

# Estero Bay Aquatic Preserve

## SEACAR Habitat Analyses

Last compiled on 14 December, 2023

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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	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	pH	2	14	Analysis Only - 2022-04-04
pH	pH	2	14	6600 Series
pH	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	0.000001	22
Salinity	ppt	0	70
Water Temperature	Degrees C	3	40
pH		2	13
Dissolved Oxygen Saturation	%	0.000001	310
Specific Conductivity	mS/cm	0.005000001	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	0.000001	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: Quality Assurance Flags inserted based on threshold checks listed in Table 1 & 2

SEACAR QAQC Description	Include	SEACAR QAQCFlagCode
Exceeds Maximum threshold. Not verified in raw data	No	2Q
Exceeds Maximum threshold. Verified in raw data	No	3Q
Below Minimum threshold. Not verified in raw data	No	4Q
Below Minimum threshold. Verified in raw data	No	5Q
Within threshold tolerance	Yes	6Q
No defined thresholds for this parameter	Yes	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	No	0	Value based on field kit determination; results may not be accurate
STORET-WIN	J	No	0	Estimated value
STORET-WIN	V	No	0	Analyte was detected at or above method detection limit
STORET-WIN	Y	No	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

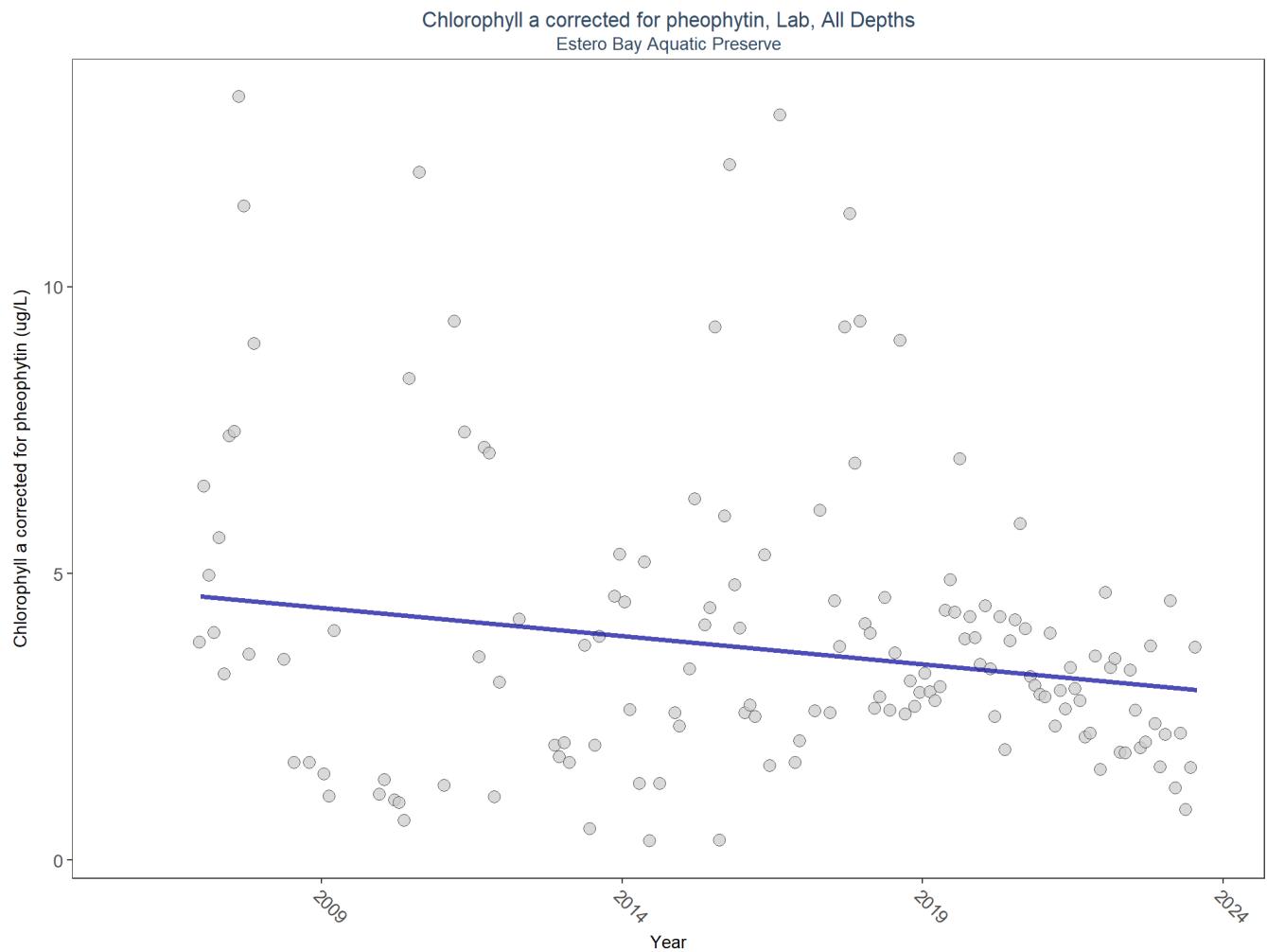
## Water Quality - Discrete

The following files were used in the discrete analysis:

- *Combined\_WQ\_WC\_NUT\_Chlorophyll\_a\_corrected\_for\_pheophytin-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Chlorophyll\_a\_uncorrected\_for\_pheophytin-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Colored\_dissolved\_organic\_matter\_CDOM-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Dissolved\_Oxygen-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Dissolved\_Oxygen\_Saturation-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_pH-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Salinity-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Secchi\_Depth-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Nitrogen-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Phosphorus-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Suspended\_Solids\_TSS-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Turbidity-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_Water\_Temperature-2023-Dec-08.txt*

## Chlorophyll a corrected for pheophytin - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1834	18	2.61	TRUE	-0.1069	0.1285	-0.09866071	4.702191	16.3413	0.1289	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	1320	2006	2023
476	302	2008	2023
103	170	2020	2021
4063	62	2018	2023

#### Program names:

5002 - Florida STORET / WIN

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

103 - EPA STOrage and RETrieval Data Warehouse (STORET)

4063 - Estero Bay Tributary Monitoring

## Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 7: Value Qualifiers for Chlorophyll a corrected for pheophytin

<i>Year</i>	<i>N_Total</i>	<i>N_I</i>	<i>perc_I</i>	<i>N_Q</i>	<i>perc_Q</i>	<i>N_U</i>	<i>perc_U</i>
2006	1	1	100.0				
2007	46	3	6.5			4	8.7
2008	5	2	40.0				
2009	8	7	87.5				
2010	9	5	55.6	3	33.3	1	11.1
2011	14	3	21.4	6	42.9		
2012	6	2	33.3			2	33.3
2013	25	10	40.0			5	20.0
2014	20	1	5.0	1	5.0	5	25.0
2015	26	4	15.4			3	11.5
2016	22	8	36.4	2	9.1		
2017	35	4	11.4				
2018	274	77	28.1				
2019	268	63	23.5			2	0.8
2020	261	59	22.6	1	0.4	1	0.4
2021	450	118	26.2			13	2.9
2022	262	108	41.2			20	7.6
2023	122	48	39.3			31	25.4

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit  
<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

### Programs containing Value Qualified data:

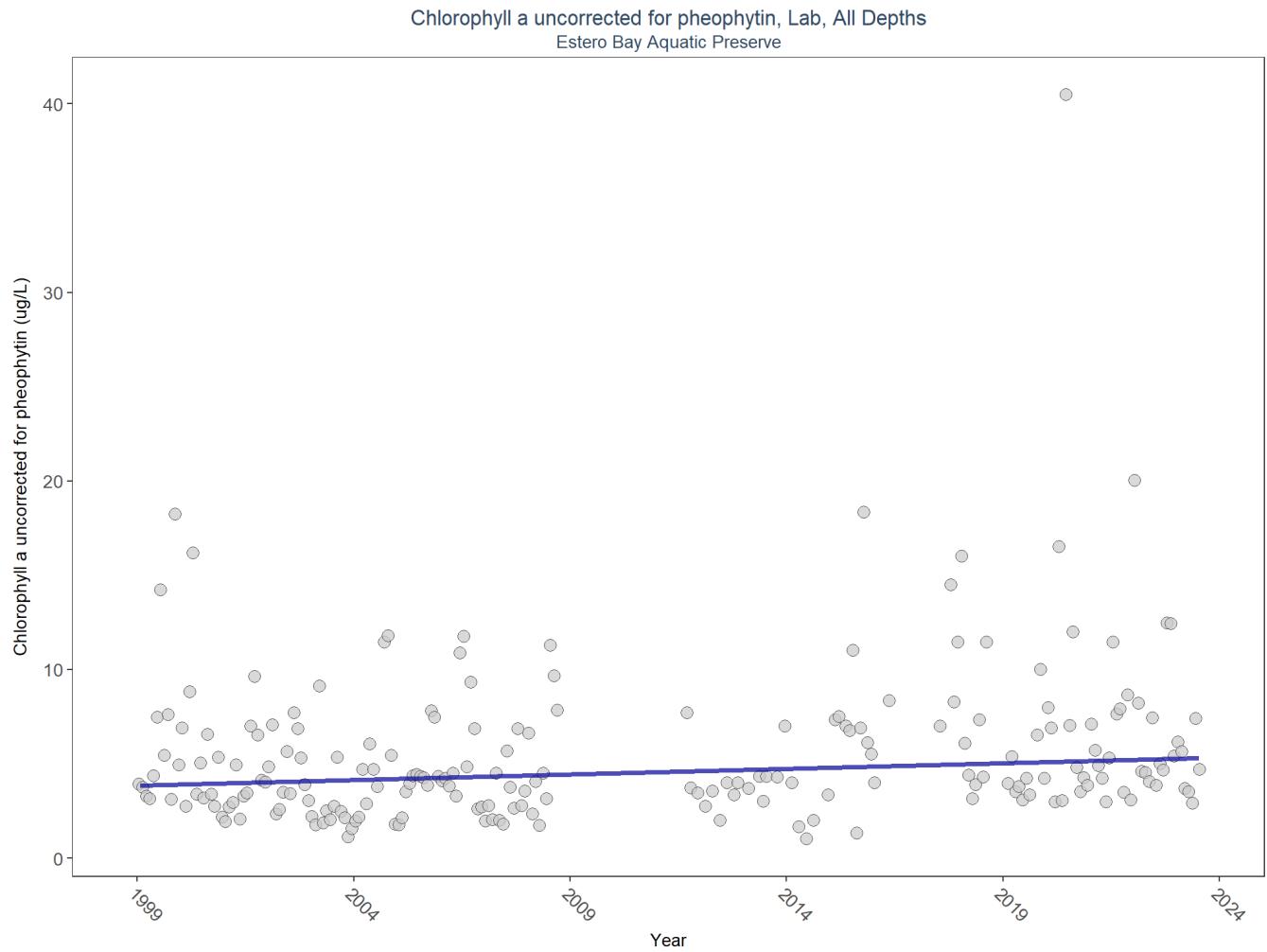
5002 - Florida STORET / WIN

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

4063 - Estero Bay Tributary Monitoring

## Chlorophyll a uncorrected for pheophytin - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	877	23	4.096	TRUE	0.1489	0.0028	0.0587485	3.854689	10.0405	0.5267	1

*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	347	1999	2008
476	276	1999	2023
5002	151	2011	2023
103	110	2003	2022
514	7	2013	2018
115	1	2003	2003

#### Program names:

509 - SERC Water Quality Monitoring Network

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

### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 9: Value Qualifiers for Chlorophyll a uncorrected for pheophytin

Year	$N_{Total}$	$N_I$	$perc_I$	$N_Q$	$perc_Q$	$N_U$	$perc_U$
2000	46					2	4.3
2001	42					6	14.3
2003	44					6	13.6
2004	40	6	15.0			1	2.5
2005	37					1	2.7
2006	45					4	8.9
2007	55	14	25.4			2	3.6
2008	31	3	9.7				
2011	7				1	14.3	
2018	33	1	3.0				
2019	42	3	7.1				
2020	54	1	1.9	2		3.7	
2021	164	2	1.2				
2022	54	2	3.7	3		5.6	

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

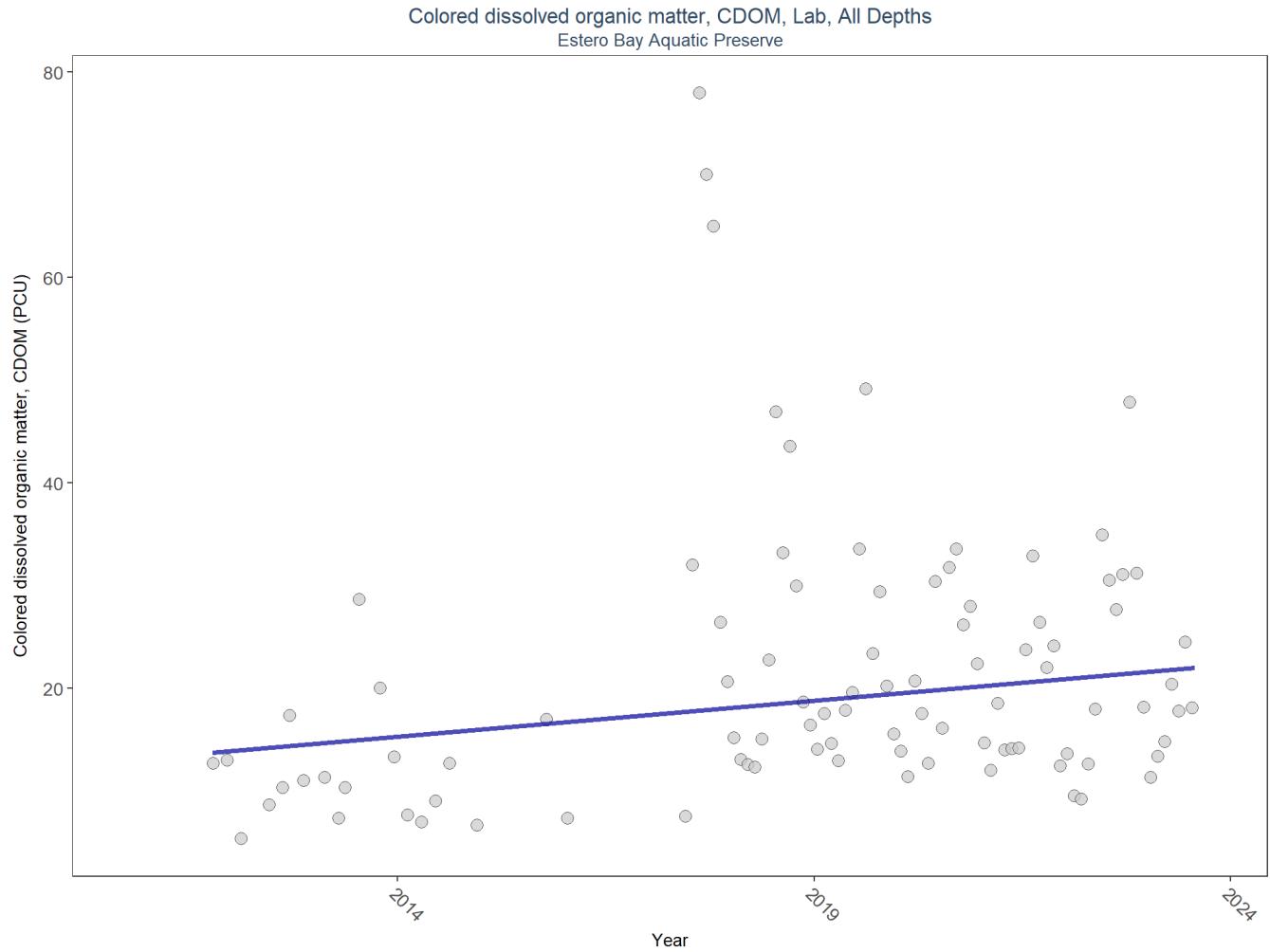
### Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

5002 - Florida STORET / WIN

## Colored dissolved organic matter, CDOM - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1558	13	14	TRUE	0.2464	0.0025	0.7030208	13.19121	13.2009	0.2804	1

$p < 0.00005$  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	1211	2018	2023
476	226	2017	2023
514	63	2011	2017
4063	62	2018	2023

### Program names:

5002 - Florida STORET / WIN

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

514 - Florida LAKEWATCH Program

4063 - Estero Bay Tributary Monitoring

## Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{\cdot}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{\cdot}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

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

<i>Year</i>	<i>N_Total</i>	<i>N_I</i>	<i>perc_I</i>	<i>N_Q</i>	<i>perc_Q</i>	<i>N_U</i>	<i>perc_U</i>
2017	35	4	11.4				
2018	275	34	12.4			4	1.4
2019	268	36	13.4			9	3.4
2020	242	49	20.2	1	0.4	2	0.8
2021	299	39	13.0			11	3.7
2022	262	38	14.5			7	2.7
2023	121	19	15.7				

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

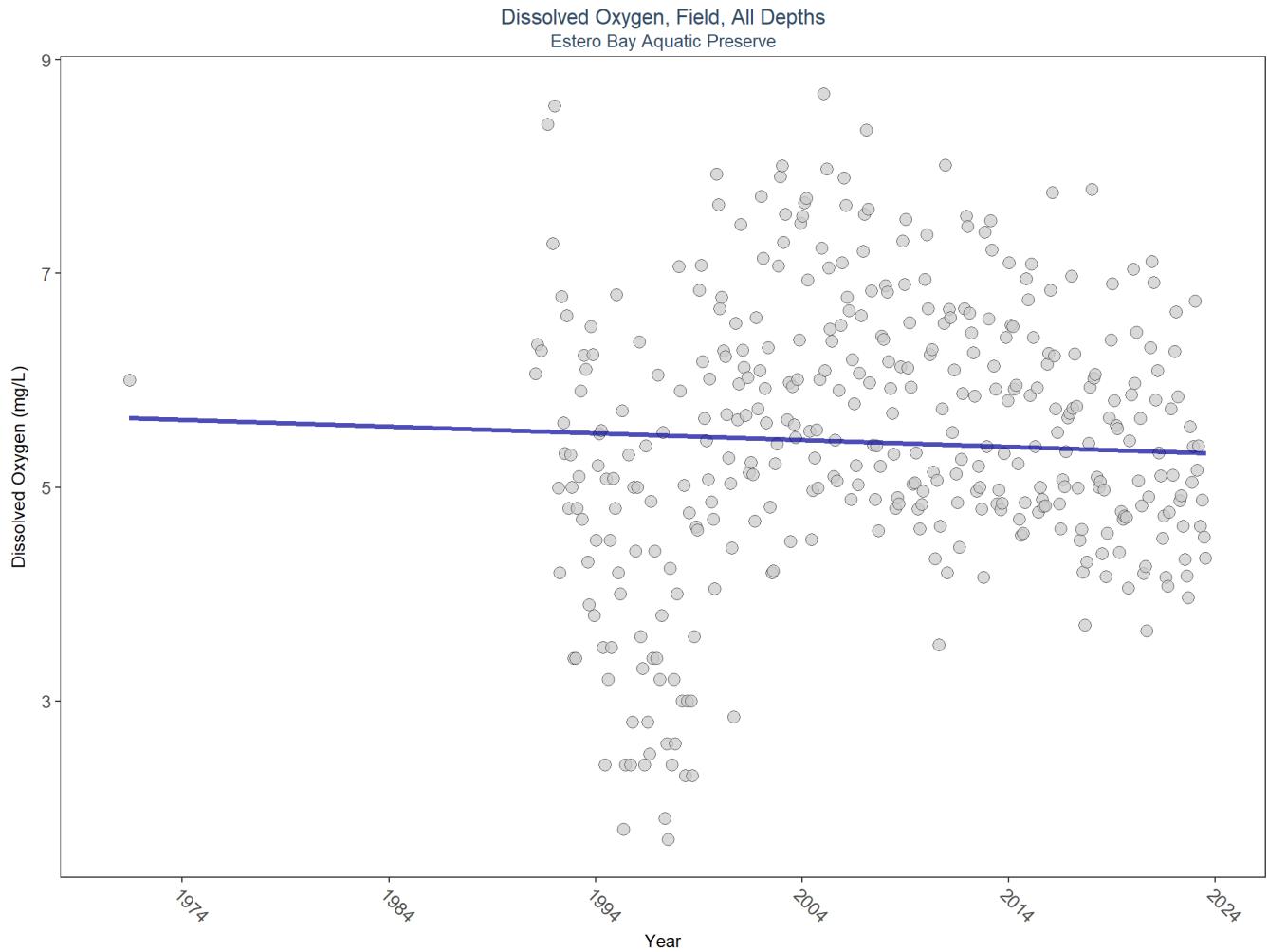
### Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

5002 - Florida STORET / WIN

## Dissolved Oxygen - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



*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
5002	6075	1991	2023
69	2258	2001	2007
509	696	1999	2008
4064	619	2011	2012
95	442	1971	2018
476	314	2008	2023
103	252	2003	2022
4042	46	2016	2022
115	2	2003	2003

Program names:

5002 - Florida STORET / WIN  
69 - Fisheries-Independent Monitoring (FIM) Program  
509 - SERC Water Quality Monitoring Network  
4064 - A spatial model to improve site selection for seagrass restoration in shallow boating environments  
95 - Harmful Algal Bloom Marine Observation Network  
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network  
103 - EPA STOrage and RETrieval Data Warehouse (STORET)  
4042 - Estero Bay Oyster Monitoring  
115 - Environmental Monitoring Assessment Program

#### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{\text{H}}$  is the total amount of values flagged with the respective value qualifier in a given year
- $\text{perc}_{\text{H}}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 13: Value Qualifiers for Dissolved Oxygen

Year	$N_{Total}$	$N_{\text{H}}$	$\text{perc}_{\text{H}}$
2008	301	10	3.3

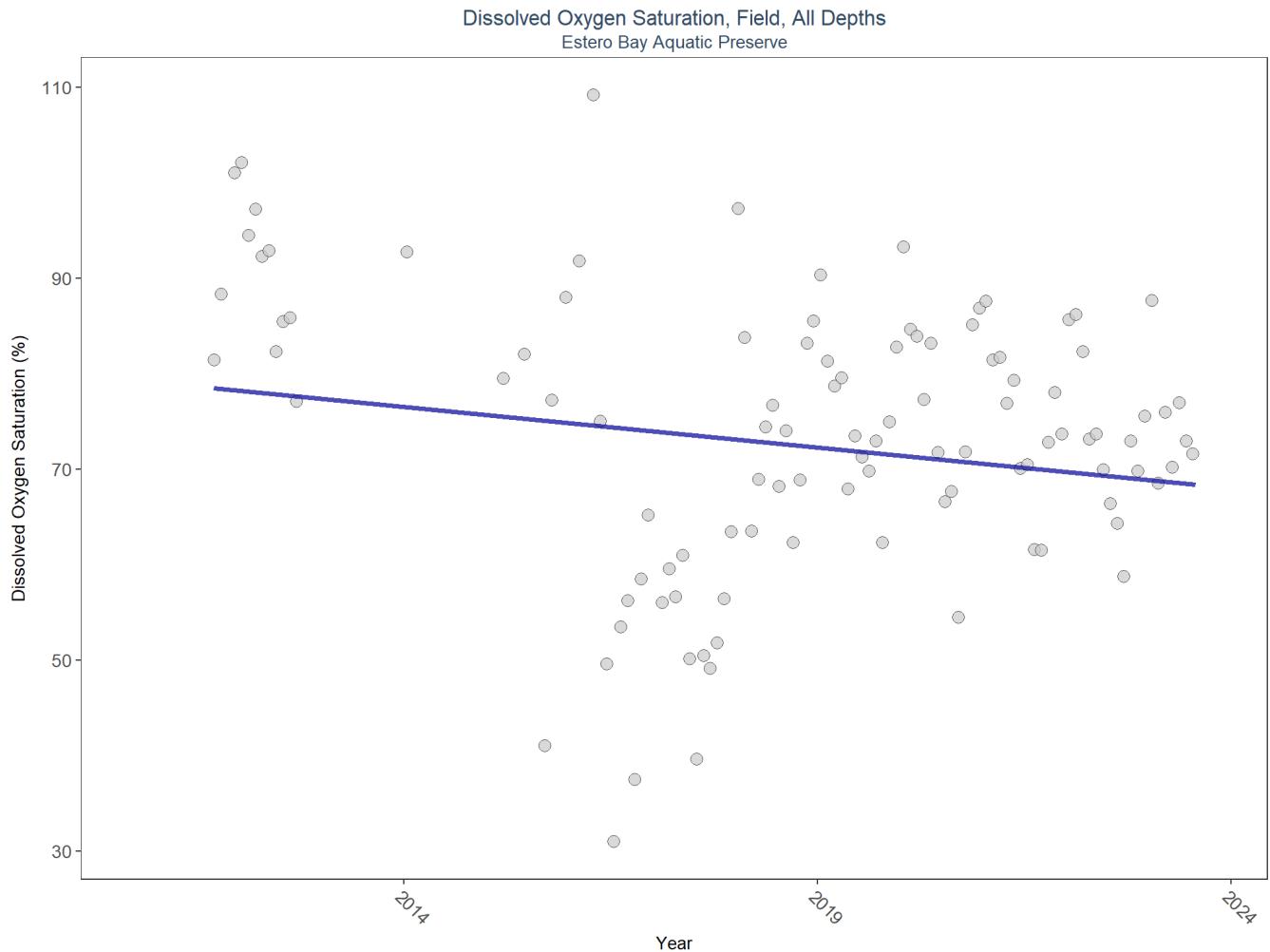
**Note:** <sup>1</sup> **H** - Value based on field kit determination

#### Programs containing Value Qualified data:

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

## Dissolved Oxygen Saturation - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2337	12	82.4	TRUE	-0.1475	0.0579	-0.8522727	79.06902	8.635	0.6555	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	1376	2015	2023
4064	619	2011	2012
476	191	2017	2023
95	120	2011	2018
4042	37	2016	2022

### Program names:

5002 - Florida STORET / WIN

4064 - A spatial model to improve site selection for seagrass restoration in shallow boating environments

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

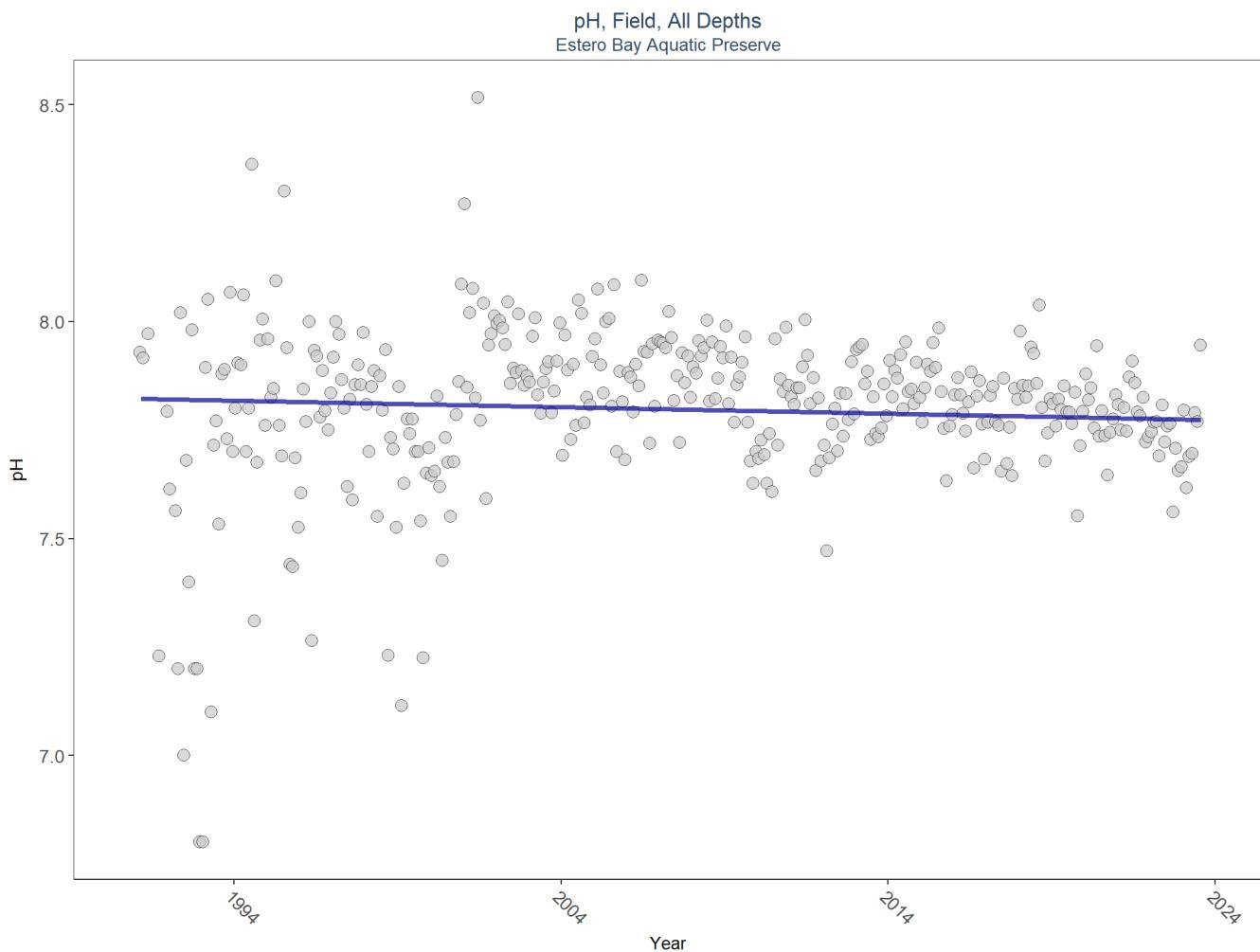
95 - Harmful Algal Bloom Marine Observation Network

4042 - Estero Bay Oyster Monitoring

There are no qualifying Value Qualifiers for Dissolved Oxygen Saturation in Estero Bay Aquatic Preserve

## pH - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



$p < 0.00005$  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
5002	6359	1991	2023
69	2264	2001	2007
95	444	2005	2018
509	270	2001	2008
103	252	2020	2022

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
476	252	2009	2023
4042	40	2016	2022
115	2	2003	2003

**Program names:**

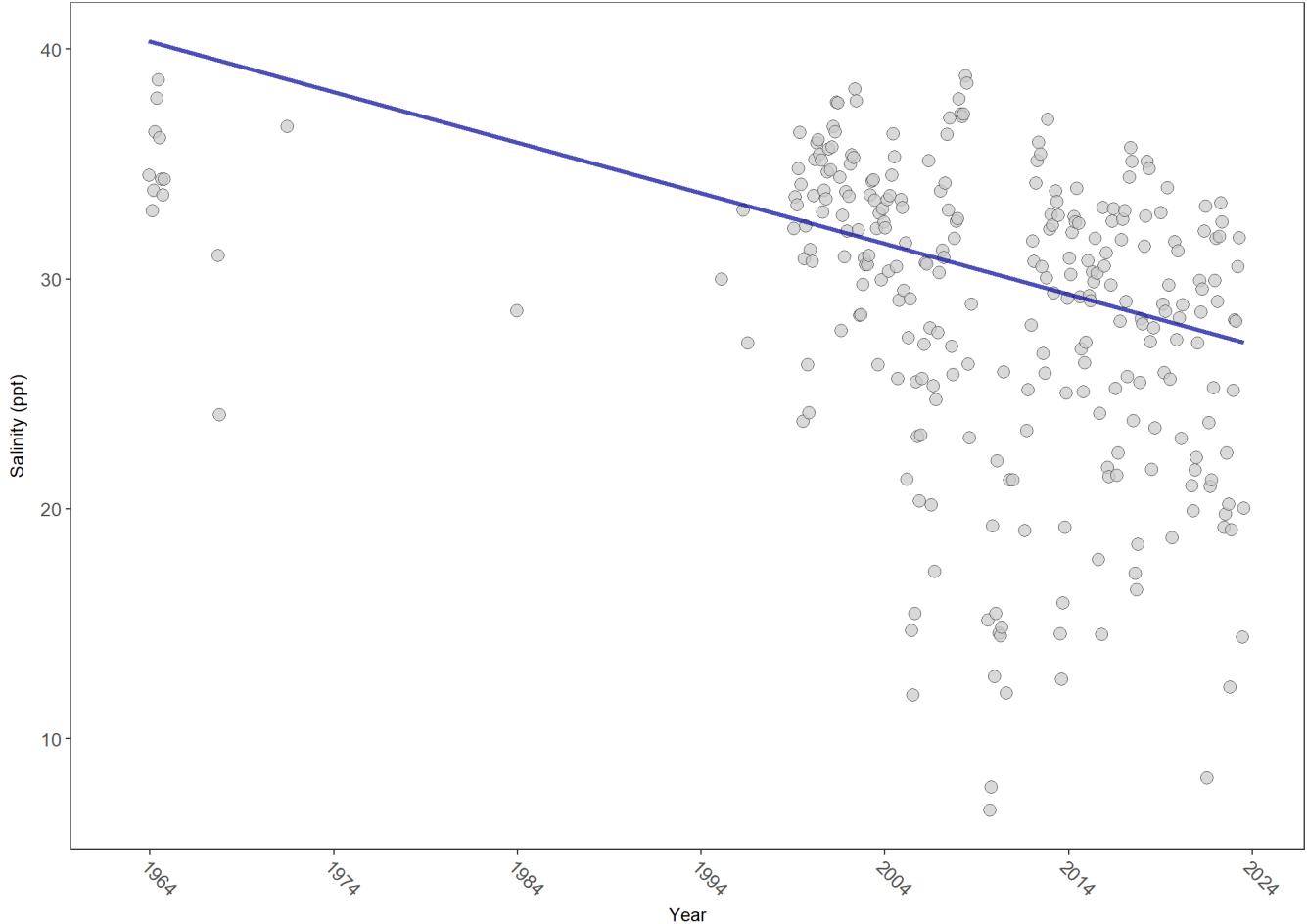
- 5002 - Florida STORET / WIN
- 69 - Fisheries-Independent Monitoring (FIM) Program
- 95 - Harmful Algal Bloom Marine Observation Network
- 509 - SERC Water Quality Monitoring Network
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET)
- 476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
- 4042 - Estero Bay Oyster Monitoring
- 115 - Environmental Monitoring Assessment Program

There are no qualifying Value Qualifiers for pH in Estero Bay Aquatic Preserve

## Salinity - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis

Salinity, Lab and Field Combined, All Depths  
Estero Bay Aquatic Preserve



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	4478	32	32.4	TRUE	-0.3757	0.0000	-0.2199038	40.55828	4.5035	0.9528	-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	2258	2001	2007
509	702	1999	2008
4064	619	2011	2012
95	526	1963	2018
476	222	2014	2023
5002	112	2009	2023
4042	46	2016	2022
115	2	2003	2003

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program

509 - SERC Water Quality Monitoring Network

4064 - A spatial model to improve site selection for seagrass restoration in shallow boating environments

95 - Harmful Algal Bloom Marine Observation Network

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

5002 - Florida STORET / WIN

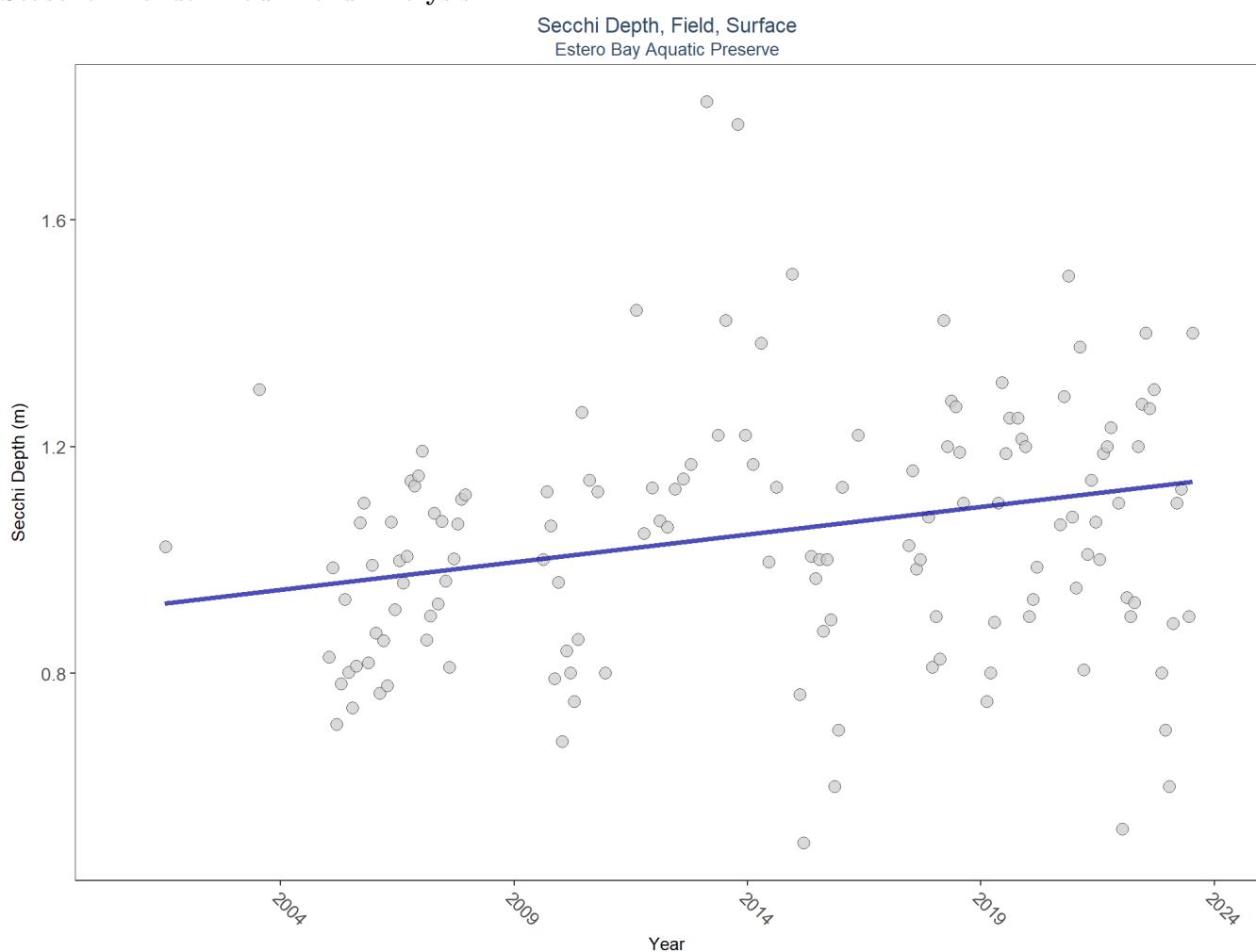
4042 - Estero Bay Oyster Monitoring

115 - Environmental Monitoring Assessment Program

There are no qualifying Value Qualifiers for Salinity in Estero Bay Aquatic Preserve

## Secchi Depth - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



$p < 0.00005$  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

<i>ProgramID</i>	<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>
69	2264	2001	2007
476	205	2017	2023
5002	148	2006	2023
514	76	2011	2018
103	53	2020	2022

#### Program names:

- 69 - Fisheries-Independent Monitoring (FIM) Program
- 476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network
- 5002 - Florida STORET / WIN
- 514 - Florida LAKEWATCH Program
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET)

#### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{\text{S}}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{\text{S}}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 18: Value Qualifiers for Secchi Depth

<i>Year</i>	<i>N_Total</i>	<i>N_S</i>	<i>perc_S</i>
2015	21	4	19.0
2017	24	2	8.3
2018	34	9	26.5
2019	42	14	33.3
2020	31	9	29.0
2021	94	14	14.9
2022	33	9	27.3
2023	14	8	57.1

Note: <sup>1</sup> S - Secchi disk visible to bottom of waterbody

#### Programs containing Value Qualified data:

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

## 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)  $TN = TKN + NO_3;$

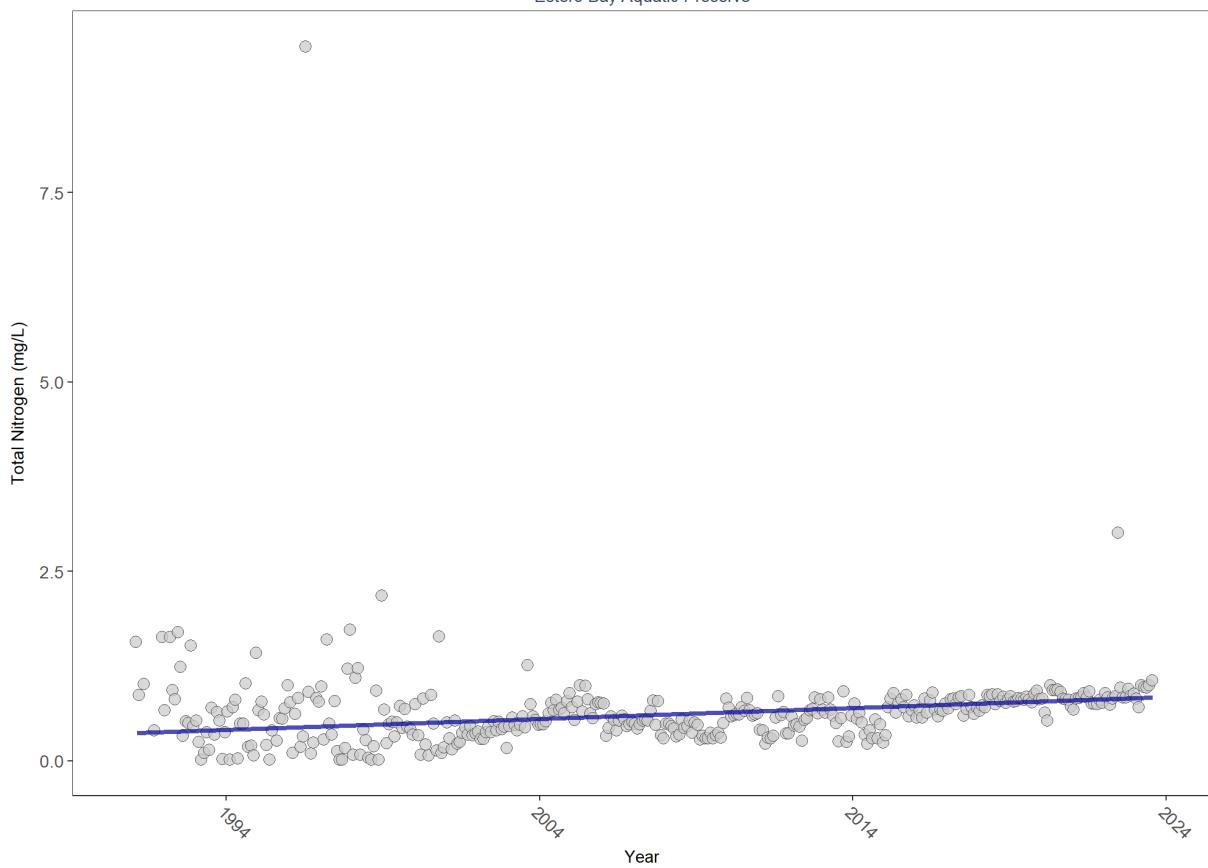
6)  $TN = ORGN + NH4 + NO3;$

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 NO<sub>3</sub>O<sub>2</sub> 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”

## Seasonal Kendall-Tau Trend Analysis

Total Nitrogen, Lab, All Depths  
Estero Bay Aquatic Preserve



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	6908	33	0.61	TRUE	0.3078	0.0000	0.01431979	0.3678542	13.4196	0.2668	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	6158	1991	2023
509	351	1999	2008
476	274	1998	2023
514	81	2011	2017
4063	57	2018	2023
303	8	2020	2021
103	6	2003	2003
115	1	2003	2003

### Program names:

5002 - Florida STORET / WIN

509 - SERC Water Quality Monitoring Network

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

514 - Florida LAKEWATCH Program

4063 - Estero Bay Tributary Monitoring

- <sup>303</sup> - River, Estuary and Coastal Observing Network  
<sup>103</sup> - EPA STOrage and RETrieval Data Warehouse (STORET)  
<sup>115</sup> - Environmental Monitoring Assessment Program

### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{\_}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{\_}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 20: Value Qualifiers for Total Nitrogen

Year	$N_{Total}$	$N_I$	$perc_I$	$N_Q$	$perc_Q$	$N_U$	$perc_U$
1991	55	1	1.8			1	1.8
1992	79					1	1.3
1993	41	1	2.4			19	46.3
1994	54	2	3.7			15	27.8
1995	39					1	2.6
1996	54	2	3.7			22	40.7
1997	54	1	1.9			15	27.8
1998	70	1	1.4			55	78.6
1999	109	1	0.9			20	18.4
2000	132	1	0.8			47	35.6
2001	209					4	1.9
2002	227	5	2.2			2	0.9
2004	322	2	0.6	2	0.6		
2005	324	16	4.9				
2006	313	100	32.0				
2007	356	61	17.1			11	3.1
2008	304	24	7.9			1	0.3
2009	281	57	20.3			19	6.8
2011	256	46	18.0			17	6.6
2012	255	6	2.4			5	2.0
2013	242	25	10.3			30	12.4
2014	283	42	14.8			13	4.6
2015	298	6	2.0			2	0.7
2017	280	1	0.4			1	0.4
2020	263			2	0.8		

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

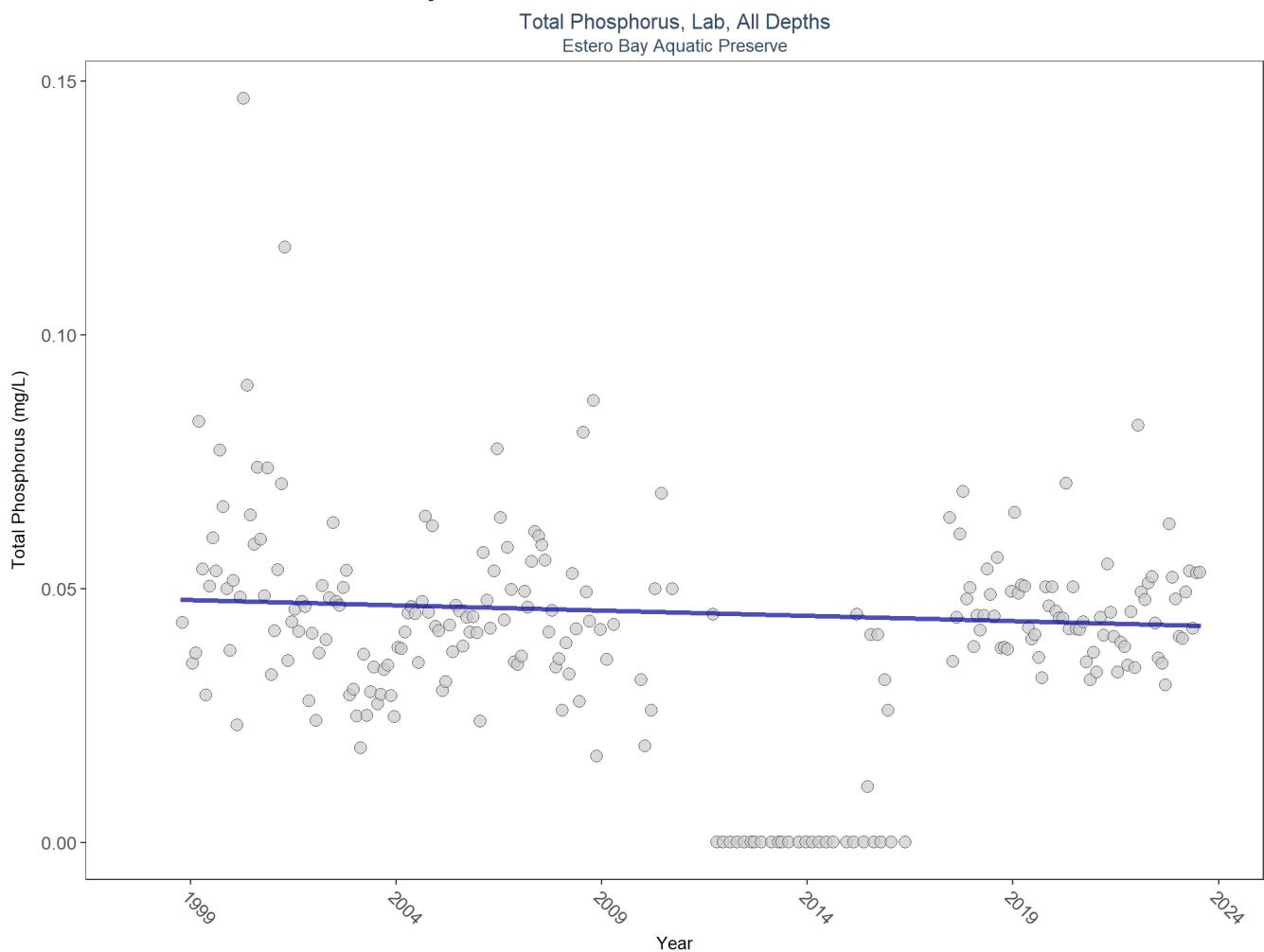
### Programs containing Value Qualified data:

<sup>5002</sup> - Florida STORET / WIN

<sup>303</sup> - River, Estuary and Coastal Observing Network

## Total Phosphorus - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2423	26	0.041	TRUE	-0.0782	0.1044	-0.0002093956	0.04805668	12.6316	0.3181	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	1334	2006	2023
476	386	1998	2023
509	351	1999	2008
103	230	2003	2022
514	81	2011	2017
4063	62	2018	2023
303	8	2020	2021
115	1	2003	2003

Program names:

*5002* - Florida STORET / WIN

*476* - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

*509* - SERC Water Quality Monitoring Network

*103* - EPA STOrage and RETrieval Data Warehouse (STORET)

*514* - Florida LAKEWATCH Program

*4063* - Estero Bay Tributary Monitoring

*303* - River, Estuary and Coastal Observing Network

*115* - Environmental Monitoring Assessment Program

### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{\text{Q}}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{\text{Q}}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 22: Value Qualifiers for Total Phosphorus

Year	$N_{Total}$	$N_I$	$perc_I$	$N_Q$	$perc_Q$	$N_U$	$perc_U$
1998	3			3	100.0		
1999	41			5	12.2		
2001	38	1	2.6			1	2.6
2002	43					7	16.3
2003	47					1	2.1
2004	51	10	19.6	4	7.8		
2005	65	24	36.9			5	7.7
2006	74	37	50.0			1	1.4
2007	99	49	49.5			2	2.0
2008	34	1	2.9				
2010	10	2	20.0				
2018	275	20	7.3			4	1.4
2019	268	8	3.0				
2020	287	20	7.0			5	1.7
2021	523	22	4.2			4	0.8
2022	281	19	6.8			3	1.1
2023	134	10	7.5			7	5.2

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

### Programs containing Value Qualified data:

*5002* - Florida STORET / WIN

*476* - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

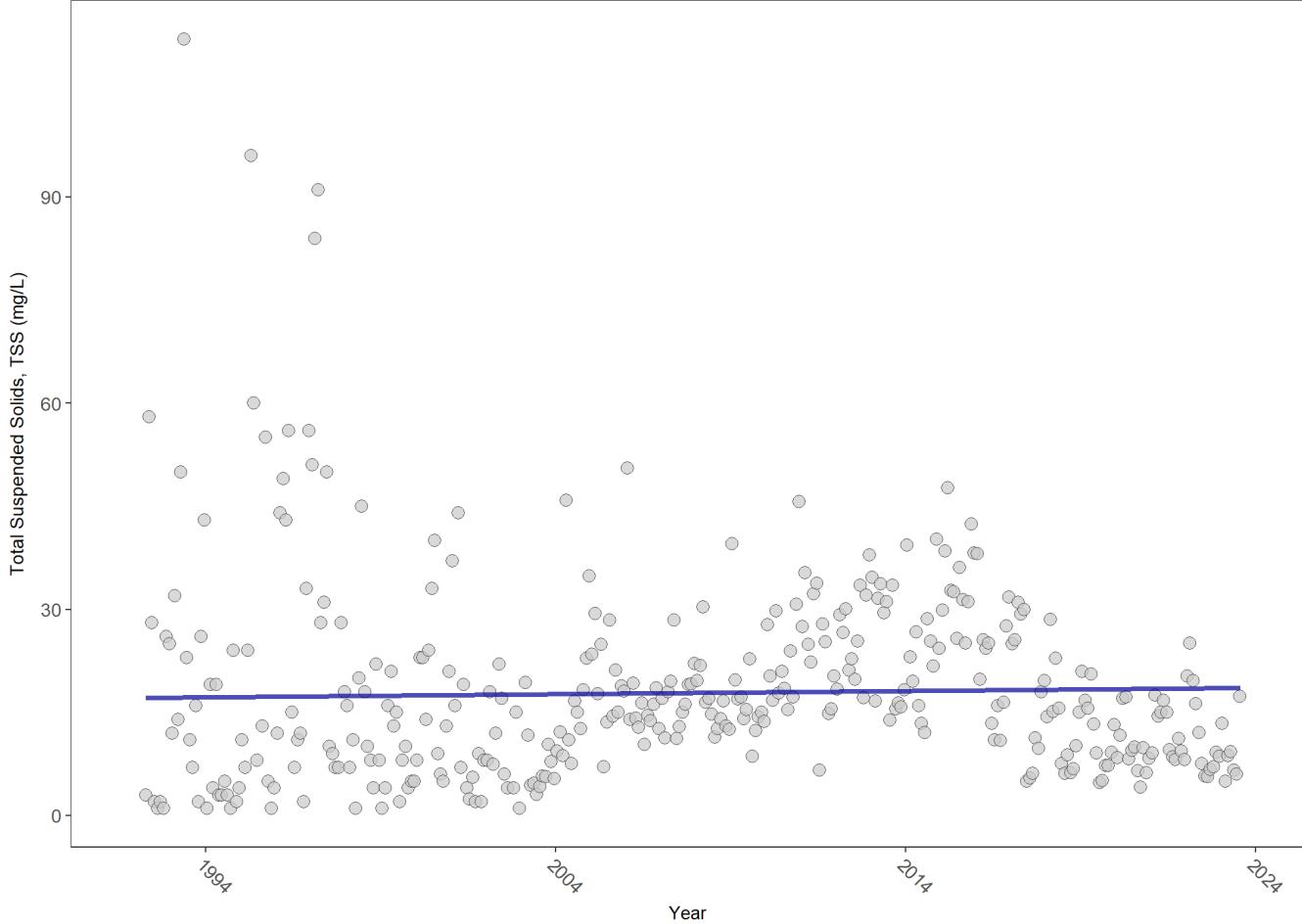
*4063* - Estero Bay Tributary Monitoring

*303* - River, Estuary and Coastal Observing Network

## Total Suspended Solids, TSS - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis

Total Suspended Solids, TSS, Lab and Field Combined, All Depths  
Estero Bay Aquatic Preserve



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	5261	32	14.2	TRUE	0.0301	0.4431	0.04638	17.07072	15.0331	0.181	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	5096	1992	2023
103	170	2020	2021
4063	62	2018	2023

#### Program names:

- 5002 - Florida STORET / WIN
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET)
- 4063 - Estero Bay Tributary Monitoring

#### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 24: Value Qualifiers for Total Suspended Solids, TSS

<i>Year</i>	<i>N_Total</i>	<i>N_I</i>	<i>perc_I</i>	<i>N_U</i>	<i>perc_U</i>
1992	9	3	33.3	2	22.2
1993	13	2	15.4		
1994	12	4	33.3	2	16.7
1995	11			1	9.1
1996	12	1	8.3		
1998	12			1	8.3
1999	12	1	8.3	1	8.3
2001	16	6	37.5		
2002	14	2	14.3	1	7.1
2003	188	85	45.2	36	19.1
2004	280	92	32.9	7	2.5
2005	286	8	2.8		
2006	276			1	0.4
2007	276	3	1.1		
2008	273	4	1.5		
2009	276	5	1.8	1	0.4
2010	217	7	3.2		
2011	242	6	2.5		
2012	218	3	1.4		
2013	204	1	0.5		
2014	250	4	1.6		
2015	265	9	3.4	1	0.4
2016	254	7	2.8		
2017	244	13	5.3		
2018	244	10	4.1	5	2.0
2019	226	13	5.8	5	2.2
2020	233	6	2.6	1	0.4
2021	401	4	1.0	7	1.8
2022	229	5	2.2	2	0.9
2023	111	4	3.6		

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **U** - Compound was analyzed for but not detected

#### Programs containing Value Qualified data:

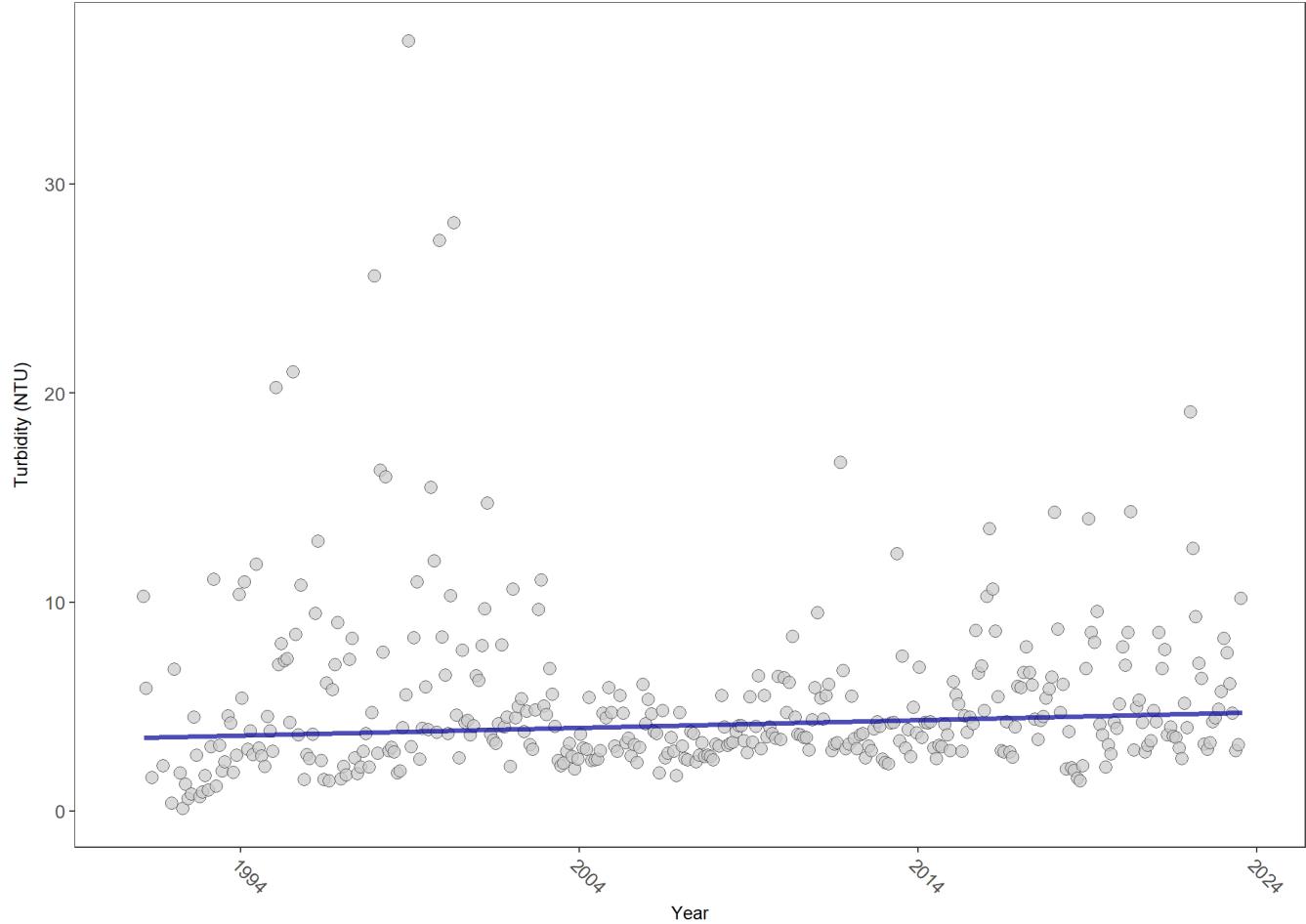
4063 - Estero Bay Tributary Monitoring

5002 - Florida STORET / WIN

## Turbidity - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis

Turbidity, Lab and Field Combined, All Depths  
Estero Bay Aquatic Preserve



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	7151	33	3.37	TRUE	0.1249	0.0005	0.03673077	3.515312	9.1375	0.6092	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	6199	1991	2023
509	348	1999	2008
476	318	1999	2023
103	221	2020	2022
4063	62	2018	2023
4042	45	2016	2022

#### Program names:

5002 - Florida STORET / WIN

509 - SERC Water Quality Monitoring Network

476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

103 - EPA STOrage and RETrieval Data Warehouse (STORET)

4063 - Estero Bay Tributary Monitoring

4042 - Estero Bay Oyster Monitoring

### Value Qualifiers

- $N_{Total}$  is total amount of data for a given year
- $N_{}$  is the total amount of values flagged with the respective value qualifier in a given year
- $perc_{}$  is the percent of data flagged with the respective value qualifier as a proportion of  $N_{Total}$

Table 26: Value Qualifiers for Turbidity

Year	$N_{Total}$	$N_I$	$perc_I$	$N_Q$	$perc_Q$	$N_U$	$perc_U$
2003	295					2	0.7
2004	355	14	3.9				
2010	205			3	1.5		
2011	245			4	1.6		
2014	255			1	0.4		
2016	263			2	0.8		
2018	279	28	10.0			4	1.4
2019	257	8	3.1			3	1.2
2020	276	3	1.1	1	0.4		
2021	508	7	1.4	4	0.8	1	0.2
2022	290	1	0.3				
2023	129	1	0.8				

**Note:** <sup>1</sup> **I** - Reported value is greater than or equal to lab method detection limit, but less than quantitation limit

<sup>2</sup> **Q** - Sample held beyond the accepted holding time <sup>3</sup> **U** - Compound was analyzed for but not detected

### Programs containing Value Qualified data:

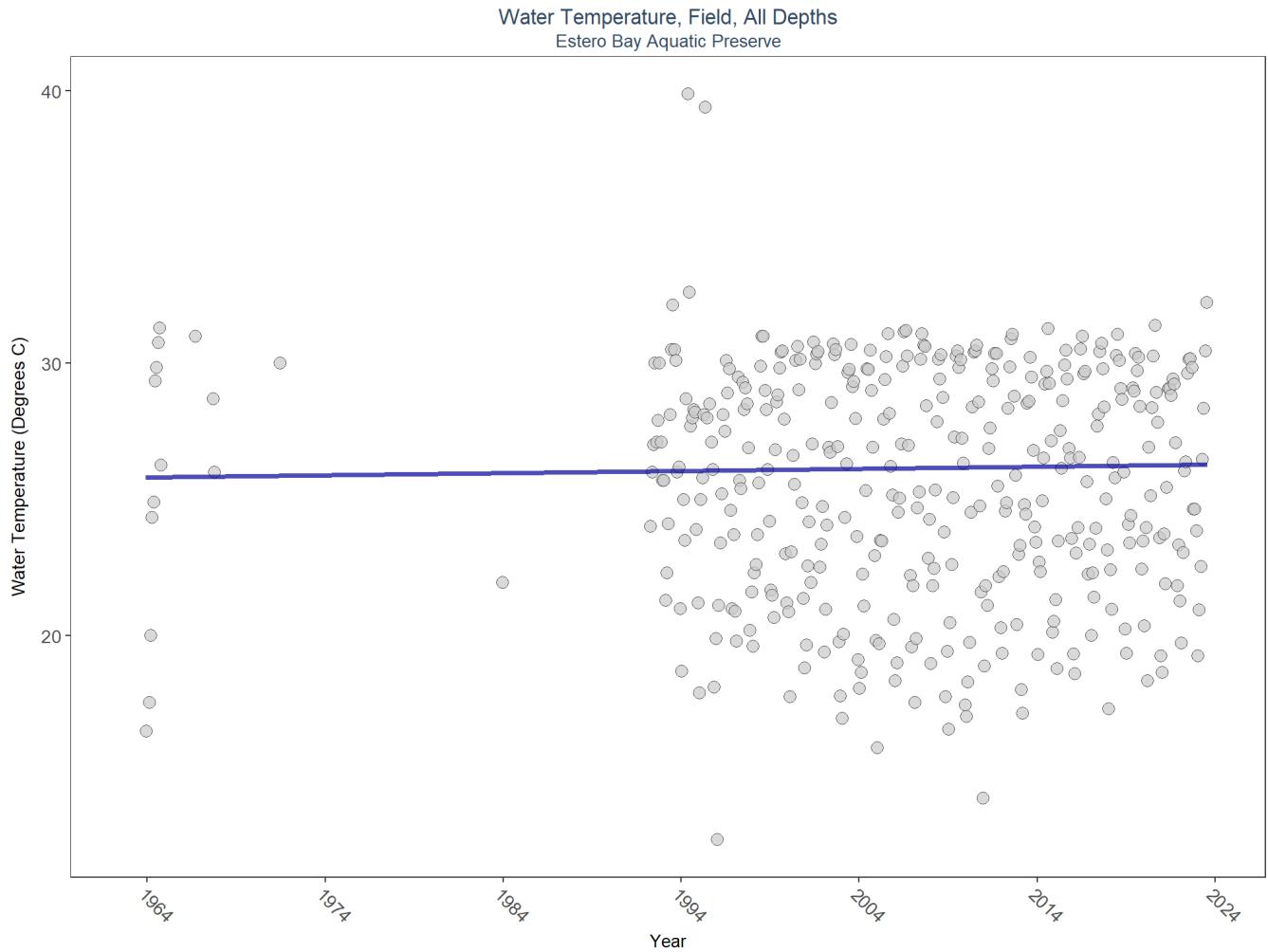
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network

5002 - Florida STORET / WIN

4063 - Estero Bay Tributary Monitoring

## Water Temperature - Discrete Water Quality

### Seasonal Kendall-Tau Trend Analysis



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	9967	38	26.1	TRUE	0.0313	0.3828	0.0008077712	25.80083	5.3839	0.9112	0

*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
5002	5382	1992	2023
69	2257	2001	2007
509	702	1999	2008
4064	619	2011	2012
95	494	1963	2018
103	253	2020	2022
476	217	2011	2023
4042	46	2016	2022
115	2	2003	2003

Program names:

5002 - Florida STORET / WIN  
69 - Fisheries-Independent Monitoring (FIM) Program  
509 - SERC Water Quality Monitoring Network  
4064 - A spatial model to improve site selection for seagrass restoration in shallow boating environments  
95 - Harmful Algal Bloom Marine Observation Network  
103 - EPA STOrage and RETrieval Data Warehouse (STORET)  
476 - Charlotte Harbor Estuaries Volunteer Water Quality Monitoring Network  
4042 - Estero Bay Oyster Monitoring  
115 - Environmental Monitoring Assessment Program

There are no qualifying Value Qualifiers for Water Temperature in Estero Bay Aquatic Preserve

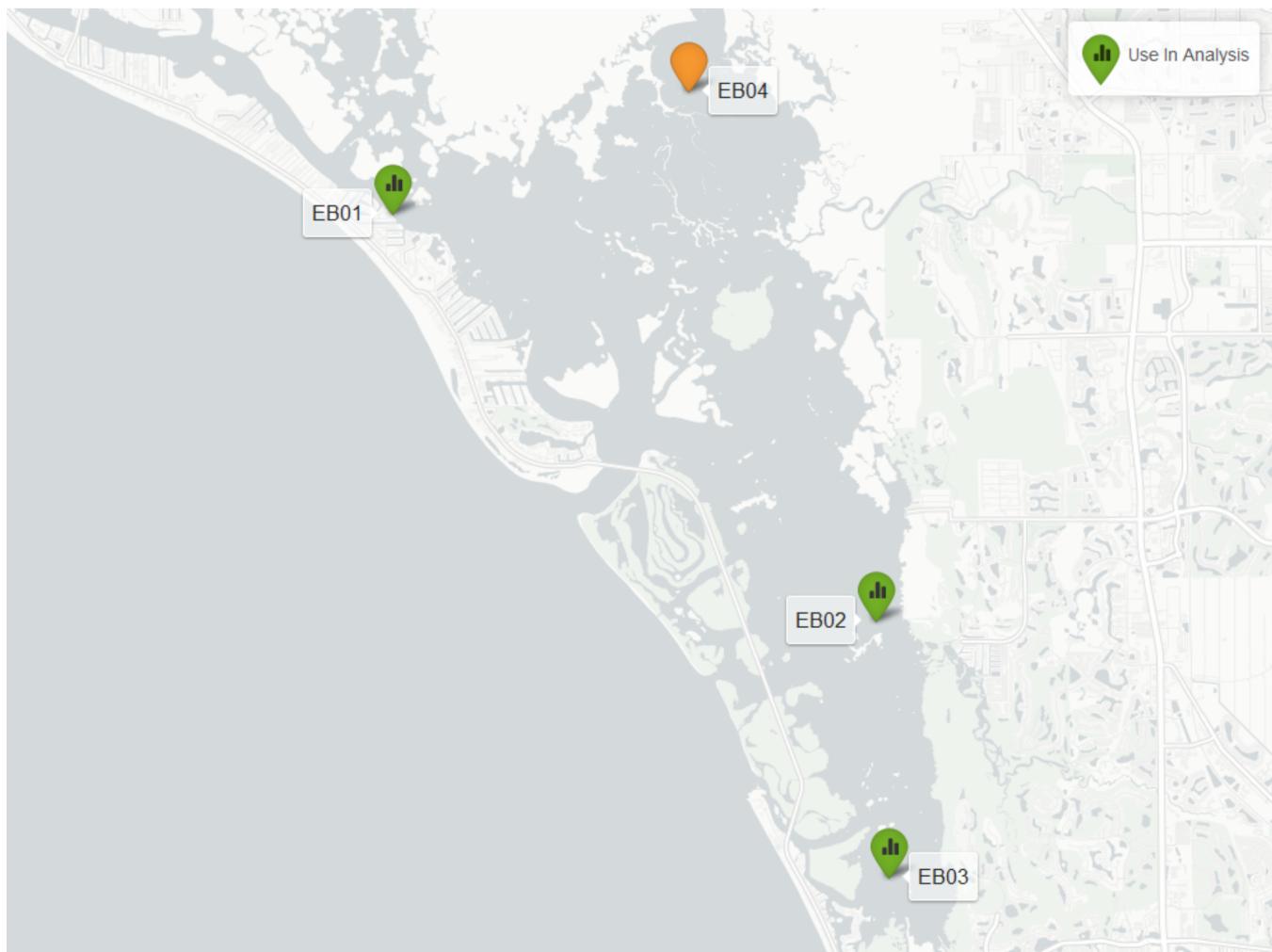
## Water Quality - Continuous

The following files were used in the continuous analysis:

- *Combined\_WQ\_WC\_NUT\_cont\_Dissolved\_Oxygen\_SW-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_cont\_Dissolved\_Oxygen\_Saturation\_SW-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_cont\_pH\_SW-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_cont\_Salinity\_SW-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_cont\_Turbidity\_SW-2023-Dec-08.txt*
- *Combined\_WQ\_WC\_NUT\_cont\_Water\_Temperature\_SW-2023-Dec-08.txt*

Table 28: Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

<i>ProgramLocationID</i>	<i>Years of Data</i>	<i>Use in Analysis</i>
EB01	19	TRUE
EB02	19	TRUE
EB03	19	TRUE
EB04	2	FALSE

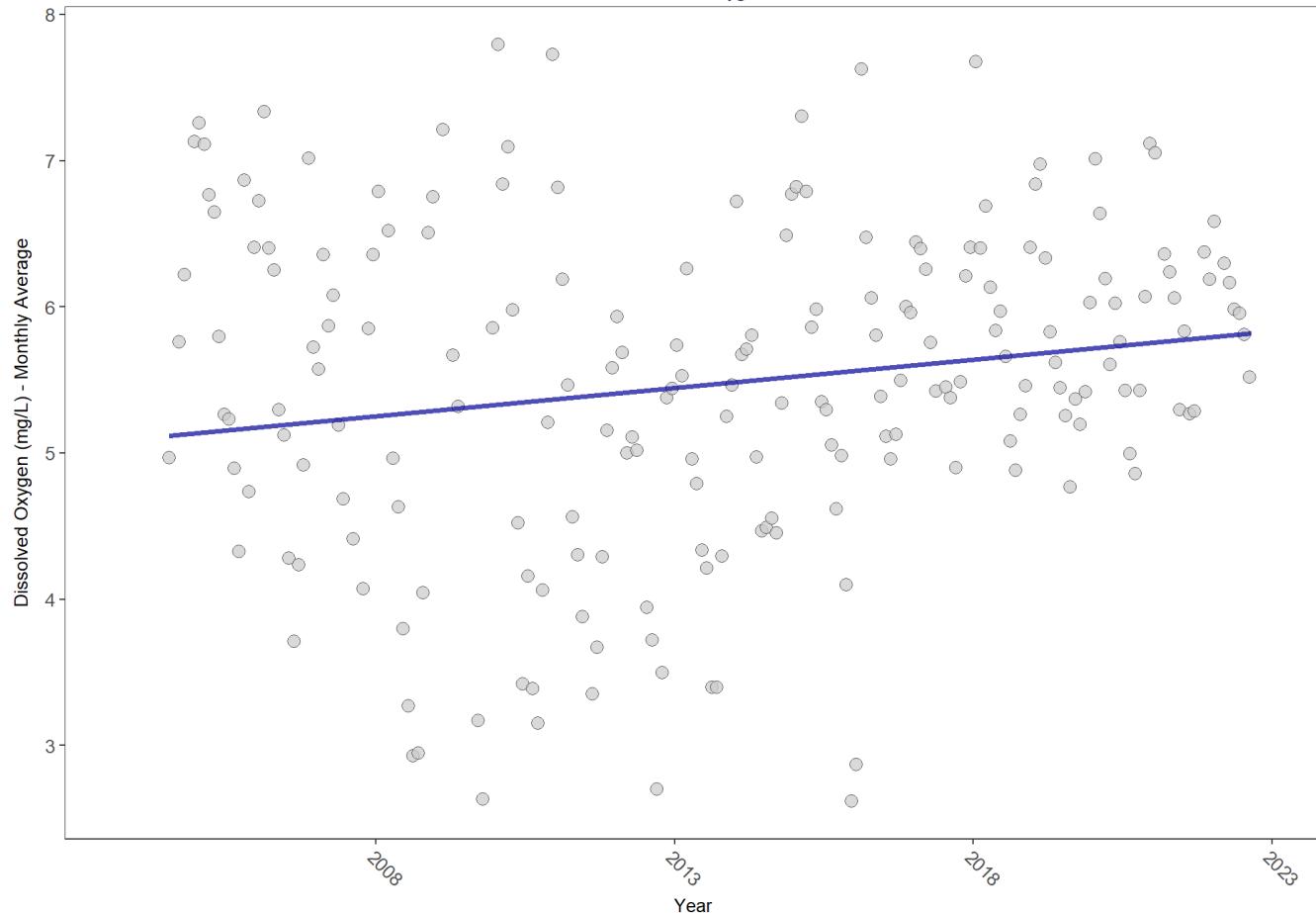


## Dissolved Oxygen - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01  
Dissolved Oxygen



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	478415	19	5.6	TRUE	0.2196	0.0000	0.03869549	5.095745	20.9159	0.0343	1

*p < 0.00005 appear as 0 due to rounding.*

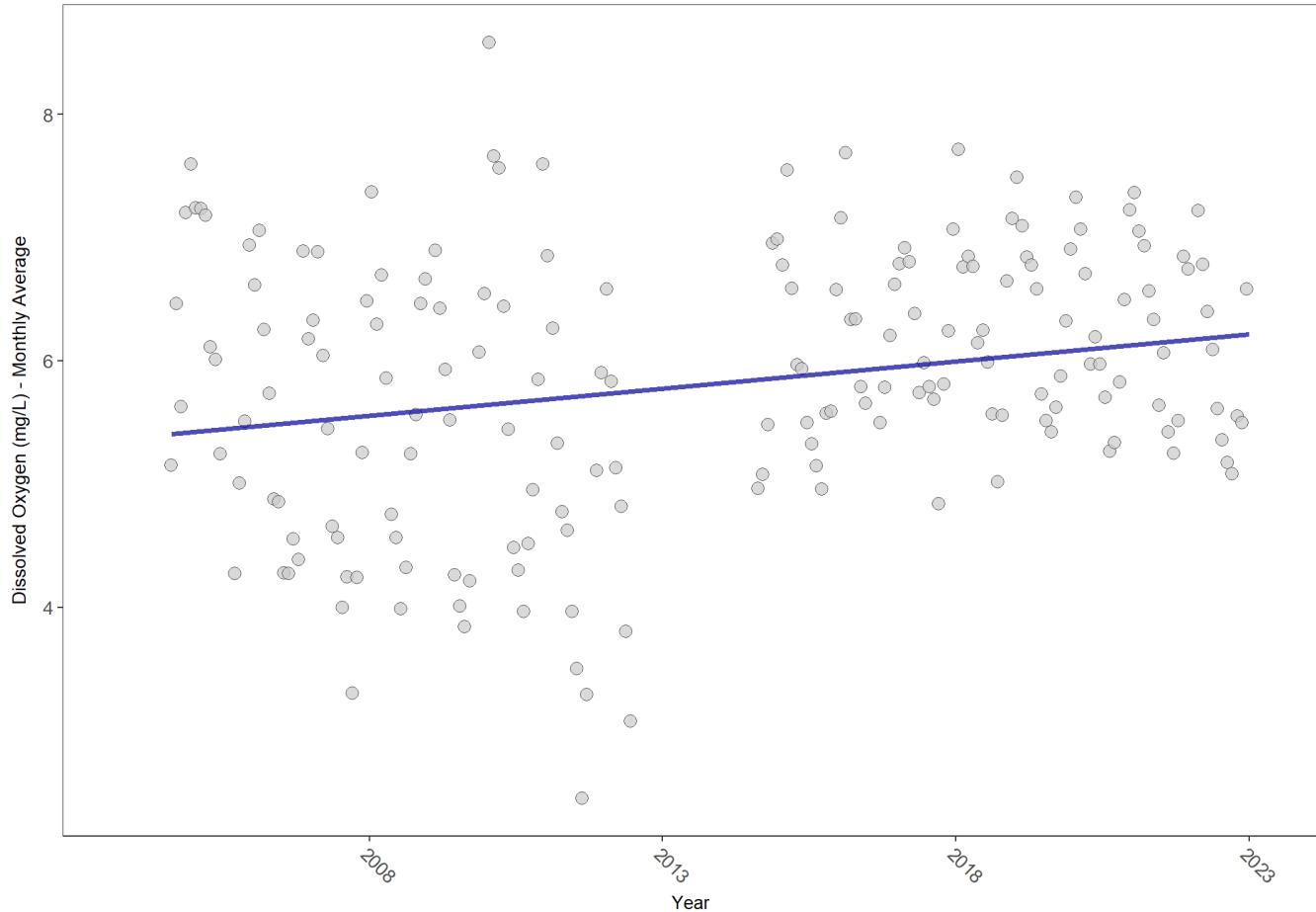
*SennIntercept is intercept value at beginning of record for monitoring location*

## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB02

Dissolved Oxygen



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	425084	18	6	TRUE	0.277	0.0000	0.04401642	5.379935	6.7347	0.8201	1

$p < 0.00005$  appear as 0 due to rounding.

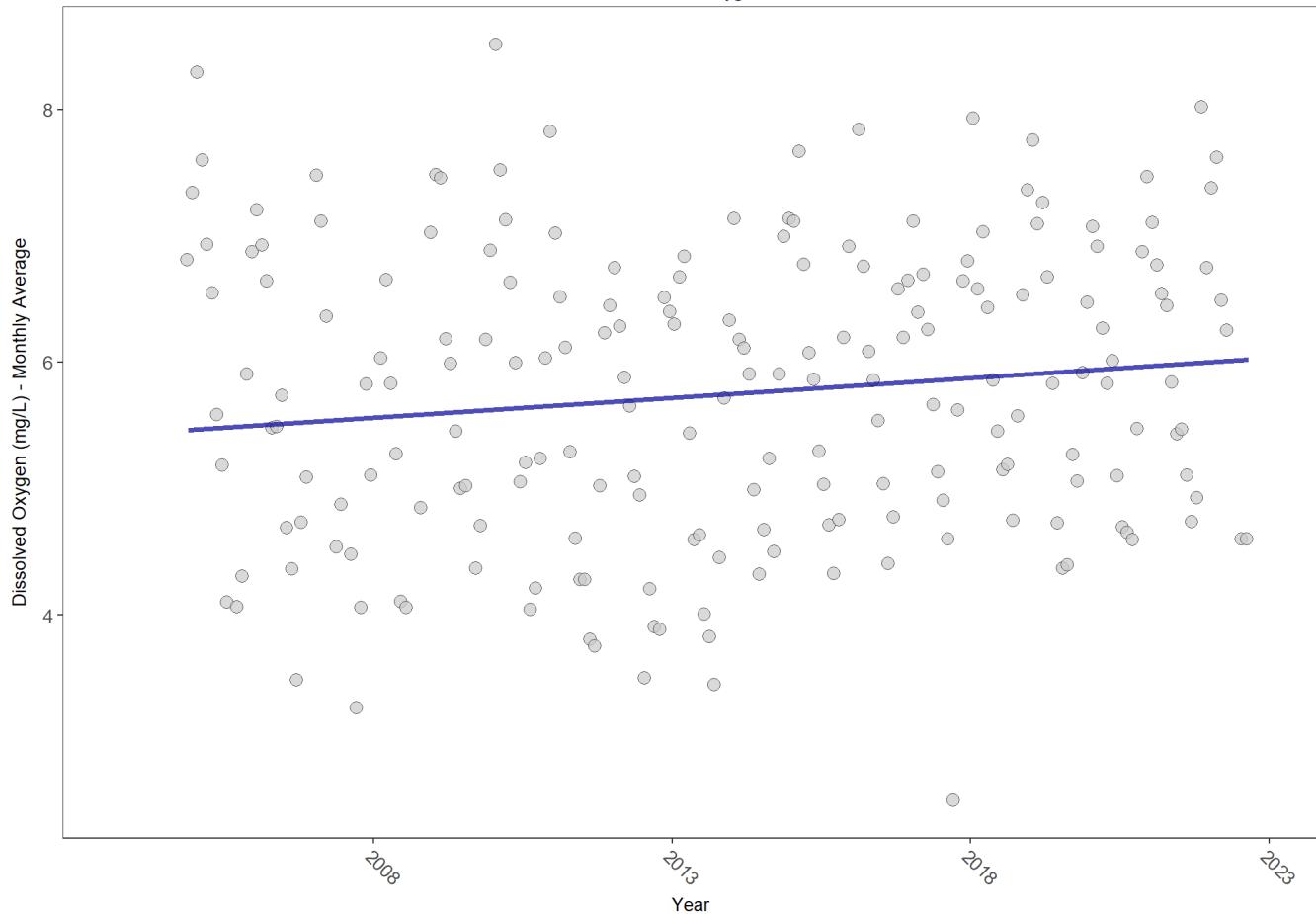
*SennIntercept* is intercept value at beginning of record for monitoring location

## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB03

Dissolved Oxygen



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	439701	19	5.9	TRUE	0.1991	0.0002	0.03138447	5.435208	11.2299	0.4242	1

$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

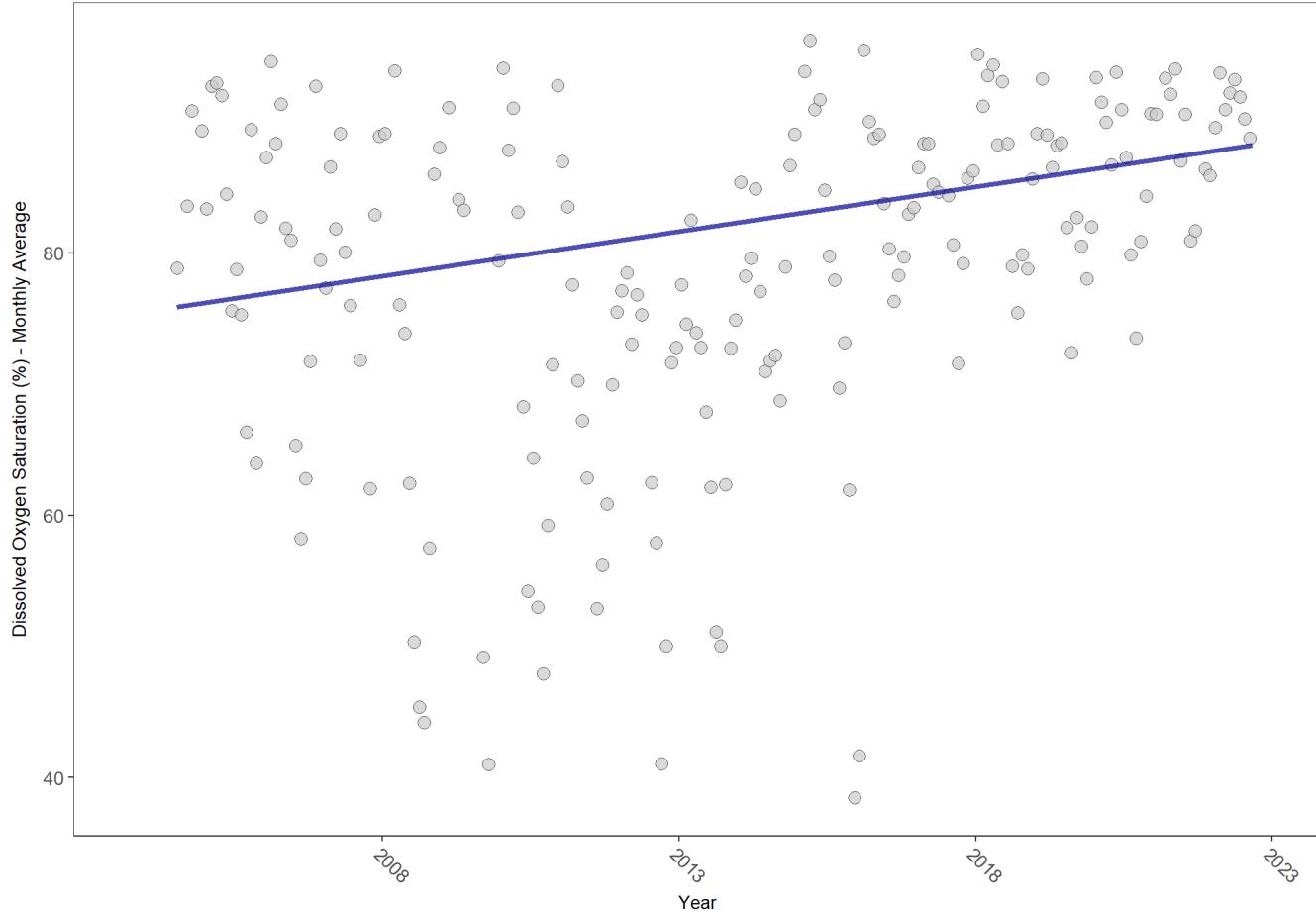
## Dissolved Oxygen Saturation - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01

Dissolved Oxygen Saturation



$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

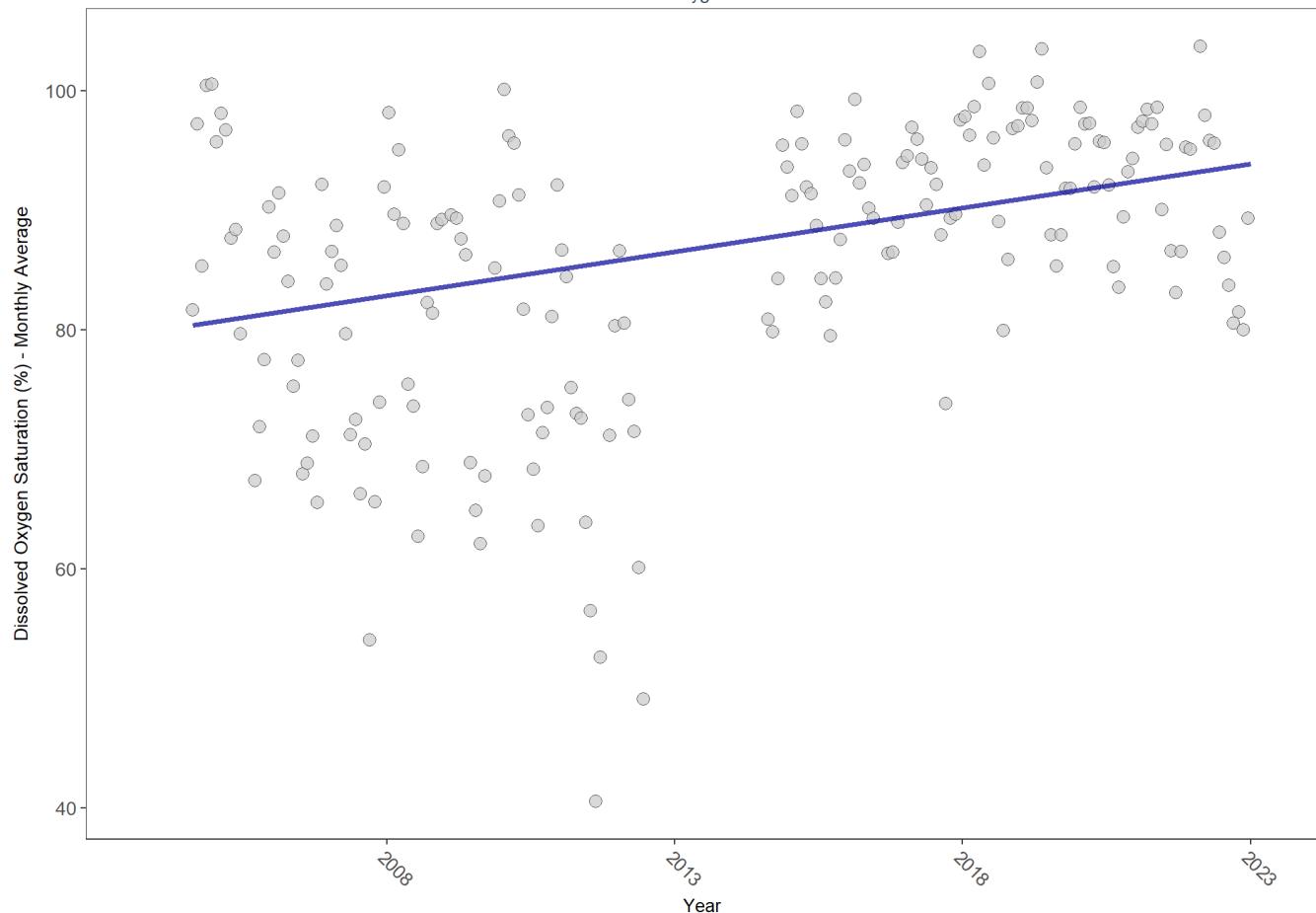
## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve

EB02

Dissolved Oxygen Saturation



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	425321	18	87.4	TRUE	0.3976	0.0000	0.7378543	79.88953	3.9449	0.9715	1

$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

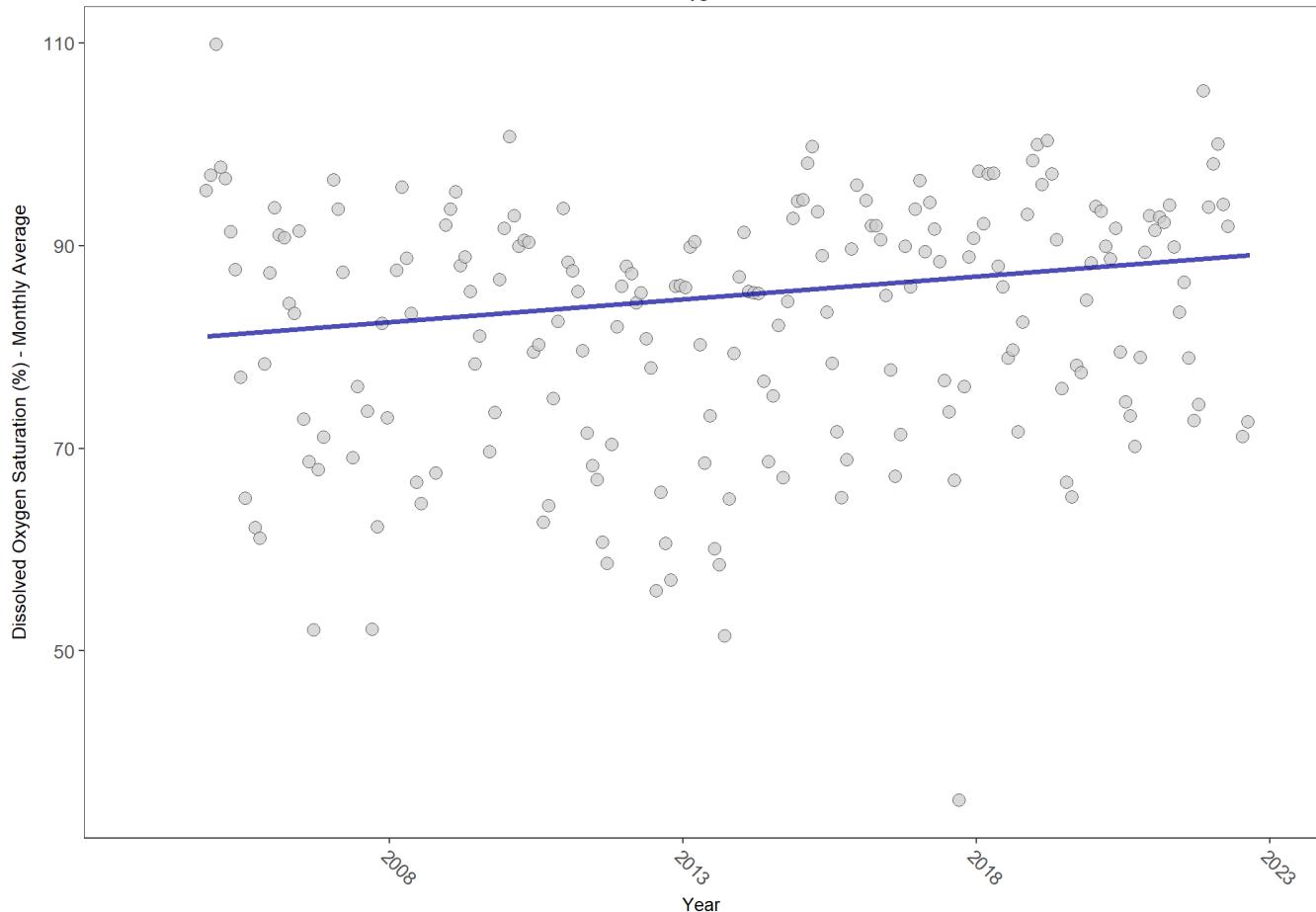
## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve

EB03

Dissolved Oxygen Saturation



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	441227	19	83.7	TRUE	0.2531	0.0000	0.4503603	80.68982	6.4615	0.8409	1

$p < 0.00005$  appear as 0 due to rounding.

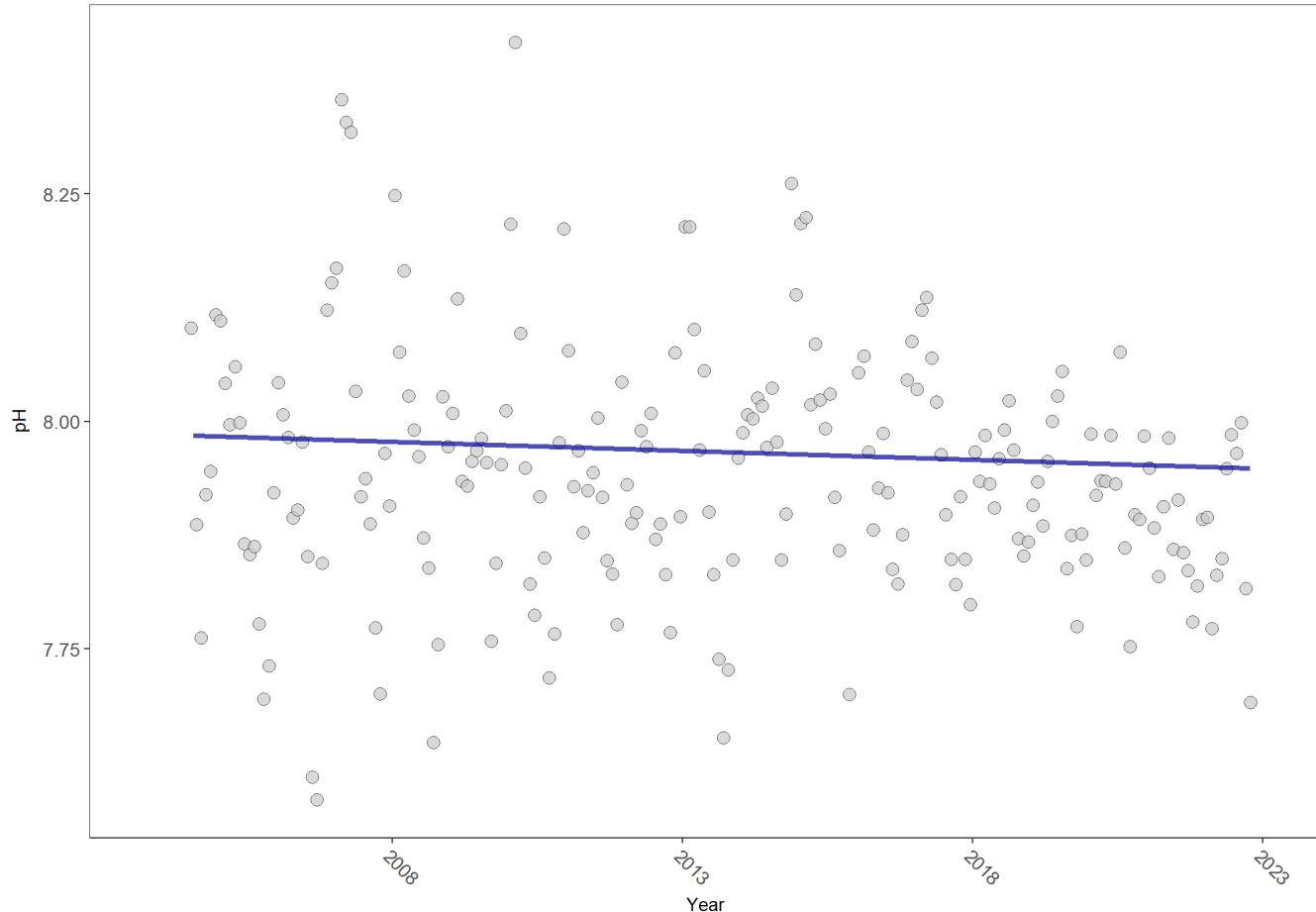
SennIntercept is intercept value at beginning of record for monitoring location

## pH - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01  
pH



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	562188	19	7.9	TRUE	-0.0841	0.1157	-0.001947073	7.985223	27.3963	0.004	0

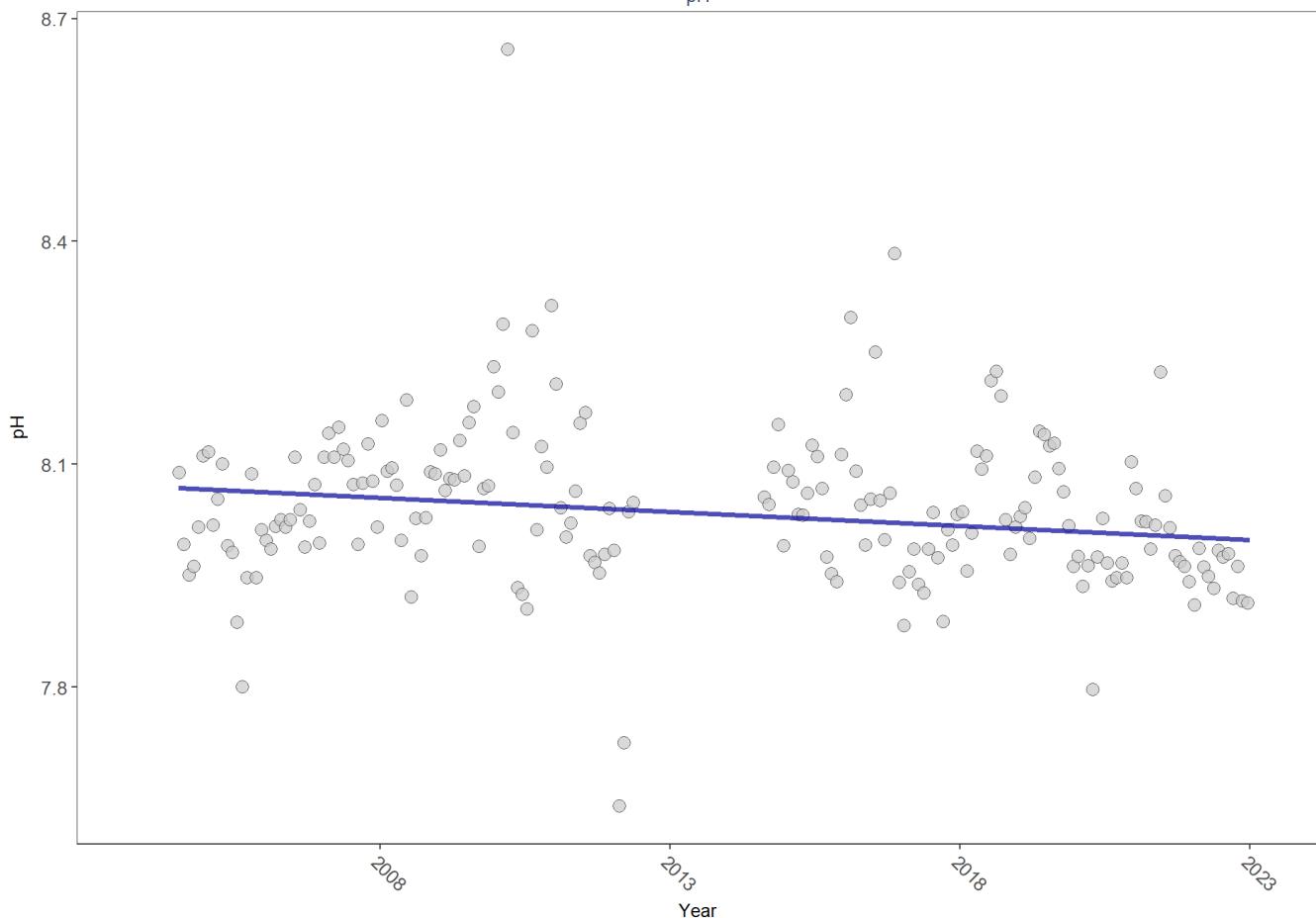
*p < 0.00005 appear as 0 due to rounding.*

*SennIntercept is intercept value at beginning of record for monitoring location*

## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB02  
pH



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	485867	18	8	TRUE	-0.1645	0.0018	-0.003752756	8.070007	10.9632	0.4464	-1

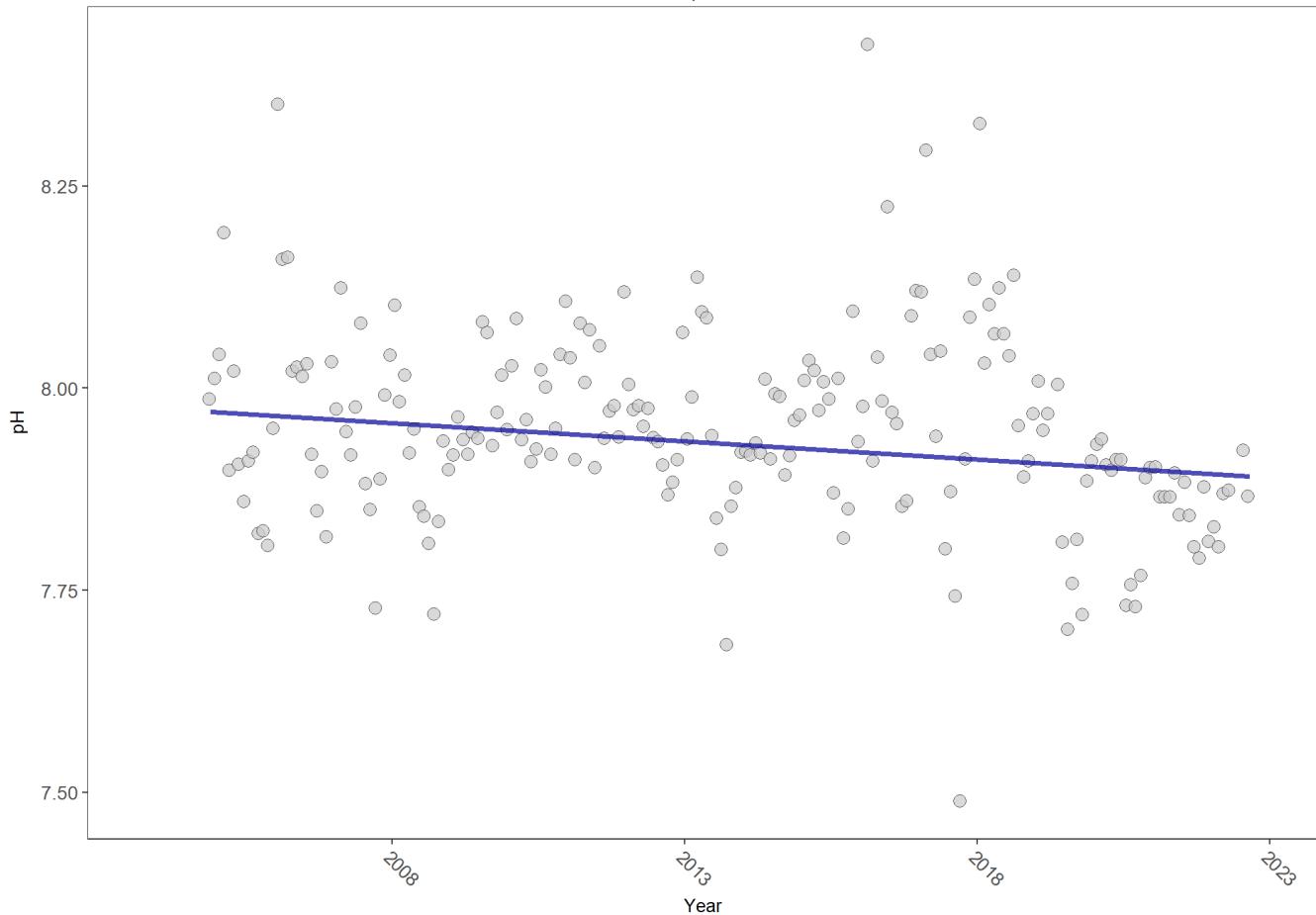
$p < 0.00005$  appear as 0 due to rounding.

*SennIntercept* is intercept value at beginning of record for monitoring location

## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB03  
pH



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	525178	19	8	TRUE	-0.1705	0.0007	-0.004519888	7.974864	5.7266	0.891	-1

*p < 0.00005 appear as 0 due to rounding.*

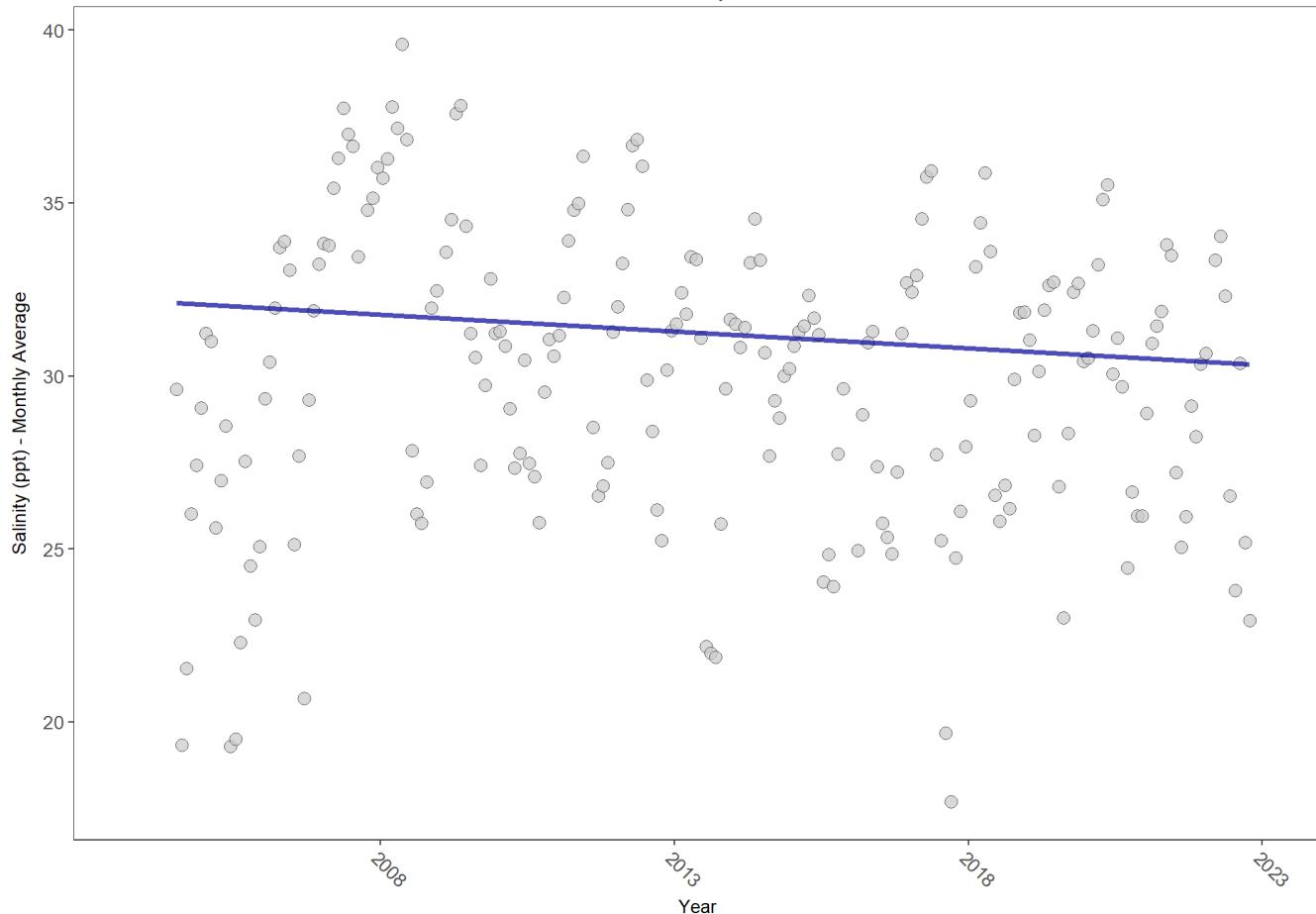
*SennIntercept is intercept value at beginning of record for monitoring location*

## Salinity - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01  
Salinity



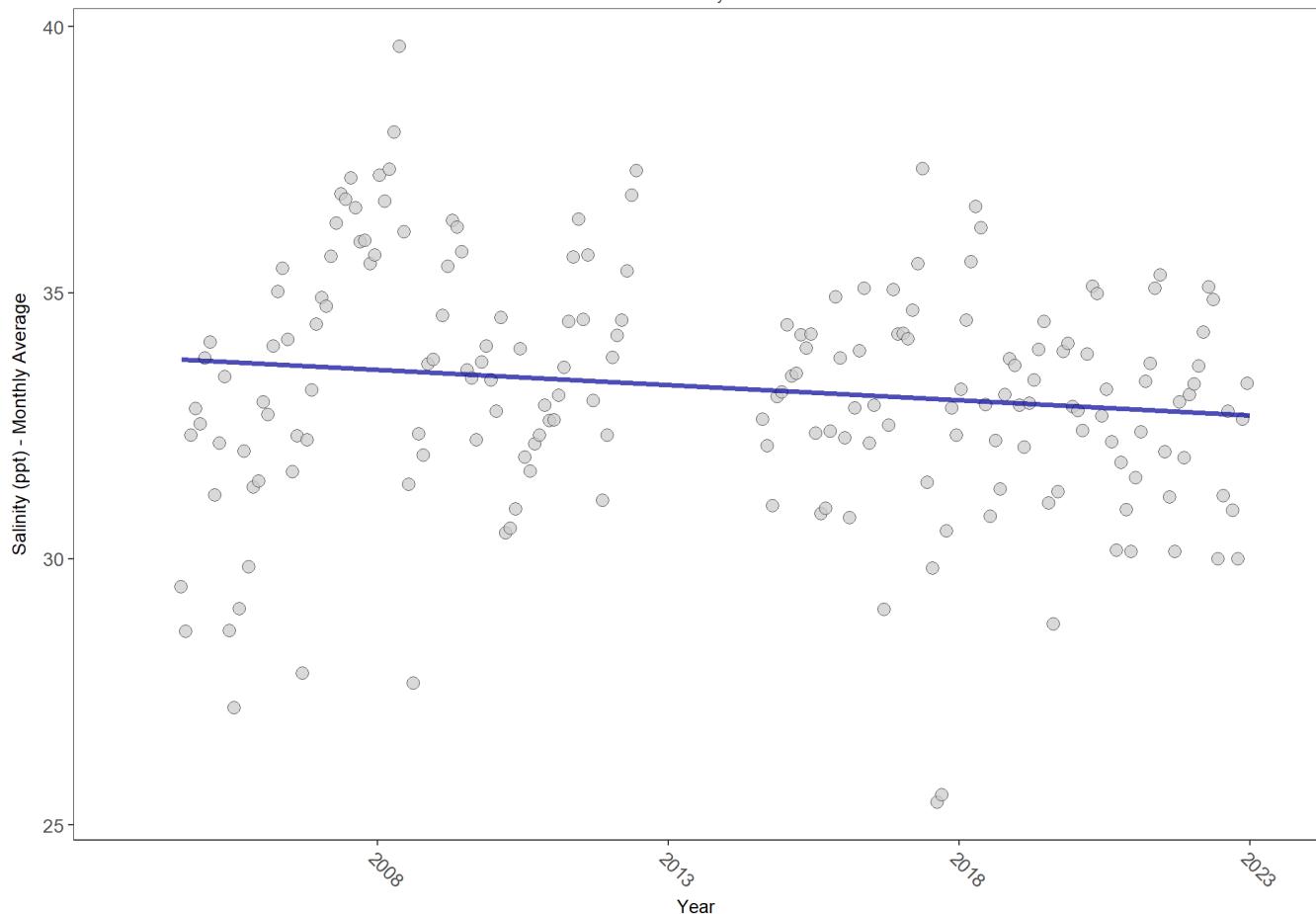
*p < 0.00005 appear as 0 due to rounding.*

*SennIntercept is intercept value at beginning of record for monitoring location*

## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB02  
Salinity



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	510202	18	33.5	TRUE	-0.1303	0.0150	-0.05705875	33.77745	4.3971	0.9568	-1

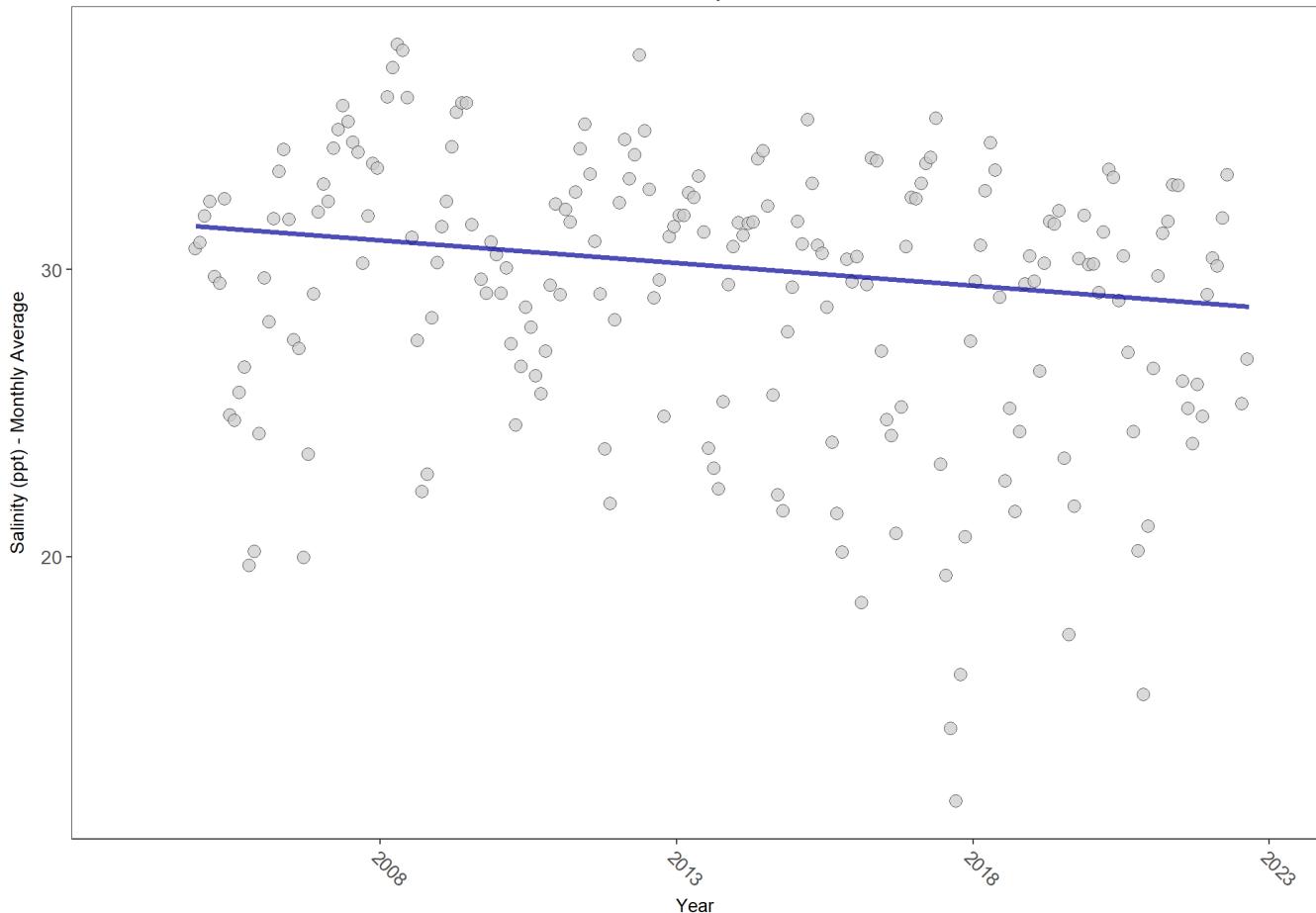
$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB03  
Salinity



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	533169	19	30.9	TRUE	-0.2138	0.0000	-0.1580336	31.65294	4.2465	0.9621	-1

$p < 0.00005$  appear as 0 due to rounding.

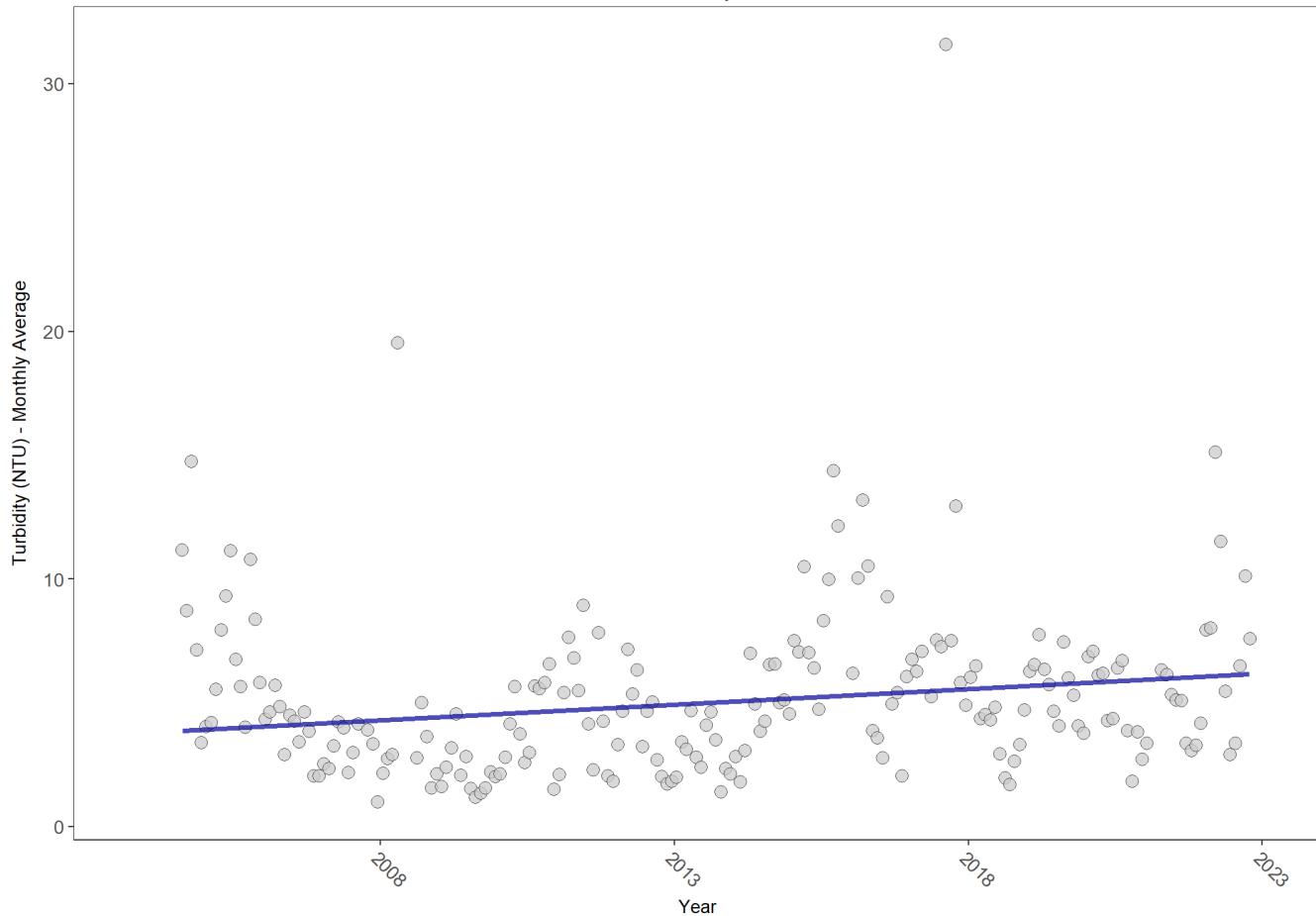
SennIntercept is intercept value at beginning of record for monitoring location

## Turbidity - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01  
Turbidity



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	510965	19	4	TRUE	0.1797	0.0005	0.1255335	3.788219	11.0838	0.4363	1

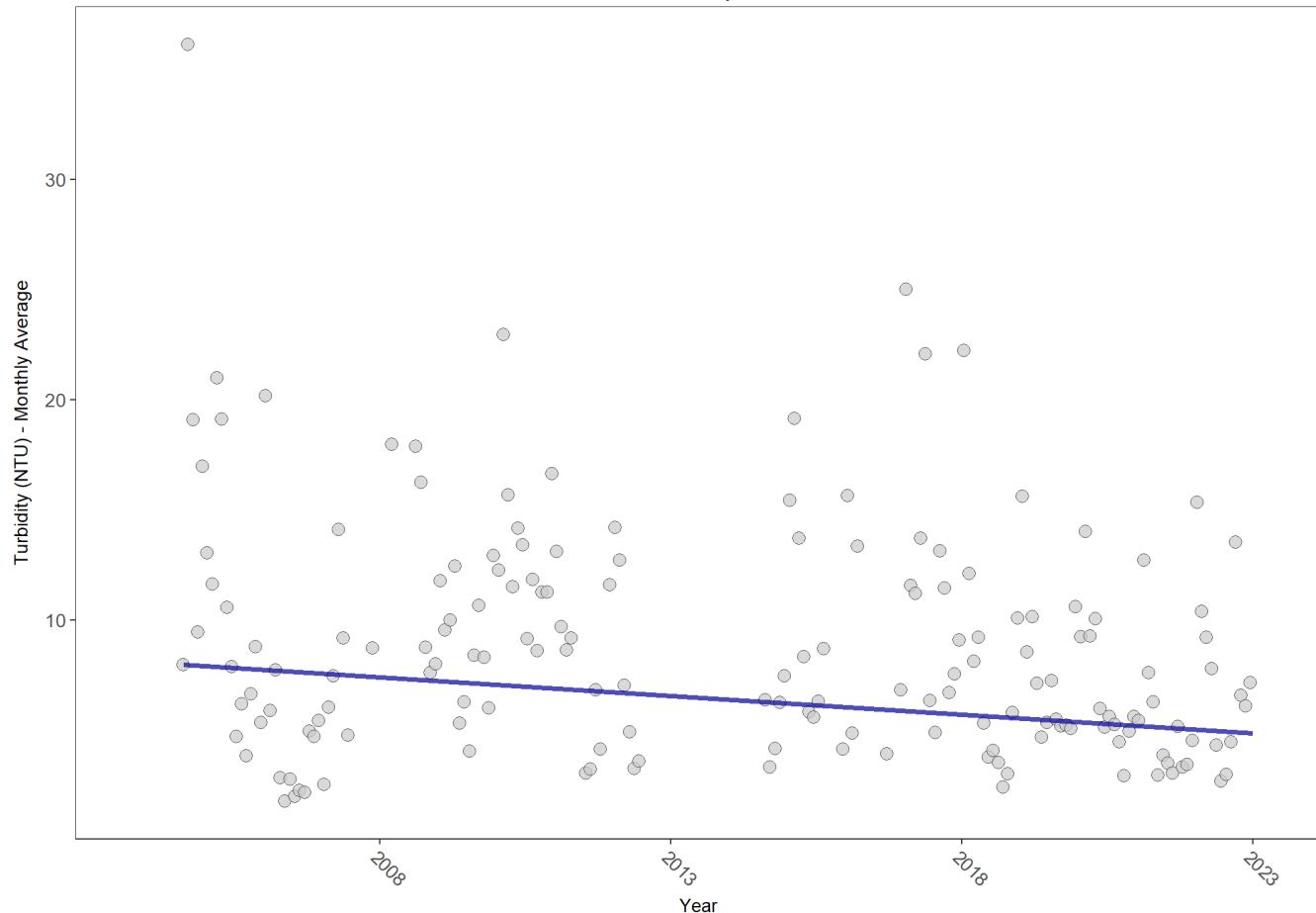
$p < 0.00005$  appear as 0 due to rounding.

*SennIntercept* is intercept value at beginning of record for monitoring location

## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB02  
Turbidity



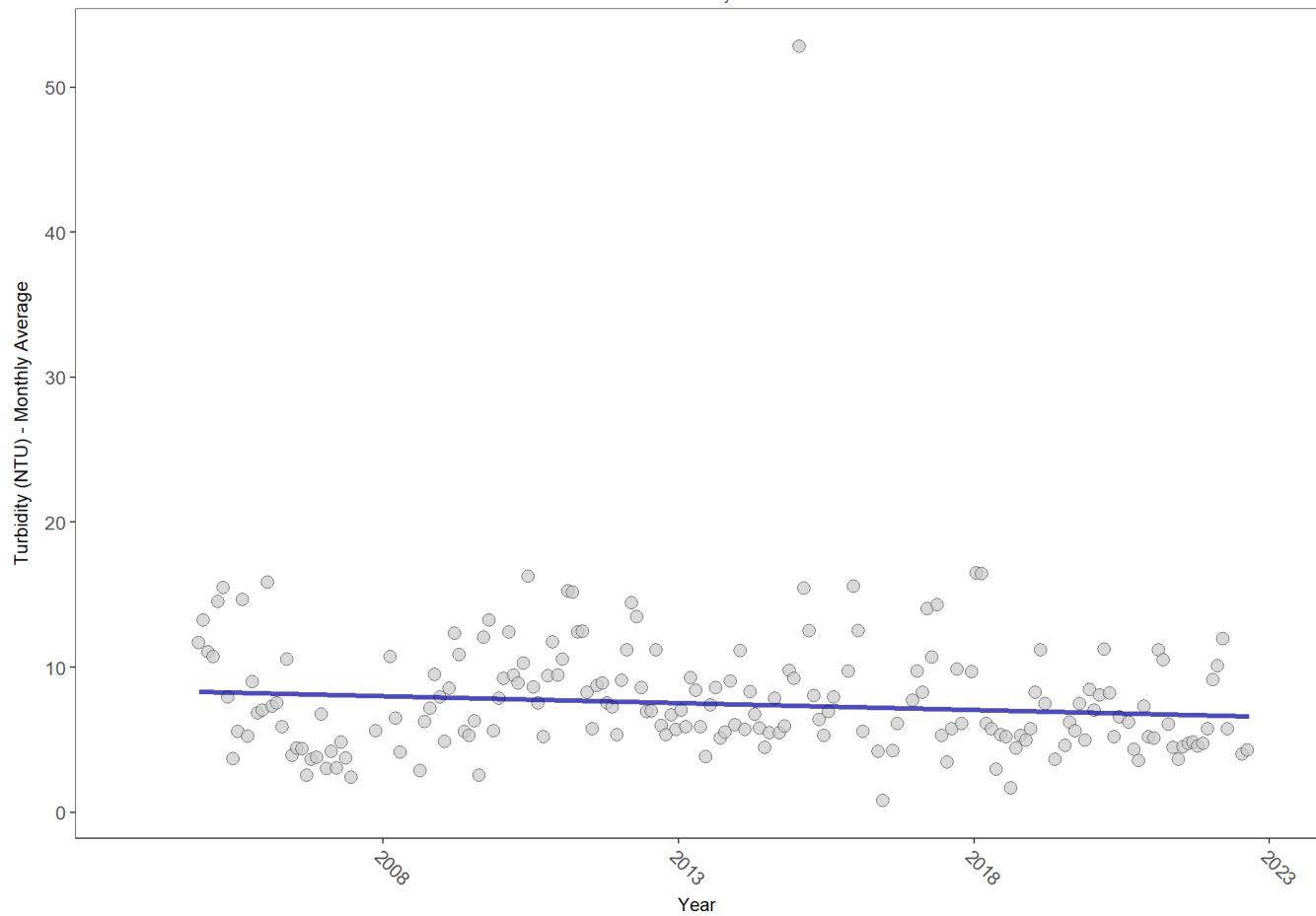
$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB03  
Turbidity



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	413599	19	5	TRUE	-0.1336	0.0190	-0.09501454	8.373902	7.8047	0.7307	-1

$p < 0.00005$  appear as 0 due to rounding.

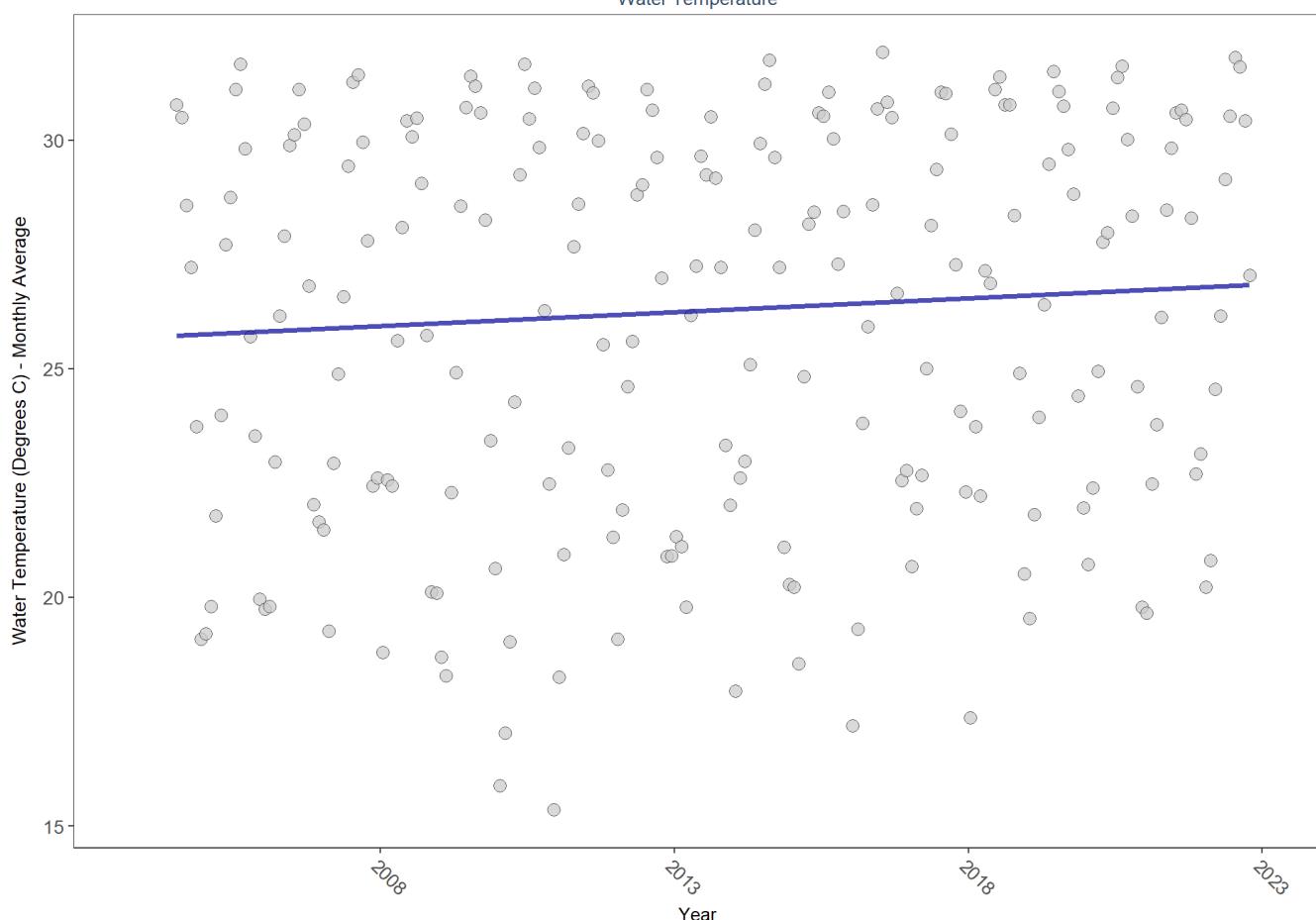
SennIntercept is intercept value at beginning of record for monitoring location

## Water Temperature - Continuous Water Quality

### EB01

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB01  
Water Temperature



*p < 0.00005 appear as 0 due to rounding.*

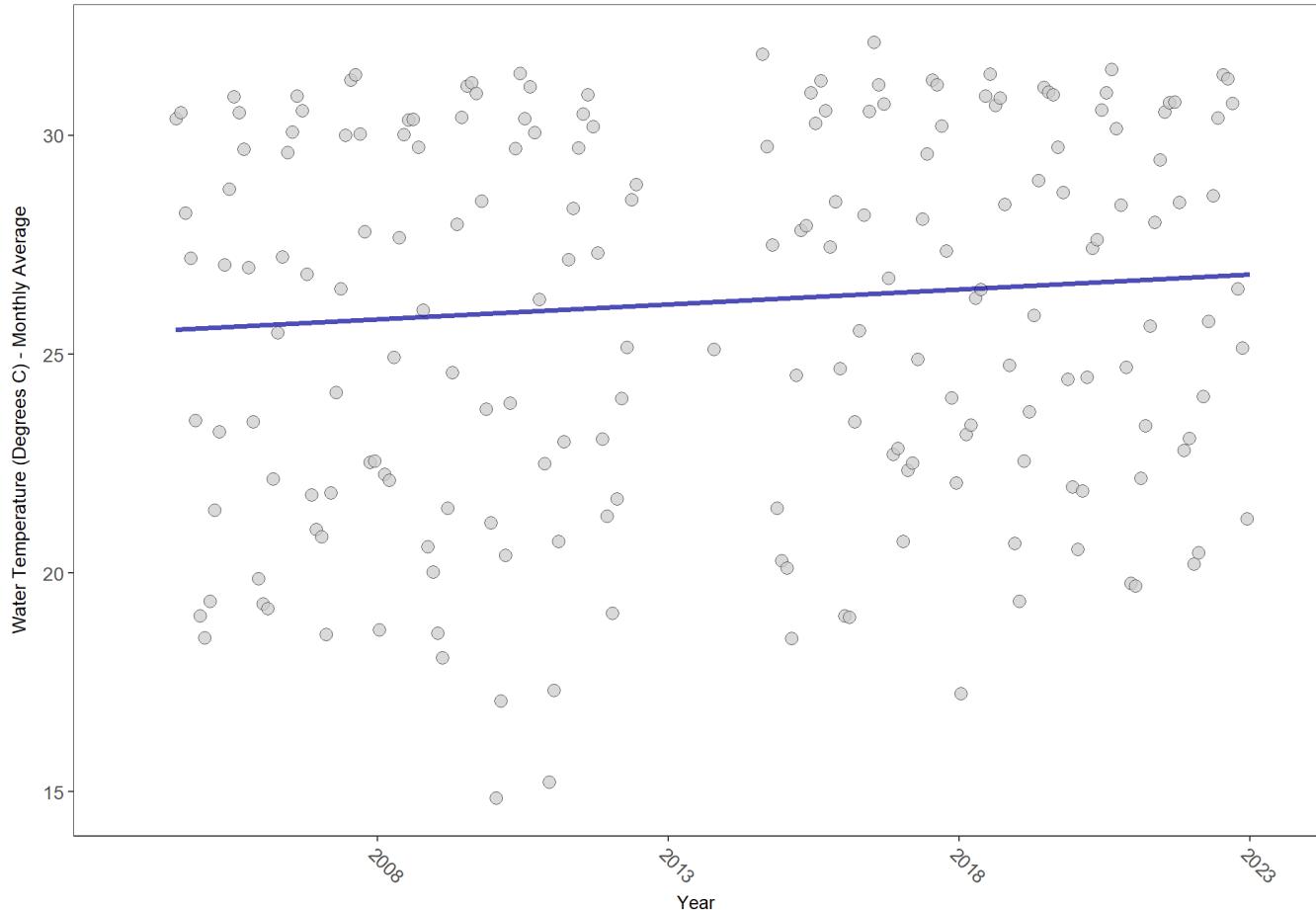
*SennIntercept is intercept value at beginning of record for monitoring location*

## EB02

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB02

Water Temperature



*p < 0.00005 appear as 0 due to rounding.*

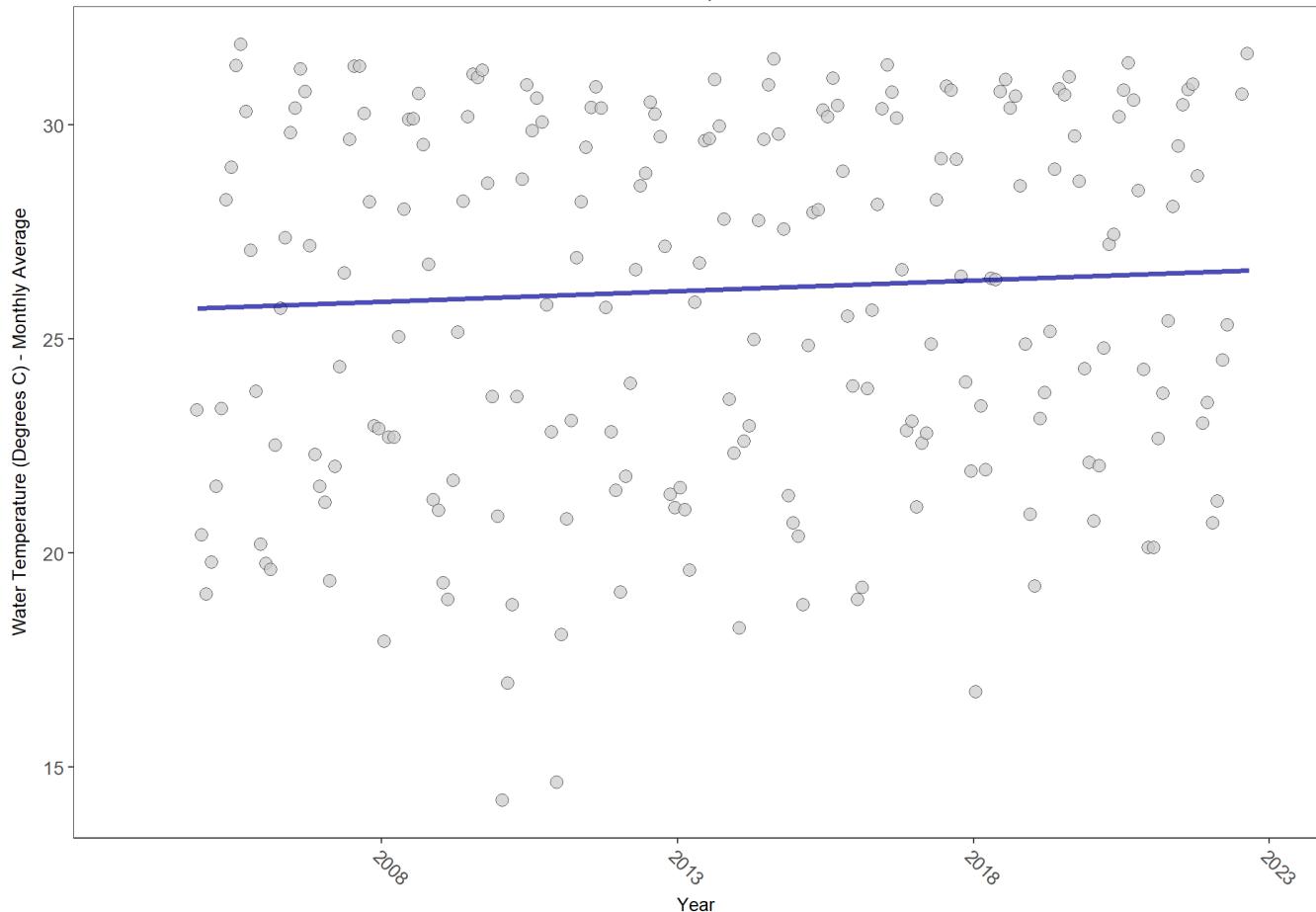
*SennIntercept is intercept value at beginning of record for monitoring location*

## EB03

Estero Bay Aquatic Preserve Continuous Water Quality Monitoring (474)

Estero Bay Aquatic Preserve  
EB03

Water Temperature



RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
bottom	572084	19	26.5	TRUE	0.1722	0.0006	0.04927919	25.67835	7.636	0.7455	1

*p < 0.00005 appear as 0 due to rounding.*

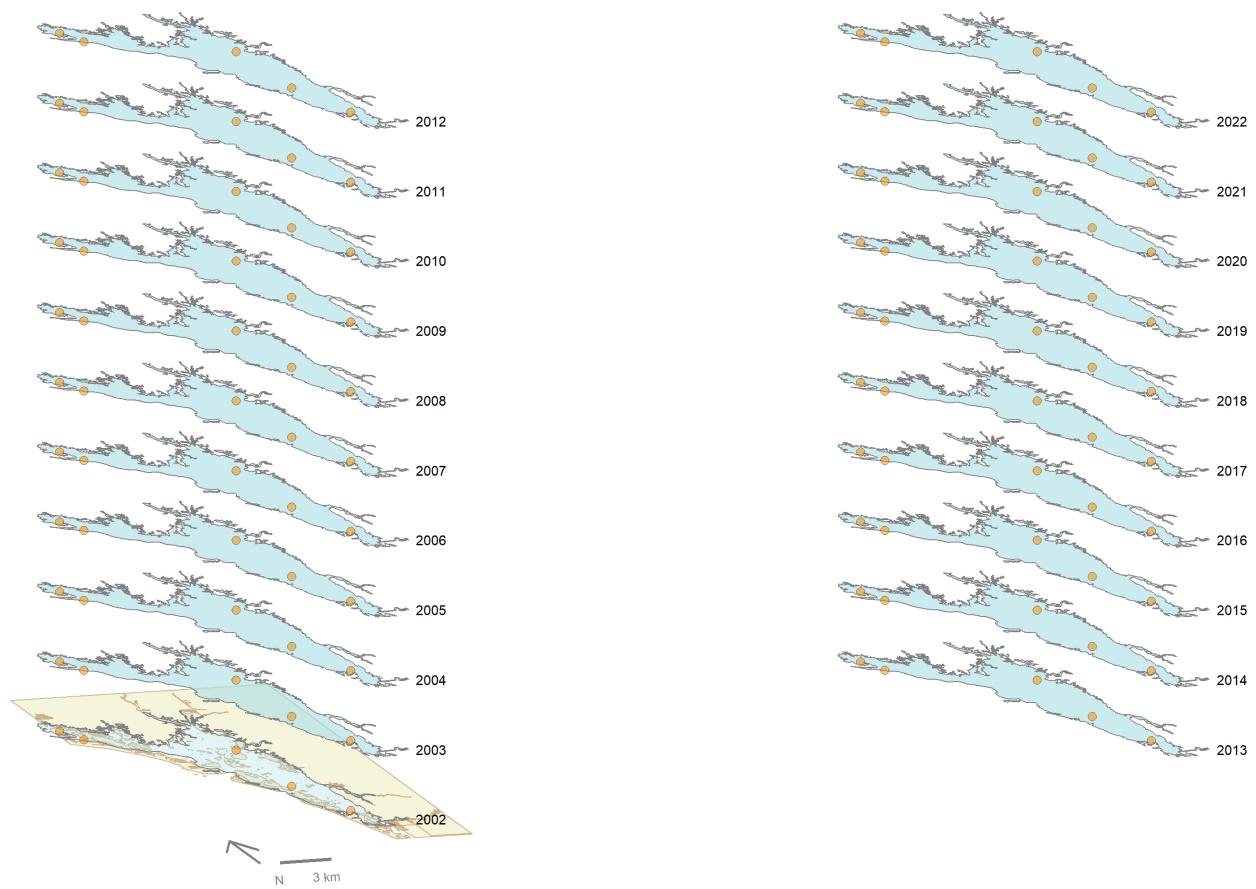
*SennIntercept is intercept value at beginning of record for monitoring location*



# Submerged Aquatic Vegetation

The data file used is: All\_SAV\_Parameters-2023-Dec-13.txt

Estero Bay Aquatic Preserve  
Sample Locations - SAV Percent Cover



Program name  
● Estero Bay Seagrass Monitoring

**Sampling locations by Program:**

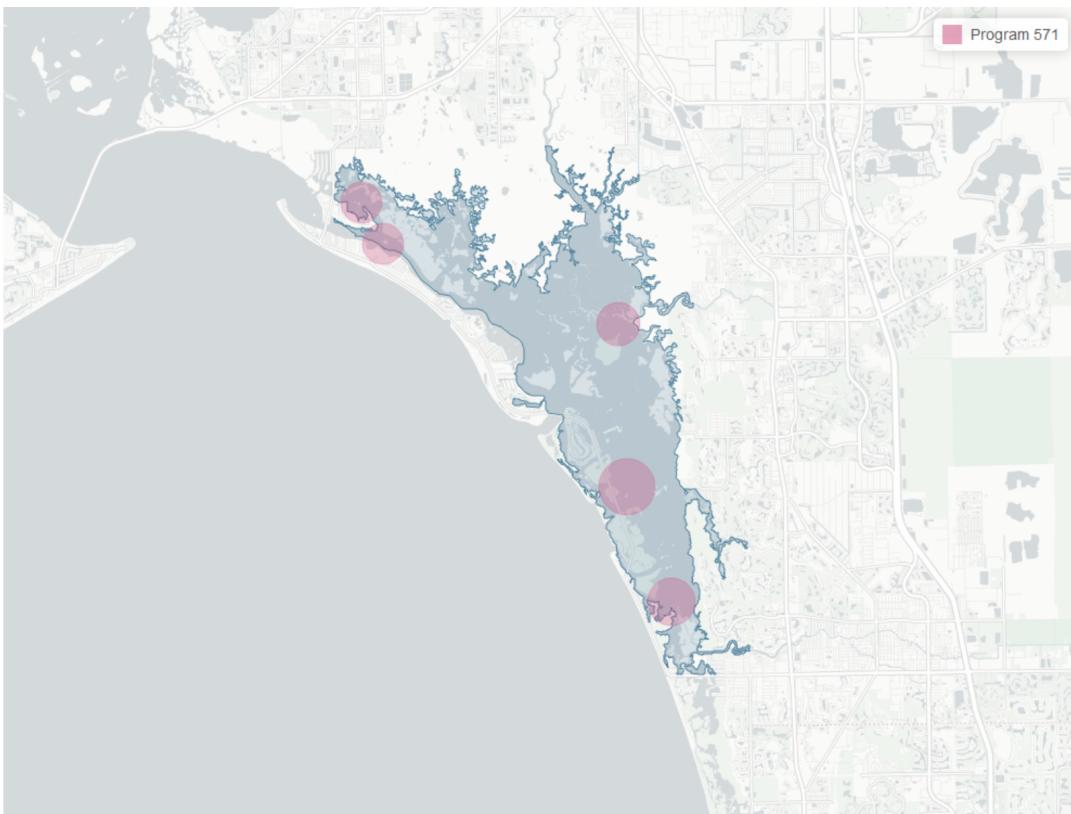
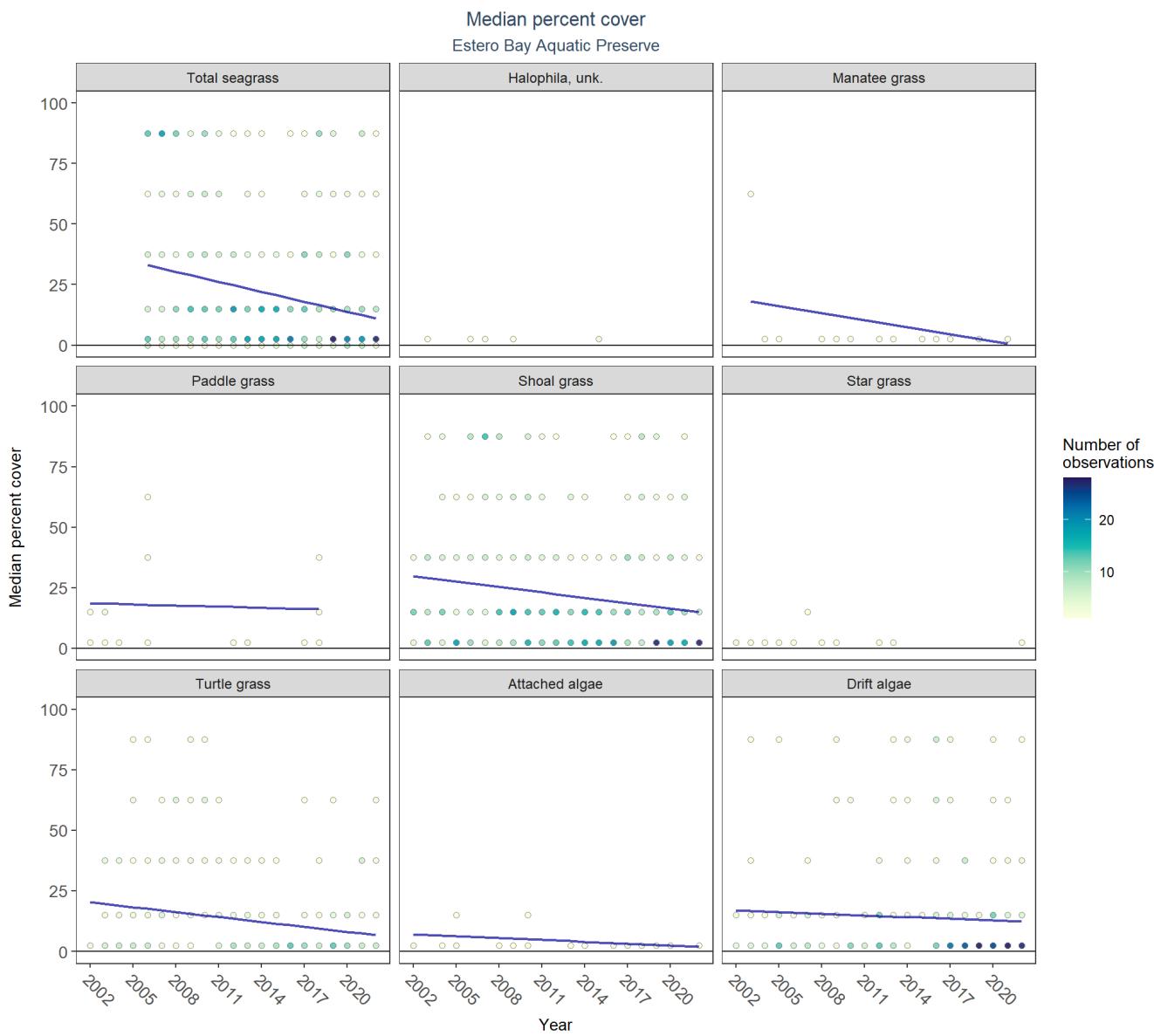


Table 29: Estero Bay Seagrass Monitoring - *Program 571*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
2238	2002	2022	Braun Blanquet	5



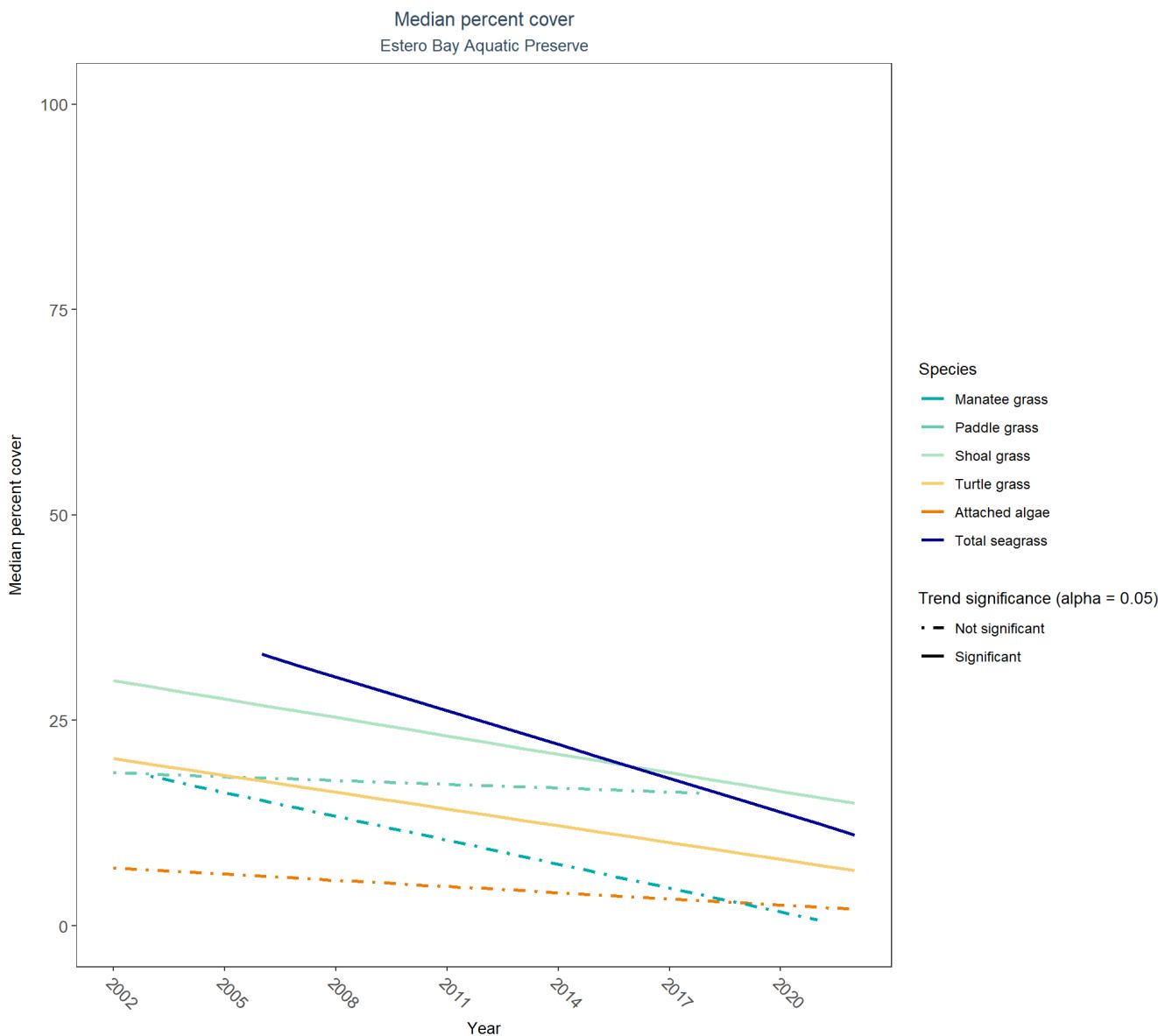
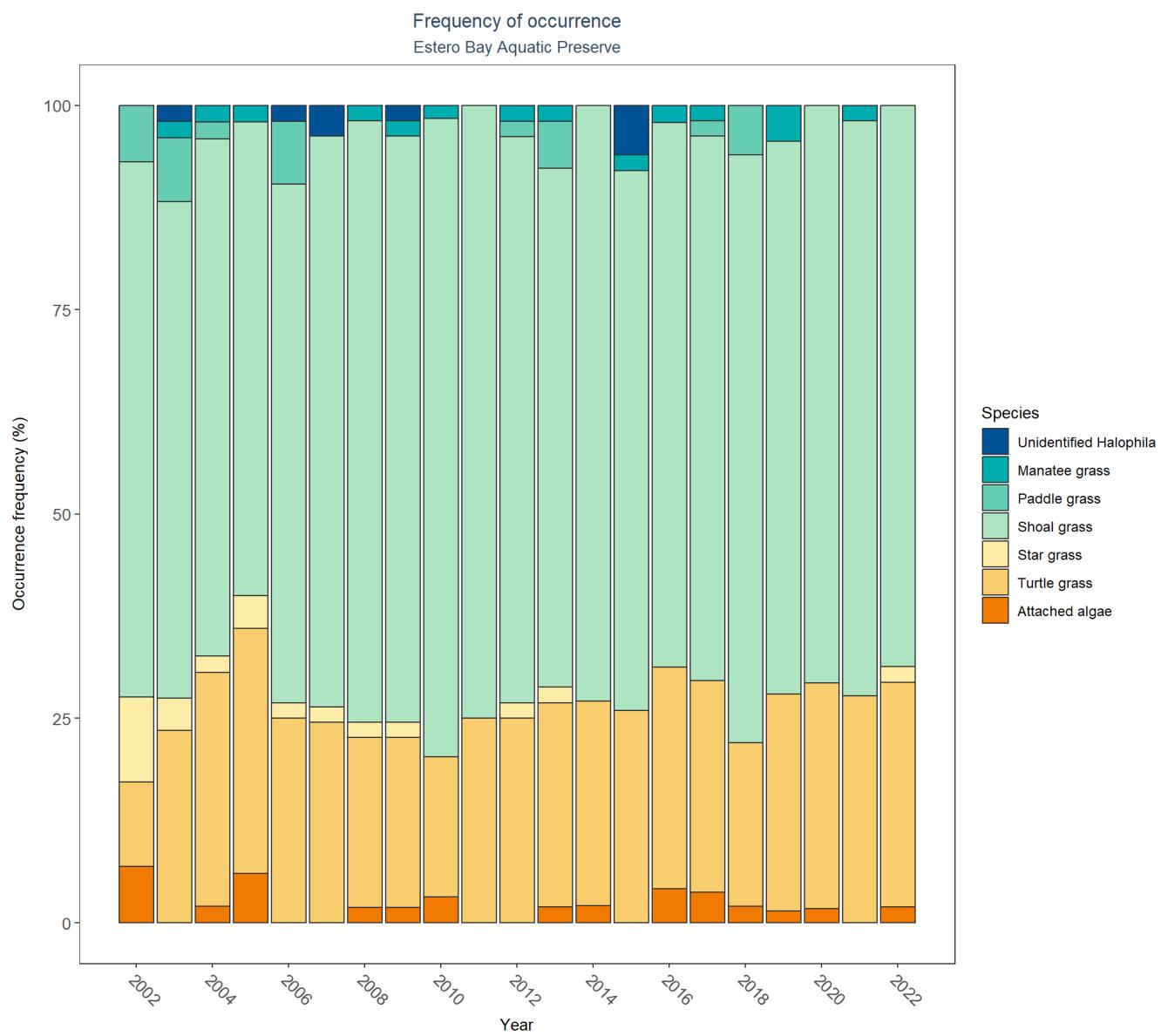
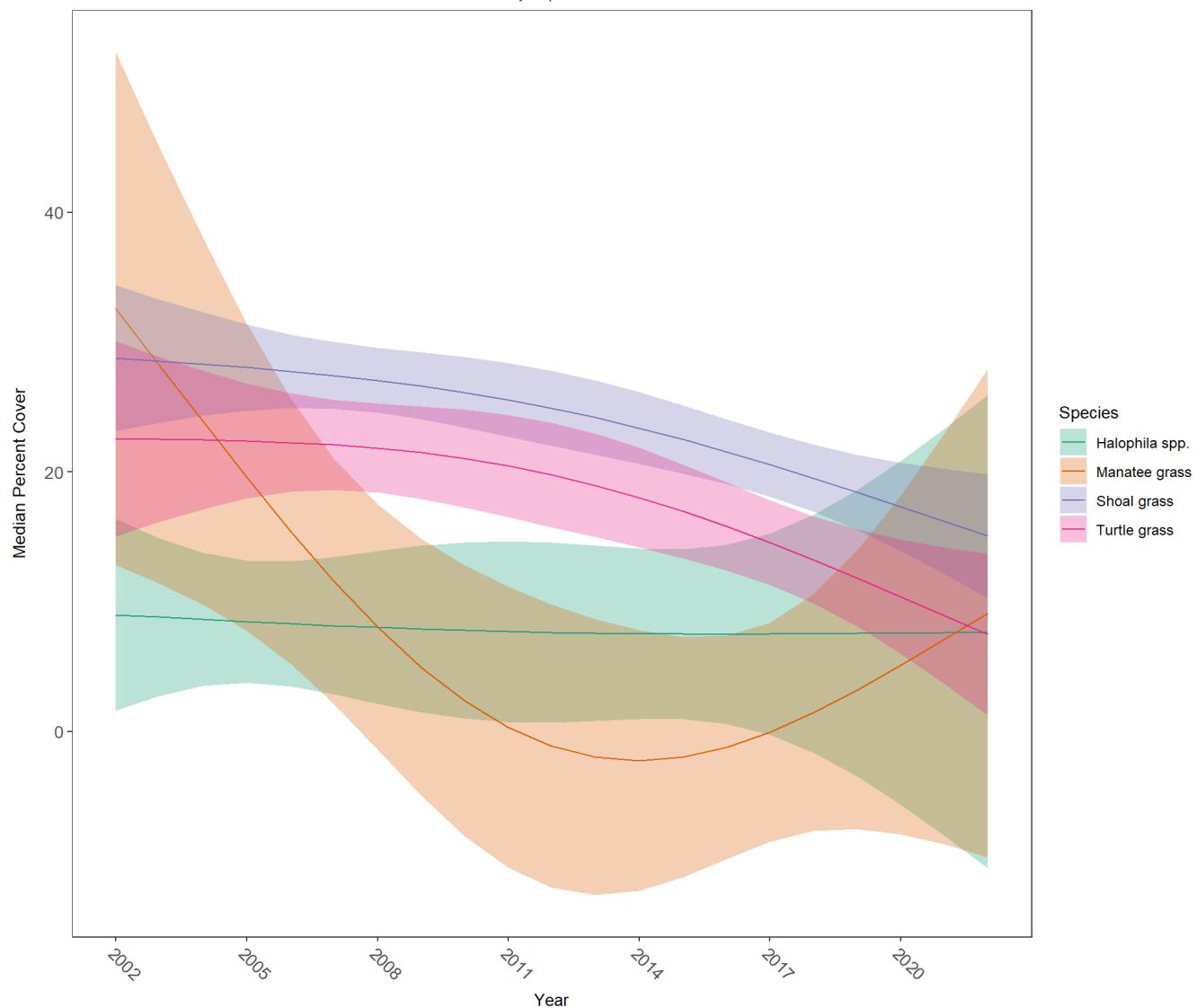


Table 30: Percent Cover Trend Analysis for Estero Bay Aquatic Preserve

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Attached algae	No significant trend	2002 - 2022	9.0354	-0.2507	0.3843
Drift algae	No significant trend	2002 - 2022	18.6207	-0.2207	0.4153
Manatee grass	No significant trend	2003 - 2021	26.9391	-0.9721	0.3518
Paddle grass	No significant trend	2002 - 2018	19.9126	-0.1586	0.8100
Shoal grass	Significantly decreasing trend	2002 - 2022	35.8422	-0.7484	0.0042
Star grass	Model did not fit the available data	2002 - 2022			
Total seagrass	Significantly decreasing trend	2006 - 2022	49.5110	-1.3725	0.0183
Turtle grass	Significantly decreasing trend	2002 - 2022	25.7820	-0.6800	0.0270
Halophila, unk.	Model did not fit the available data	2003 - 2015			



Median Percent Cover for seagrass species  
Estero Bay Aquatic Preserve



Species must have at least 10 years of data to be evaluated

*Drift algae, Total seagrass, Attached algae, and Total SAV* are excluded from the analyses