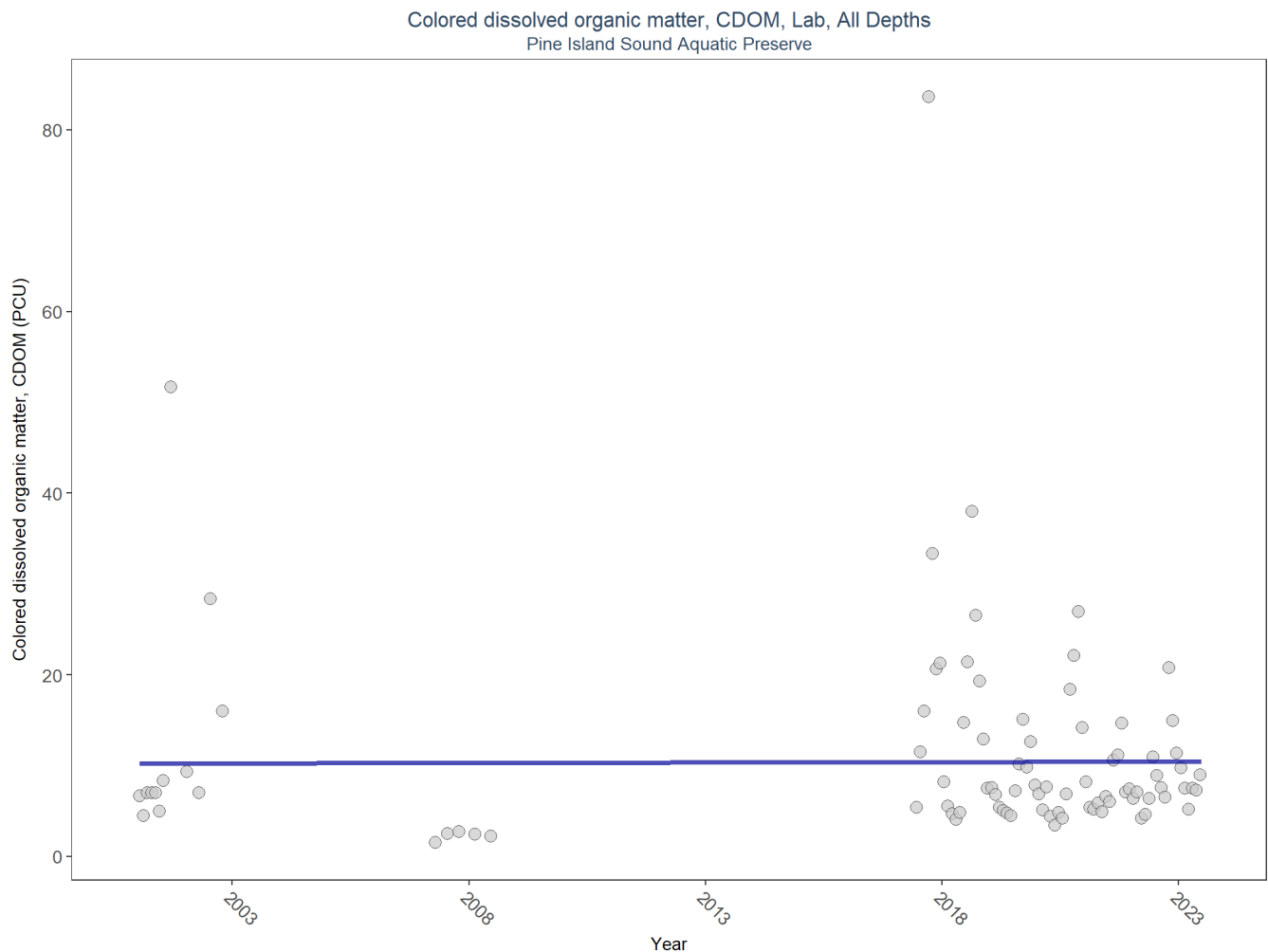
Colored dissolved organic matter, CDOM, Lab, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1069	11	7.02	TRUE	-0.0148	0.8789	0.01212041	10.21096	17.942	0.0829	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 10: Programs contributing data for Colored dissolved organic matter, CDOM

ProgramID	N_Data	YearMin	YearMax
5002	792	2018	2023
476	207	2017	2023
513	35	2007	2022
514	35	2001	2002

Program names:

5002 - Florida STORET / WIN

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

513 - Coastal Charlotte Harbor Monitoring Network

514 - Florida LAKEWATCH Program

Table 11: Value Qualifiers for Colored dissolved organic matter, CDOM

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
3	2007	6	4	66.7			2	33.3
4	2008	5	2	40.0			3	60.0
5	2017	26	1	3.9			1	3.9
6	2018	169	51	30.2			10	5.9
7	2019	186	70	37.6			13	7.0
8	2020	172	69	40.1			15	8.7
9	2021	209	71	34.0			12	5.7
10	2022	199	43	21.6	3	1.5	27	13.6
11	2023	62	19	30.6			3	4.8

Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
5002 - Florida STORET / WIN
*513* - Coastal Charlotte Harbor Monitoring Network

Value Qualifiers

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.

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

Dissolved Oxygen

Discrete Seasonal Kendall-Tau Trend Analysis
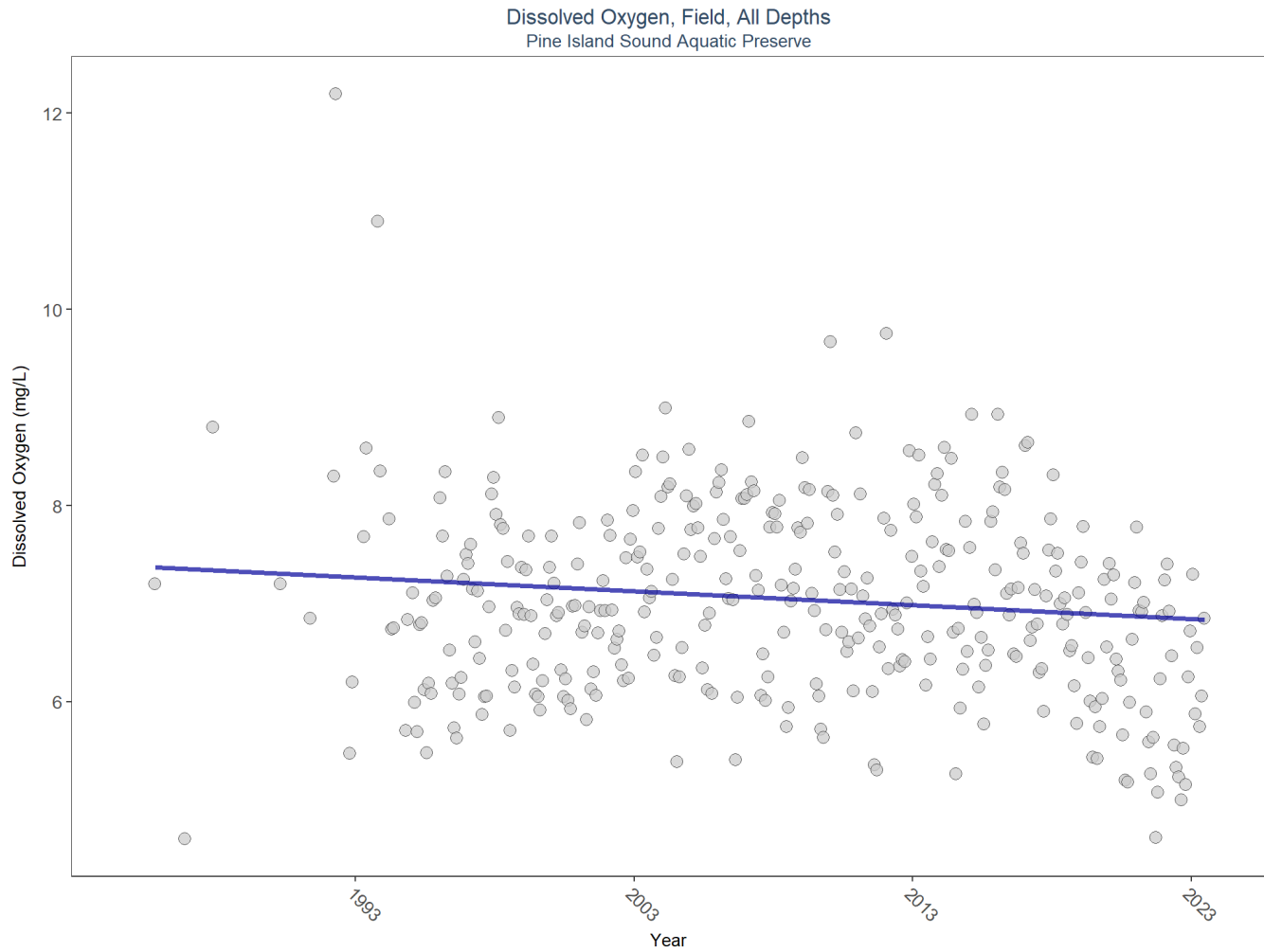
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	27856	37	7	TRUE	-0.109	0.0033	-0.01421928	7.385159	9.1939	0.604	-1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 12: Programs contributing data for Dissolved Oxygen

ProgramID	N_Data	YearMin	YearMax
69	15949	1990	2017
5002	9250	1987	2023
95	1489	1985	2018
509	696	1999	2008
476	301	2008	2023
103	221	2003	2022
303	61	2019	2020
115	11	2002	2004
118	1	2006	2006

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program
5002 - Florida STORET / WIN
95 - Harmful Algal Bloom Marine Observation Network
509 - SERC Water Quality Monitoring Network
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
303 - River, Estuary and Coastal Observing Network
115 - Environmental Monitoring Assessment Program
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment

Table 13: Value Qualifiers for Dissolved Oxygen

	Year	N_Total	N_H	perc_H
22	2008	1463	20	1.4

**Programs containing Value Qualified data:**

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

Value Qualifiers

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.

Dissolved Oxygen Saturation

Discrete Seasonal Kendall-Tau Trend Analysis
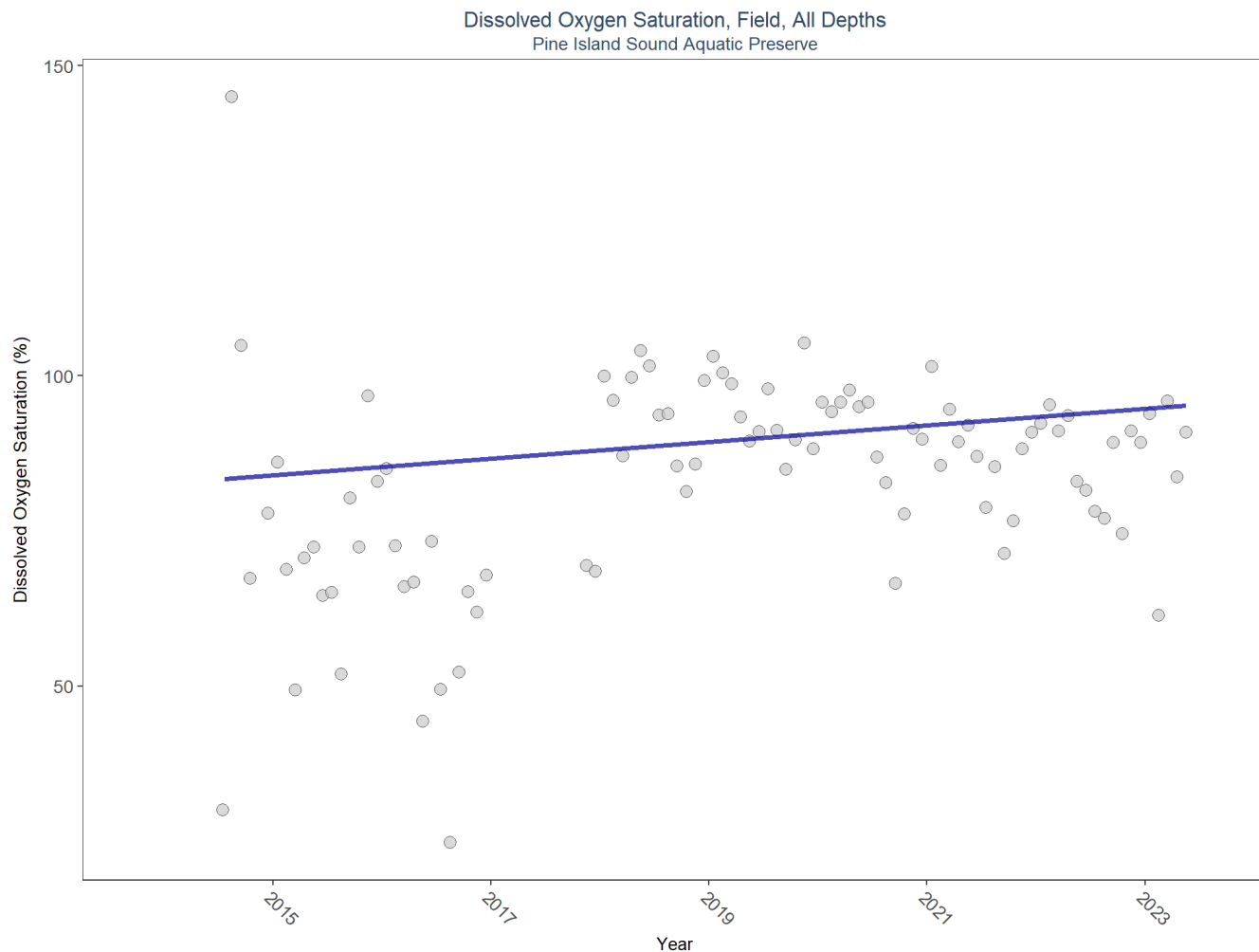
Dissolved Oxygen Saturation, Field, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1545	10	92.94074	TRUE	0.1592	0.0547	1.347601	82.60594	5.6307	0.8968	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 14: Programs contributing data for Dissolved Oxygen Saturation

ProgramID	N_Data	YearMin	YearMax
5002	1047	2014	2023
303	343	2019	2021
476	163	2017	2023
95	2	2016	2016

Program names:

5002 - Florida STORET / WIN
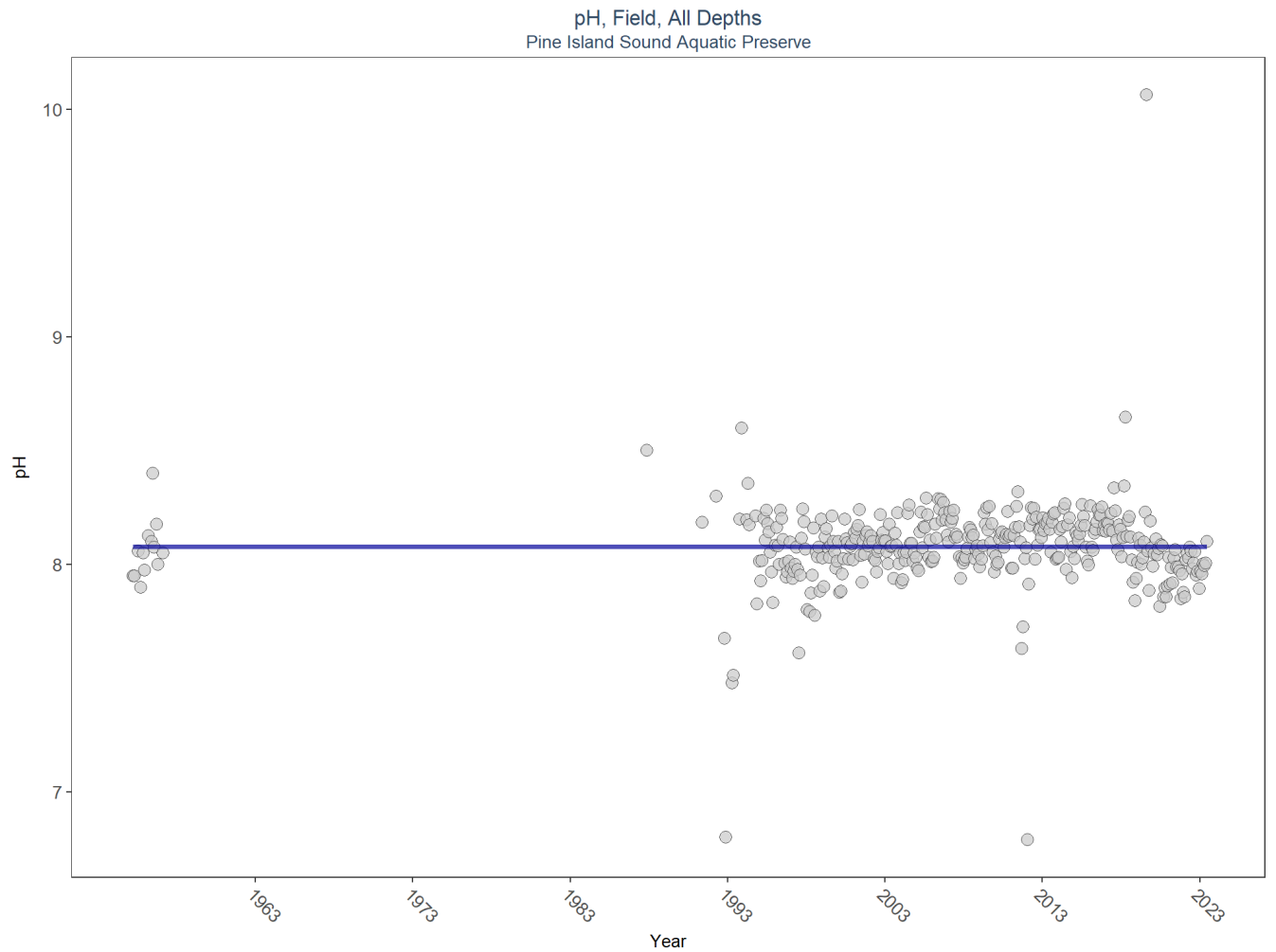*303* - River, Estuary and Coastal Observing Network
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
95 - Harmful Algal Bloom Marine Observation Network

There are no qualifying Value Qualifiers for Dissolved Oxygen Saturation in Pine Island Sound Aquatic Preserve

pH

Discrete Seasonal Kendall-Tau Trend Analysis

pH, Field, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	25265	37	8.1	TRUE	0.0016	0.9801	0.000003684598	8.079074	8.1015	0.7042	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 15: Programs contributing data for pH

| ProgramID	N_Data	YearMin	YearMax
69	15789	1991	2017
5002	7029	1987	2023
95	1405	1955	2018
303	304	2019	2021
103	291	2020	2022
509	270	2001	2008
476	238	2009	2023
115	11	2002	2004

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program
5002 - Florida STORET / WIN
95 - Harmful Algal Bloom Marine Observation Network
303 - River, Estuary and Coastal Observing Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
509 - SERC Water Quality Monitoring Network
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
115 - Environmental Monitoring Assessment Program

There are no qualifying Value Qualifiers for pH in Pine Island Sound Aquatic Preserve

Salinity

Discrete Seasonal Kendall-Tau Trend Analysis
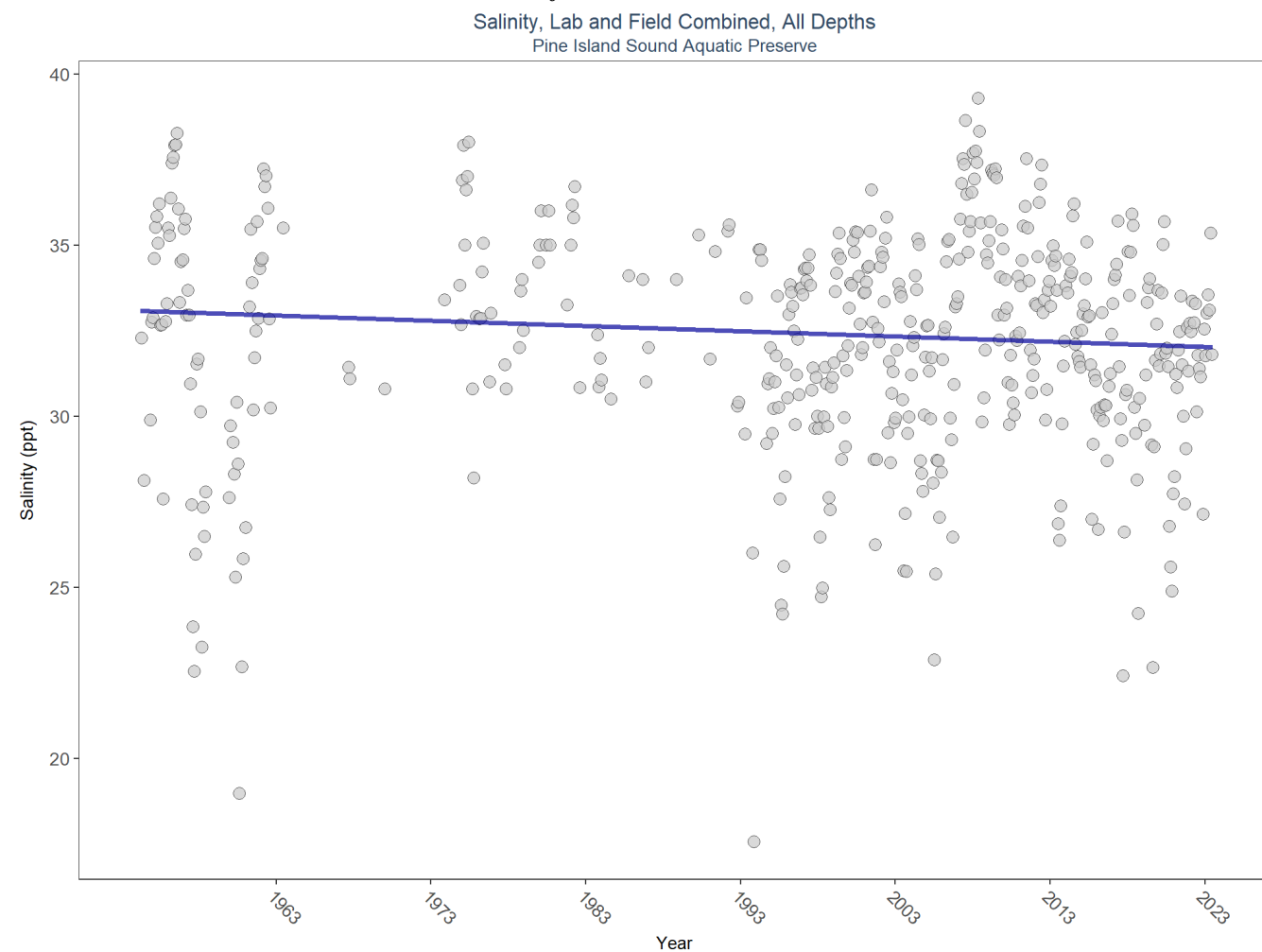
Salinity, Lab and Field Combined, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	26481	62	32.9	TRUE	-0.0781	0.0158	-0.01516298	33.07653	6.4292	0.8432	-1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 16: Programs contributing data for Salinity

ProgramID	N_Data	YearMin	YearMax
69	16066	1990	2017
5002	6177	1995	2023
95	2881	1954	2018
509	702	1999	2008
303	360	2019	2021
476	197	2016	2023
456	71	1970	2012
118	20	2015	2020
115	11	2002	2004
103	1	2004	2004

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program

5002 - Florida STORET / WIN

95 - Harmful Algal Bloom Marine Observation Network

509 - SERC Water Quality Monitoring Network

303 - River, Estuary and Coastal Observing Network

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

456 - Oyster Sentinel

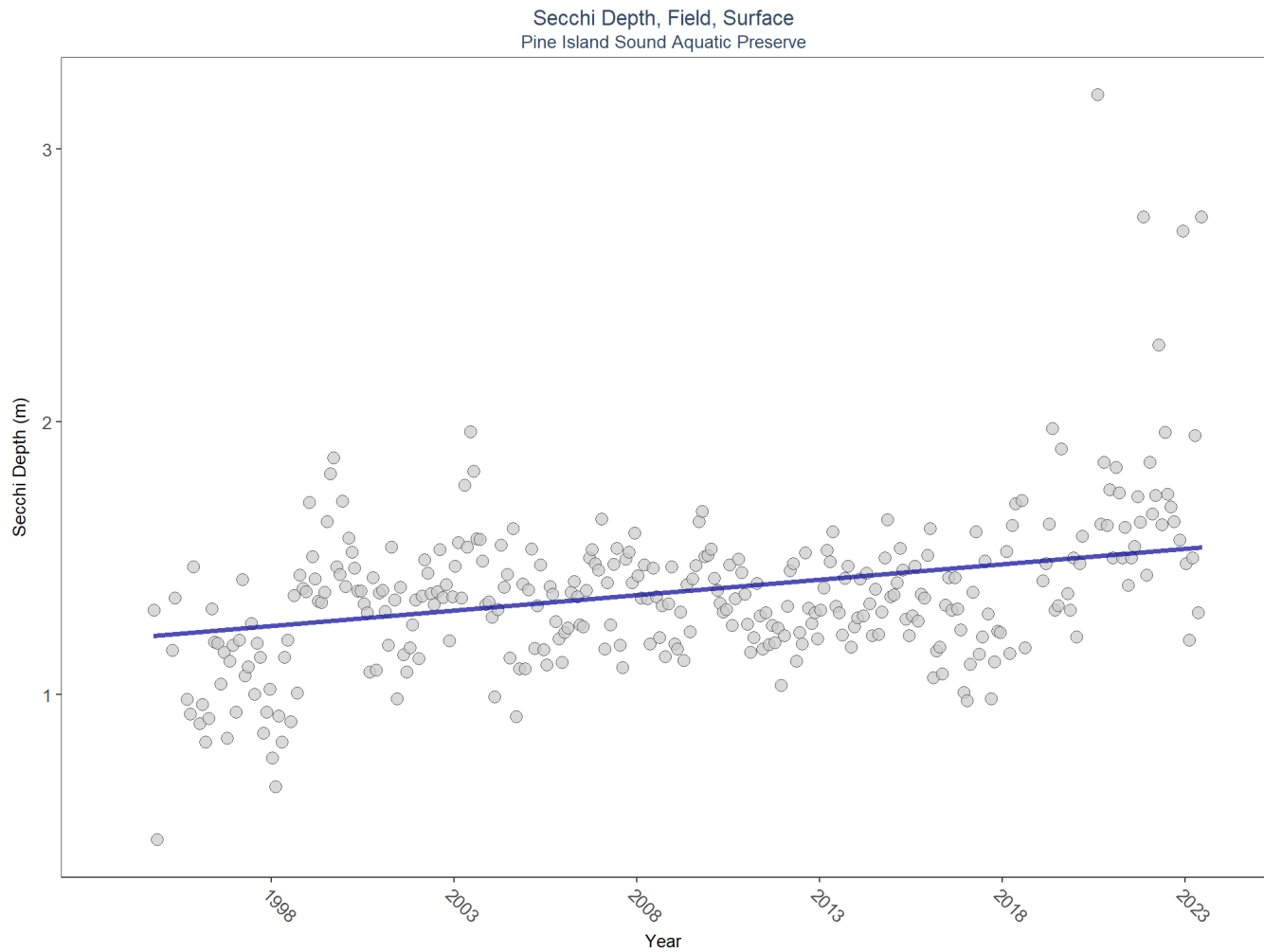*118* - National Aquatic Resource Surveys, National Coastal Condition Assessment

115 - Environmental Monitoring Assessment Program

103 - EPA STOrage and RETrieval Data Warehouse (STORET)

There are no qualifying Value Qualifiers for Salinity in Pine Island Sound Aquatic Preserve

Secchi Depth

Discrete Seasonal Kendall-Tau Trend Analysis

Secchi Depth, Field, Surface
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
Surface	16194	30	1.2	TRUE	0.2534	0.0000	0.01137778	1.205712	5.2999	0.9158	1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 17: Programs contributing data for Secchi Depth

ProgramID	N_Data	YearMin	YearMax
69	15774	1994	2017
476	195	2017	2023
5002	98	2005	2023
103	69	2020	2022
514	53	2001	2002
115	3	2002	2004
303	2	2019	2019

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

5002 - Florida STORET / WIN
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
514 - Florida LAKEWATCH Program
115 - Environmental Monitoring Assessment Program
303 - River, Estuary and Coastal Observing Network

Table 18: Value Qualifiers for Secchi Depth

	Year	N_Total	N_S	perc_S
24	2017	843	5	0.6
25	2018	28	6	21.4
26	2019	42	16	38.1
27	2020	44	12	27.3
28	2021	124	17	13.7
29	2022	58	16	27.6
30	2023	15	2	13.3

Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
5002 - Florida STORET / WIN

Value Qualifiers

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.

Total Nitrogen

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:
  - FDEP report that if both "Total" and "Dissolved" are reported, only "Total" is used. If the total is not reported, they do use dissolved as a best available replacement.
  - An analysis of all SEACAR data shows that 90% of all possible TN calculations can be done using nitrogen components with the same sample fraction, rather than use nitrogen components with mixed total/dissolved sample fractions. In other words, TN can be calculated when TKN and NO3O2 are both total sample fraction, or when both are dissolved sample fraction. This is important, because then the calculated TN value is not based on components with mixed sample fractions.
- Values inserted into data:
  - ParameterName = "Total Nitrogen"
  - SEACAR_QAQCFlagCode = "1Q"
  - SEACAR_QAQC_Description = "SEACAR Calculated"

Discrete Seasonal Kendall-Tau Trend Analysis

Total Nitrogen, Lab, All Depths
Pine Island Sound Aquatic Preserve
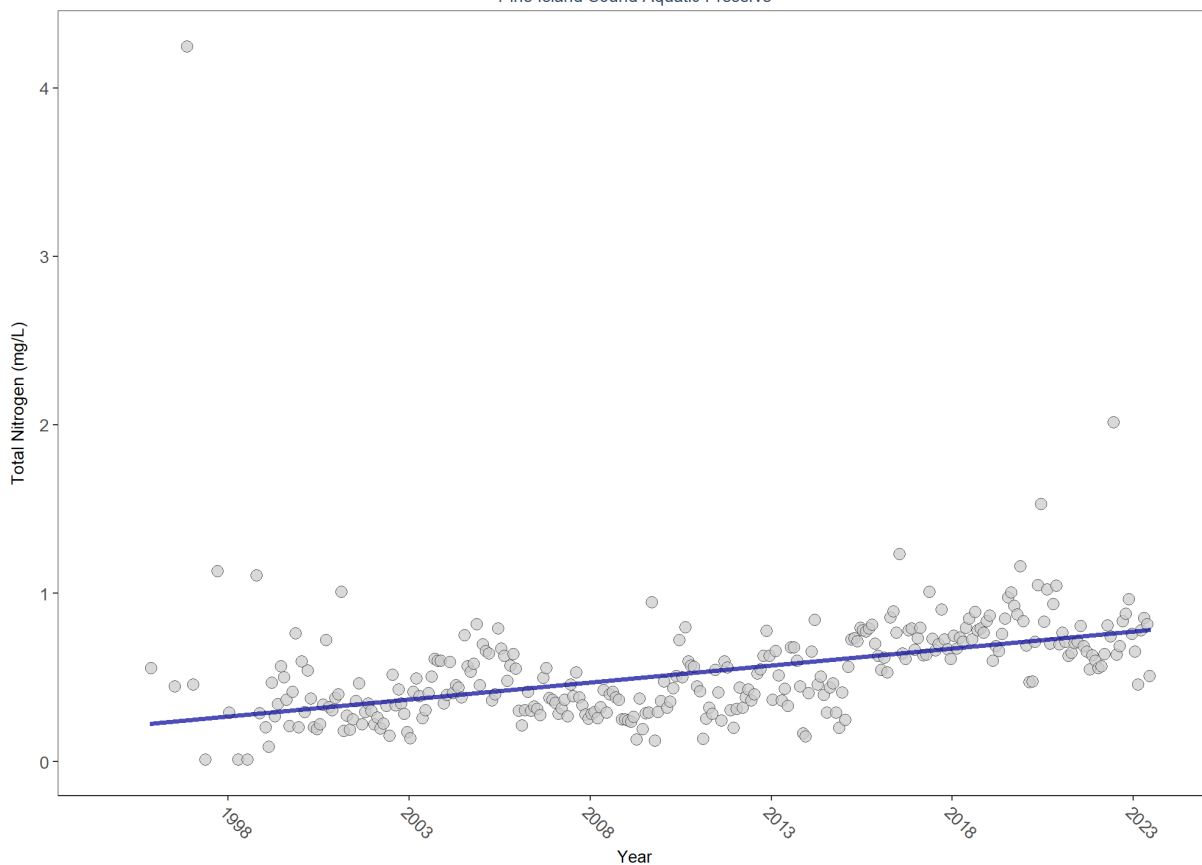
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	3987	29	0.52	TRUE	0.4286	0.0000	0.02019328	0.2072088	10.1472	0.5172	1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 19: Programs contributing data for Total Nitrogen

ProgramID	N_Data	YearMin	YearMax
5002	2809	1995	2023
303	401	2019	2023
509	351	1999	2008
476	312	1998	2023
514	59	2001	2002
103	42	2002	2006
513	36	2006	2022
115	4	2002	2004

Program names:

5002 - Florida STORET / WIN
303 - River, Estuary and Coastal Observing Network
509 - SERC Water Quality Monitoring Network
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
514 - Florida LAKEWATCH Program

Table 20: Value Qualifiers for Total Nitrogen

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
3	1997	15					5	33.3
4	1998	23					10	43.5
5	1999	62					10	16.1
7	2001	185					11	6.0
9	2003	121					2	1.6
10	2004	169	2	1.2	1	0.6		
11	2005	198	24	12.1				
12	2006	180	73	40.6			8	4.4
13	2007	191	50	26.2			14	7.3
14	2008	198	25	12.6			3	1.5
15	2009	159	49	30.8			24	15.1
17	2011	126	24	19.0			17	13.5
18	2012	98	9	9.2			3	3.1
19	2013	77	9	11.7			11	14.3
20	2014	152	22	14.5			5	3.3
21	2015	102	5	4.9			2	2.0
26	2020	276			1	0.4		
27	2021	329			1	0.3		

Programs containing Value Qualified data:

5002 - Florida STORET / WIN
303 - River, Estuary and Coastal Observing Network

Value Qualifiers

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.

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

Total Phosphorus

Discrete Seasonal Kendall-Tau Trend Analysis
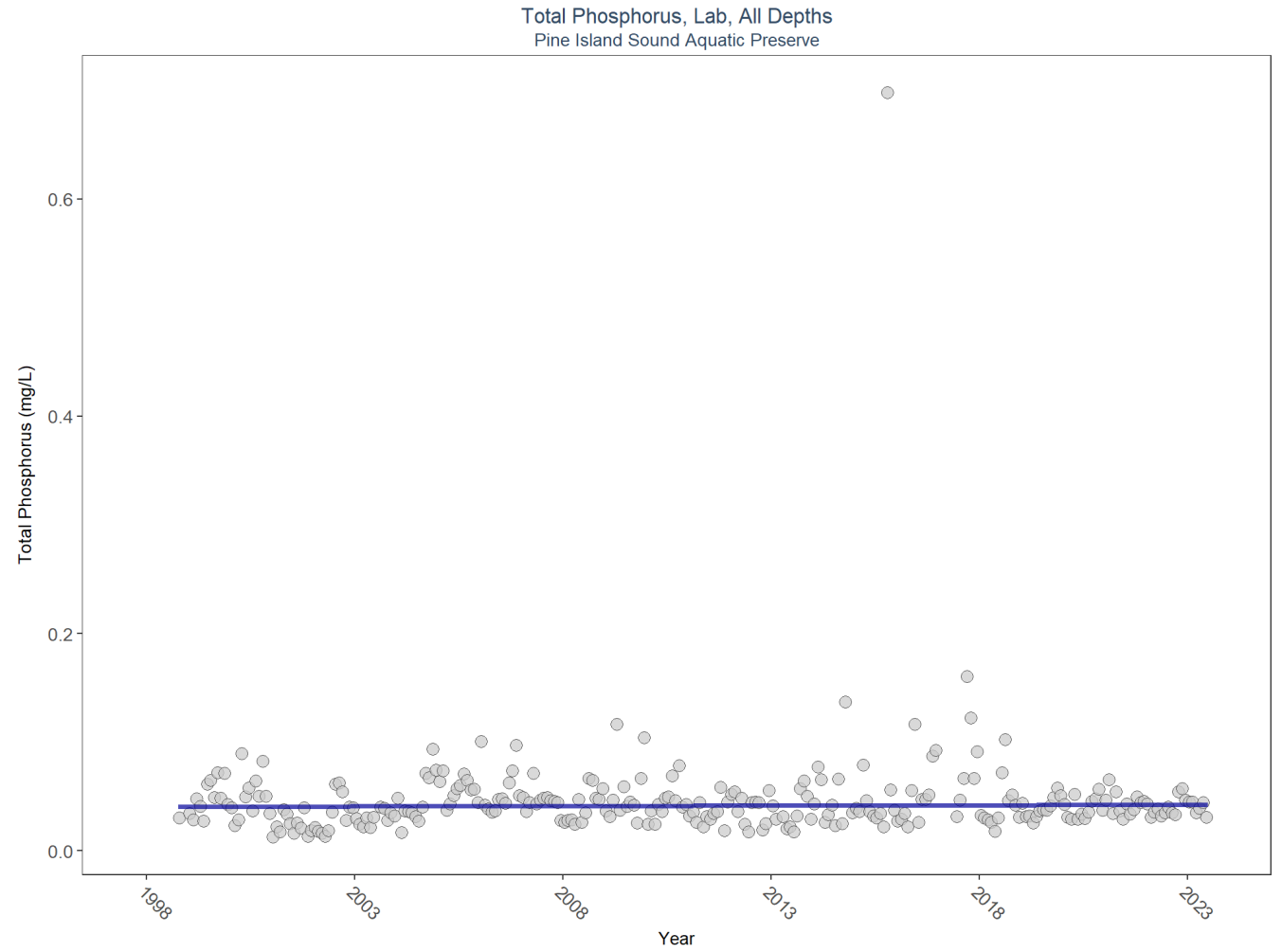
Total Phosphorus, Lab, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2536	26	0.036	TRUE	0.0248	0.5700	0.00007878788	0.04032941	16.2324	0.1327	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 21: Programs contributing data for Total Phosphorus

ProgramID	N_Data	YearMin	YearMax
5002	985	2005	2023
476	475	1998	2023
303	386	2019	2023
509	348	1999	2008
103	293	2002	2022
514	59	2001	2002
513	36	2006	2022
115	4	2002	2004

Program names:

5002 - Florida STORET / WIN
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
303 - River, Estuary and Coastal Observing Network
509 - SERC Water Quality Monitoring Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
514 - Florida LAKEWATCH Program
513 - Coastal Charlotte Harbor Monitoring Network
115 - Environmental Monitoring Assessment Program

Table 22: Value Qualifiers for Total Phosphorus

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
1	1998	3			3	100.0		
2	1999	47			10	21.3		
3	2000	42	1	2.4	3	7.1		
4	2001	76			5	6.6		
5	2002	94					20	21.3
6	2003	47					3	6.4
7	2004	65	11	16.9	8	12.3		
8	2005	105	45	42.9			1	0.9
9	2006	94	49	52.1			2	2.1
10	2007	89	39	43.8			1	1.1
11	2008	66	5	7.6				
12	2009	32	1	3.1				
13	2010	24	5	20.8				
14	2011	25	7	28.0				
15	2012	13	4	30.8				
16	2013	14	6	42.9				
17	2014	13	3	23.1				
18	2015	12	2	16.7				
19	2016	12	4	33.3				
21	2018	169	31	18.3			10	5.9
22	2019	270	57	21.1			1	0.4
23	2020	304	66	21.7			1	0.3
24	2021	562	81	14.4	10	1.8	7	1.2
25	2022	300	44	14.7	2	0.7	3	1.0
26	2023	79	3	3.8				

Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
5002 - Florida STORET / WIN
303 - River, Estuary and Coastal Observing Network
513 - Coastal Charlotte Harbor Monitoring Network

Value Qualifiers

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.

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

Total Suspended Solids, TSS

Discrete Seasonal Kendall-Tau Trend Analysis
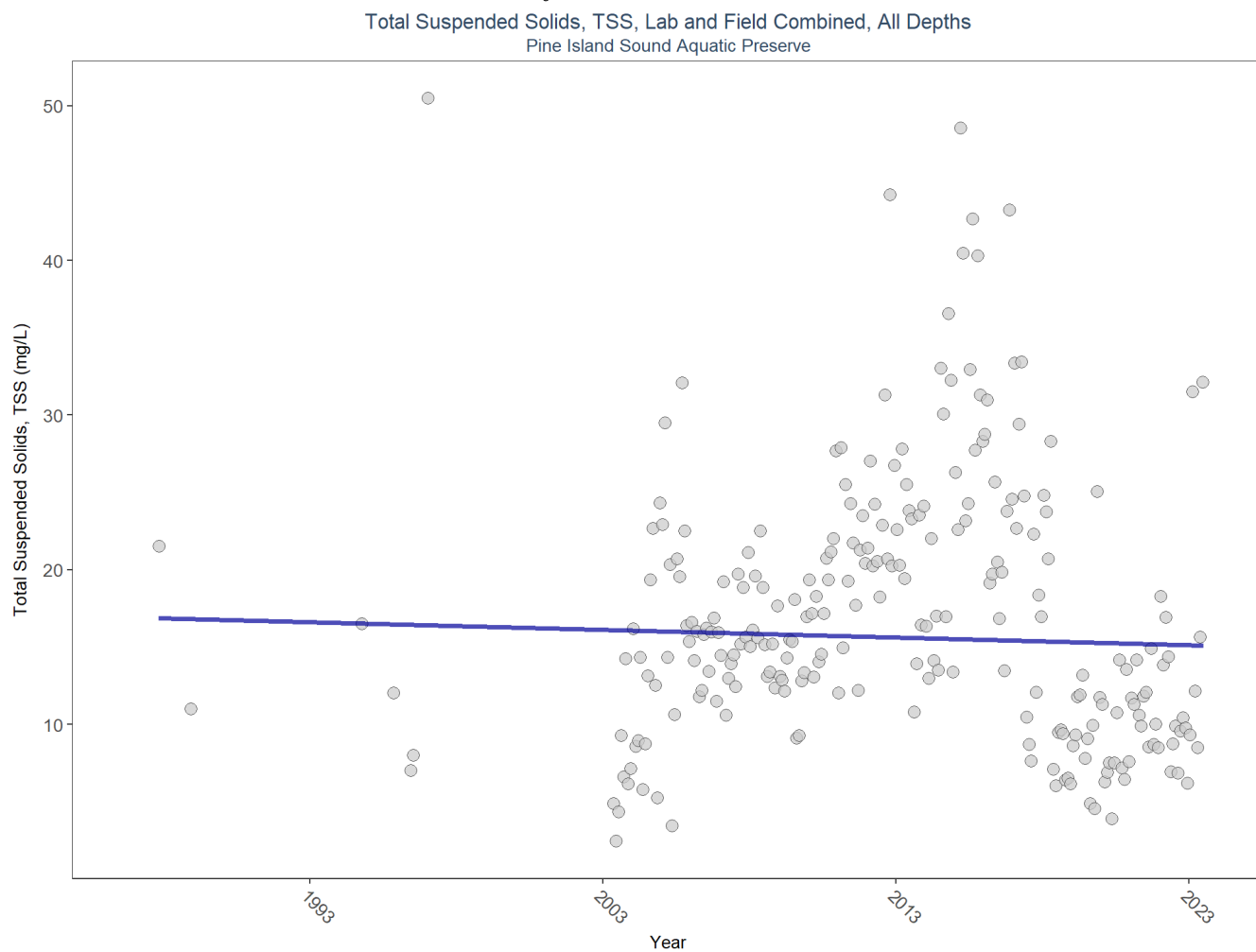
Total Suspended Solids, TSS, Lab and Field Combined, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2558	27	12.9	TRUE	-0.0184	0.7298	-0.04887838	16.89323	8.5293	0.6653	0

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 23: Programs contributing data for Total Suspended Solids, TSS

ProgramID	N_Data	YearMin	YearMax
5002	2442	1987	2023
103	115	2020	2021
513	24	2018	2022

Program names:

5002 - Florida STORET / WIN

103 - EPA STOrage and RETrieval Data Warehouse (STORET)

513 - Coastal Charlotte Harbor Monitoring Network

Table 24: Value Qualifiers for Total Suspended Solids, TSS

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
7	2003	54	19	35.2			8	14.8
8	2004	112	36	32.1			5	4.5
9	2005	115	2	1.7				
11	2007	153	7	4.6				
12	2008	171	14	8.2	5	2.9	2	1.2
13	2009	154	5	3.2				
15	2011	123	1	0.8				
16	2012	91					1	1.1
18	2014	145	1	0.7				
22	2018	141	1	0.7			1	0.7
23	2019	147	15	10.2				
24	2020	153	13	8.5				
25	2021	253	1	0.4	2	0.8		
26	2022	152	2	1.3				
27	2023	53	1	1.9	1	1.9		

Programs containing Value Qualified data:

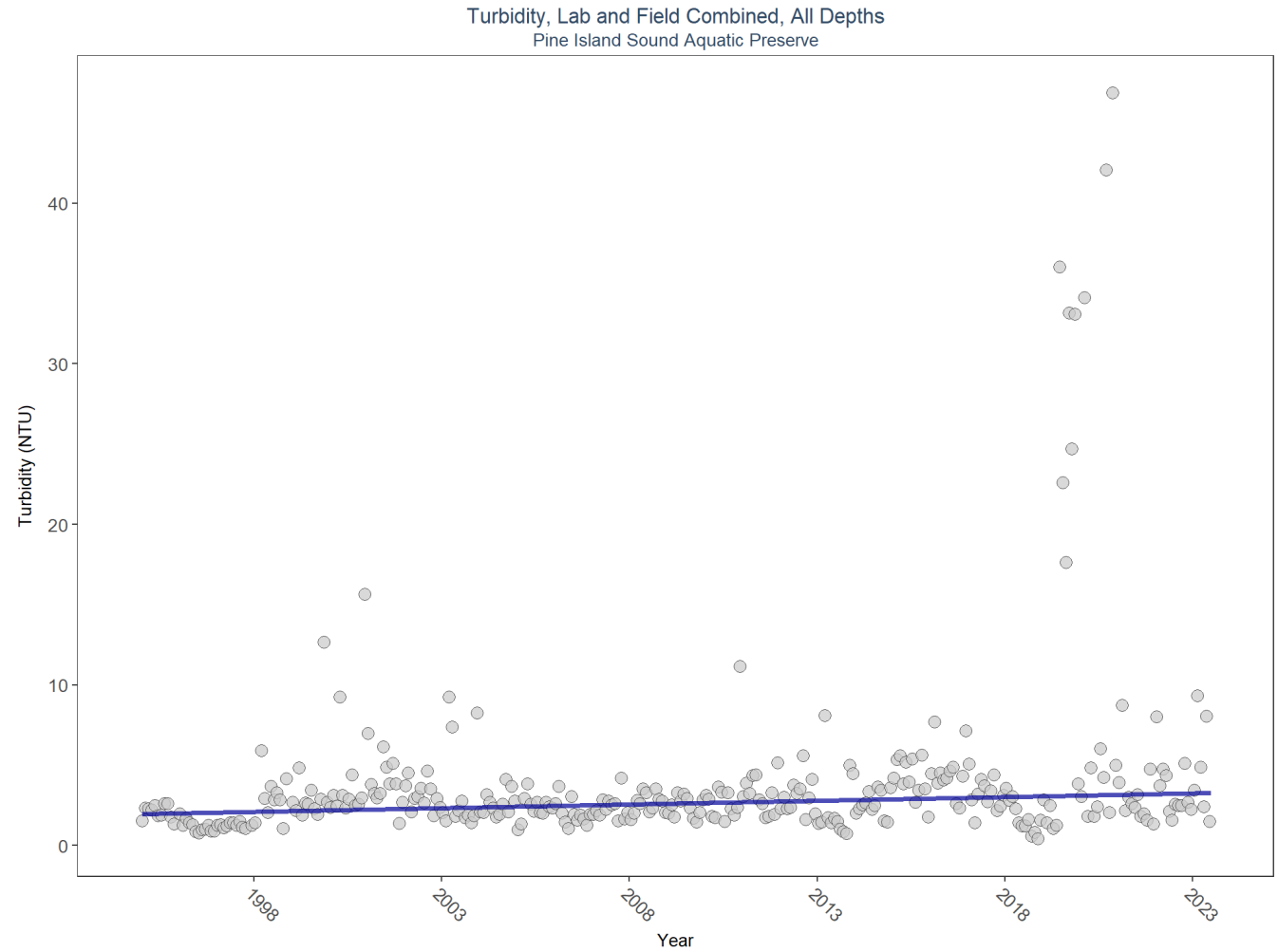*5002* - Florida STORET / WIN

Value Qualifiers

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.

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

Turbidity

Discrete Seasonal Kendall-Tau Trend Analysis

Turbidity, Lab and Field Combined, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	7784	29	1.94	TRUE	0.1743	0.0000	0.0456462	1.976801	7.7972	0.7313	1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 25: Programs contributing data for Turbidity

ProgramID	N_Data	YearMin	YearMax
5002	6506	1995	2023
476	385	1999	2023
509	348	1999	2008
303	334	2019	2021
103	252	2006	2022
513	25	2006	2022

Program names:

5002 - Florida STORET / WIN
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

509 - SERC Water Quality Monitoring Network
303 - River, Estuary and Coastal Observing Network
103 - EPA STOrage and RETrieval Data Warehouse (STORET)
513 - Coastal Charlotte Harbor Monitoring Network

Table 26: Value Qualifiers for Turbidity

	Year	N_Total	N_I	perc_I	N_Q	perc_Q	N_U	perc_U
6	2000	453			5	1.1		
9	2003	365					10	2.7
10	2004	319	21	6.6			1	0.3
12	2006	341	11	3.2				
13	2007	326	2	0.6				
15	2009	318			3	0.9		
16	2010	324			4	1.2		
17	2011	302			3	1.0		
18	2012	162			4	2.5		
20	2014	144			2	1.4		
24	2018	169	31	18.3			21	12.4
25	2019	305	17	5.6			27	8.8
26	2020	359	29	8.1			3	0.8
27	2021	482	31	6.4				
28	2022	216	2	0.9	3	1.4		

Programs containing Value Qualified data:

5002 - Florida STORET / WIN
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
513 - Coastal Charlotte Harbor Monitoring Network

Value Qualifiers

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.

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

Water Temperature

Discrete Seasonal Kendall-Tau Trend Analysis
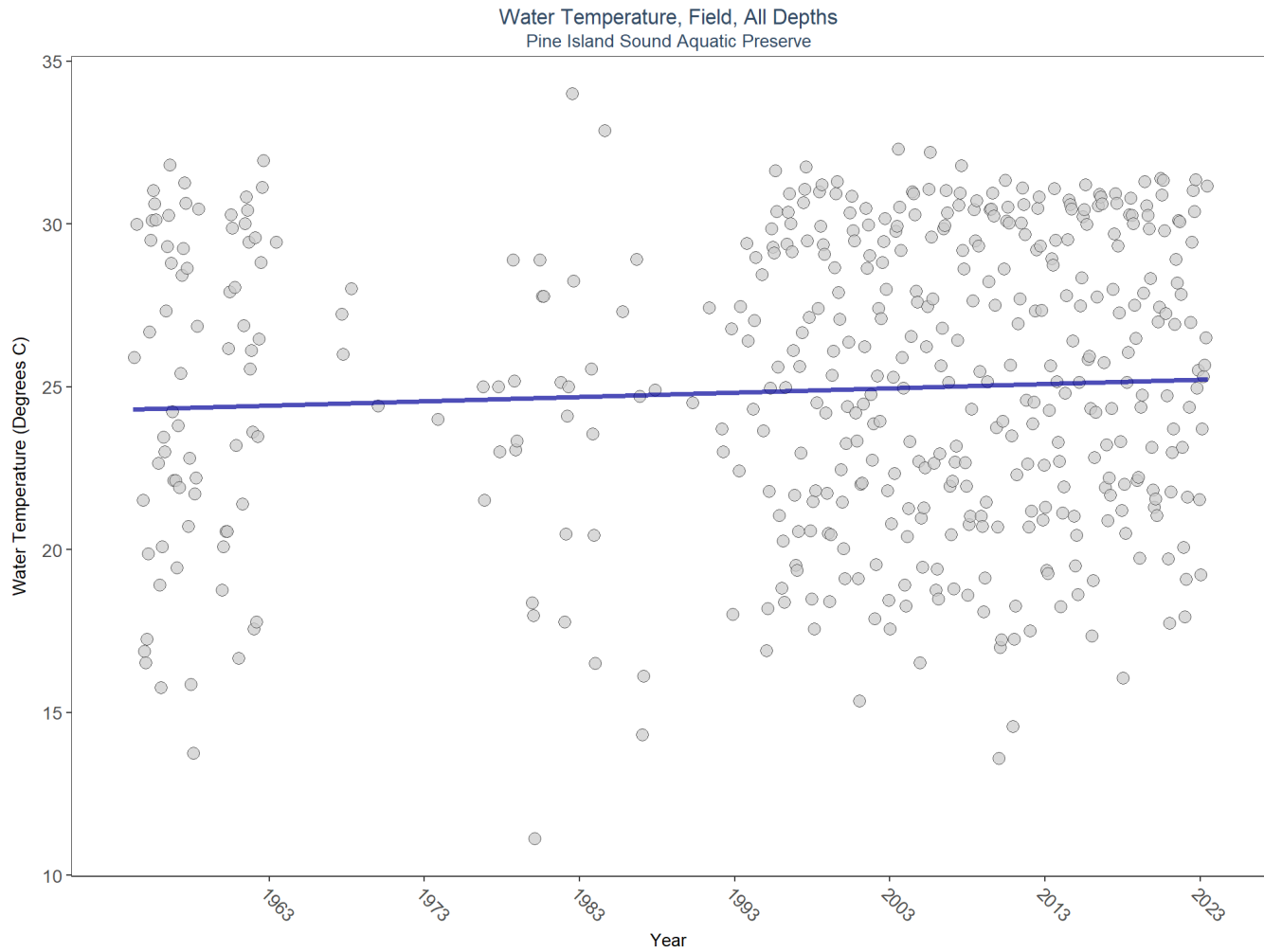
Water Temperature, Field, All Depths
Pine Island Sound Aquatic Preserve

RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	29534	60	26.2	TRUE	0.1152	0.0004	0.01313658	24.30619	15.8701	0.146	1

p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Table 27: Programs contributing data for Water Temperature

ProgramID	N_Data	YearMin	YearMax
69	16065	1990	2017
5002	9301	1987	2023
95	2551	1954	2018
509	702	1999	2008
303	345	2019	2021
103	293	2004	2022
476	196	2017	2023
456	71	1970	2012
115	11	2002	2004

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program

5002 - Florida STORET / WIN

95 - Harmful Algal Bloom Marine Observation Network

509 - SERC Water Quality Monitoring Network

303 - River, Estuary and Coastal Observing Network

103 - EPA STOrage and RETrieval Data Warehouse (STORET)

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

456 - Oyster Sentinel

115 - Environmental Monitoring Assessment Program

There are no qualifying Value Qualifiers for Water Temperature in Pine Island Sound Aquatic Preserve

Water Quality - Continuous

The following files were used in the continuous analysis:

- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_SW-2023-Jul-14.txt*

- *Combined_WQ_WC_NUT_cont_Dissolved_Oxygen_Saturation_SW-2023-Jul-14.txt*

- *Combined_WQ_WC_NUT_cont_pH_SW-2023-Jul-14.txt*

- *Combined_WQ_WC_NUT_cont_Salinity_SW-2023-Jul-14.txt*

- *Combined_WQ_WC_NUT_cont_Turbidity_SW-2023-Jul-14.txt*

- *Combined_WQ_WC_NUT_cont_Water_Temperature_SW-2023-Jul-14.txt*

Table 28: National Water Information System (7)

ProgramLocationID	years_of_data	Use_In_Analysis
02293249	4	FALSE
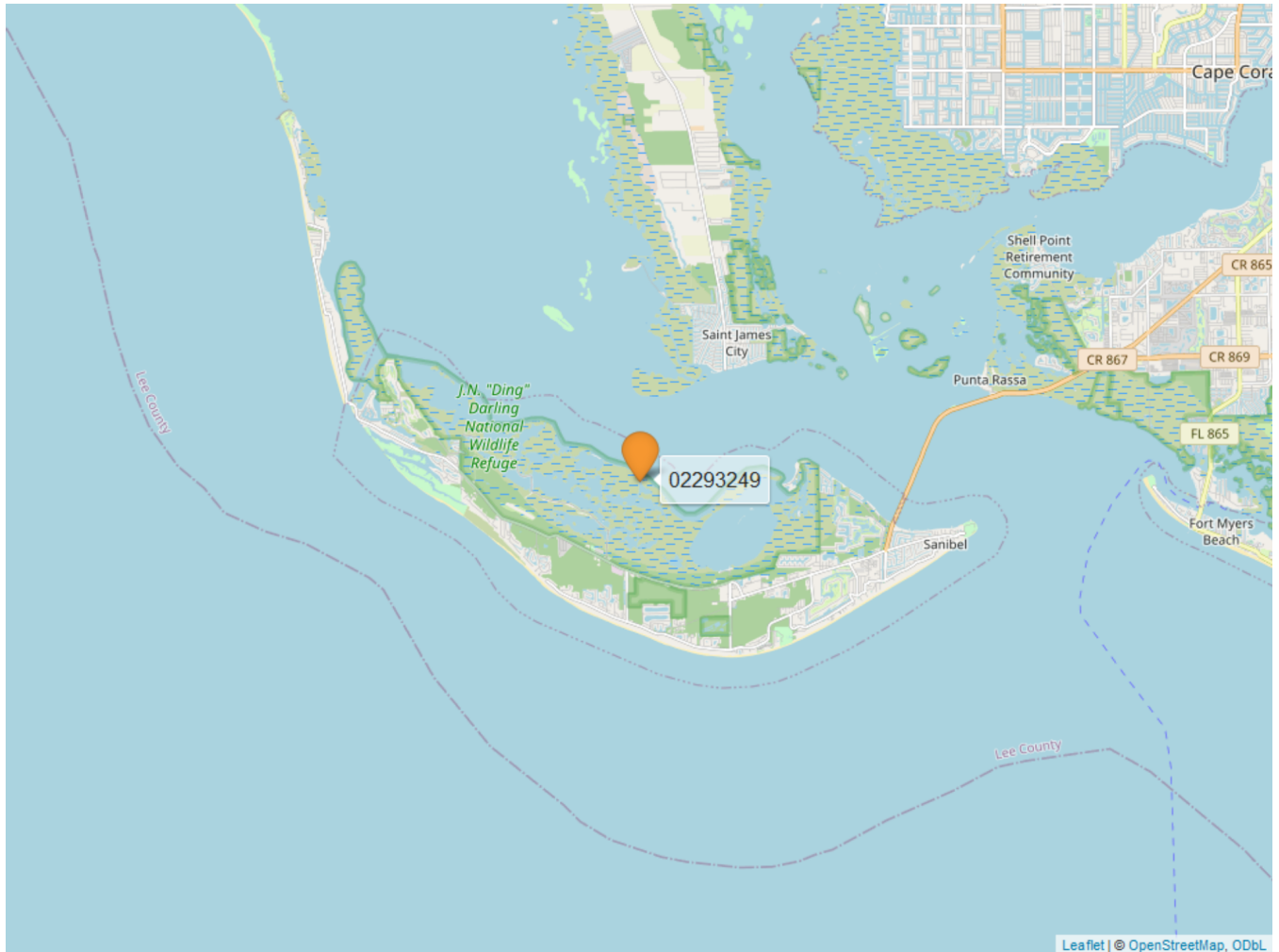
Submerged Aquatic Vegetation

The data file used is: **All_SAV_Parameters-2023-Oct-12.txt**

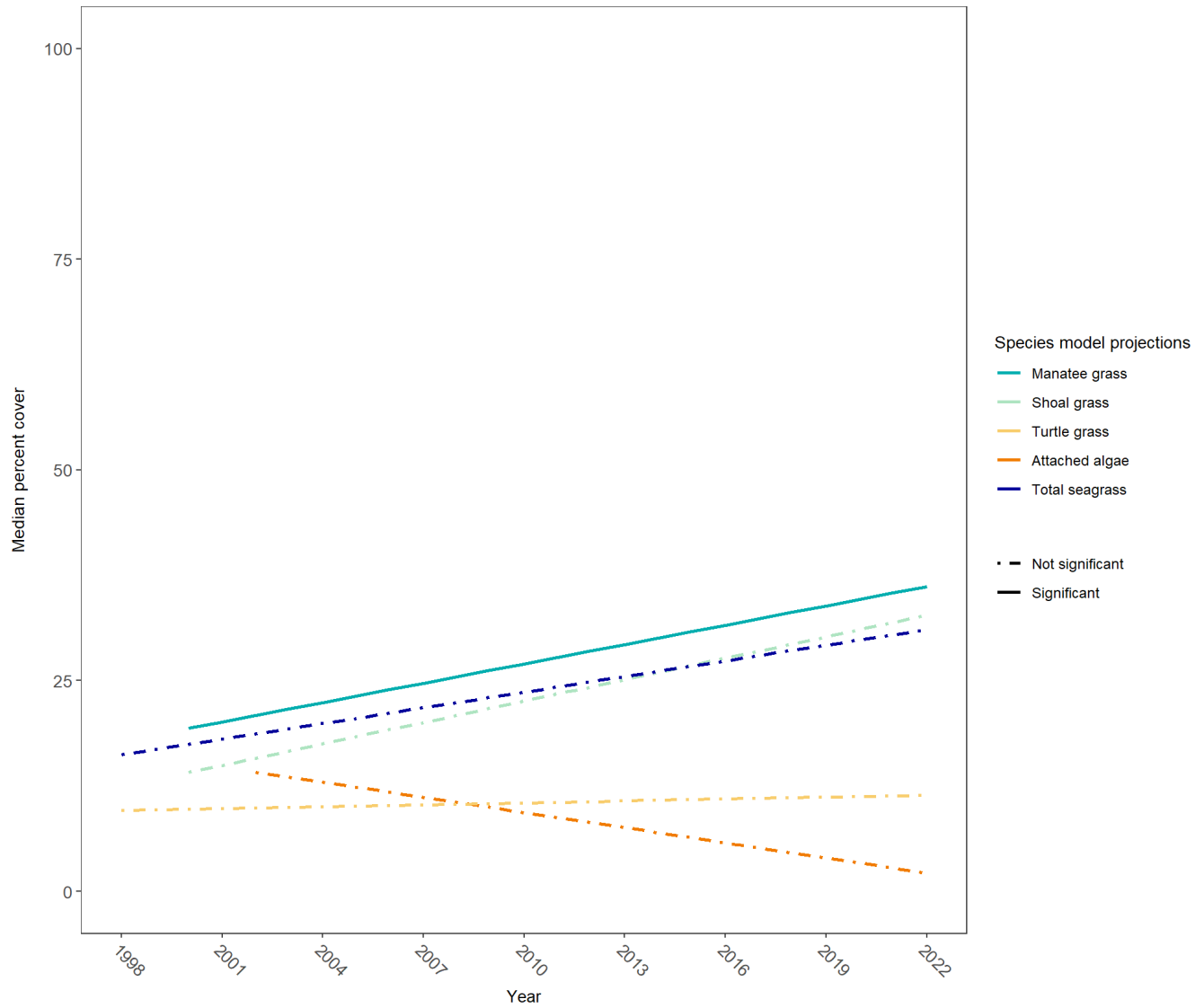Pine Island Sound Aquatic Preserve
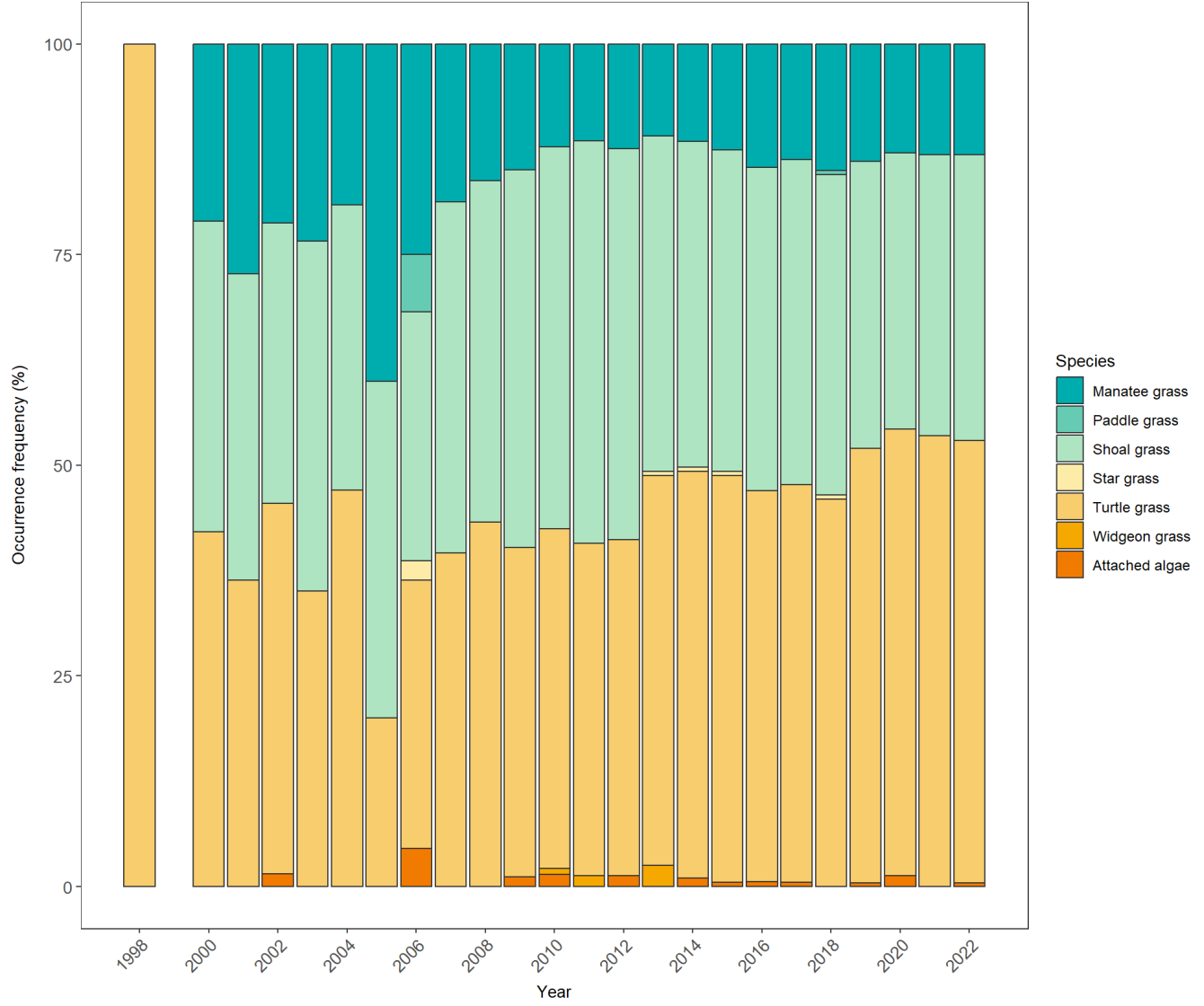Sample Locations - SAV Percent Cover
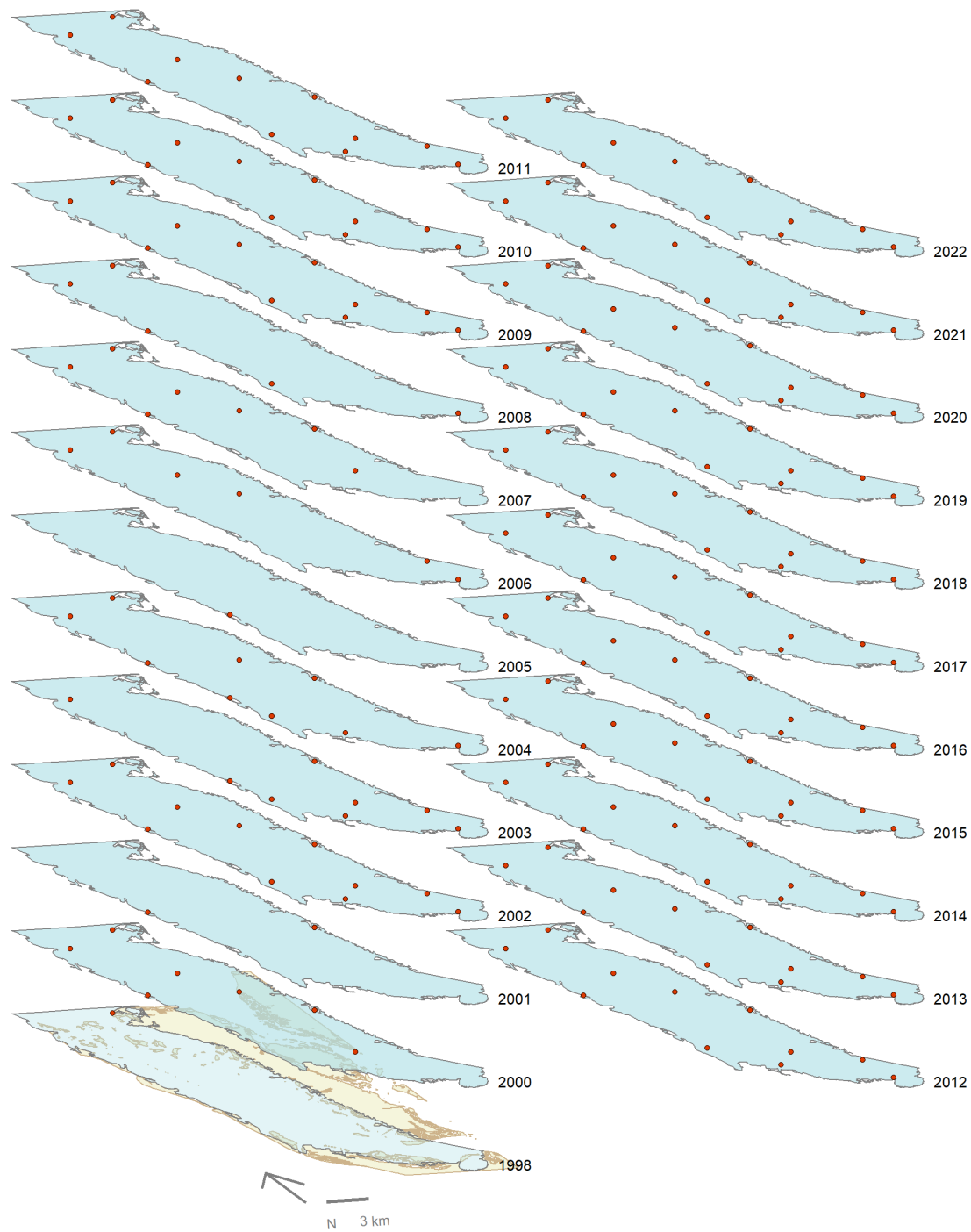
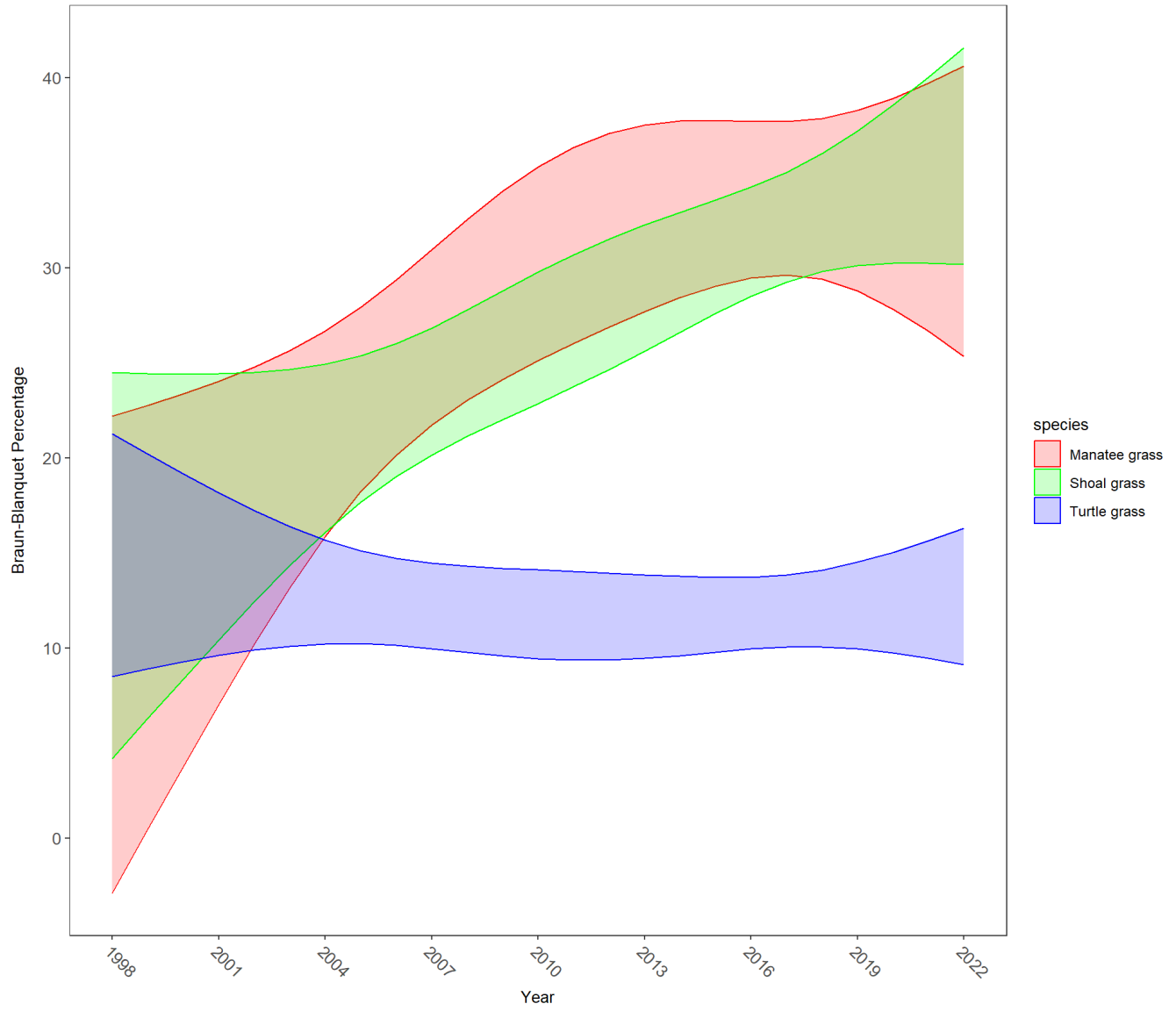Program name

- Charlotte Harbor Seagrass Monitoring

Median percent cover
Pine Island Sound Aquatic Preserve Aquatic Preserve

Frequency of occurrence
Pine Island Sound Aquatic Preserve

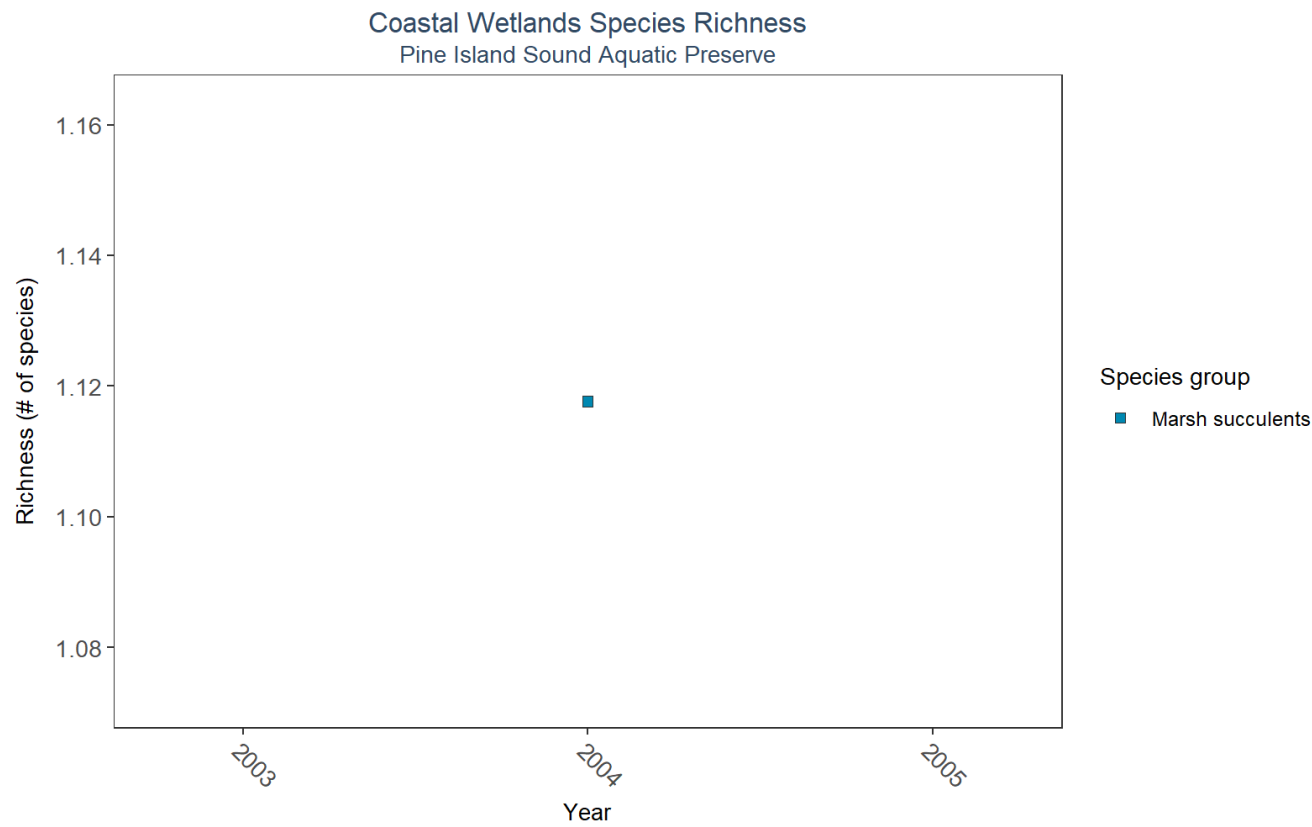BB_pct over Years for Seagrass Species in Pine Island Sound Aquatic Preserve

Coastal Wetlands

The data file used is: **All_CW_Parameters-2023-Jun-05.txt**

Coastal Wetlands Species Richness
Pine Island Sound Aquatic Preserve

SpeciesGroup	N_Years	EarliestYear	LatestYear	N_Data	Min	Max	Median	Mean	StDev	Year_MinRichness	Year_MaxRichness
Marsh succulents	1	2004	2004	17	1	2	1	1.12	0.33	2004	2004