

# Big Bend Seagrasses Aquatic Preserve

## Seagrass and Water Quality Trend Analysis

Florida SEACAR

2024-05-01

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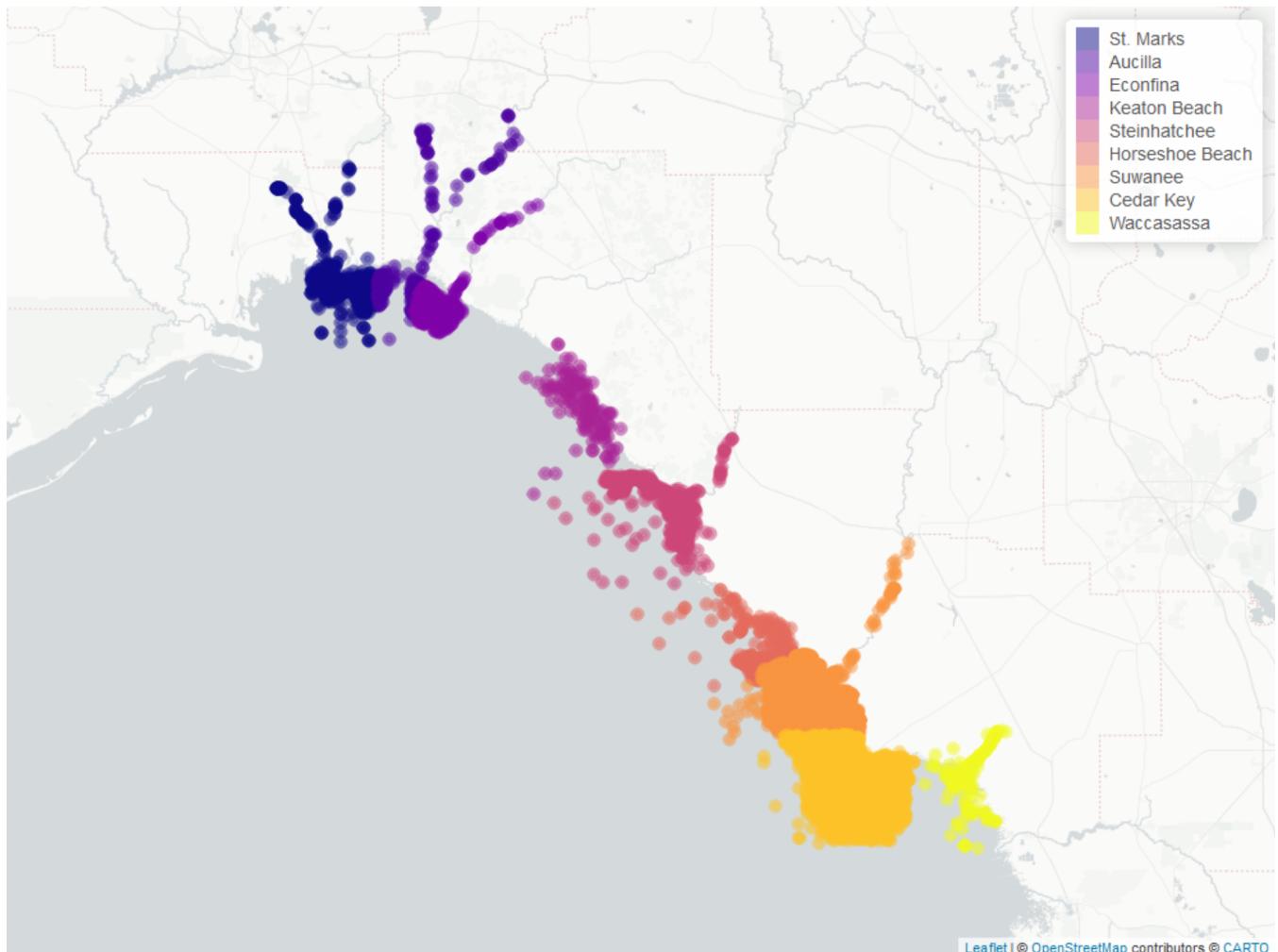
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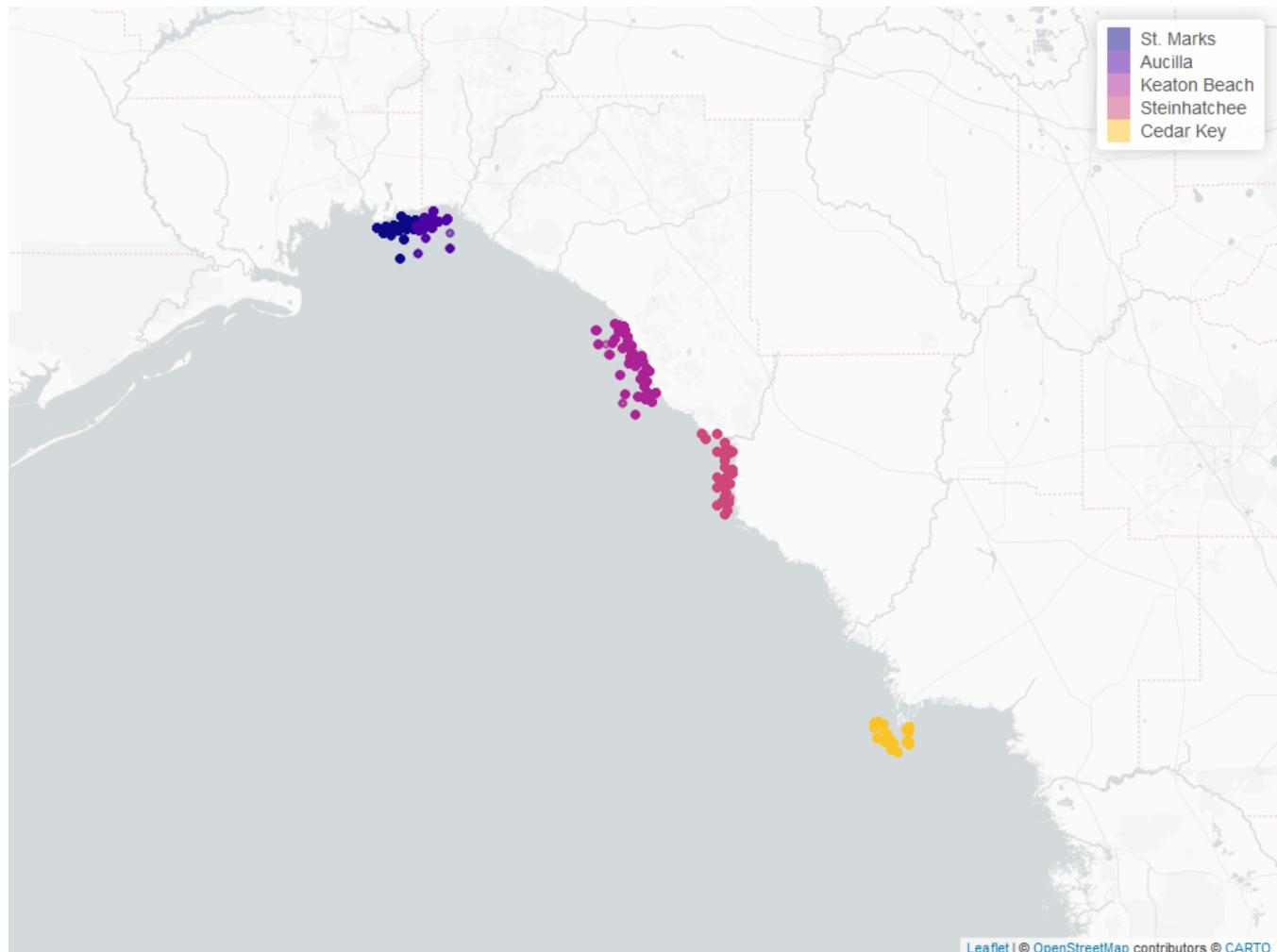
The following files were used in the analysis:

- *Combined\_WQ\_WC\_NUT\_Ammonia\_Un-ionized\_NH3-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Chlorophyll\_a\_corrected\_for\_pheophytin-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Chlorophyll\_a\_uncorrected\_for\_pheophytin-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Colored\_dissolved\_organic\_matter\_CDOM-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Dissolved\_Oxygen-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Dissolved\_Oxygen\_Saturation-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Light\_Exinction\_Coefficient-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_NH4\_Filtered-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Nitrate\_N-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Nitrite\_N-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Nitrogen\_organic-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_NO2\_3\_Filtered-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_pH-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_PO4\_Filtered-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Salinity-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Secchi\_Depth-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Specific\_Conductivity-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Kjeldahl\_Nitrogen\_TKN-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Nitrogen-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Phosphorus-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Total\_Suspended\_Solids\_TSS-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Turbidity-2024-Mar-27.txt*
- *Combined\_WQ\_WC\_NUT\_Water\_Temperature-2024-Mar-27.txt*

## Water Quality Discrete - Sample Locations - All Parameters



## Submerged Aquatic Vegetation - Sample Locations



# Horseshoe Beach

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

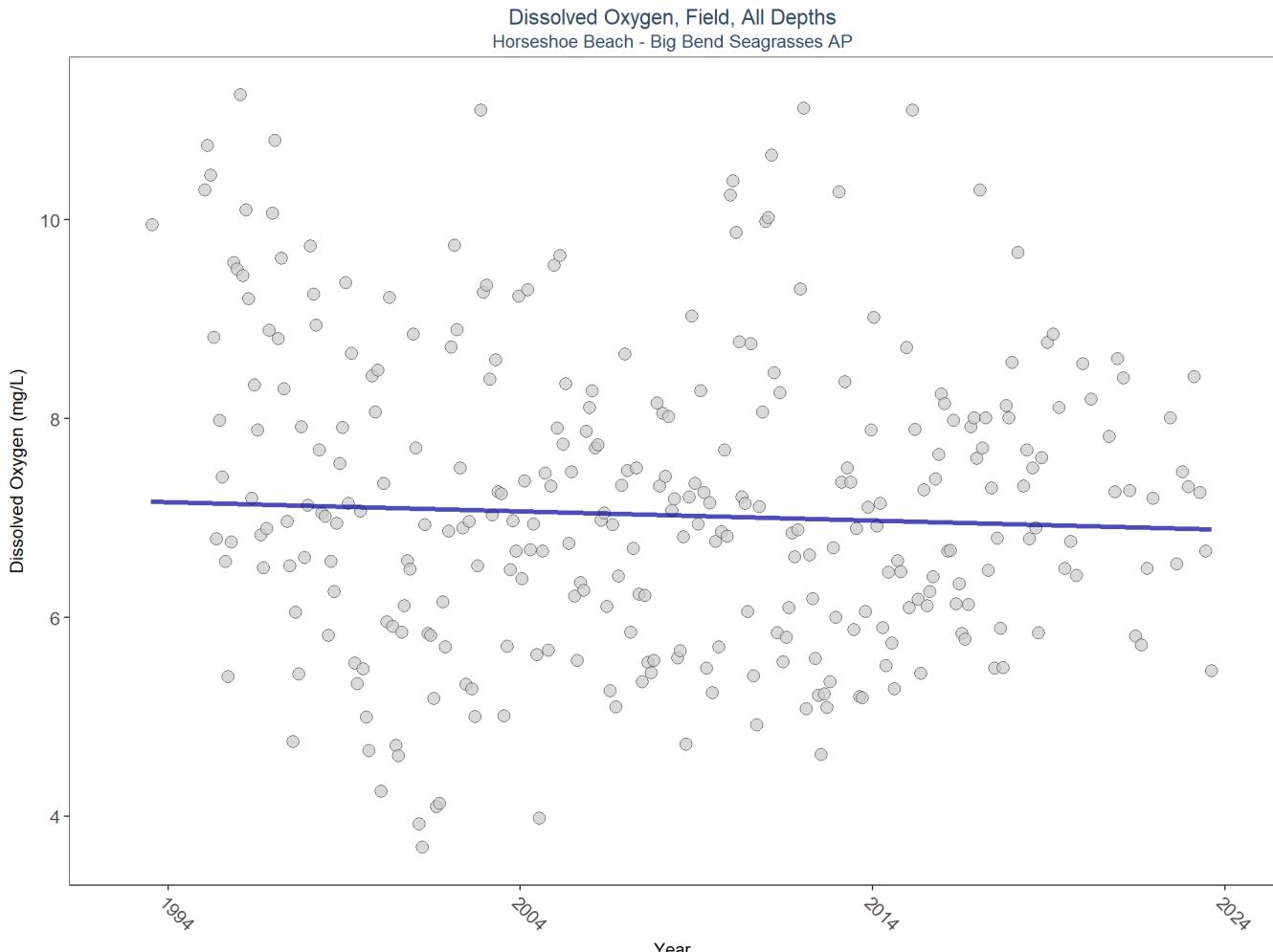
Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

Table 1: Seasonal Kendall-Tau Results for Horseshoe Beach

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	2002 - 2023	8	239	FALSE	-	-	-	-
Dissolved Oxygen	1993 - 2023	30	25796	TRUE	-0.01	7.17	0.3271	0
Dissolved Oxygen Saturation	2017 - 2017	1	3	FALSE	-	-	-	-
Salinity	1993 - 2023	30	27342	TRUE	0.04	23.07	0.3234	0
Water Temperature	1993 - 2023	30	27340	TRUE	0.05	22.26	0.0008	↑
Secchi Depth	1993 - 2021	25	928	TRUE	-0.01	1.17	0.0208	↓
pH	1993 - 2023	30	14096	TRUE	0.00	8.00	0.1240	0
Total Phosphorus	2002 - 2023	10	228	TRUE	0.00	0.07	0.3531	0
Colored Dissolved Organic Matter	2020 - 2021	2	9	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	2012 - 2023	9	208	FALSE	-	-	-	-
Turbidity	1995 - 2023	26	10401	TRUE	0.00	3.61	0.9929	0
Total Suspended Solids	2017 - 2017	1	2	FALSE	-	-	-	-
Total Nitrogen	2002 - 2023	10	208	TRUE	-0.03	1.09	0.0122	↓

## Discrete WQ

### Dissolved Oxygen



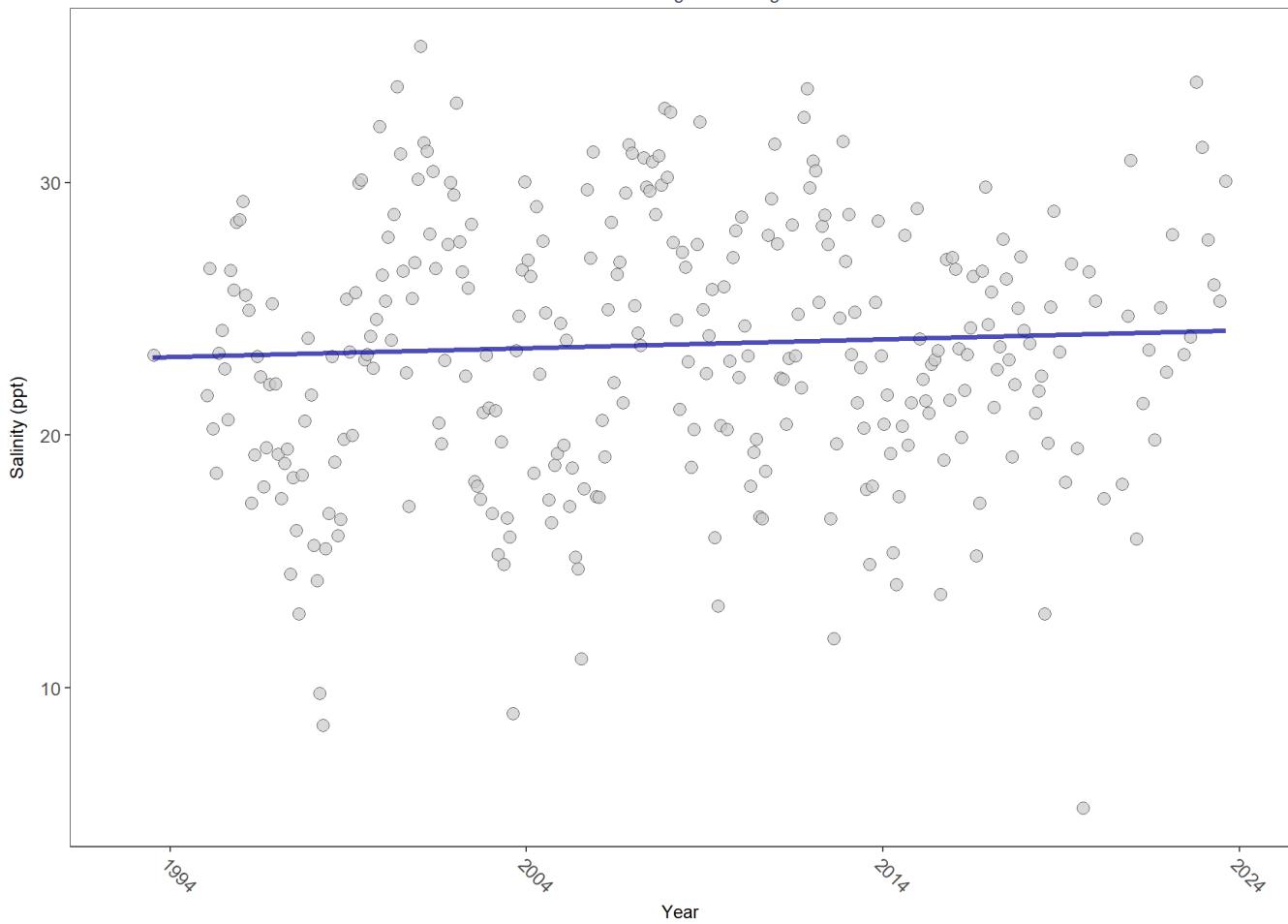
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	25796	30	7	TRUE	-0.0391	0.3271	-0.009220833	7.16998	10.2506	0.508	0

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

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

## Salinity

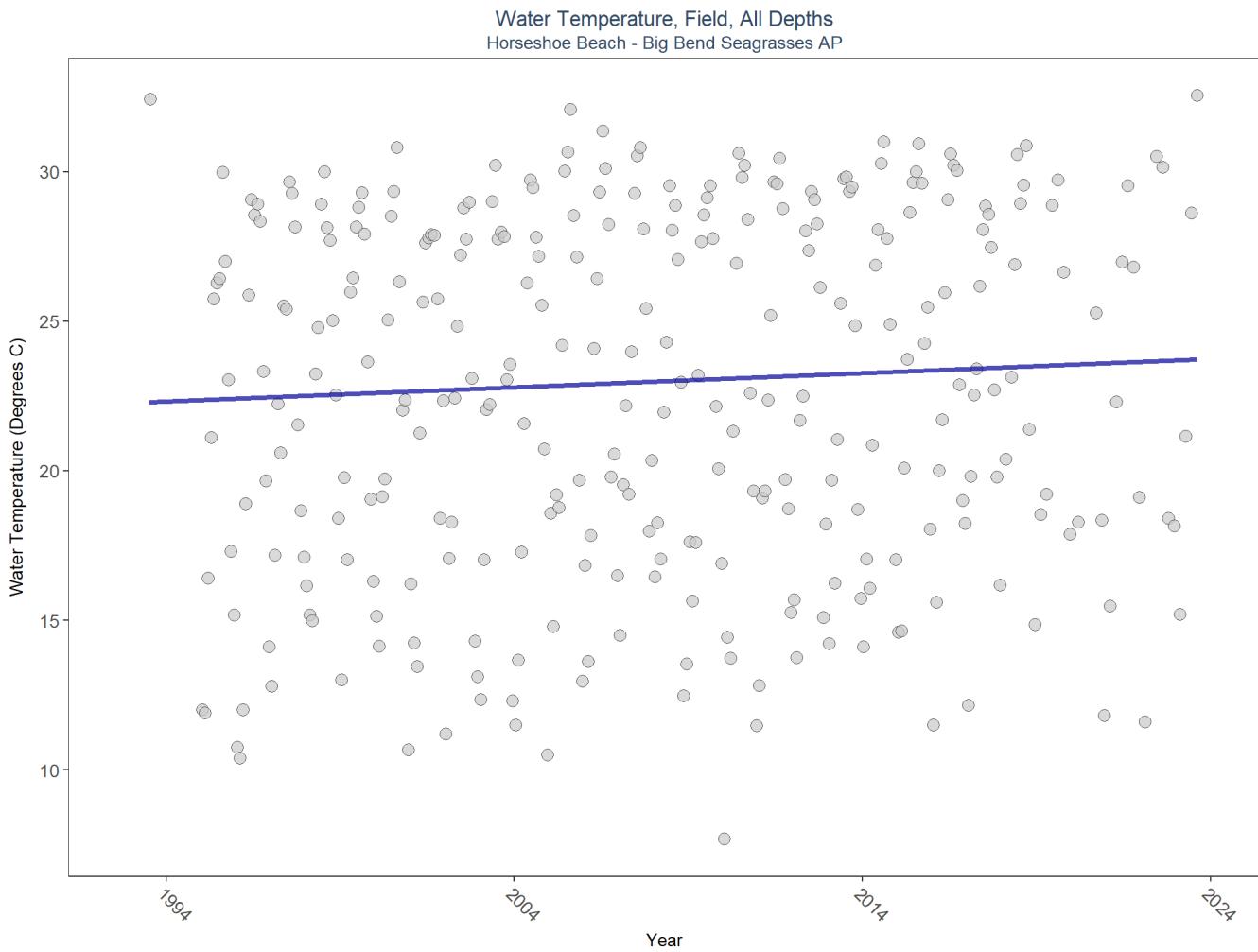
Salinity, Lab and Field Combined, All Depths  
Horseshoe Beach - Big Bend Seagrasses AP



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

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

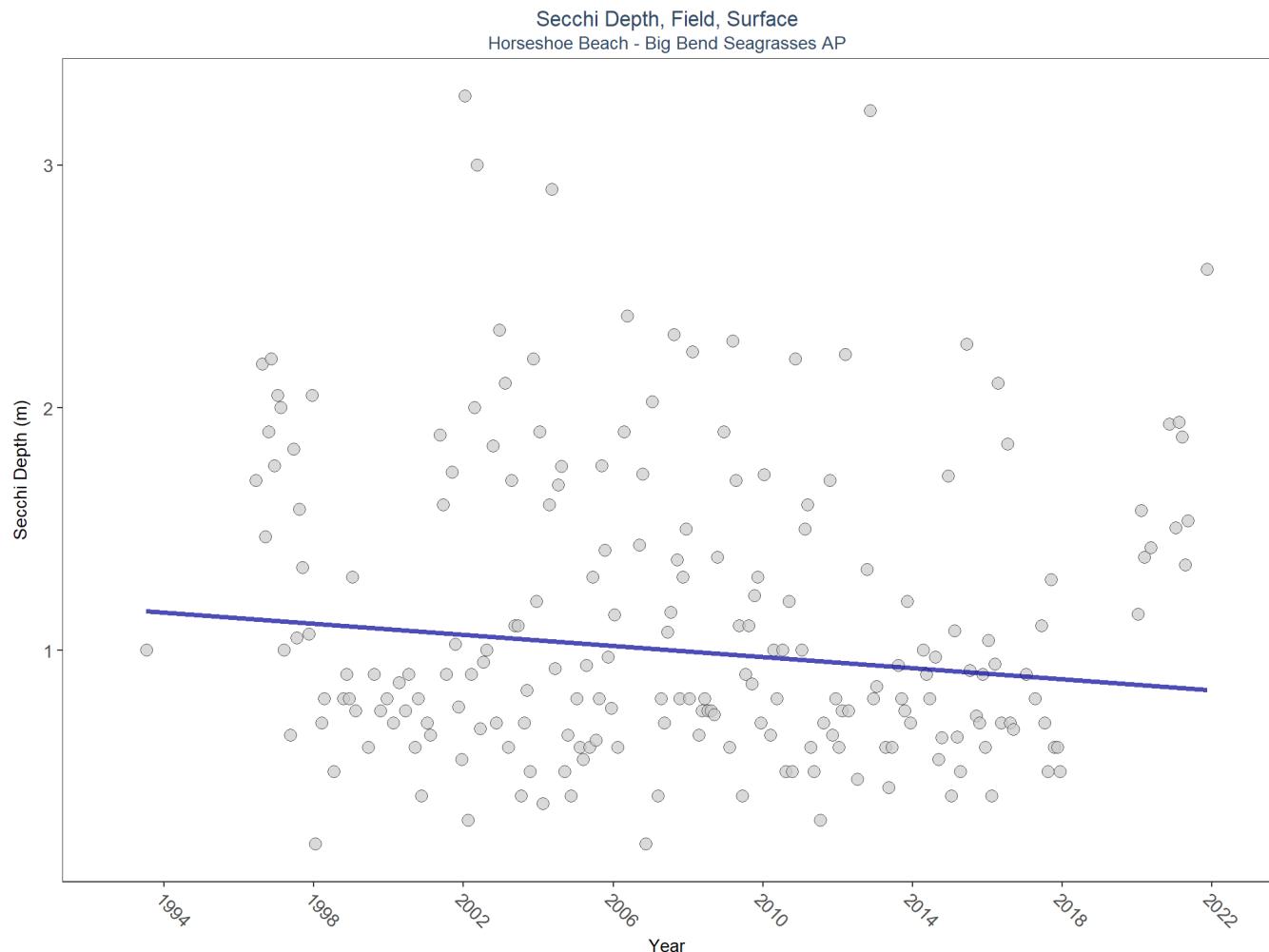
## Water Temperature



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

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

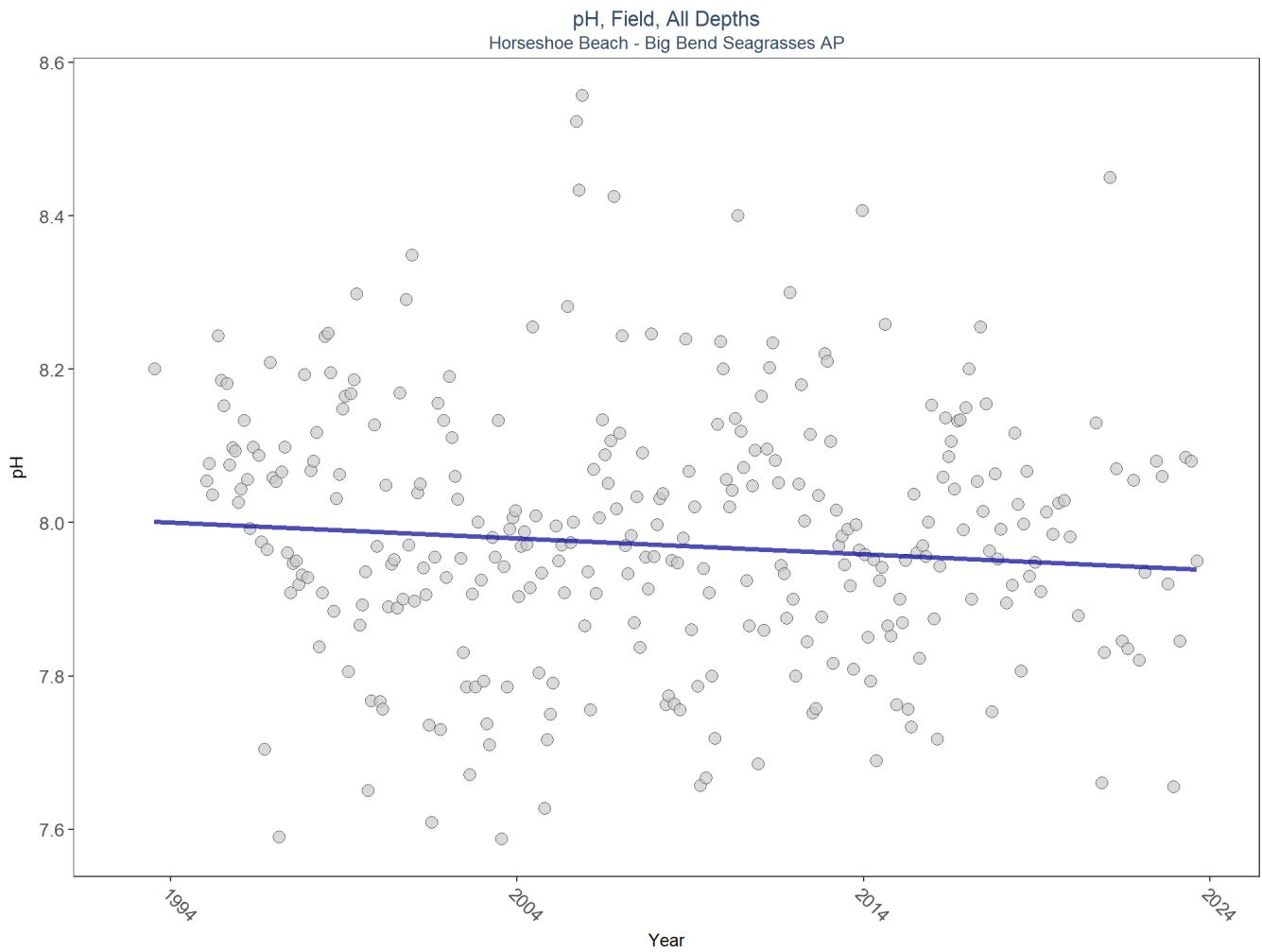
## Secchi Depth



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

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

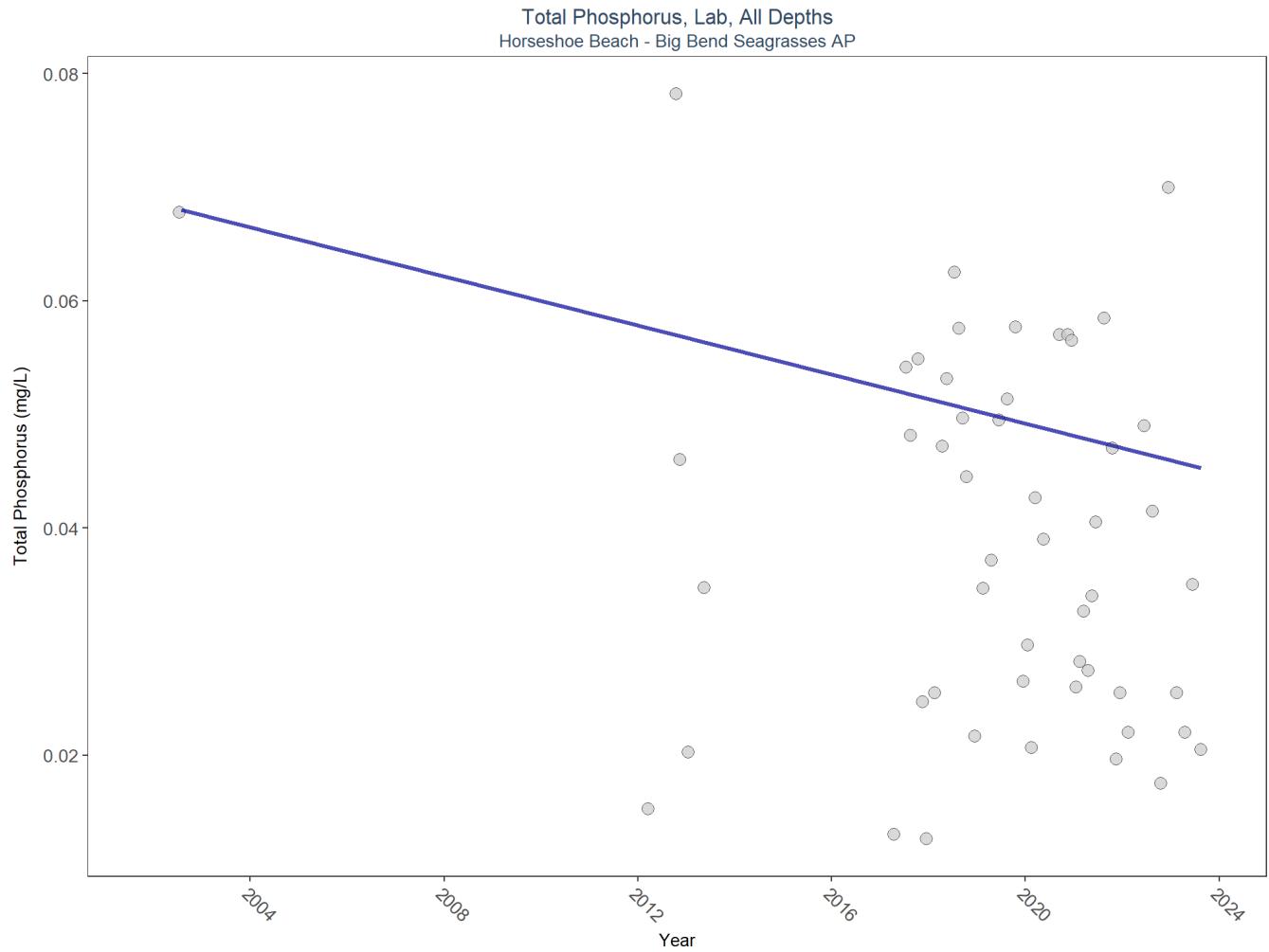
## pH



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

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

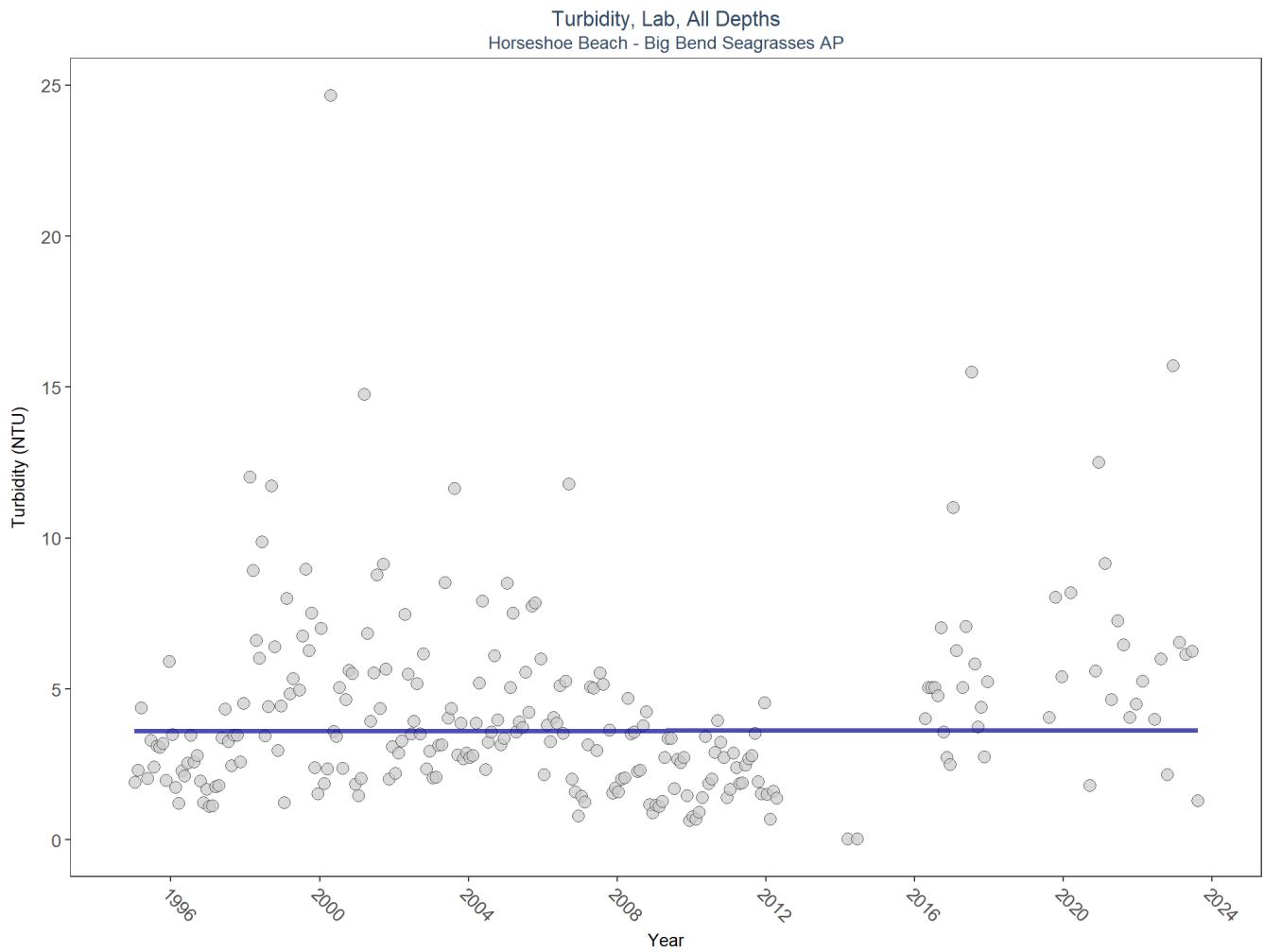
## Total Phosphorus



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

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

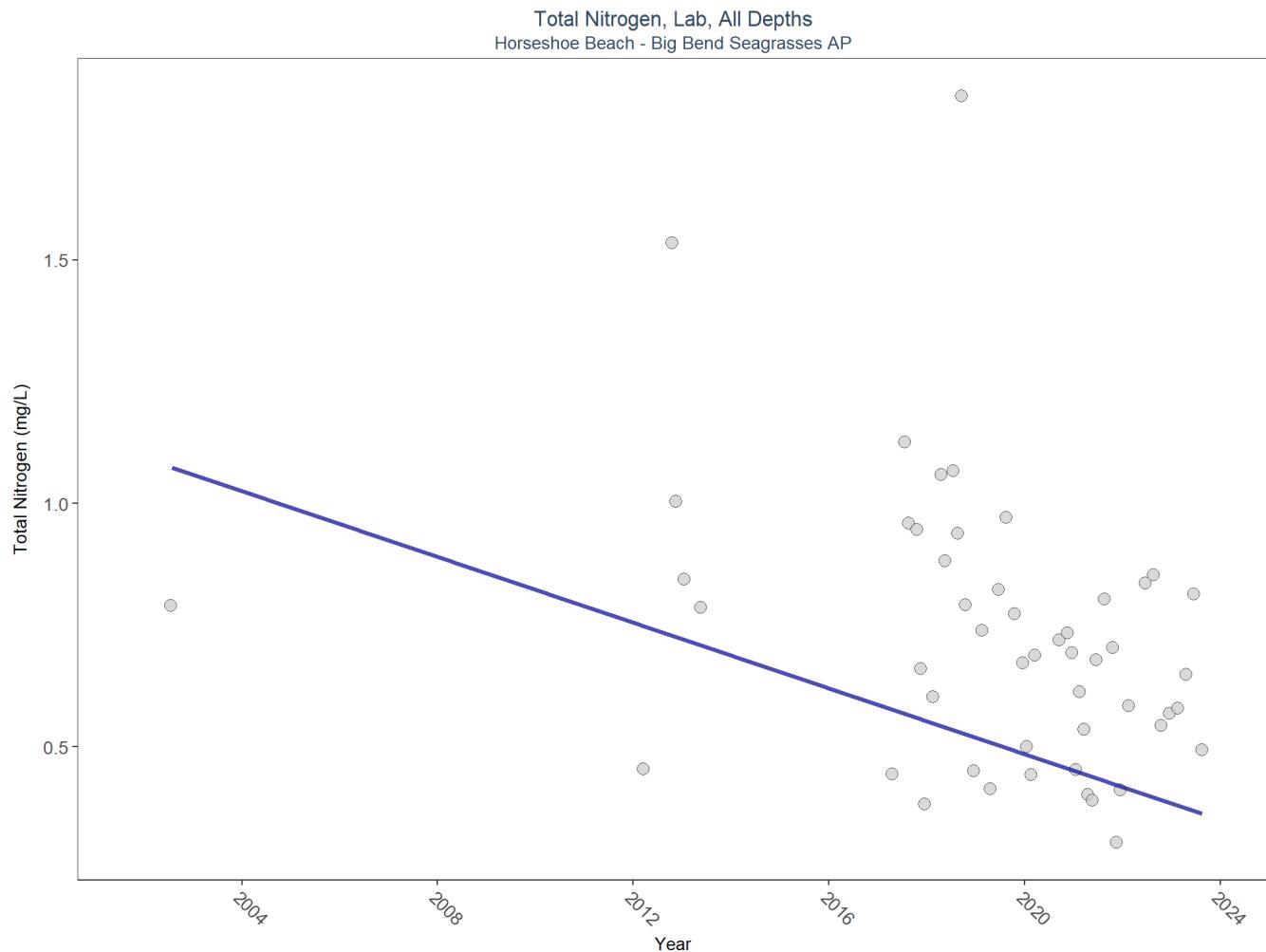
## Turbidity



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

SennIntercept is intercept value at beginning of record for monitoring location

## Total Nitrogen



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

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

## Steinhatchee

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

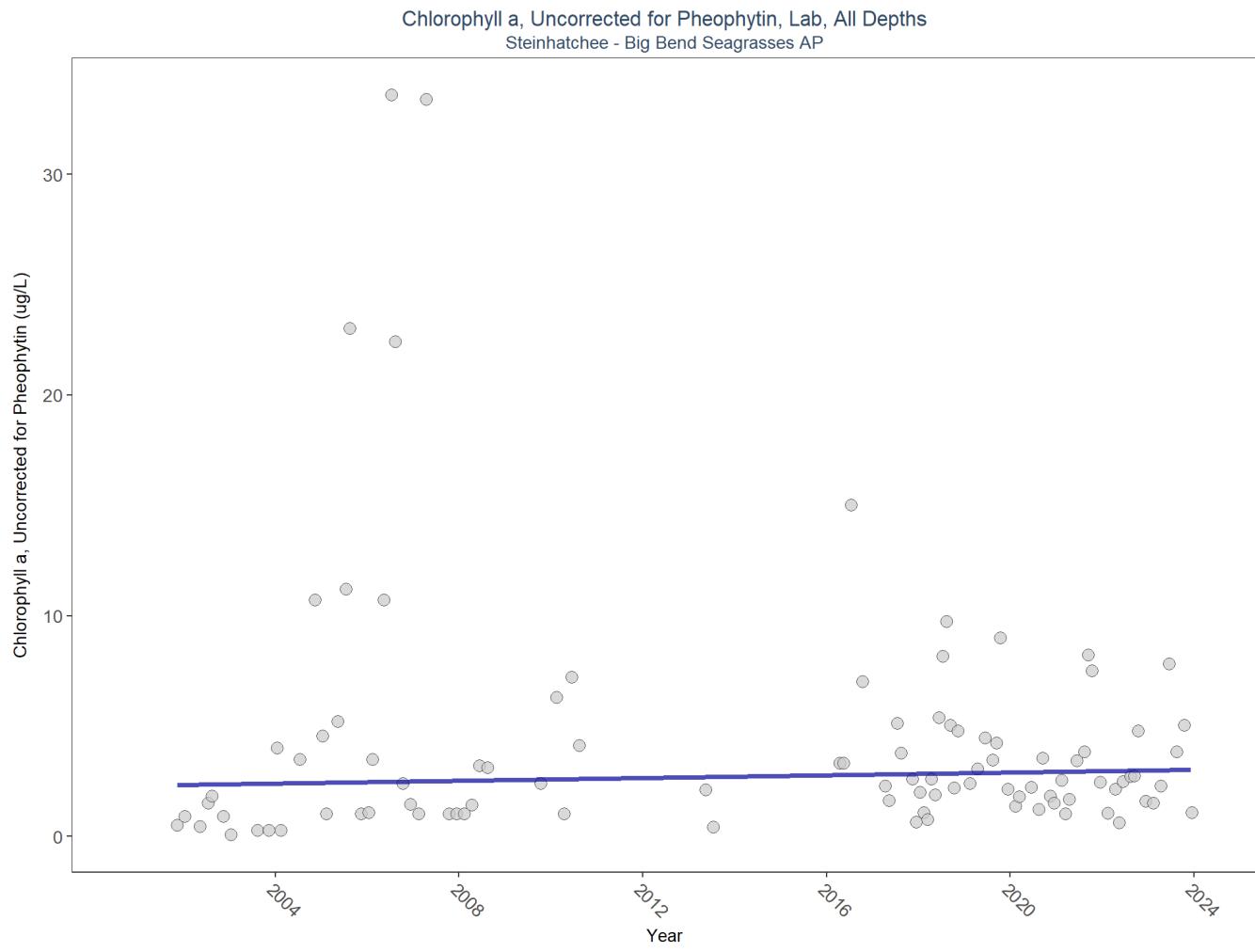
Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

Table 2: Seasonal Kendall-Tau Results for Steinhatchee

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	2001 - 2023	19	290	TRUE	0.03	2.32	0.1989	0
Dissolved Oxygen	1993 - 2023	28	2701	TRUE	-0.01	7.32	0.3905	0
Dissolved Oxygen Saturation	2001 - 2022	13	92	TRUE	2.74	22.71	0.0069	↑
Salinity	1990 - 2023	28	3132	TRUE	-0.26	34.44	0.0000	↓
Water Temperature	1990 - 2023	29	2723	TRUE	0.00	23.00	0.9435	0
Secchi Depth	1993 - 2022	18	2318	TRUE	-0.03	2.38	0.0764	0
pH	1993 - 2023	27	2692	TRUE	-0.01	8.25	0.0004	↓
Total Phosphorus	2001 - 2023	16	282	TRUE	0.00	0.06	0.0000	↓
Colored Dissolved Organic Matter	2019 - 2022	4	33	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	2001 - 2023	13	242	TRUE	0.06	0.73	0.0448	↑
Turbidity	1994 - 2023	24	227	TRUE	-0.02	2.65	0.3430	0
Total Suspended Solids	1994 - 2022	11	45	TRUE	-0.09	5.69	0.4069	0
Total Nitrogen	2001 - 2023	20	238	TRUE	0.00	0.78	0.2656	0

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin

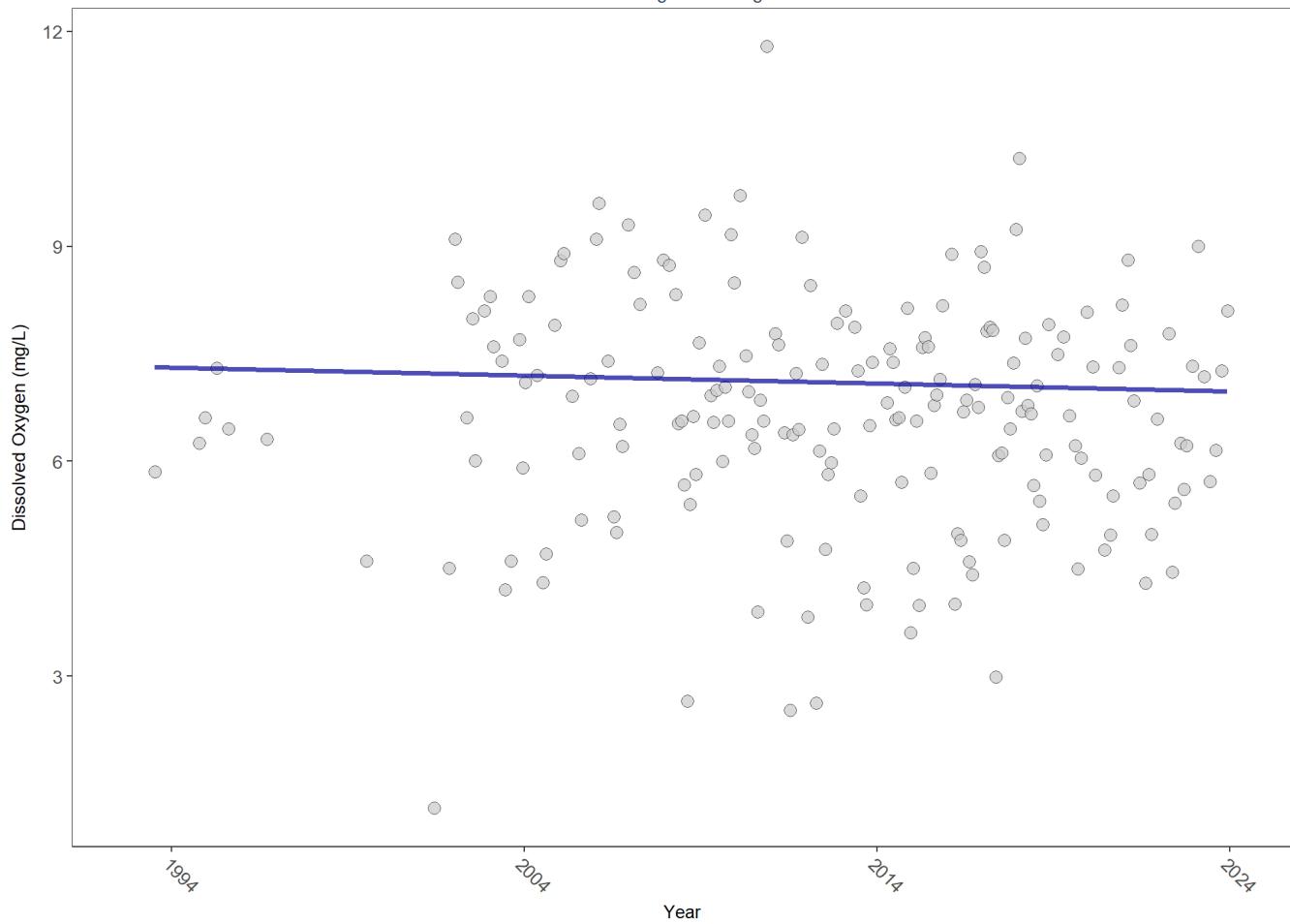


*p < 0.00005 appear as 0 due to rounding.*

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

## Dissolved Oxygen

Dissolved Oxygen, Field, All Depths  
Steinhatchee - Big Bend Seagrasses AP

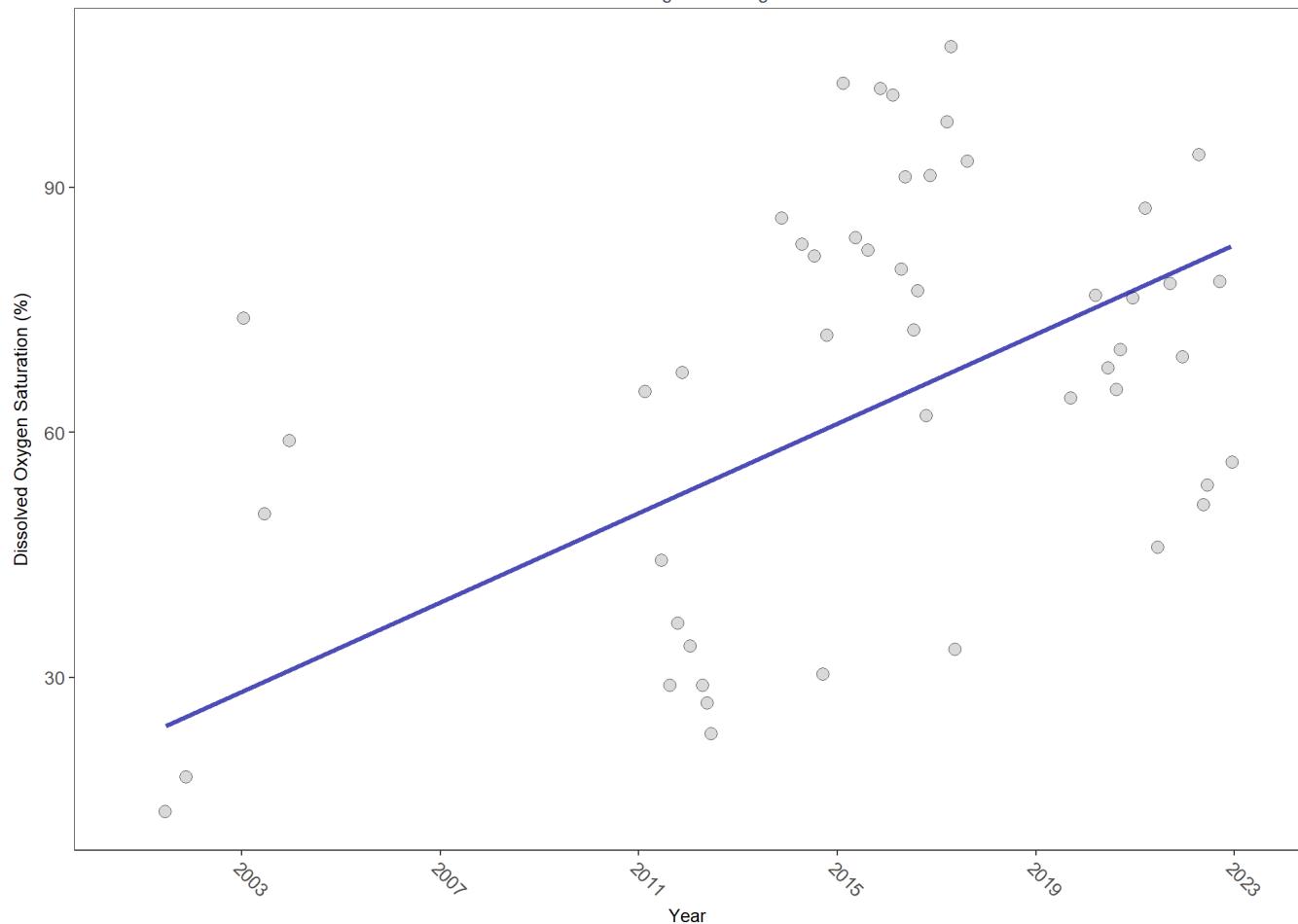


$p < 0.00005$  appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

## Dissolved Oxygen Saturation

Dissolved Oxygen Saturation, Field, All Depths  
Steinhatchee - Big Bend Seagrasses AP



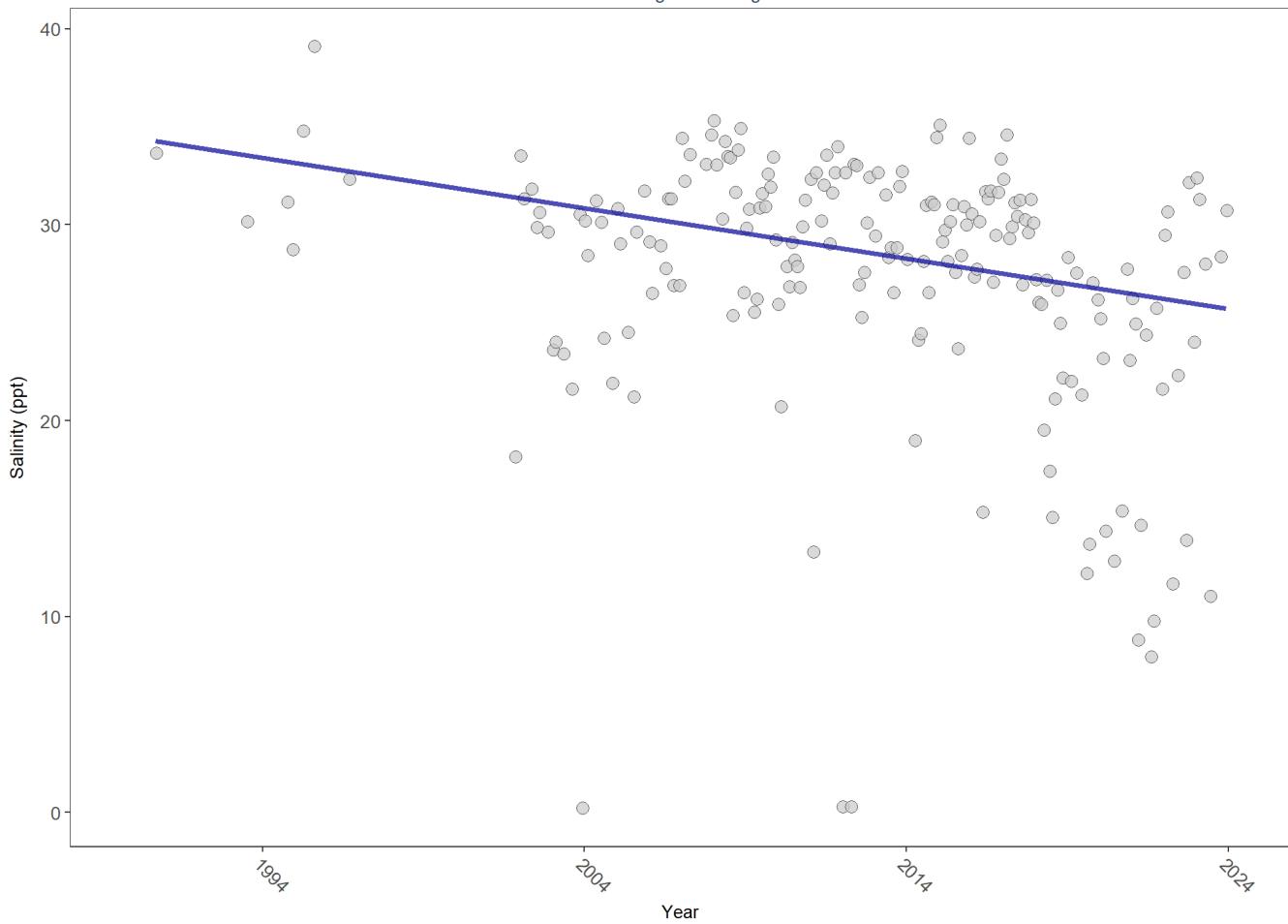
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	92	13	67.65	TRUE	0.2585	0.0069	2.739912	22.71467	14.5334	0.2049	1

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

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Steinhatchee - Big Bend Seagrasses AP

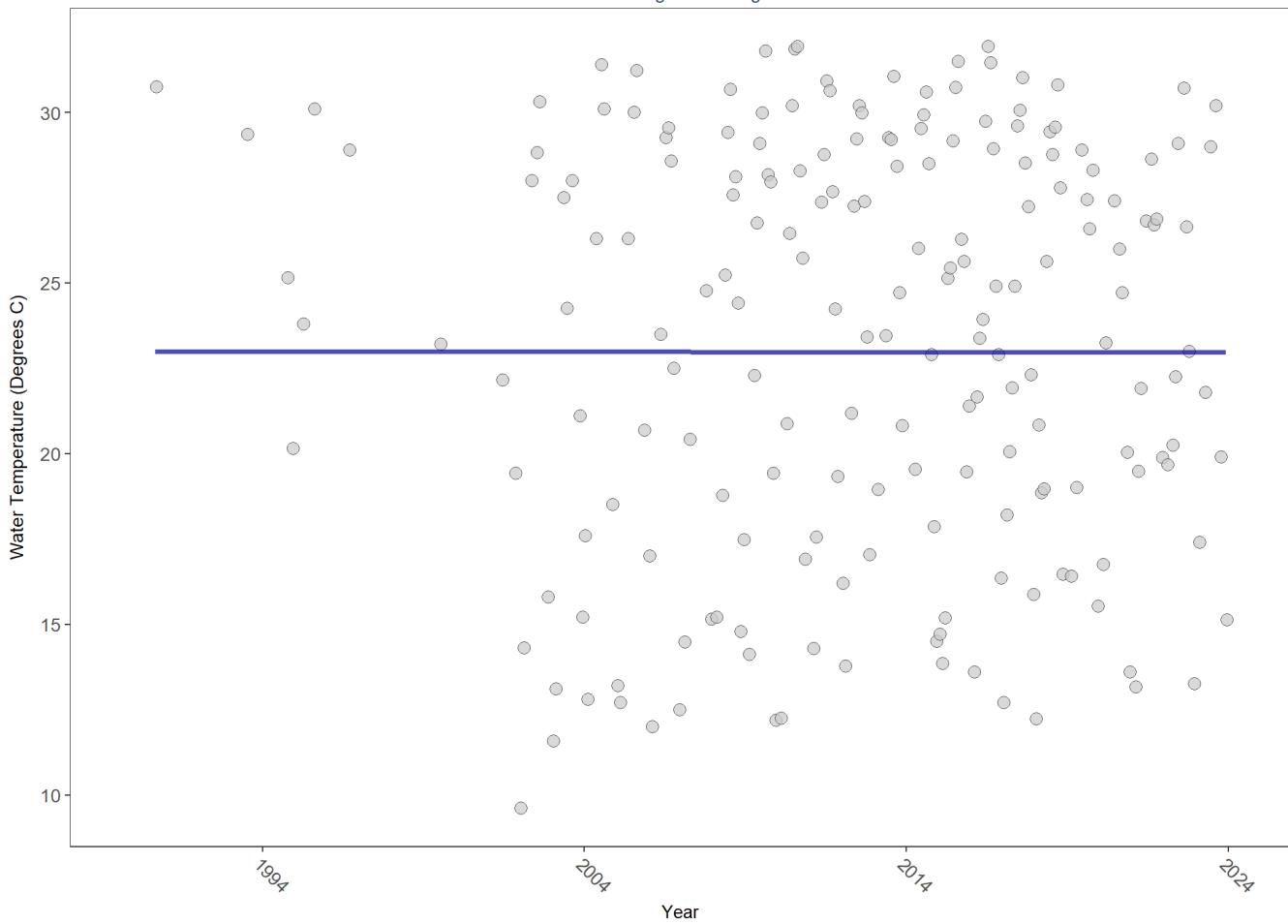


*p < 0.00005 appear as 0 due to rounding.*

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

## Water Temperature

Water Temperature, Field, All Depths  
Steinhatchee - Big Bend Seagrasses AP

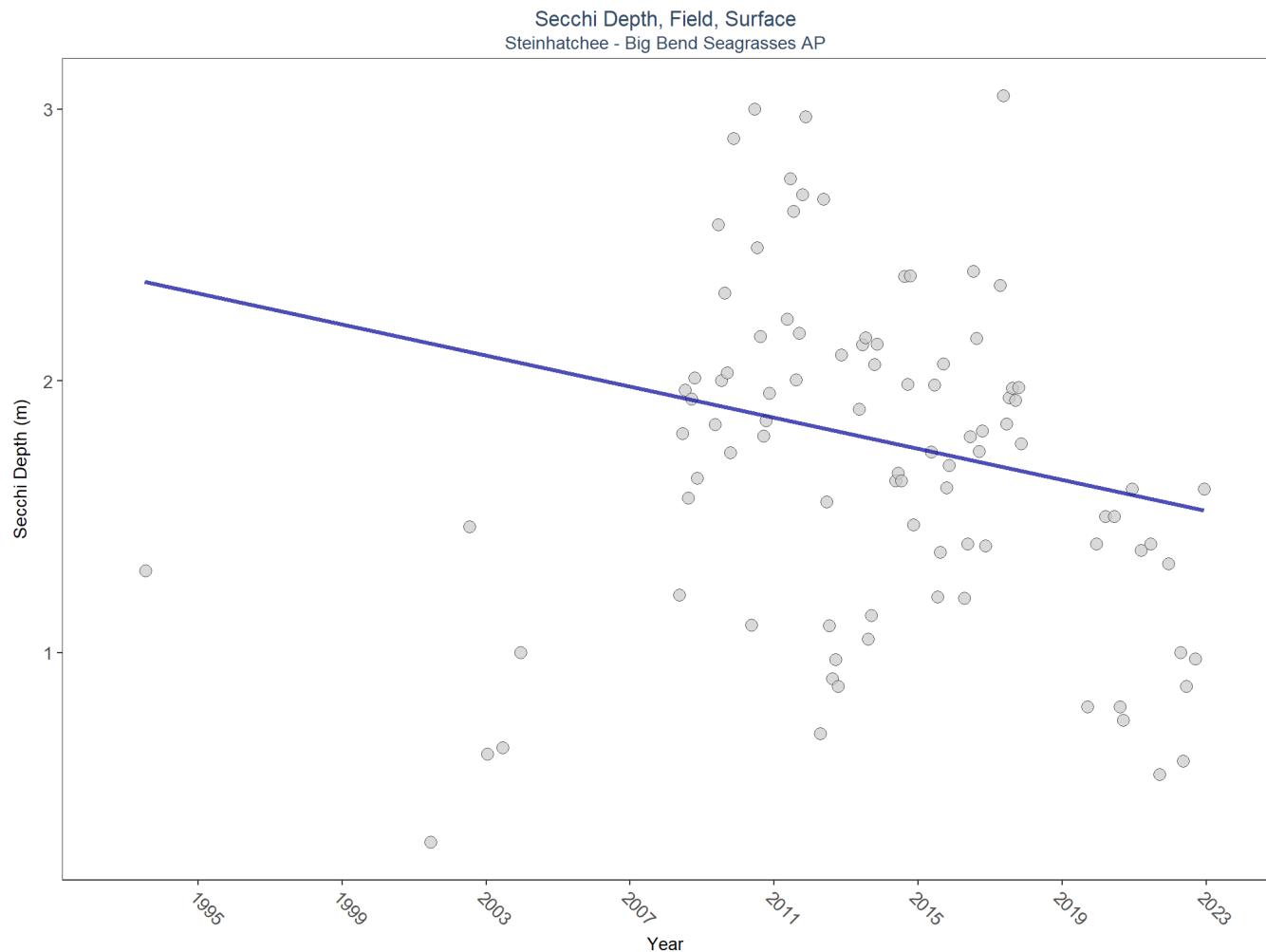


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2723	29	28.1	TRUE	-0.0047	0.9435	-0.000625	22.99502	18.2465	0.076	0

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

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

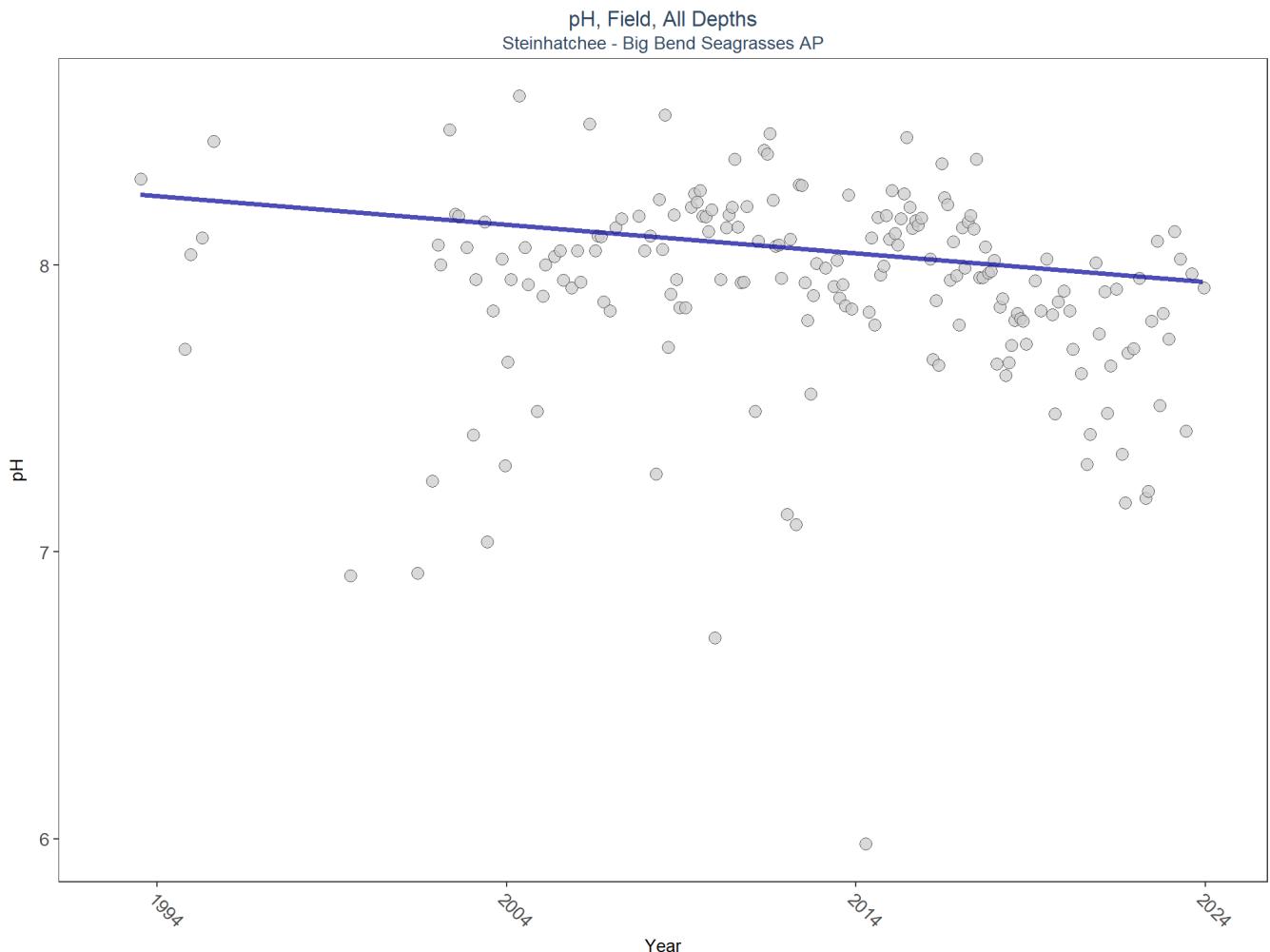
## Secchi Depth



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

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

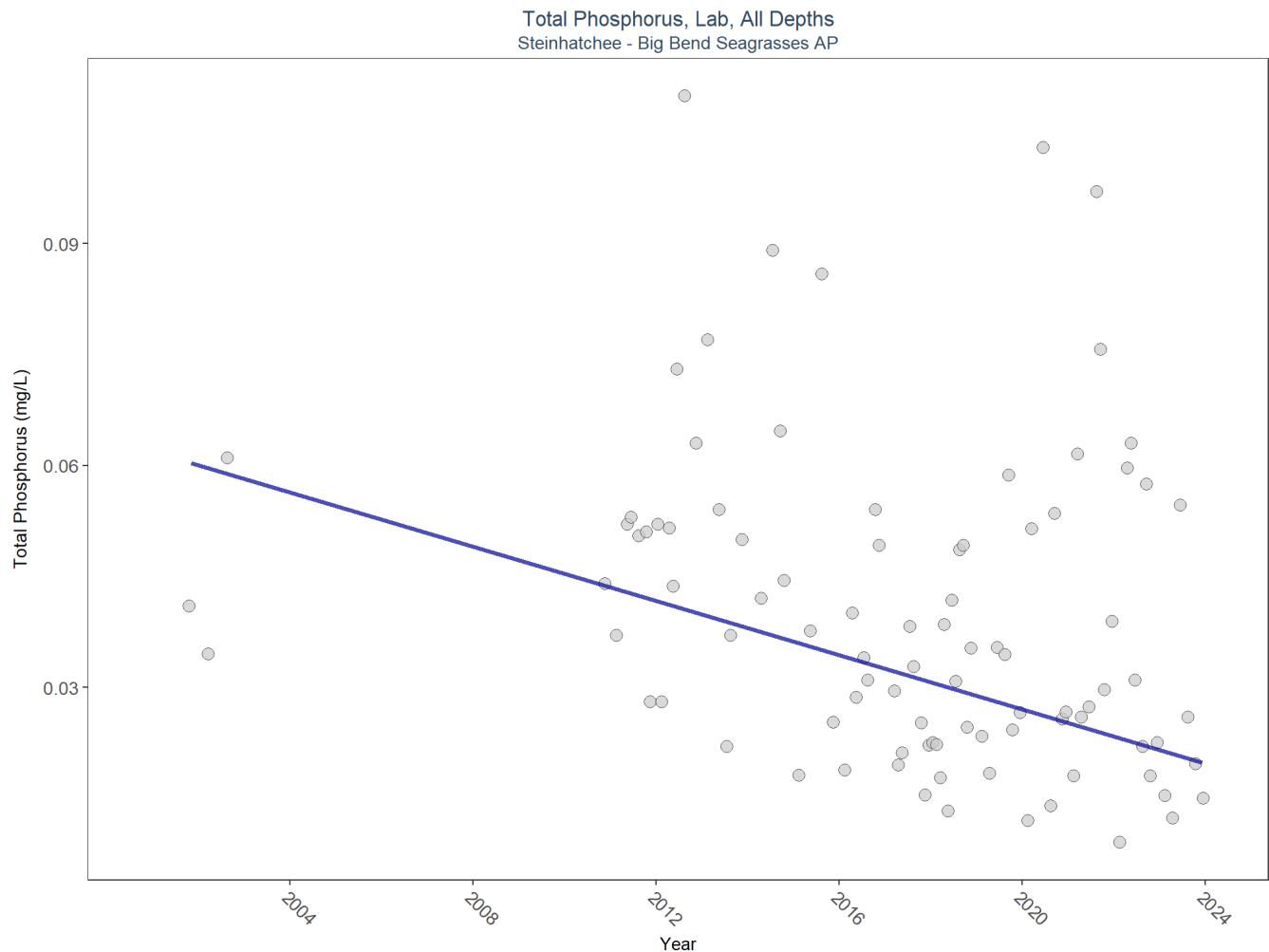
## pH



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

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

## Total Phosphorus



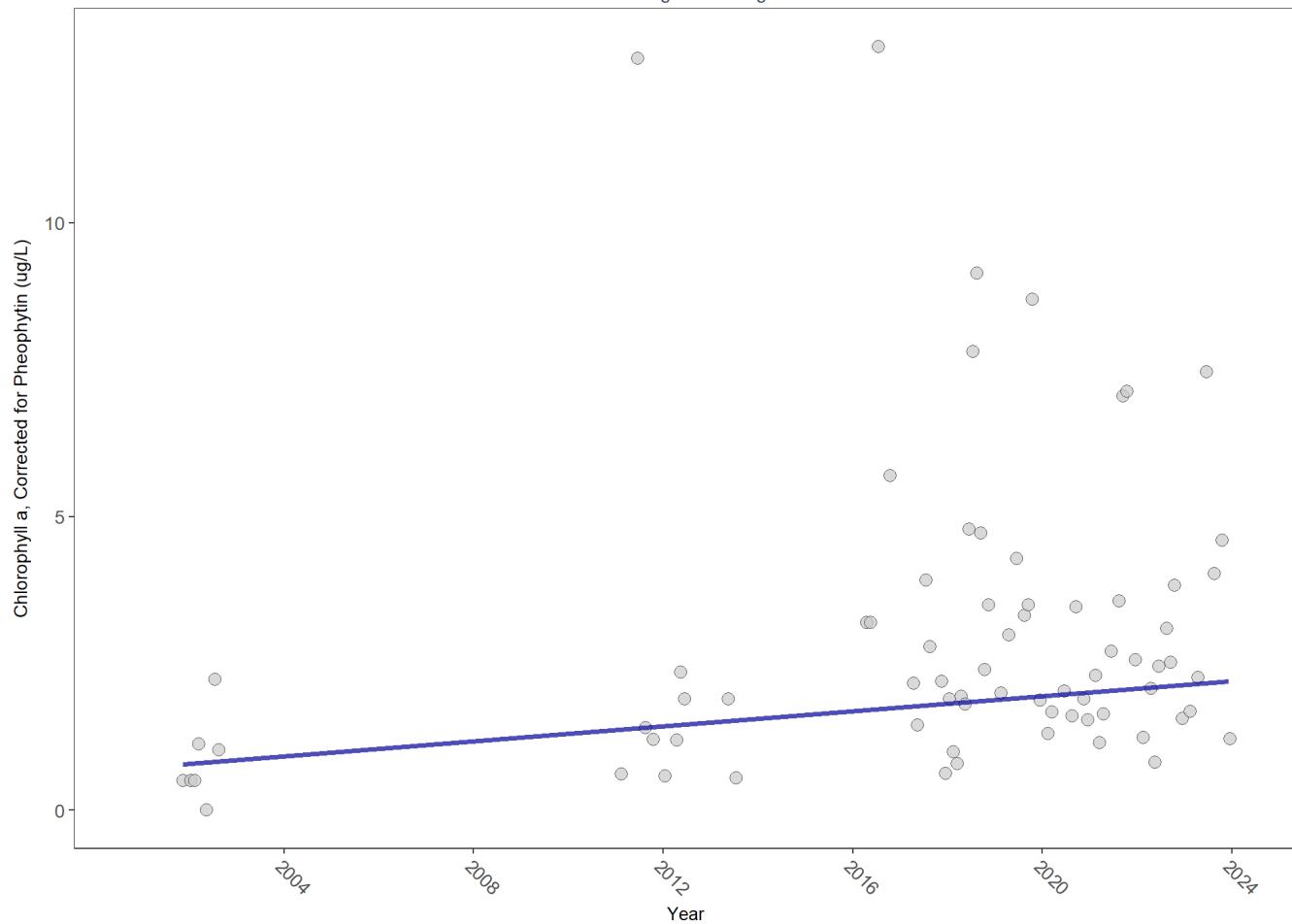
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	282	16	0.029	TRUE	-0.3207	0.0000	-0.001833333	0.06187917	12.9914	0.2939	-1

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

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

## Chlorophyll a, Corrected for Pheophytin

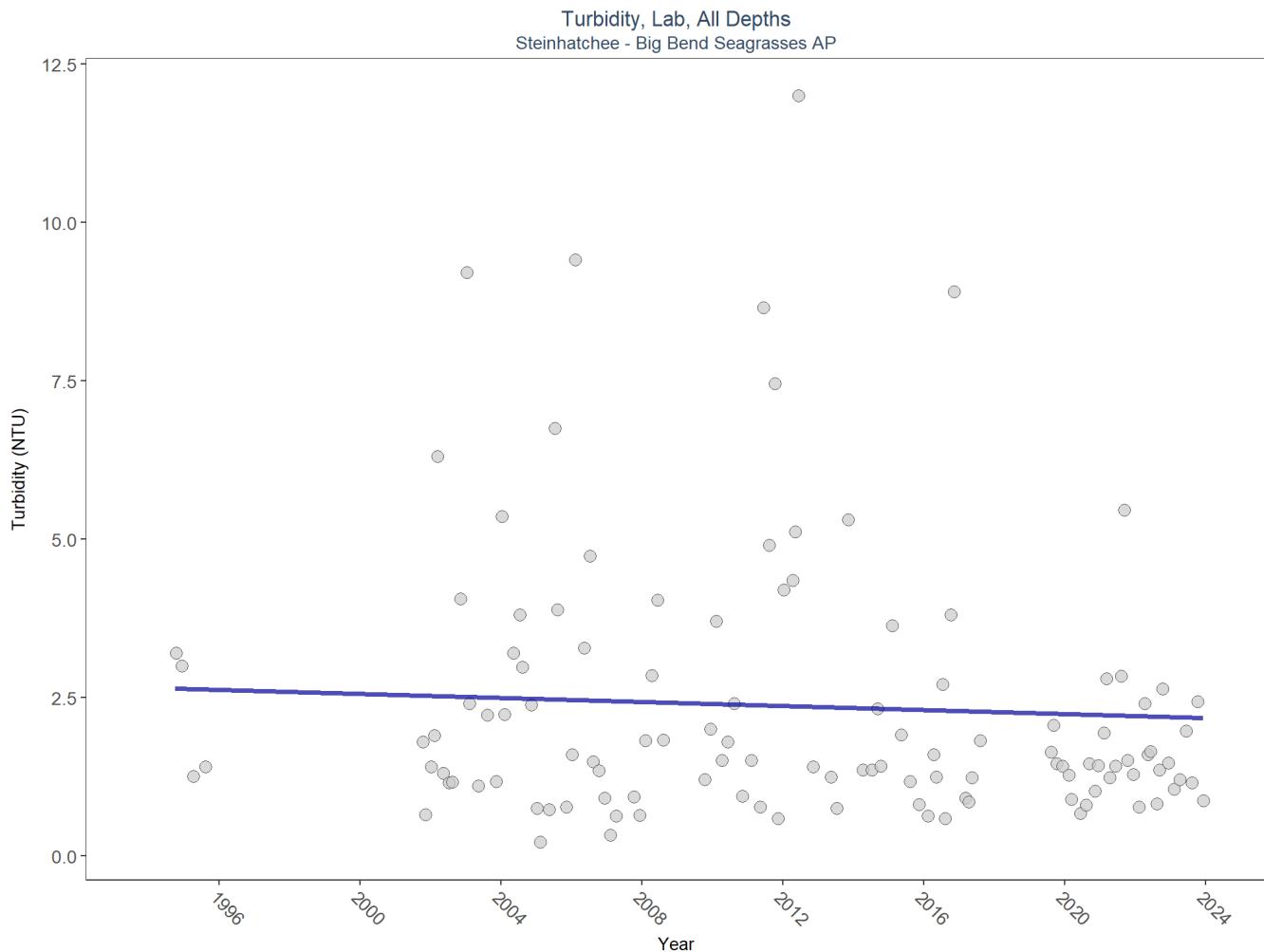
Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Steinhatchee - Big Bend Seagrasses AP



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

SennIntercept is intercept value at beginning of record for monitoring location

## Turbidity

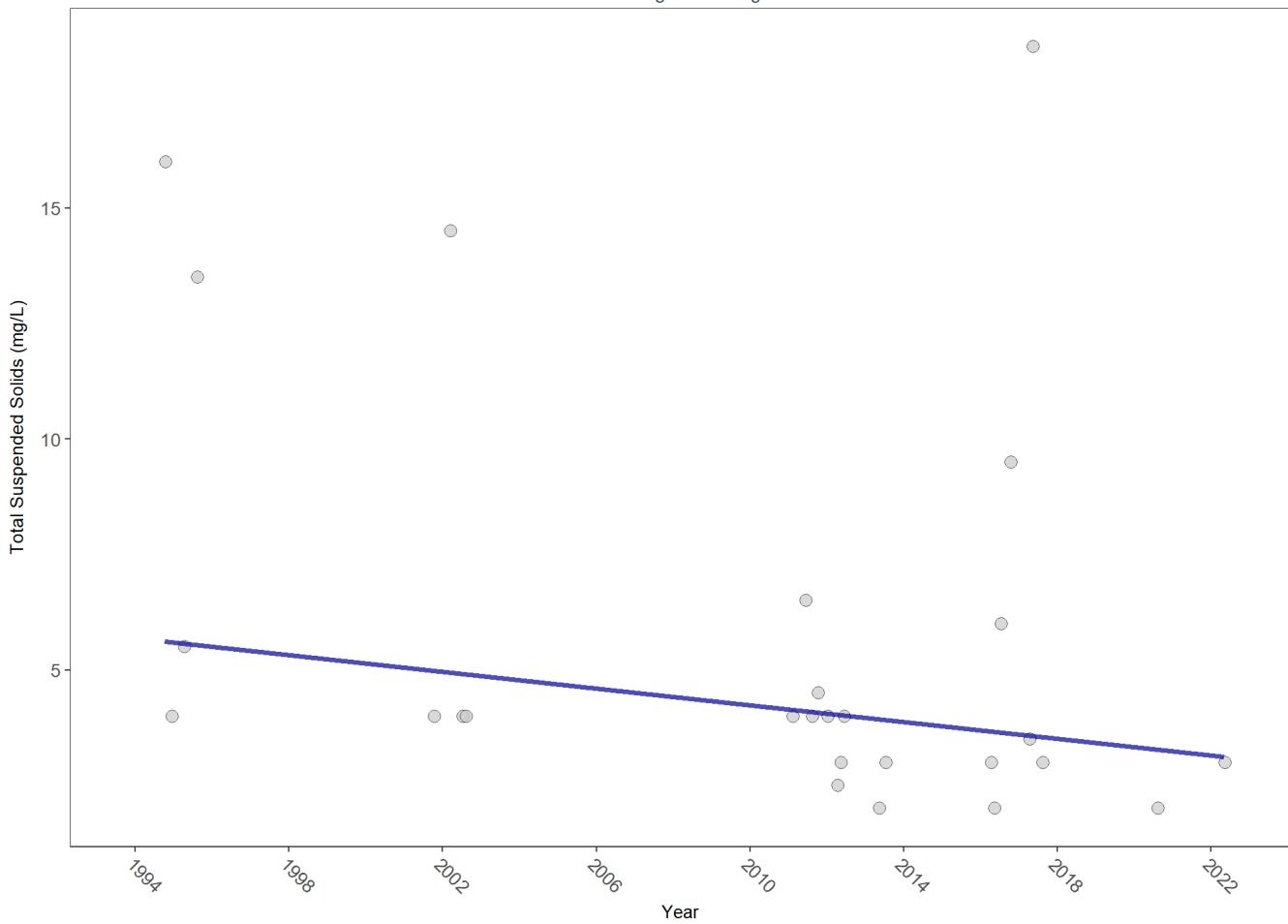


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Suspended Solids

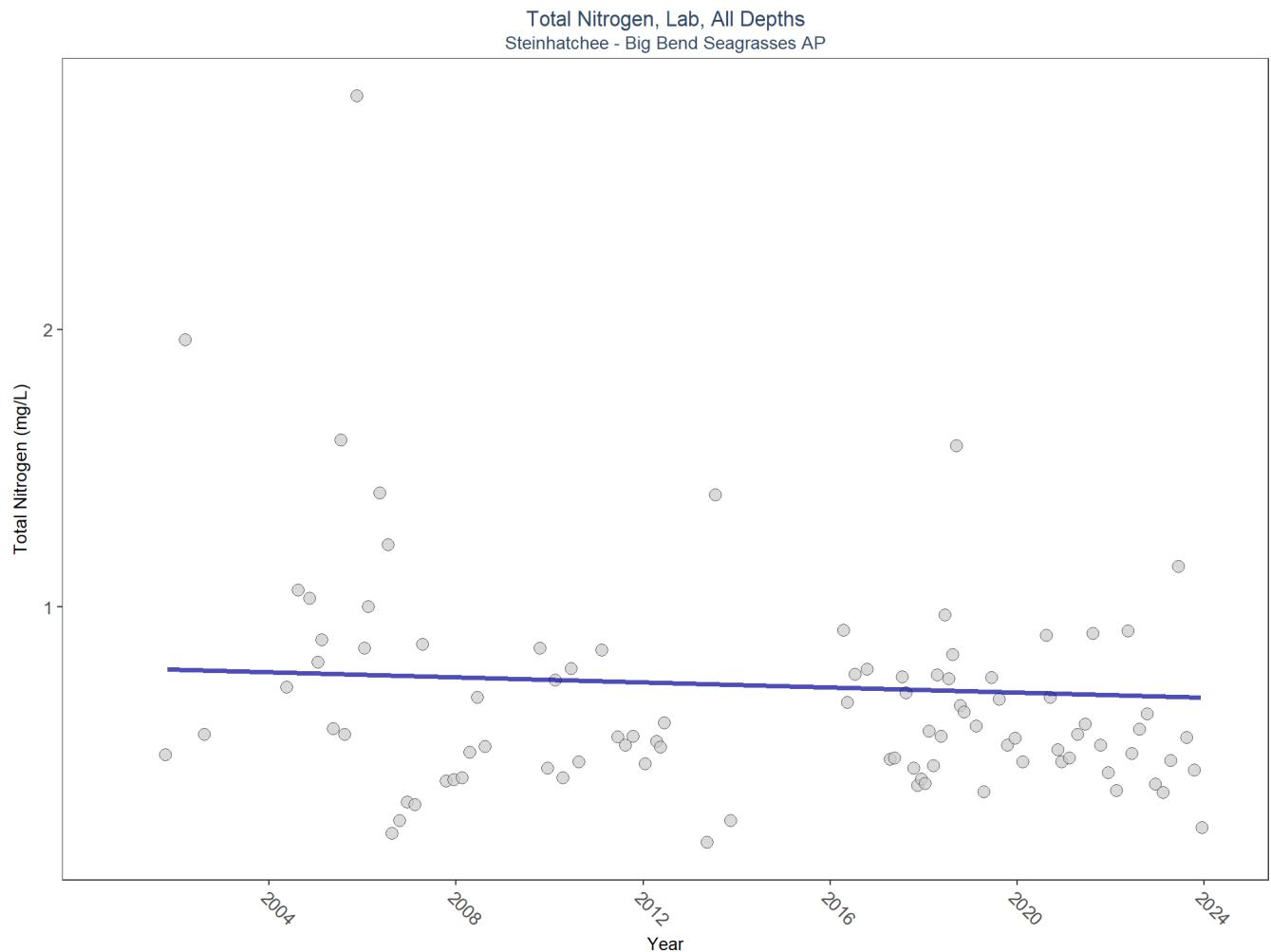
Total Suspended Solids, Lab and Field Combined, All Depths  
Steinhatchee - Big Bend Seagrasses AP



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

SennIntercept is intercept value at beginning of record for monitoring location

## Total Nitrogen



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

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

## Submerged Aquatic Vegetation

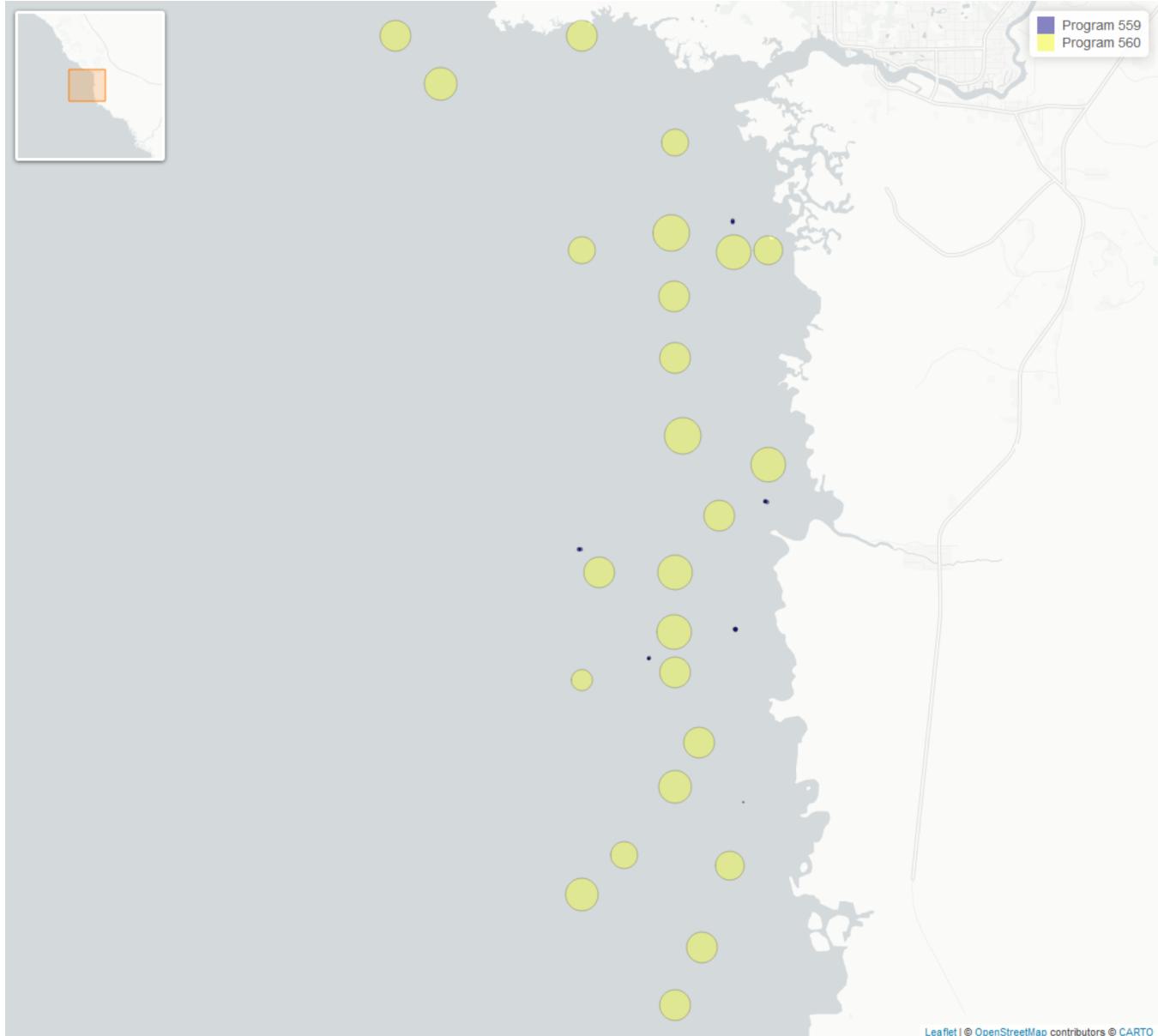


Table 3: Northern Big Bend Seagrass Monitoring - *Program 559*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
82	2012	2018	Modified Braun Blanquet	32

Table 4: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
5932	2000	2023	Modified Braun Blanquet	25
650	2022	2023	Percent Cover	25

## Median Percent Cover - Species Trends



## Median Percent Cover - Species Trend Table

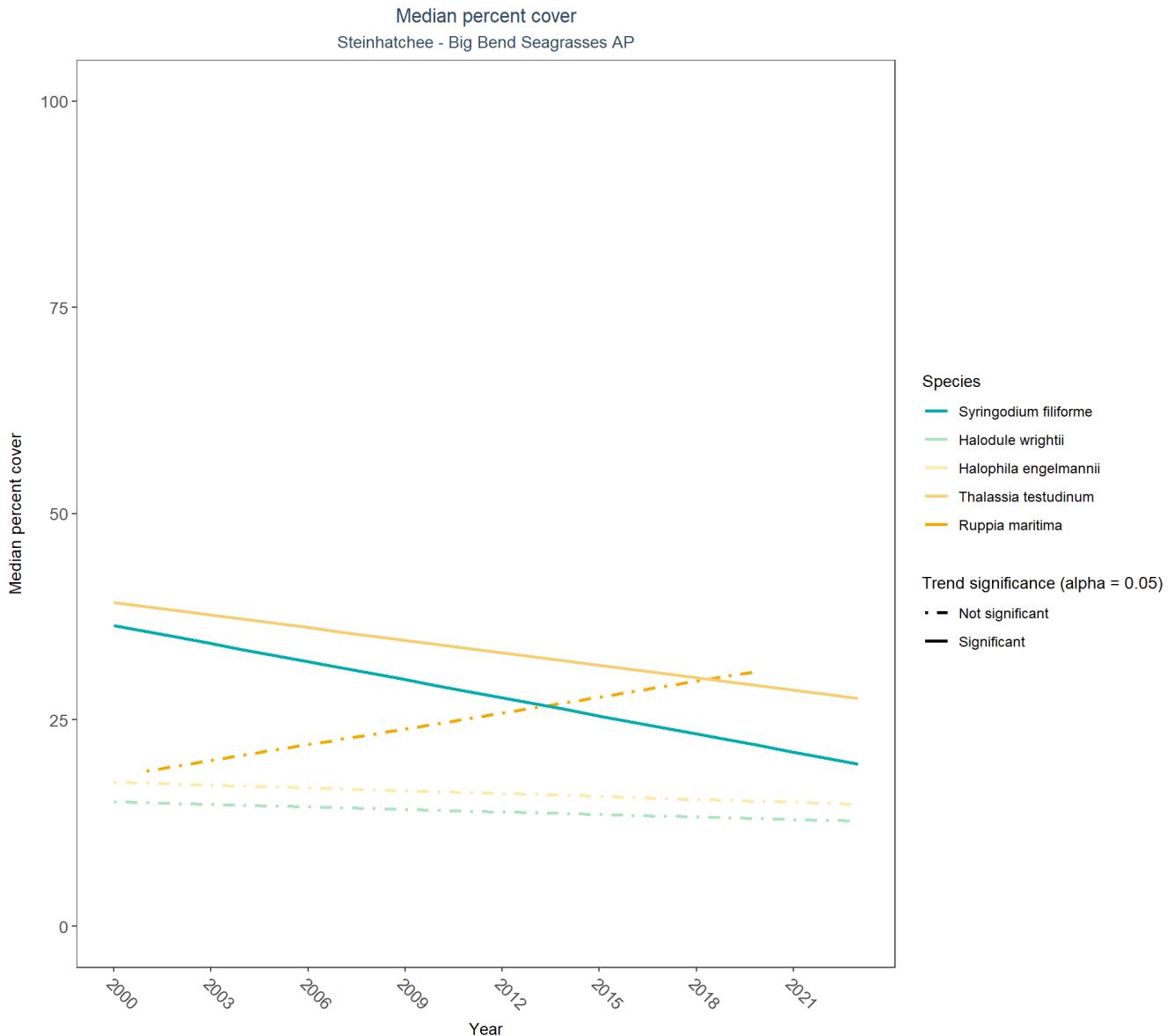
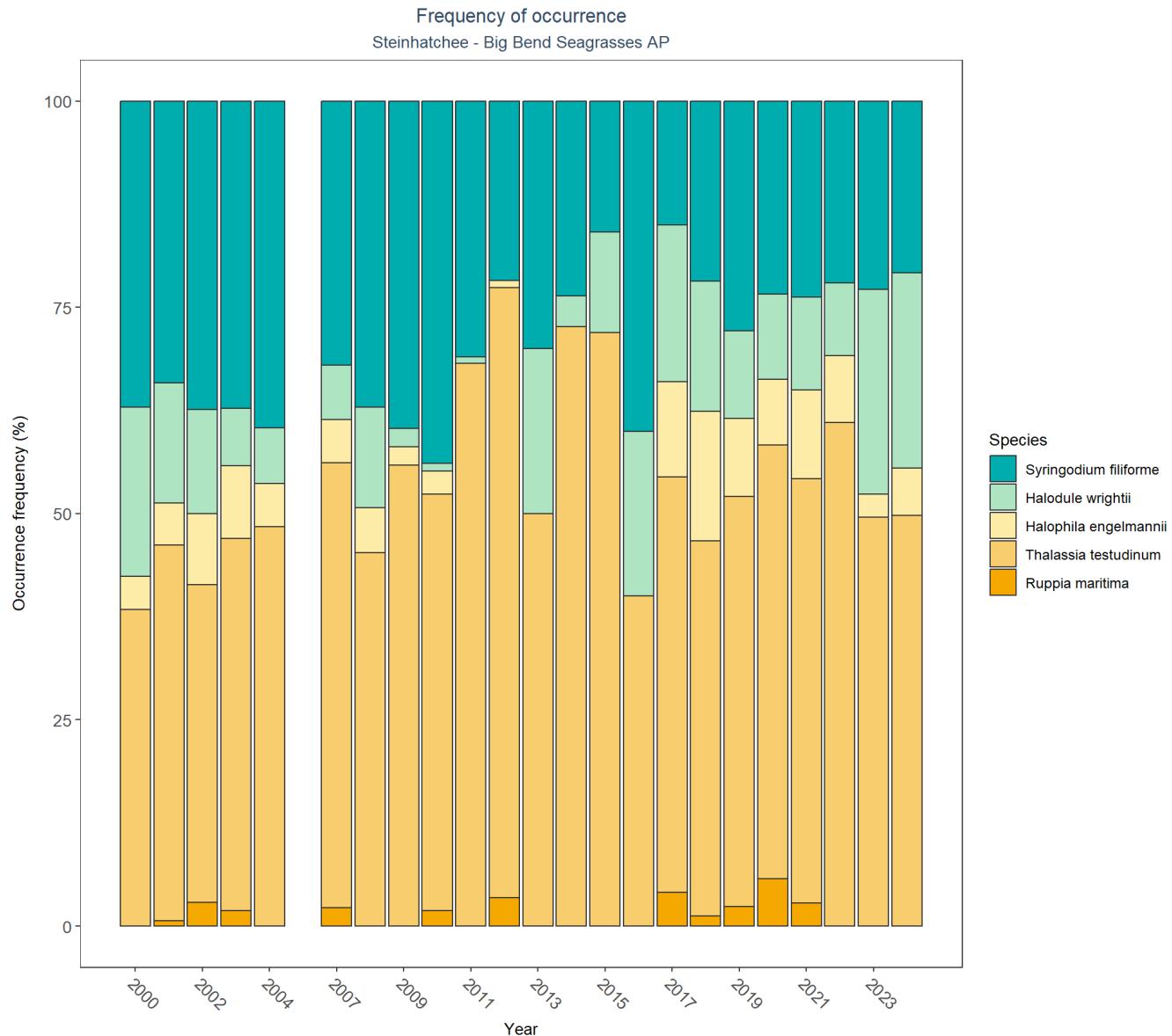


Table 5: Percent Cover Trend Analysis for Steinhatchee

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	No significant trend	2000 - 2023	17.0667	0.1788	0.3118
Halodule wrightii	No significant trend	2000 - 2023	15.0705	-0.1016	0.6154
Halophila engelmannii	No significant trend	2000 - 2023	17.4504	-0.1148	0.6068
No grass In Quadrat	Model did not fit the available data	2004 - 2023	-	-	-
Ruppia maritima	No significant trend	2001 - 2020	18.1473	0.6401	0.2906
Syringodium filiforme	Significantly decreasing trend	2000 - 2023	36.4470	-0.7298	0.0000
Thalassia testudinum	Significantly decreasing trend	2000 - 2023	39.2272	-0.5062	0.0000

## Frequency of Occurrence Barplots



## St. Marks

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

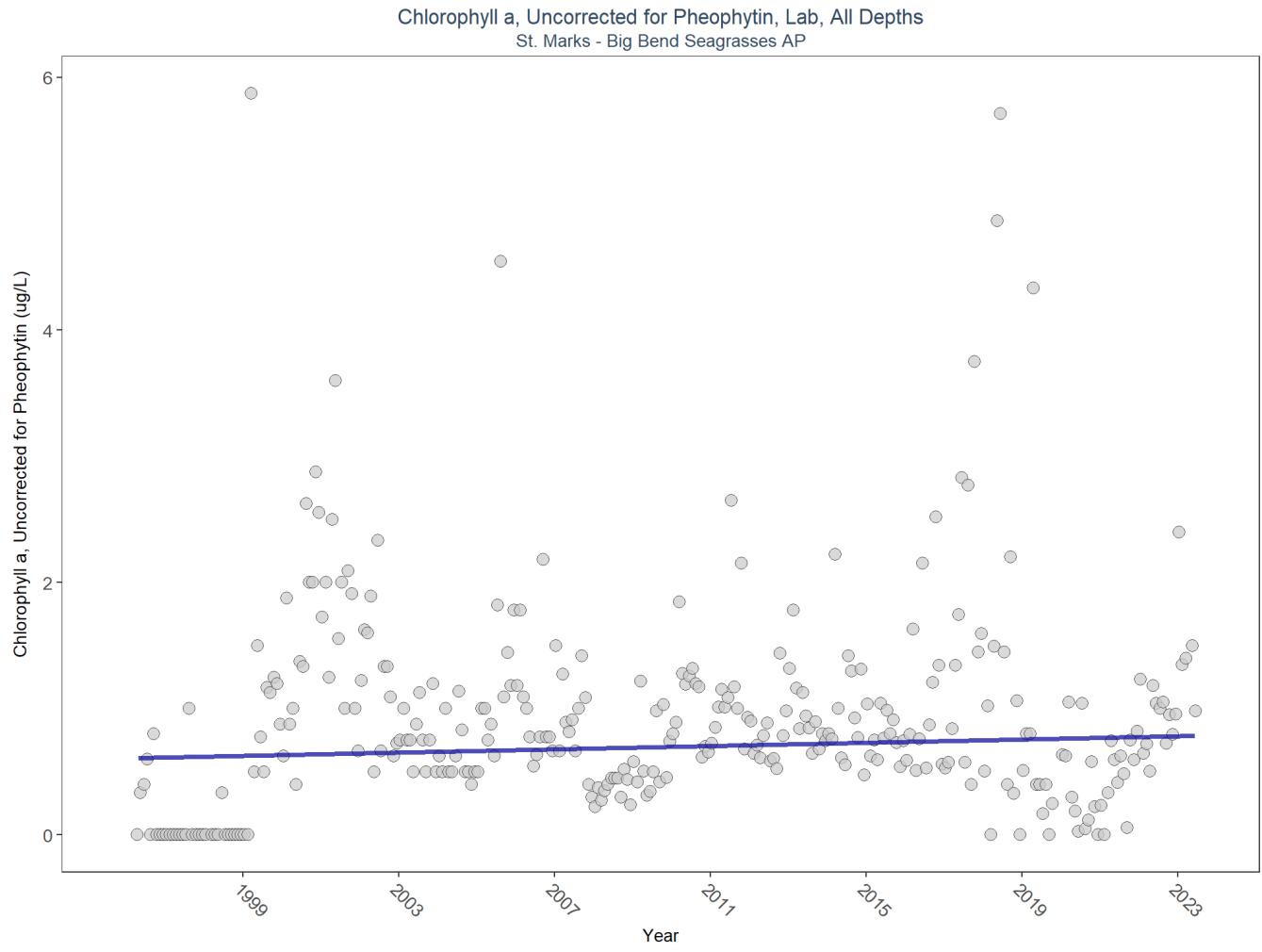
St. Marks contains a *large trend*. Trends marked in  $\uparrow$  or  $\downarrow$  are deemed *large* trends, meaning the p value is less than 5% and the slope is greater than 10% of the median value.

Table 6: Seasonal Kendall-Tau Results for St. Marks

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	1996 - 2023	28	2504	TRUE	0.01	0.61	0.0724	0
Dissolved Oxygen	1993 - 2023	25	3317	TRUE	-0.06	6.59	0.0011	$\downarrow$
Dissolved Oxygen Saturation	2001 - 2023	13	338	TRUE	-2.68	132.25	0.0002	$\downarrow$
Salinity	1964 - 2023	28	3521	TRUE	-0.55	51.60	0.0000	$\downarrow$
Water Temperature	1964 - 2023	27	3656	TRUE	0.03	21.36	0.0256	$\uparrow$
Secchi Depth	1993 - 2023	30	4211	TRUE	-0.06	4.33	0.0000	$\downarrow$
pH	1964 - 2023	25	3094	TRUE	0.00	7.67	0.8660	0
Total Phosphorus	1992 - 2023	29	2663	TRUE	0.00	0.00	0.0000	$\uparrow$
Colored Dissolved Organic Matter	2001 - 2023	23	1943	TRUE	0.47	1.83	0.0000	$\uparrow$
Chlorophyll a, Corrected for Pheophytin	1999 - 2023	25	1238	TRUE	-0.02	1.07	0.0000	$\downarrow$
Turbidity	1992 - 2023	27	1227	TRUE	0.01	0.77	0.1664	0
Total Suspended Solids	1992 - 2023	27	863	TRUE	-0.09	5.51	0.0000	$\downarrow$
Total Nitrogen	1992 - 2023	29	4174	TRUE	0.00	0.34	0.0283	$\downarrow$

## Discrete WQ

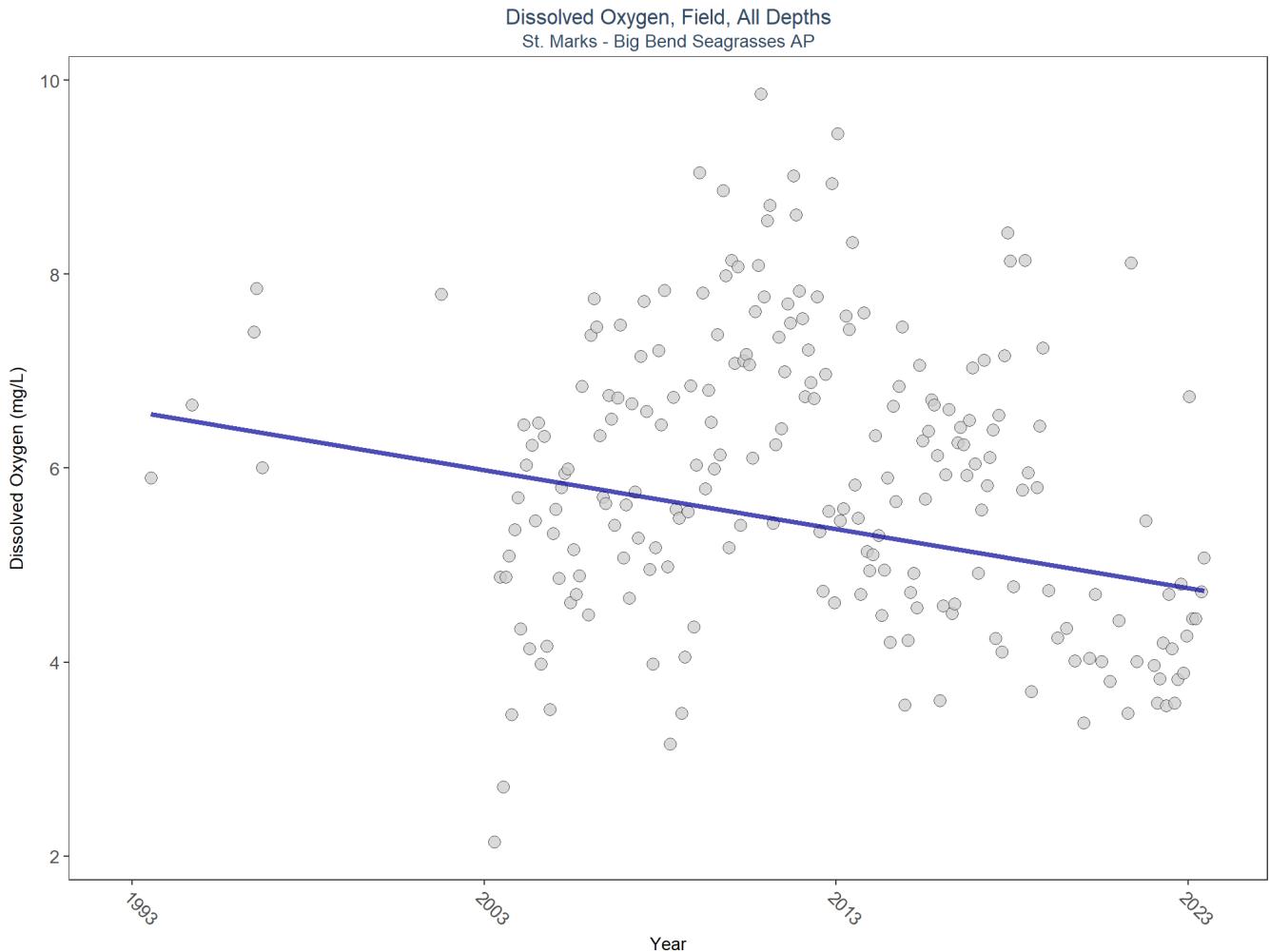
### Chlorophyll a, Uncorrected for Pheophytin



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

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

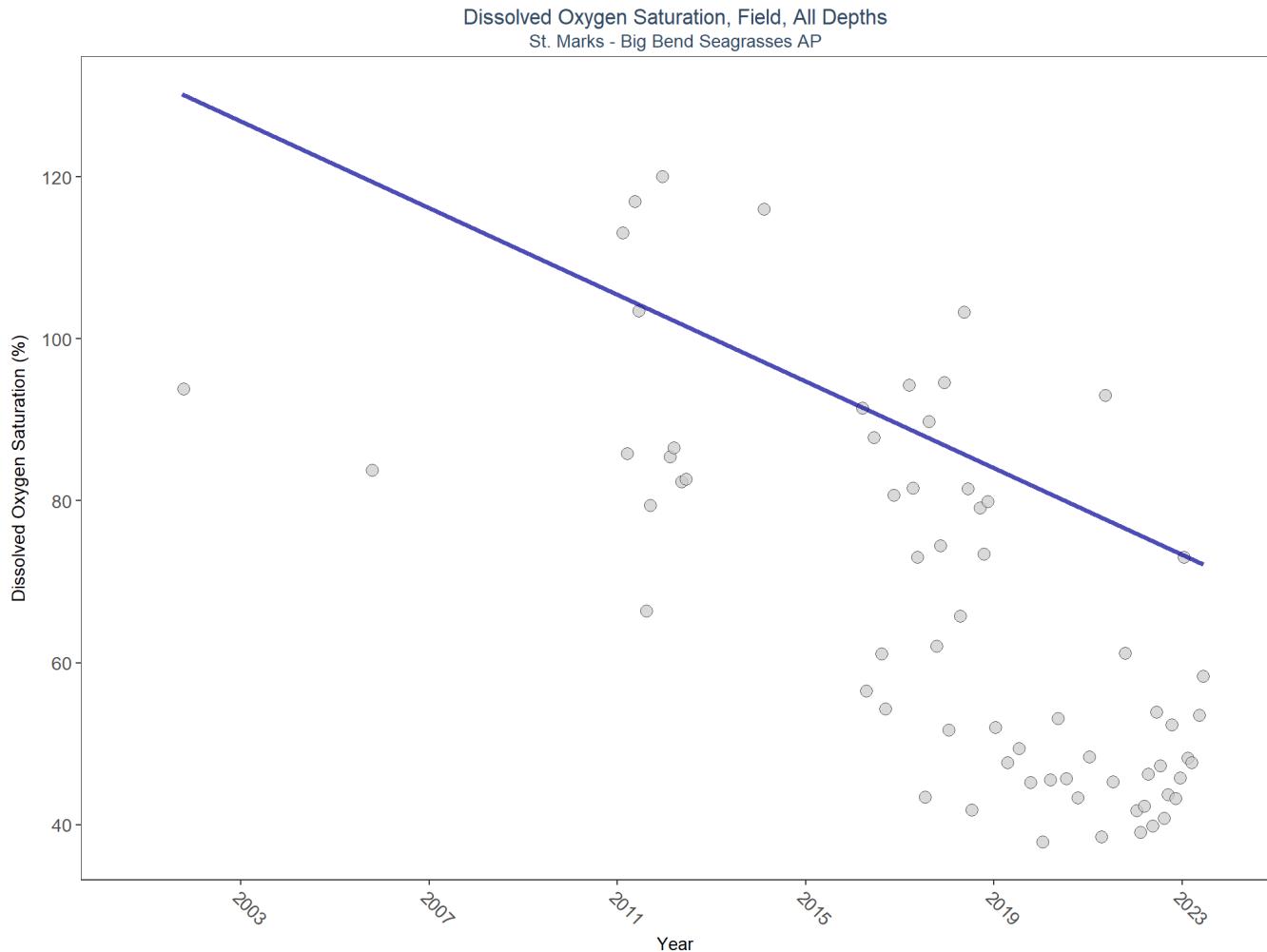
## Dissolved Oxygen



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

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

## Dissolved Oxygen Saturation



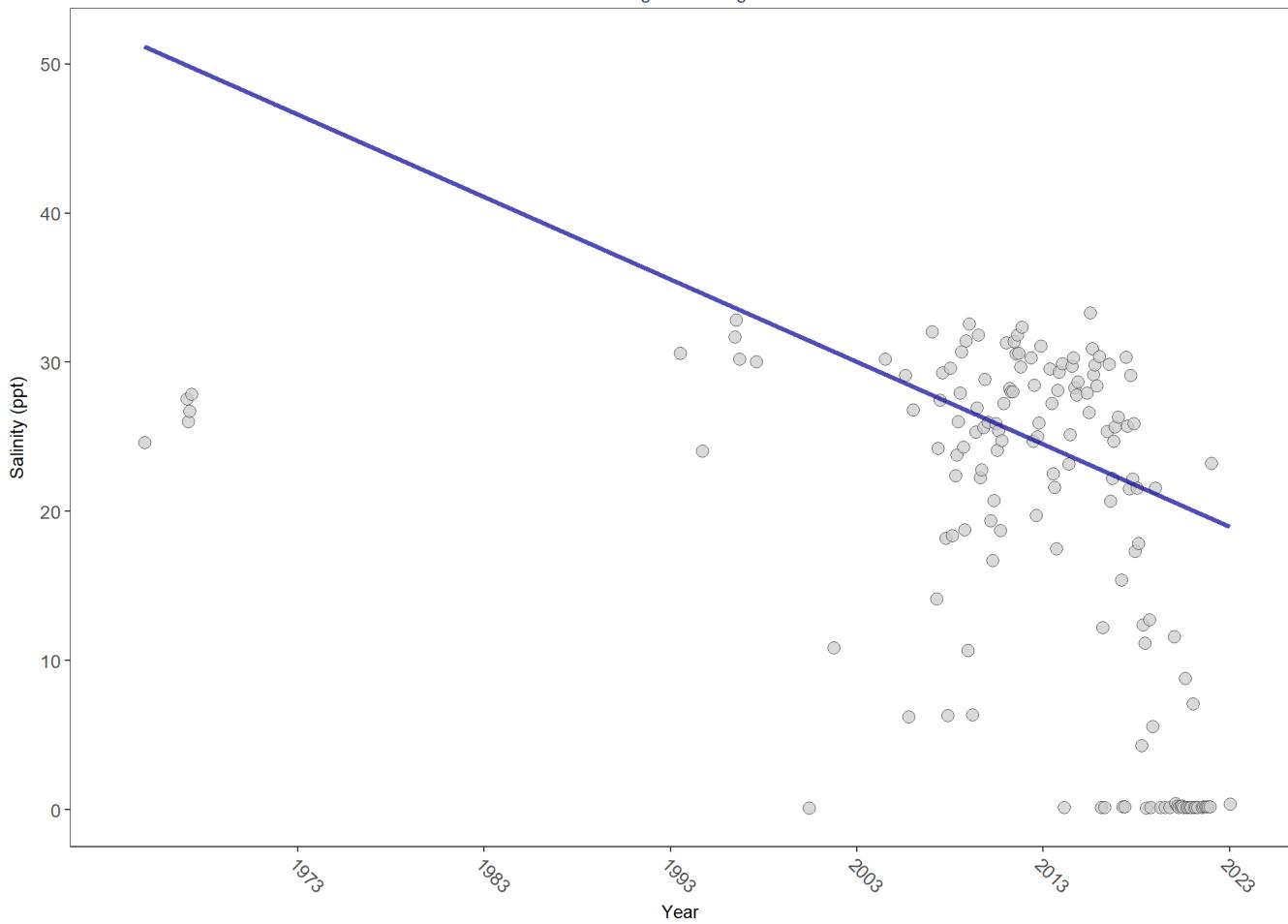
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	338	13	69.6	TRUE	-0.419	0.0002	-2.677408	132.2521	9.4345	0.5818	-1

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

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

## Salinity

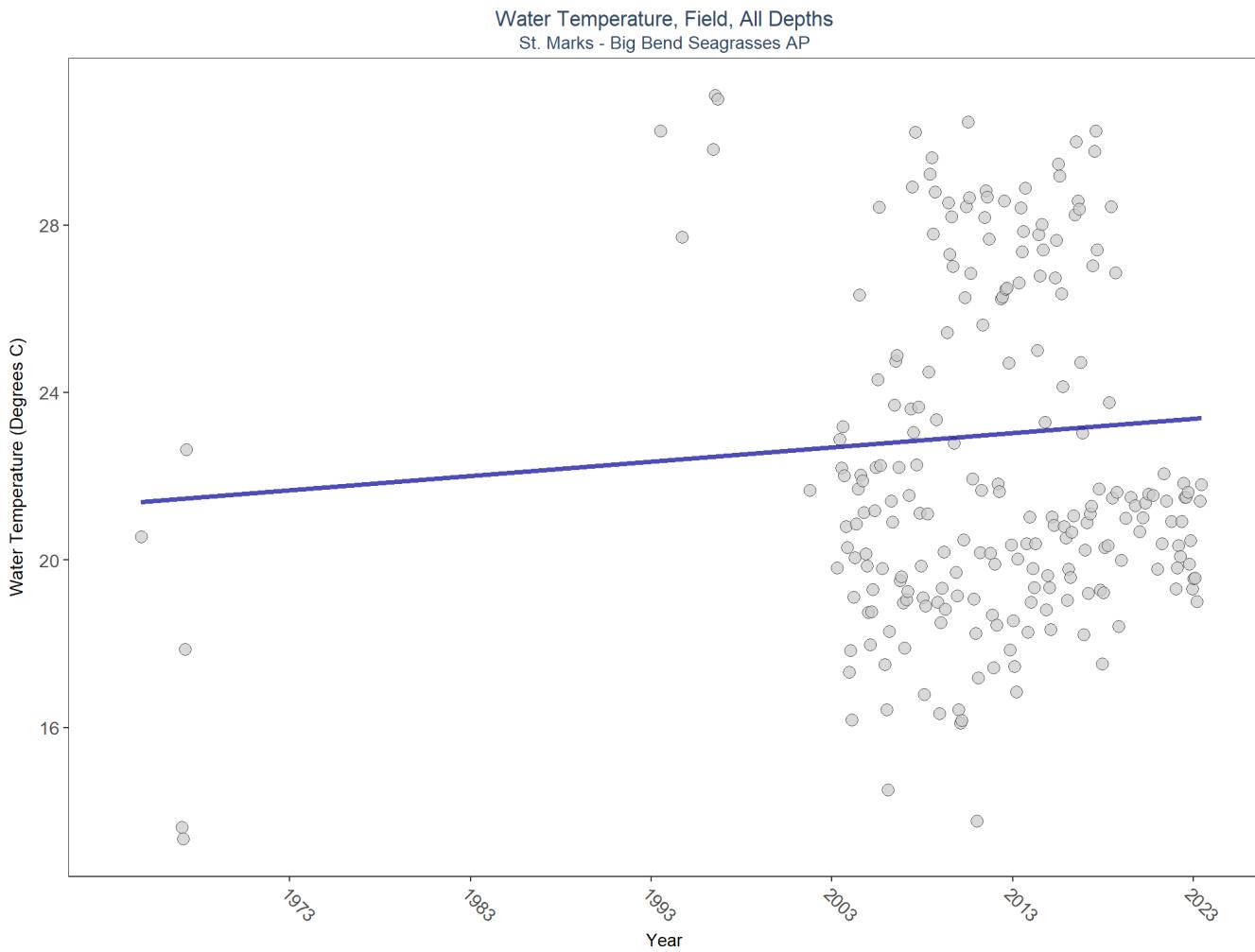
Salinity, Lab and Field Combined, All Depths  
St. Marks - Big Bend Seagrasses AP



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

SennIntercept is intercept value at beginning of record for monitoring location

## Water Temperature

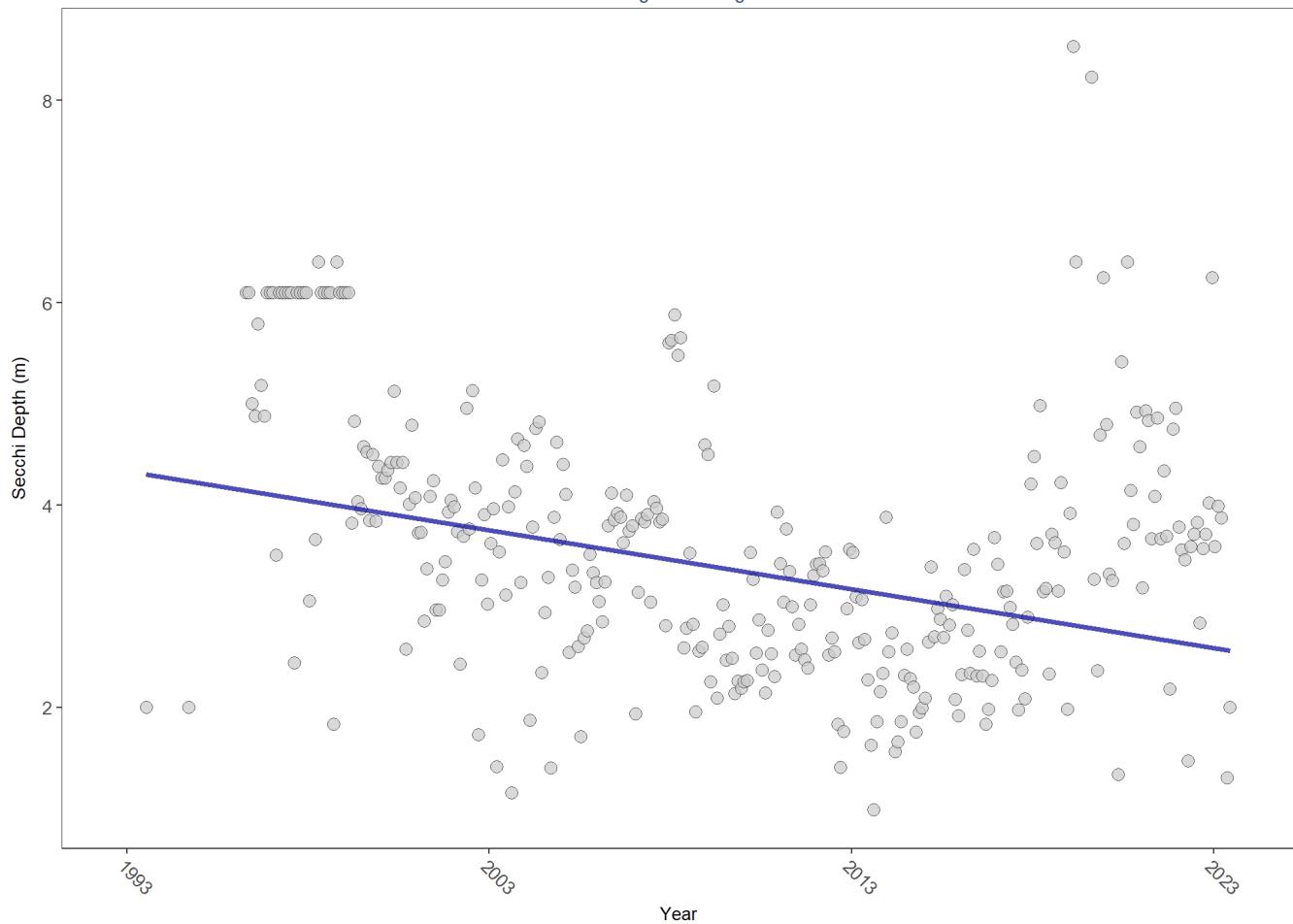


*p < 0.00005 appear as 0 due to rounding.*

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

## Secchi Depth

Secchi Depth, Field, Surface  
St. Marks - Big Bend Seagrasses AP

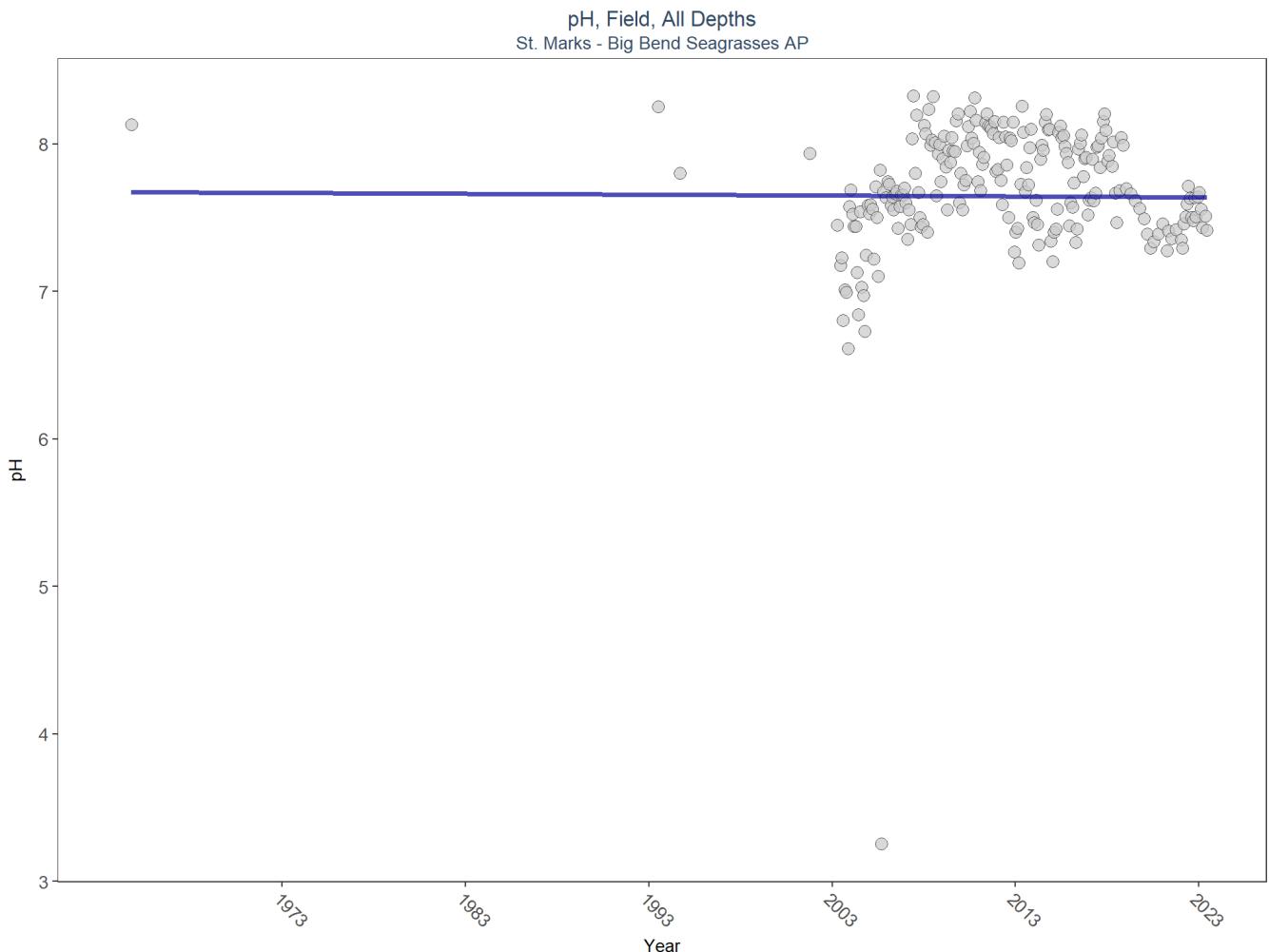


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
Surface	4211	30	2.43843	TRUE	-0.2484	0.0000	-0.05823109	4.332192	25.9634	0.0066	-1

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

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

## pH

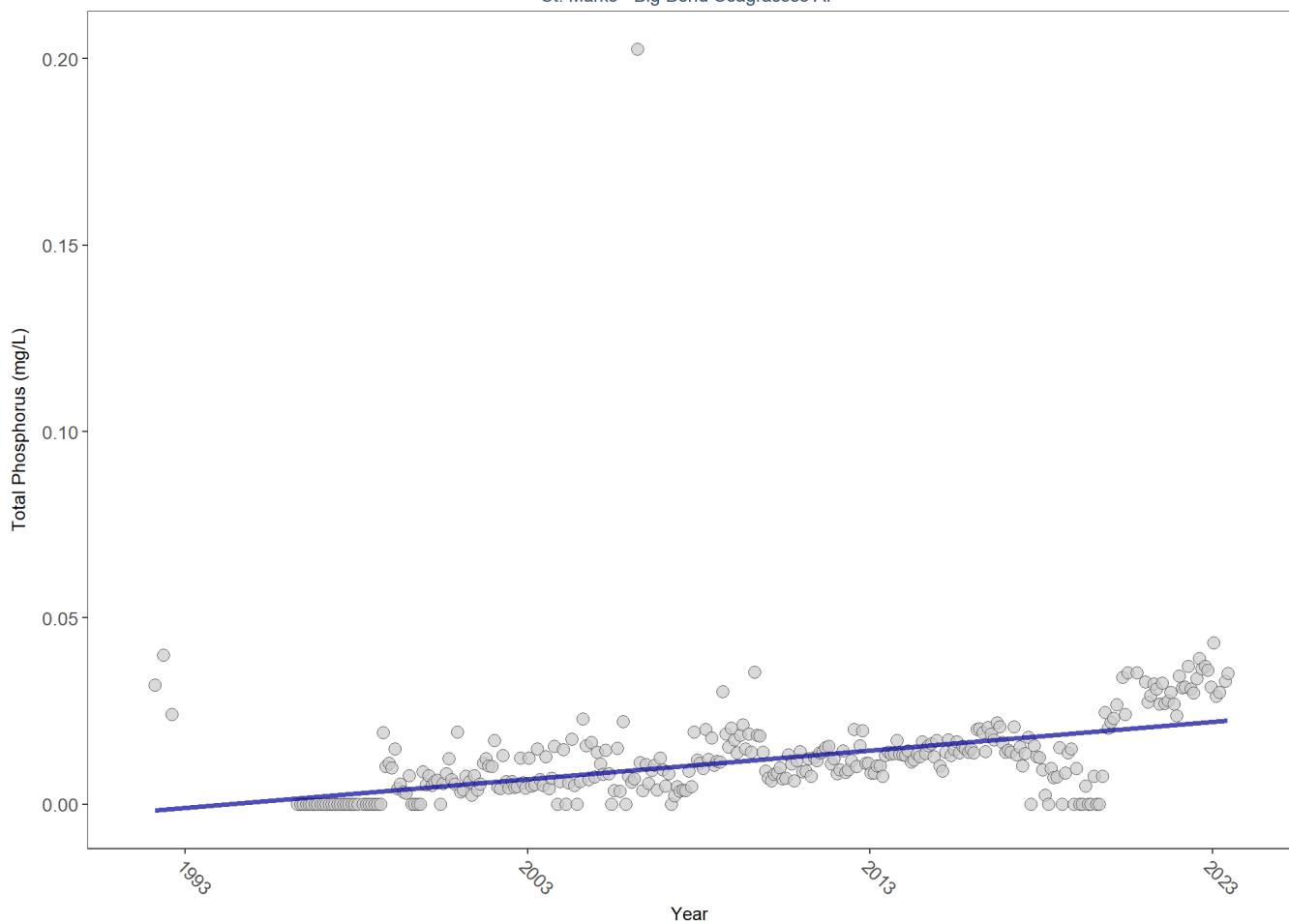


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Phosphorus

Total Phosphorus, Lab, All Depths  
St. Marks - Big Bend Seagrasses AP



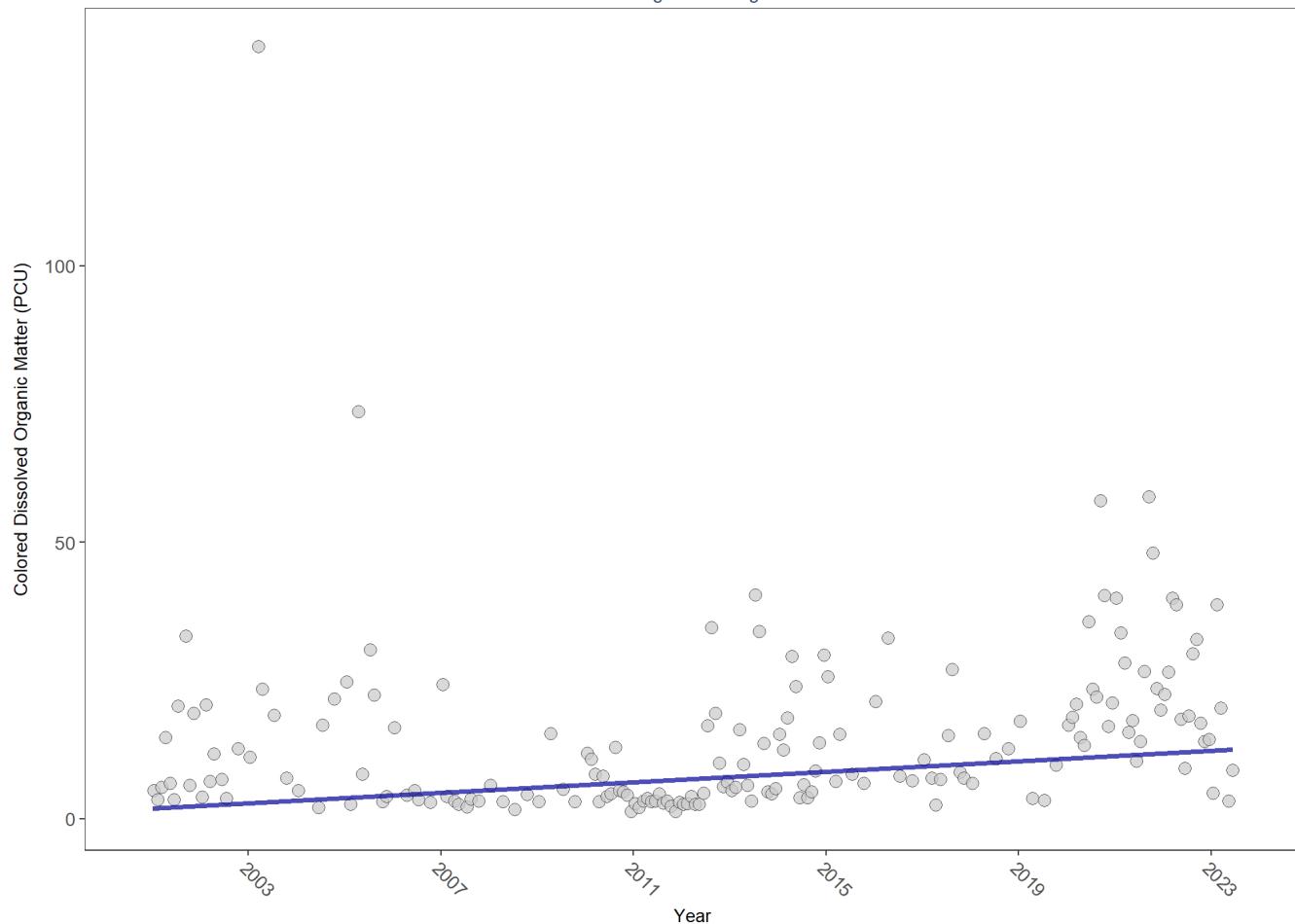
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	2663	29	3.1e-05	TRUE	0.4745	0.0000	0.0007742033	-0.001768521	6.8644	0.81	2

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

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

## Colored Dissolved Organic Matter

Colored Dissolved Organic Matter, Lab, All Depths  
St. Marks - Big Bend Seagrasses AP



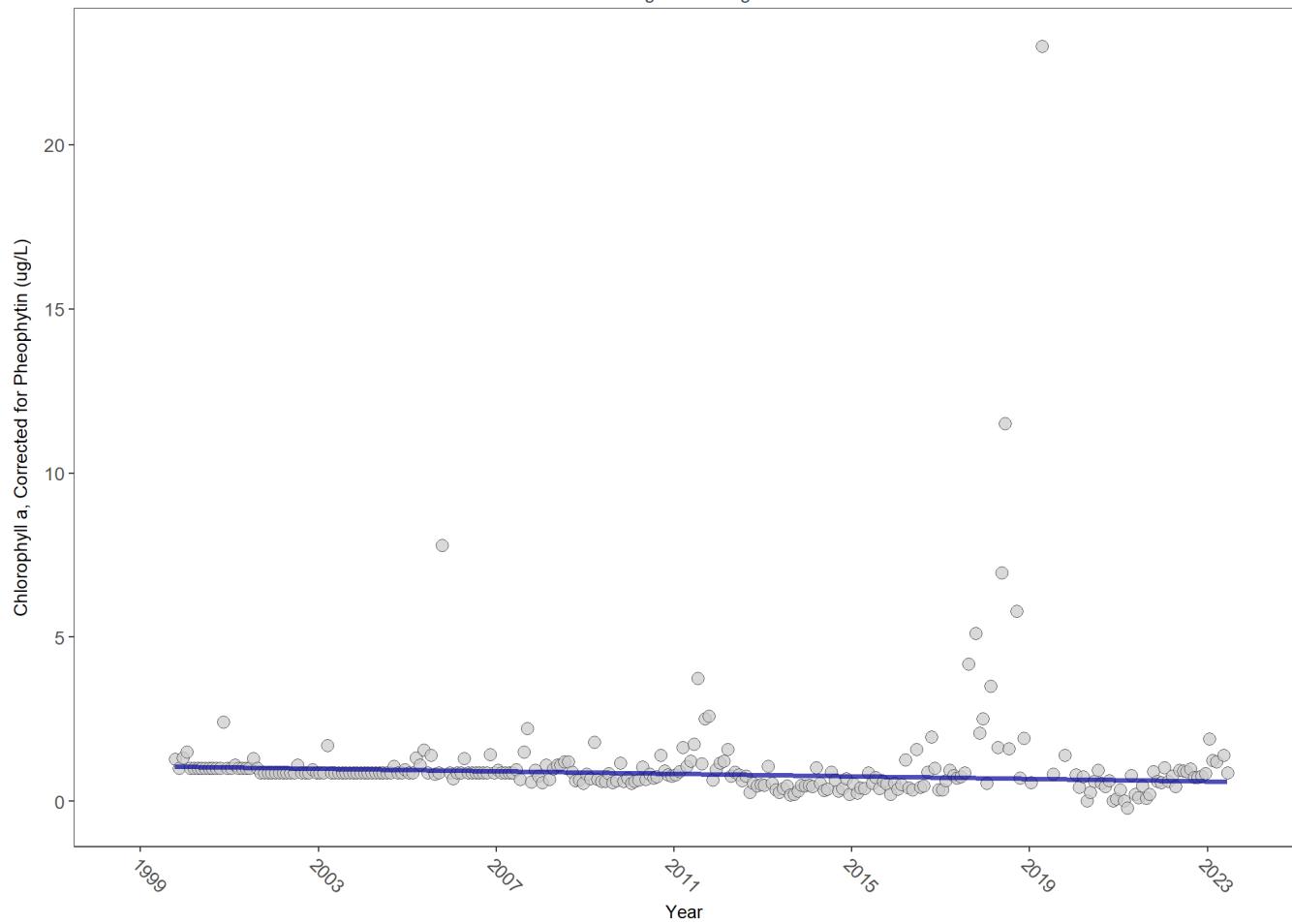
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1943	23	15.194	TRUE	0.2866	0.0000	0.4746429	1.826217	4.8897	0.9364	1

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

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

## Chlorophyll a, Corrected for Pheophytin

Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
St. Marks - Big Bend Seagrasses AP

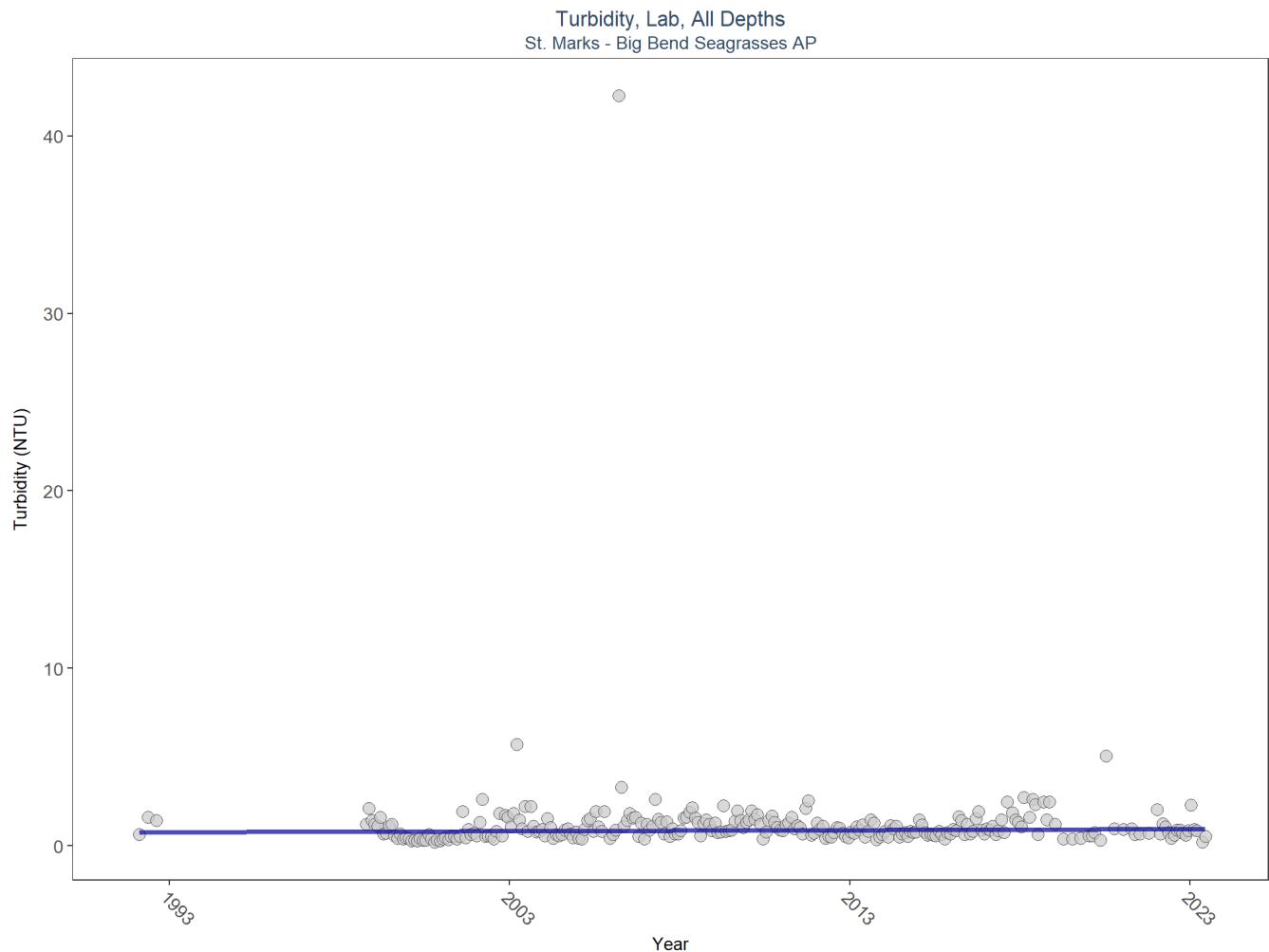


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1238	25	0.74	TRUE	-0.2519	0.0000	-0.01877976	1.066492	3.9641	0.971	-1

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

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

## Turbidity

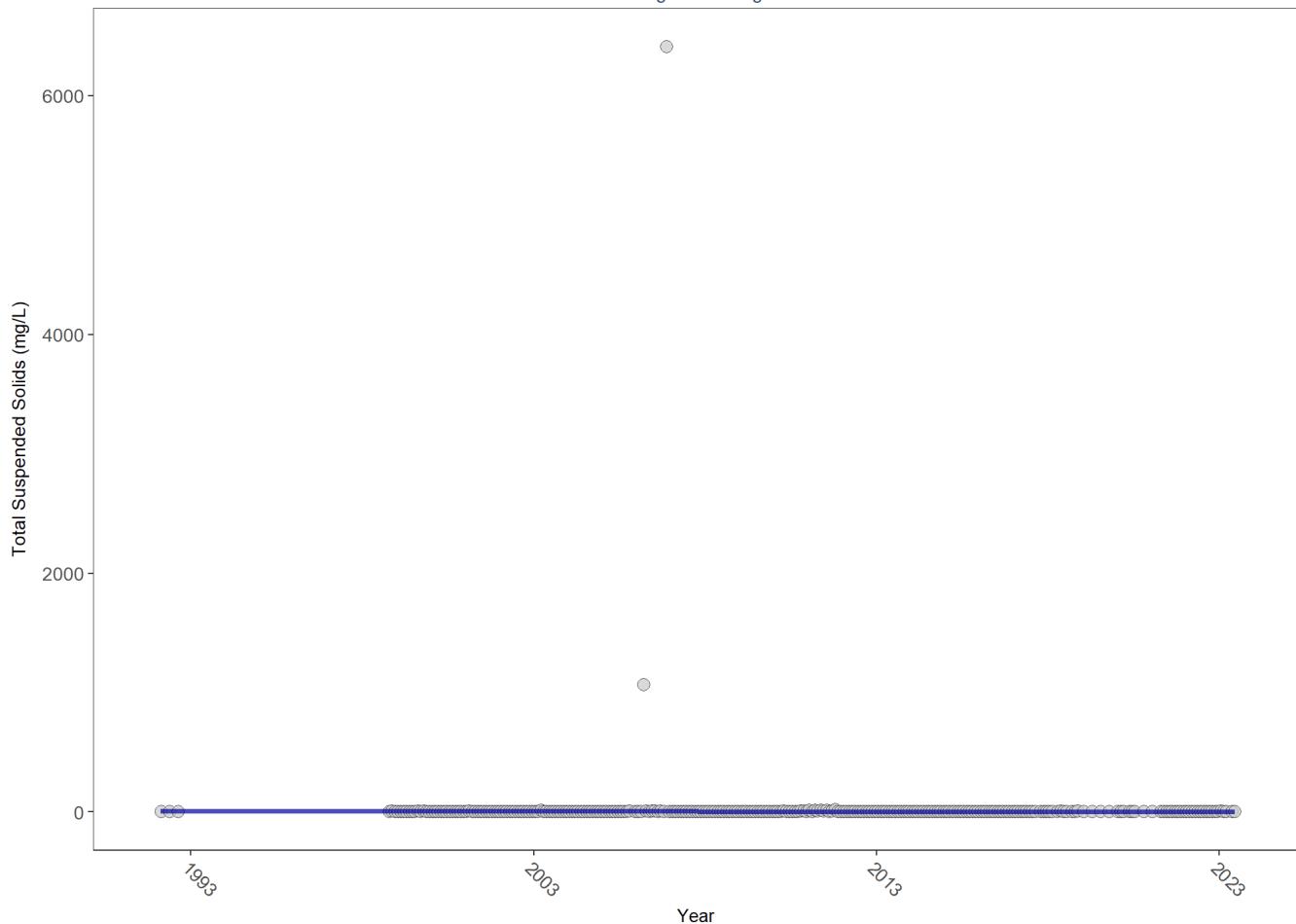


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Suspended Solids

Total Suspended Solids, Lab and Field Combined, All Depths  
St. Marks - Big Bend Seagrasses AP

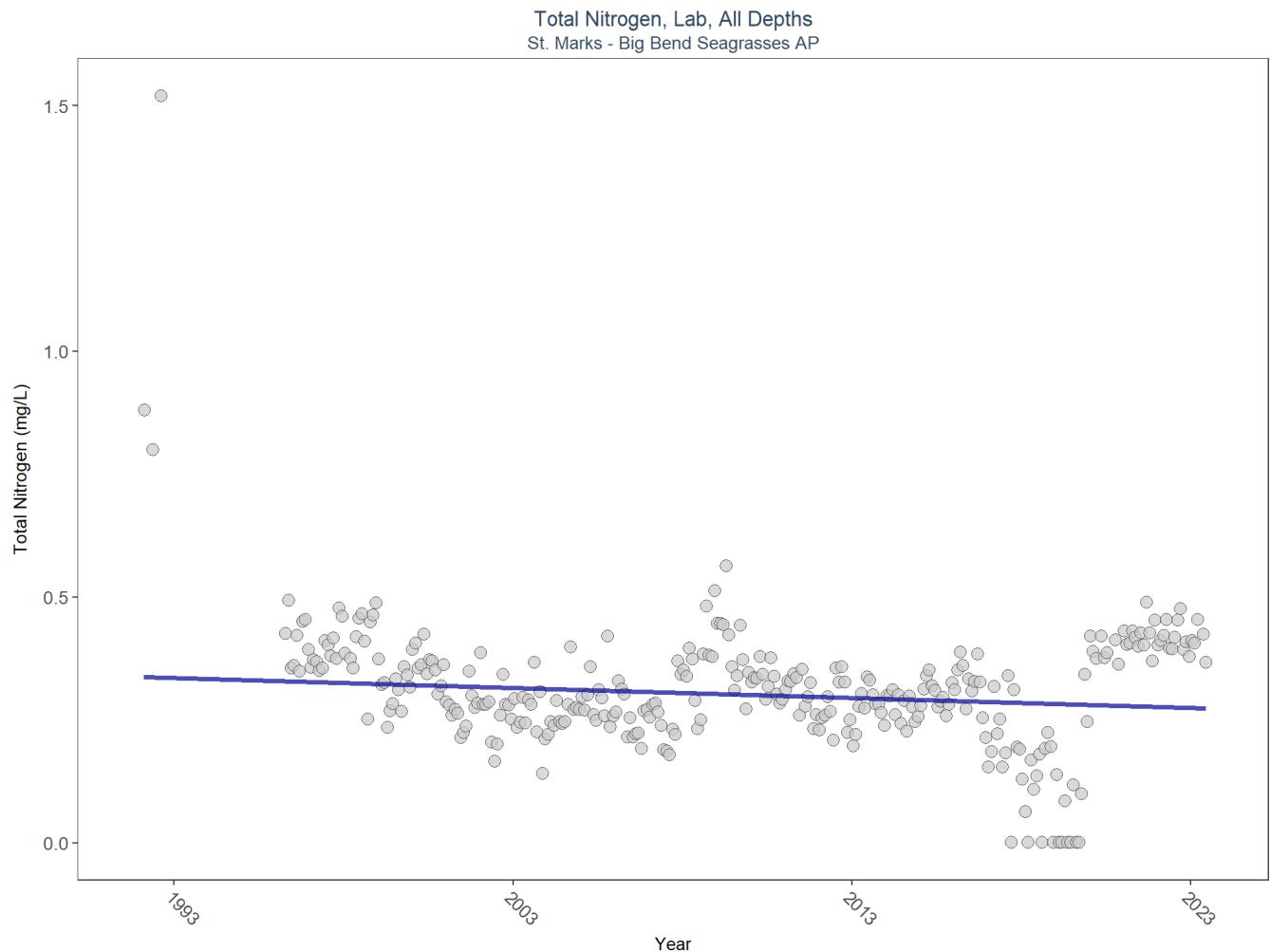


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	863	27	4	TRUE	-0.3964	0.0000	-0.09090909	5.505682	6.4272	0.8434	-1

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

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

## Total Nitrogen



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

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

## Submerged Aquatic Vegetation

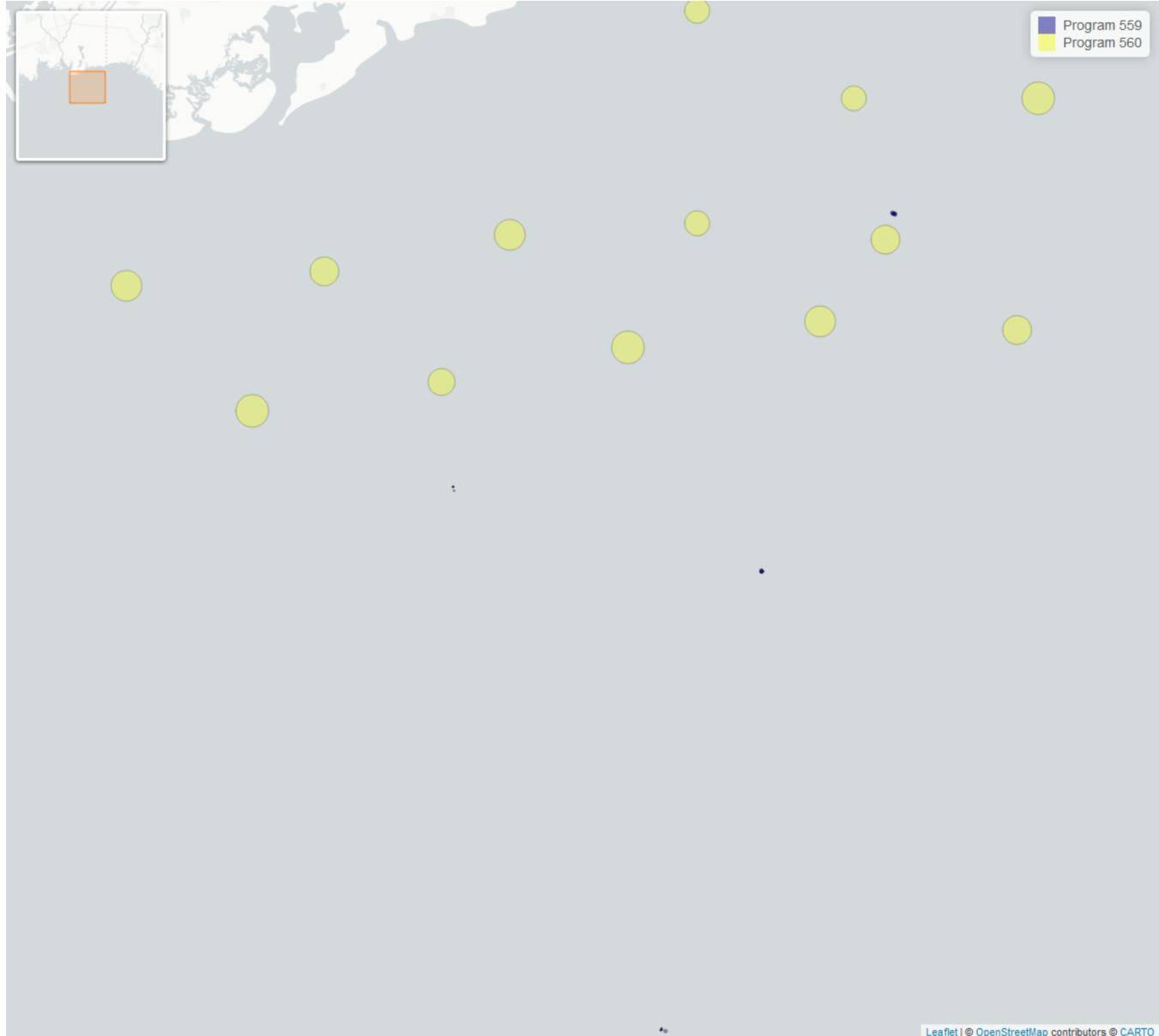


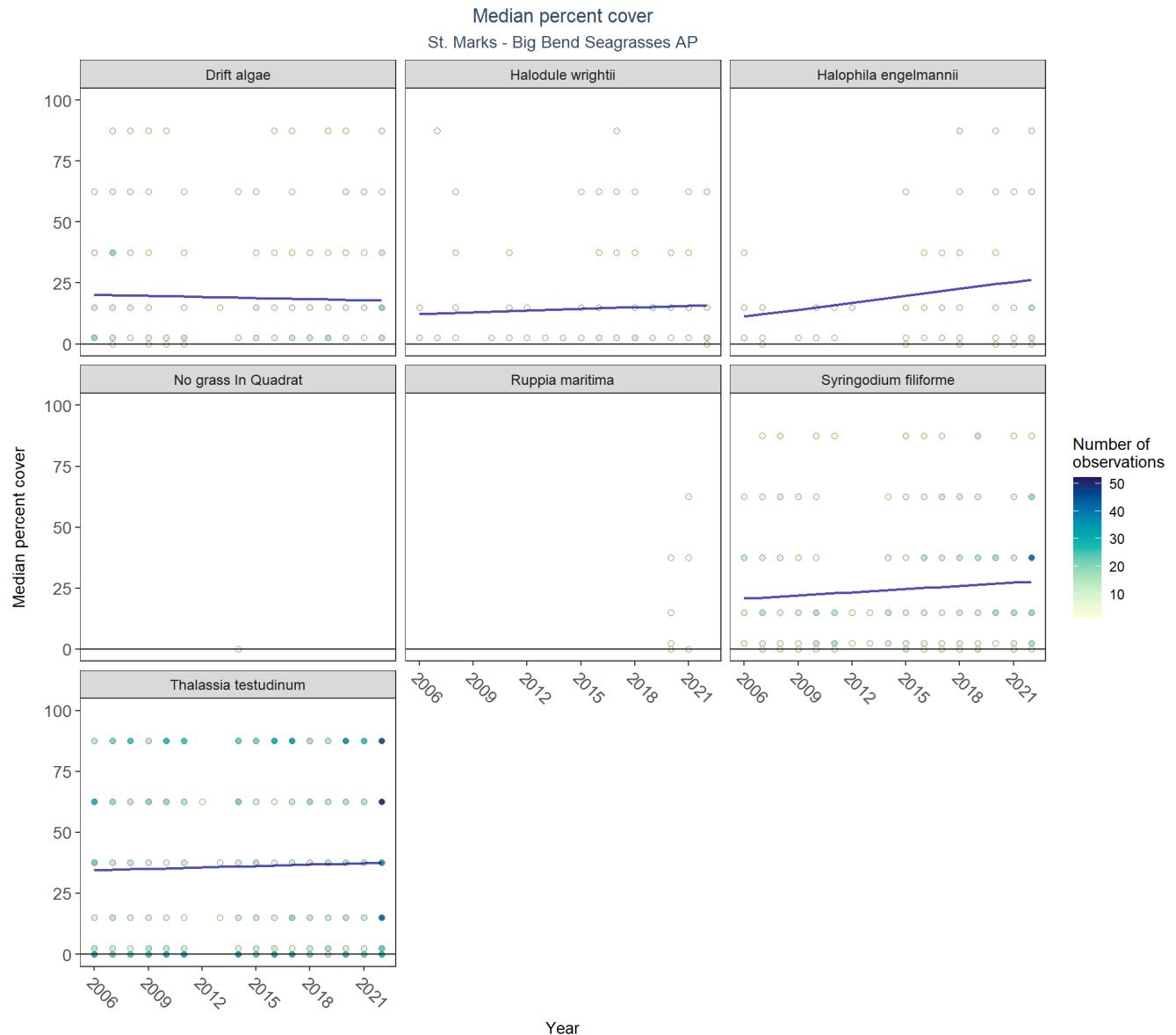
Table 7: Northern Big Bend Seagrass Monitoring - *Program 559*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
61	2012	2018	Modified Braun Blanquet	25

Table 8: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
2770	2006	2022	Modified Braun Blanquet	13
244	2022	2022	Percent Cover	13

## Median Percent Cover - Species Trends



## Median Percent Cover - Species Trend Table

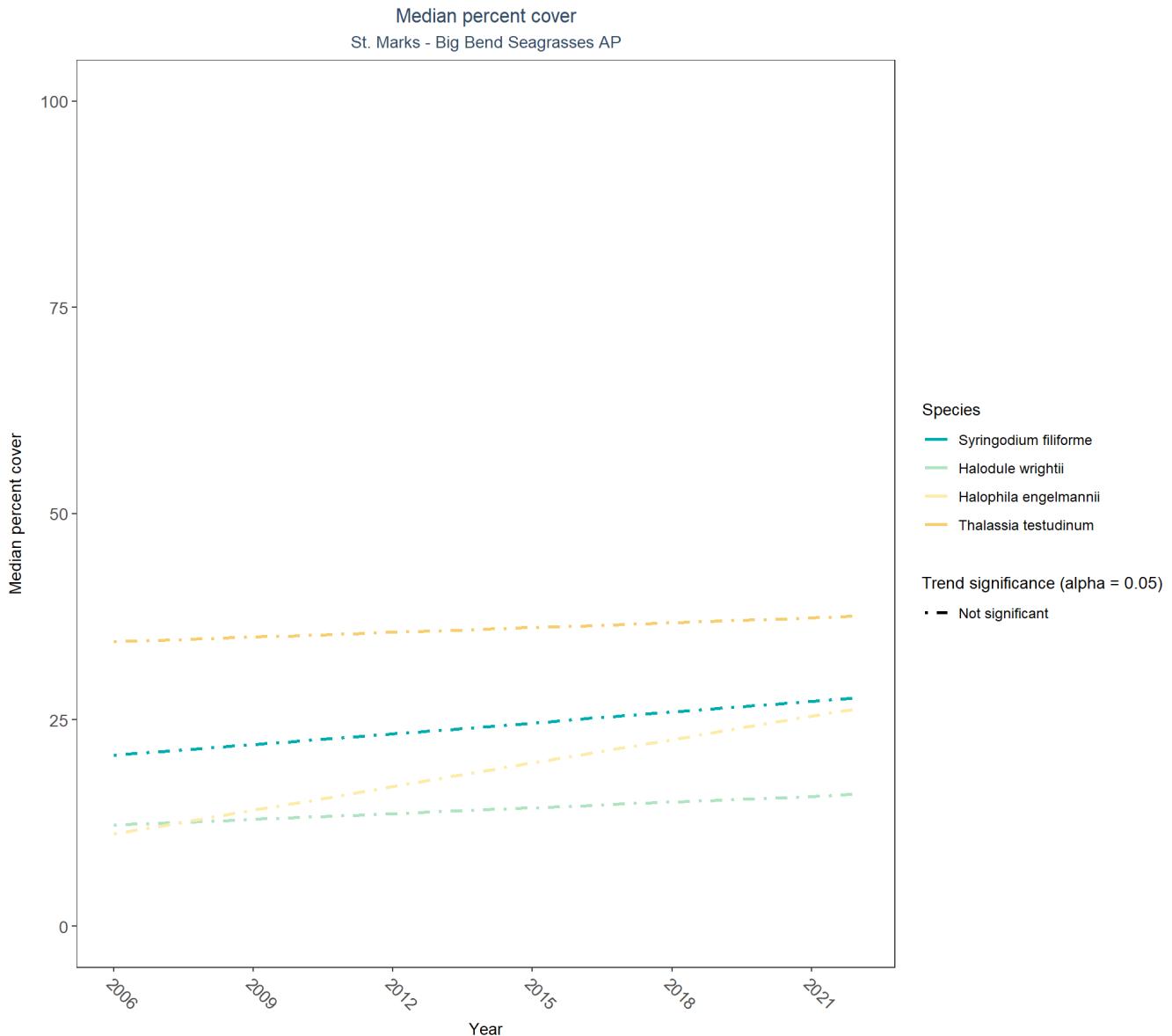
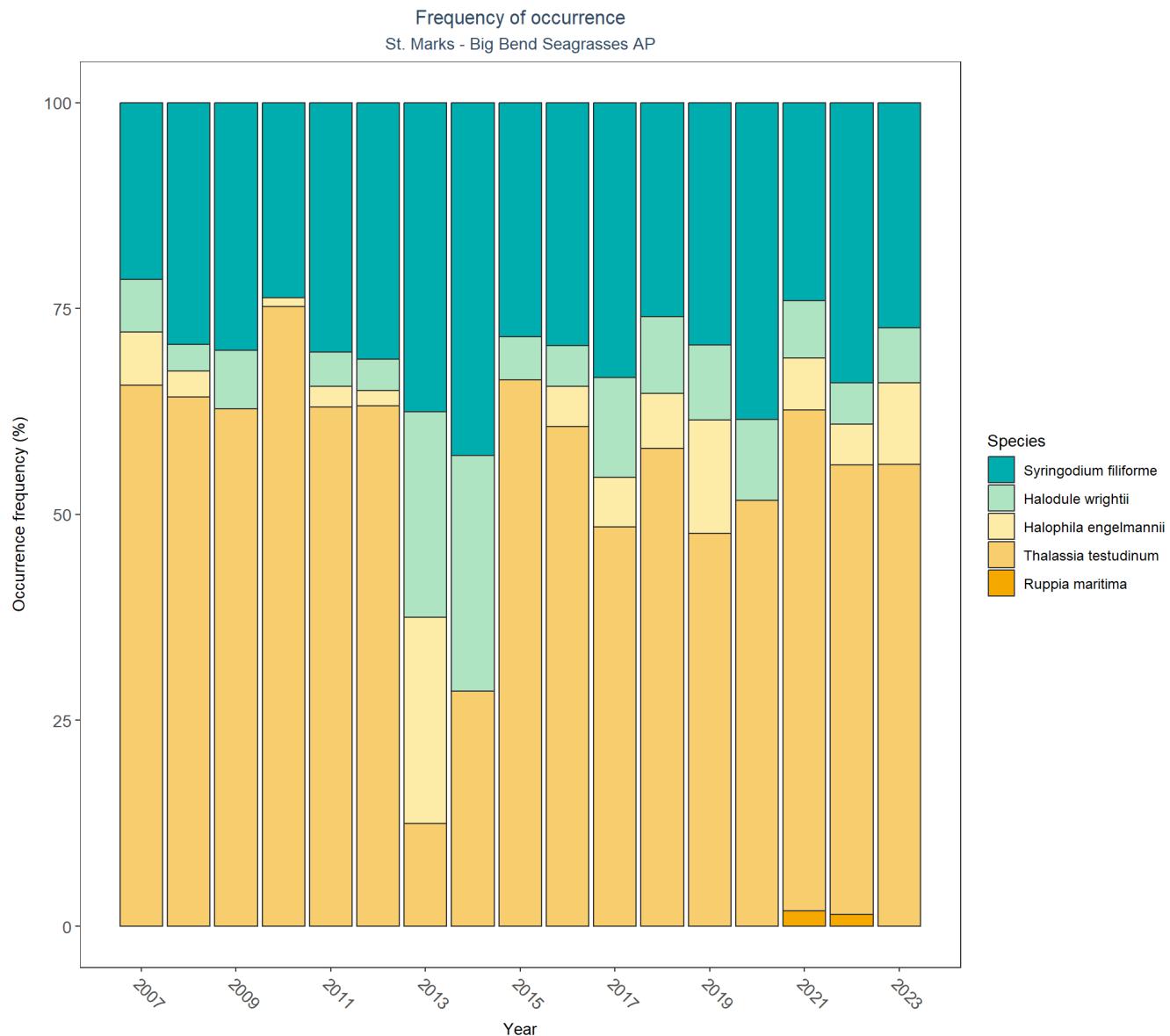


Table 9: Percent Cover Trend Analysis for St. Marks

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	No significant trend	2006 - 2022	21.0647	-0.1494	0.6633
<i>Halodule wrightii</i>	No significant trend	2006 - 2022	10.8748	0.2319	0.6131
<i>Halophila engelmannii</i>	No significant trend	2006 - 2022	5.4885	0.9516	0.0822
No grass In Quadrat	Insufficient data to calculate trend	-	-	-	-
<i>Ruppia maritima</i>	Insufficient data to calculate trend	-	-	-	-
<i>Syringodium filiforme</i>	No significant trend	2006 - 2022	18.0680	0.4379	0.1791
<i>Thalassia testudinum</i>	No significant trend	2006 - 2022	33.3257	0.1922	0.3652

## Frequency of Occurrence Barplots



## Econfina

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

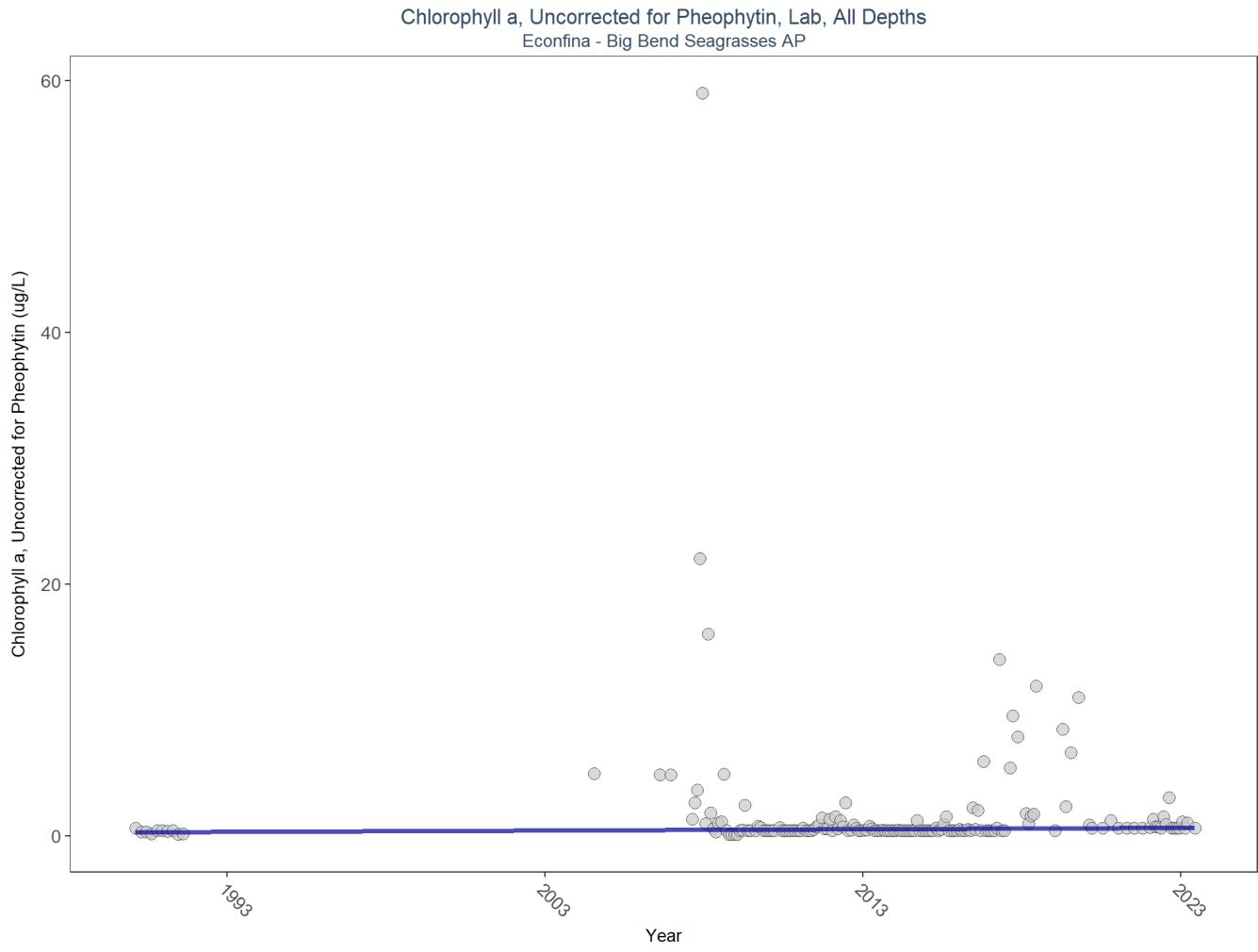
Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

Table 10: Seasonal Kendall-Tau Results for Econfina

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	1990 - 2023	21	190	TRUE	0.01	0.27	0.0000	↑
Dissolved Oxygen	1989 - 2023	35	1770	TRUE	0.04	5.01	0.0000	↑
Dissolved Oxygen Saturation	1999 - 2023	14	125	TRUE	-0.68	78.76	0.1559	0
Salinity	1991 - 2019	23	1325	TRUE	0.34	-0.03	0.0000	↑
Water Temperature	1989 - 2023	35	1768	TRUE	0.09	18.40	0.0000	↑
Secchi Depth	1991 - 2023	25	1538	TRUE	0.00	0.61	0.2058	0
pH	1989 - 2023	35	1761	TRUE	0.02	6.85	0.0000	↑
Total Phosphorus	1998 - 2023	26	329	TRUE	0.00	0.09	0.1865	0
Colored Dissolved Organic Matter	2018 - 2023	6	26	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	1999 - 2023	25	319	TRUE	0.00	0.87	0.0004	↓
Turbidity	1990 - 2023	33	495	TRUE	0.01	2.01	0.0723	0
Total Suspended Solids	1990 - 2023	33	394	TRUE	0.00	4.00	0.0100	↓
Total Nitrogen	1990 - 2023	28	394	TRUE	0.00	0.79	0.7769	0

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin



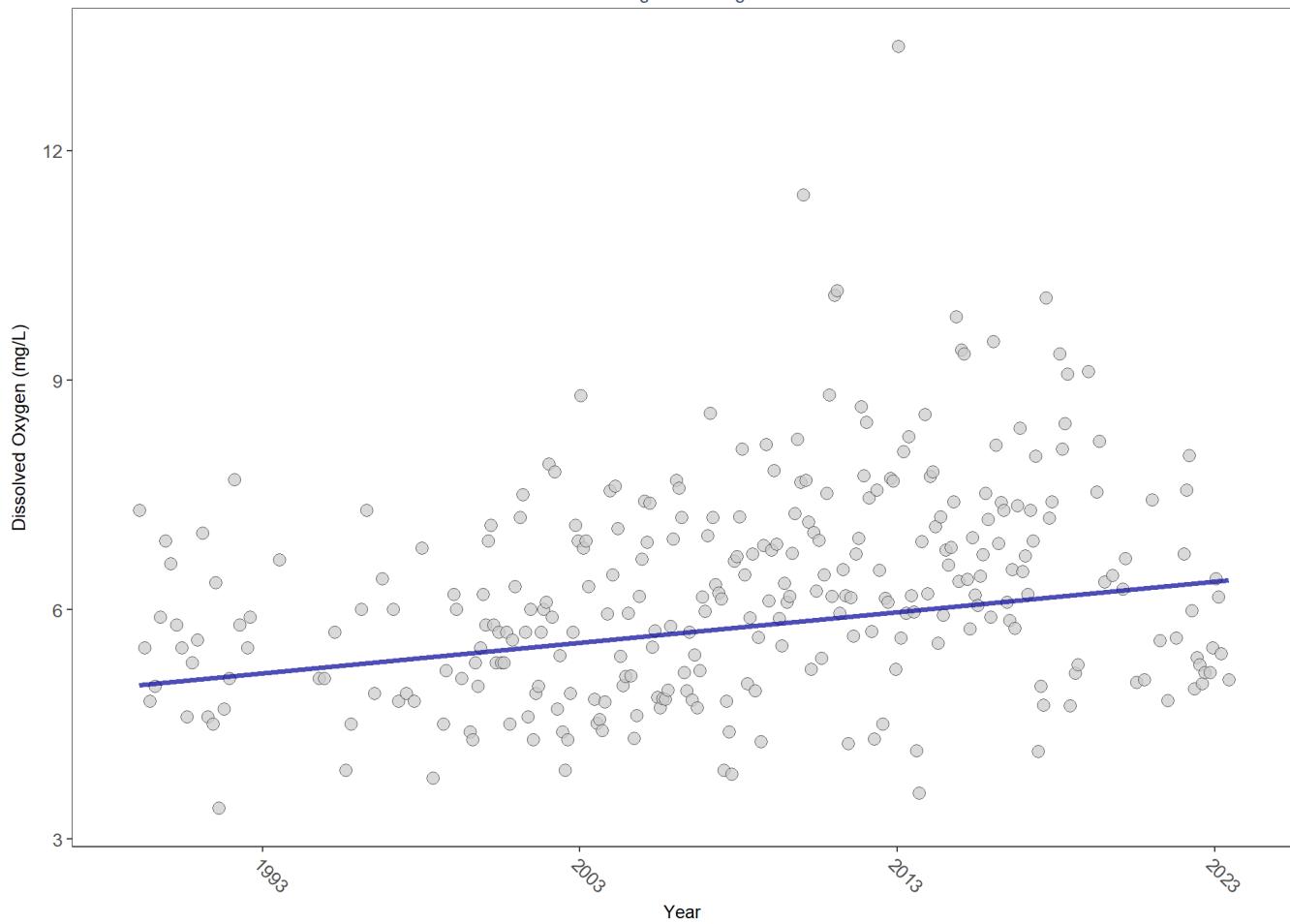
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	190	21	0.56	TRUE	0.2318	0.0000	0.01133929	0.2699123	7.2191	0.7811	1

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

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

## Dissolved Oxygen

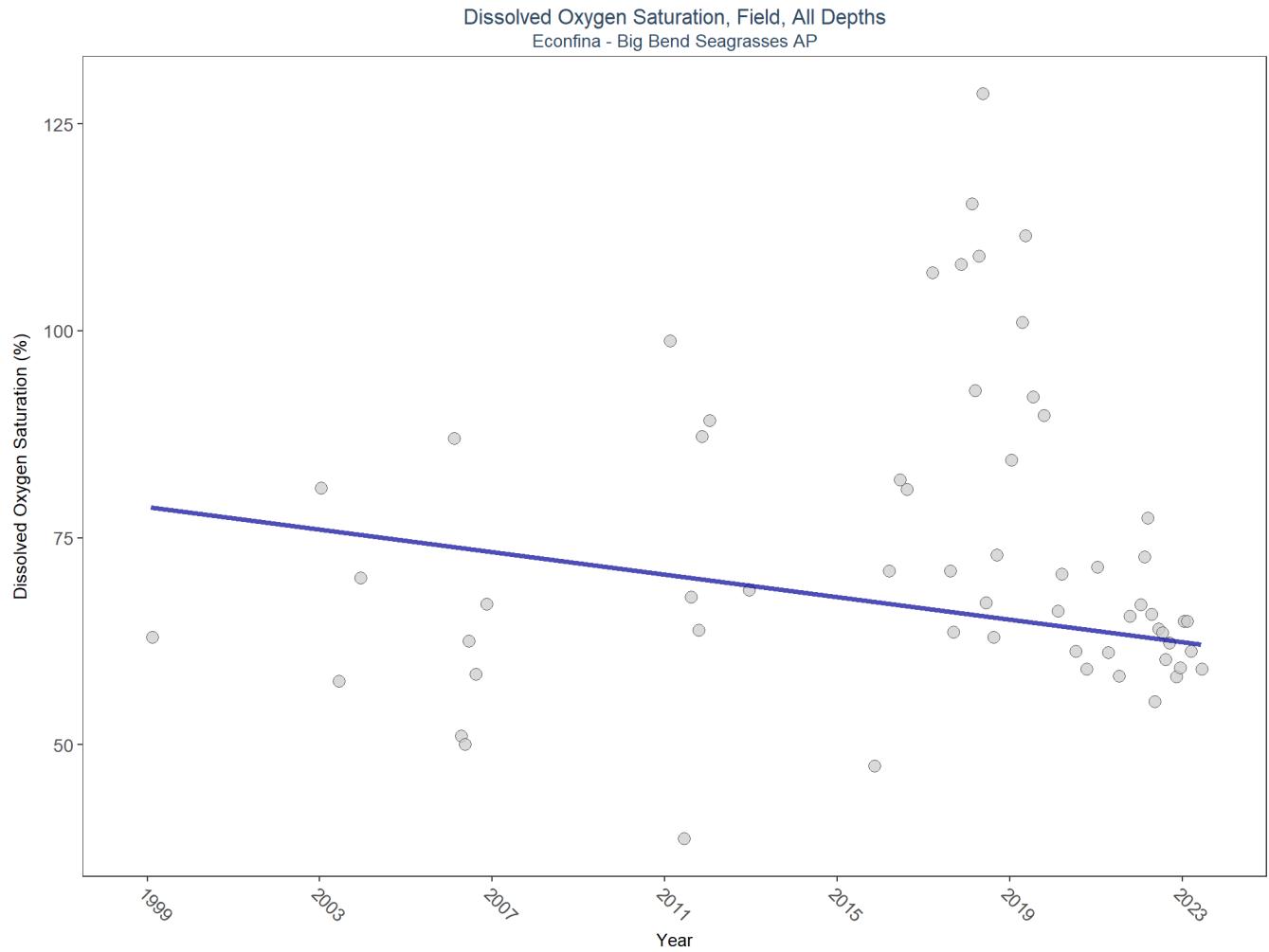
Dissolved Oxygen, Field, All Depths  
Econfina - Big Bend Seagrasses AP



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

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

## Dissolved Oxygen Saturation

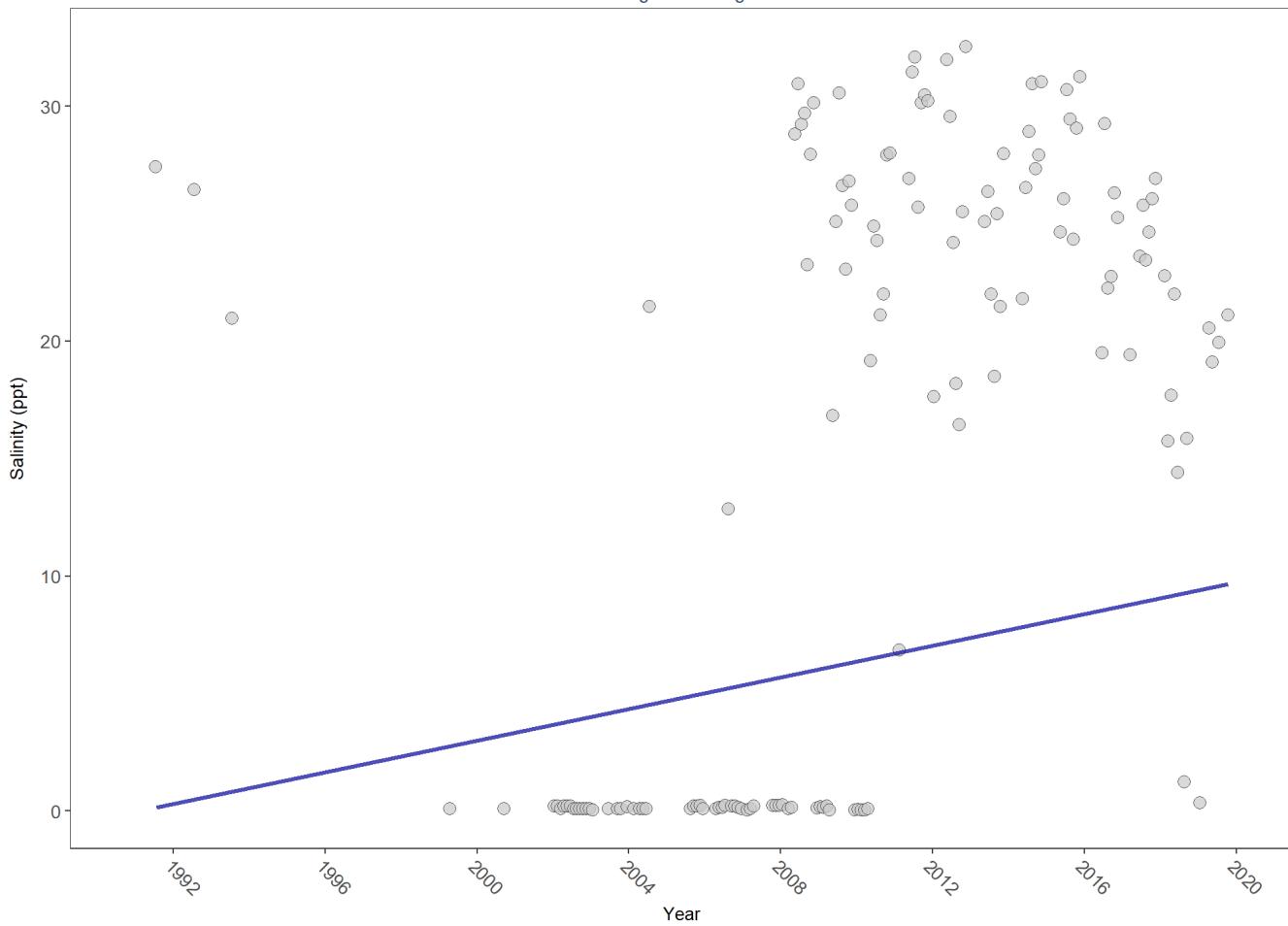


*p < 0.00005 appear as 0 due to rounding.*

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

## Salinity

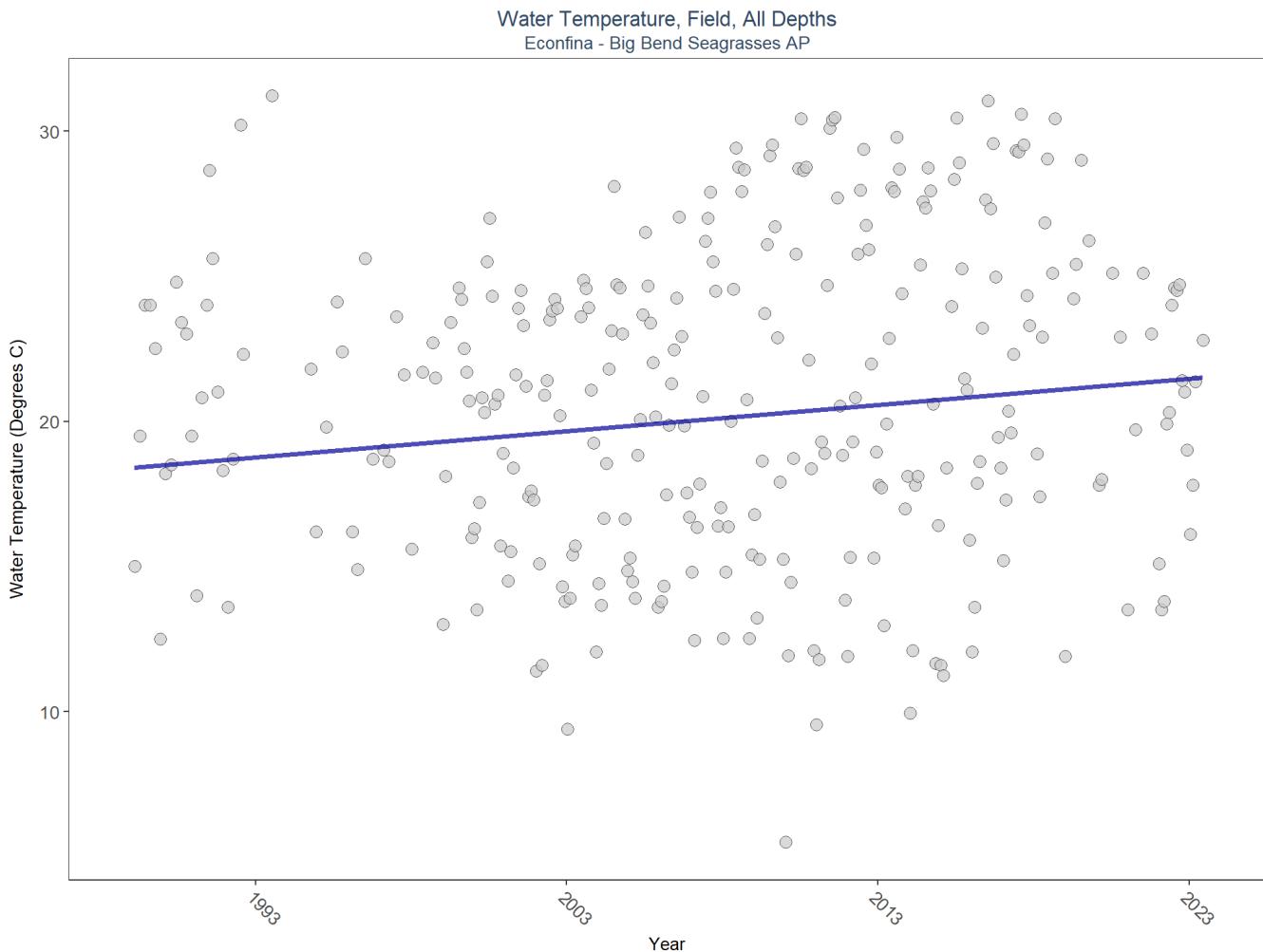
Salinity, Lab and Field Combined, All Depths  
Econfina - Big Bend Seagrasses AP



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

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

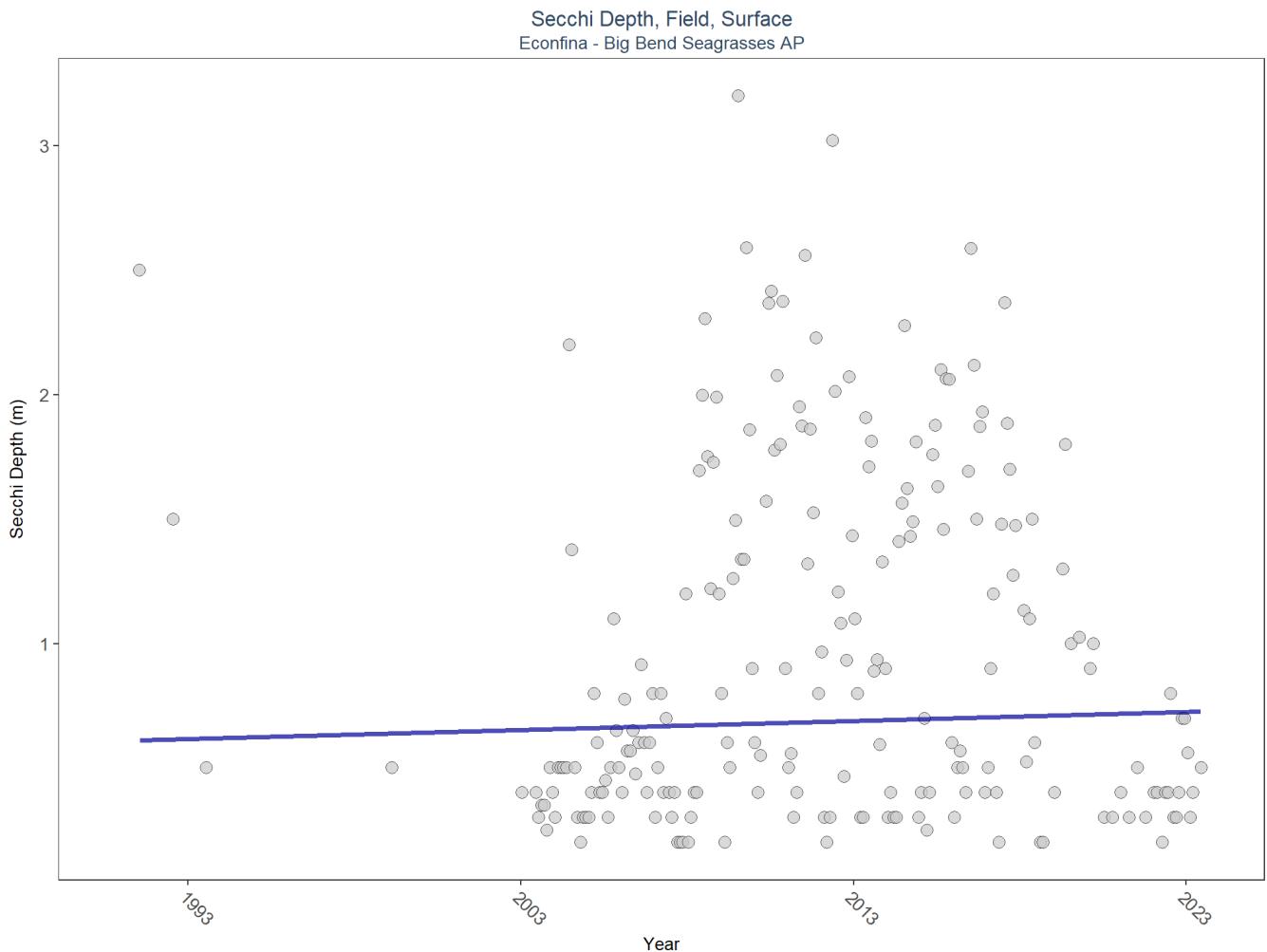
## Water Temperature



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

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

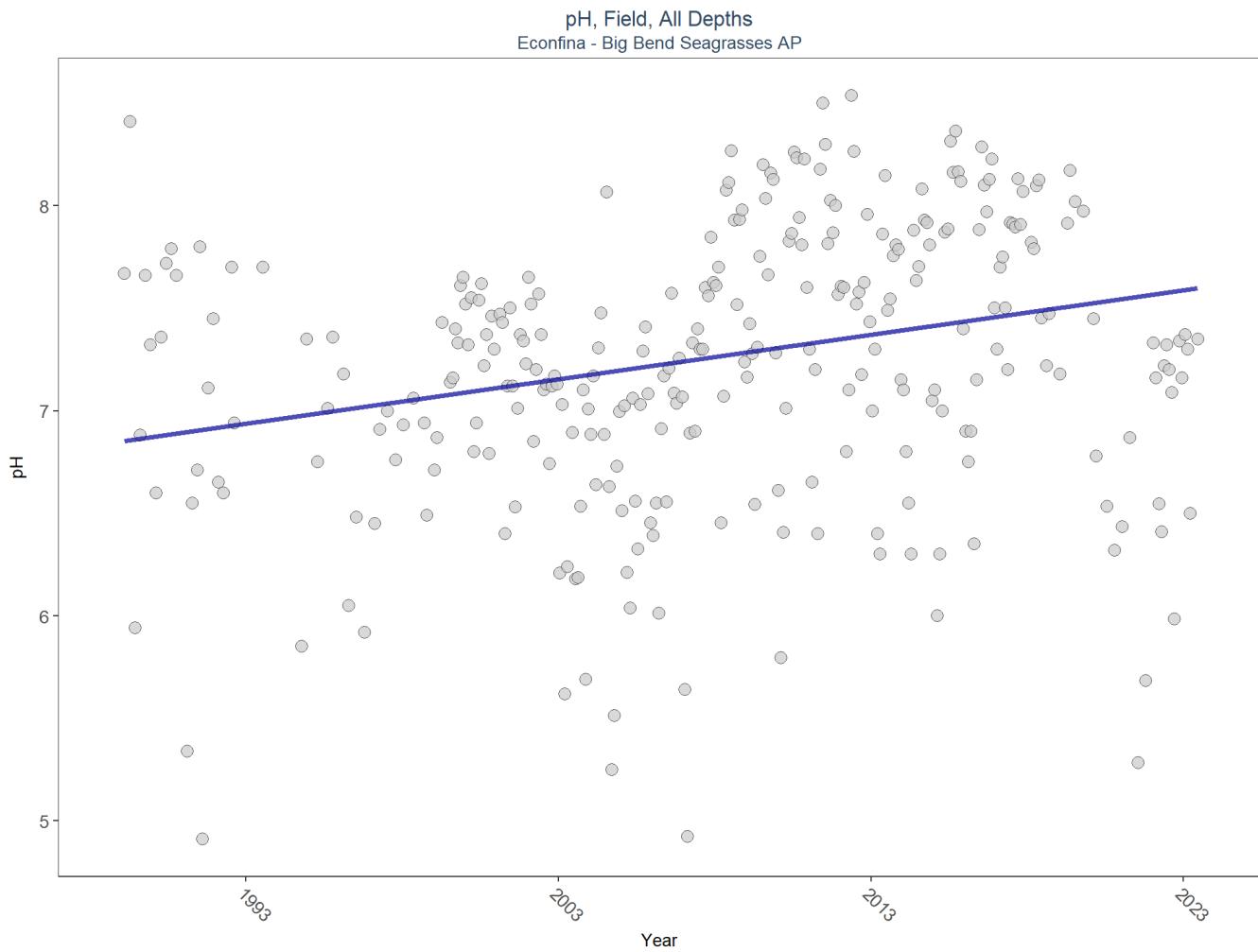
## Secchi Depth



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

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

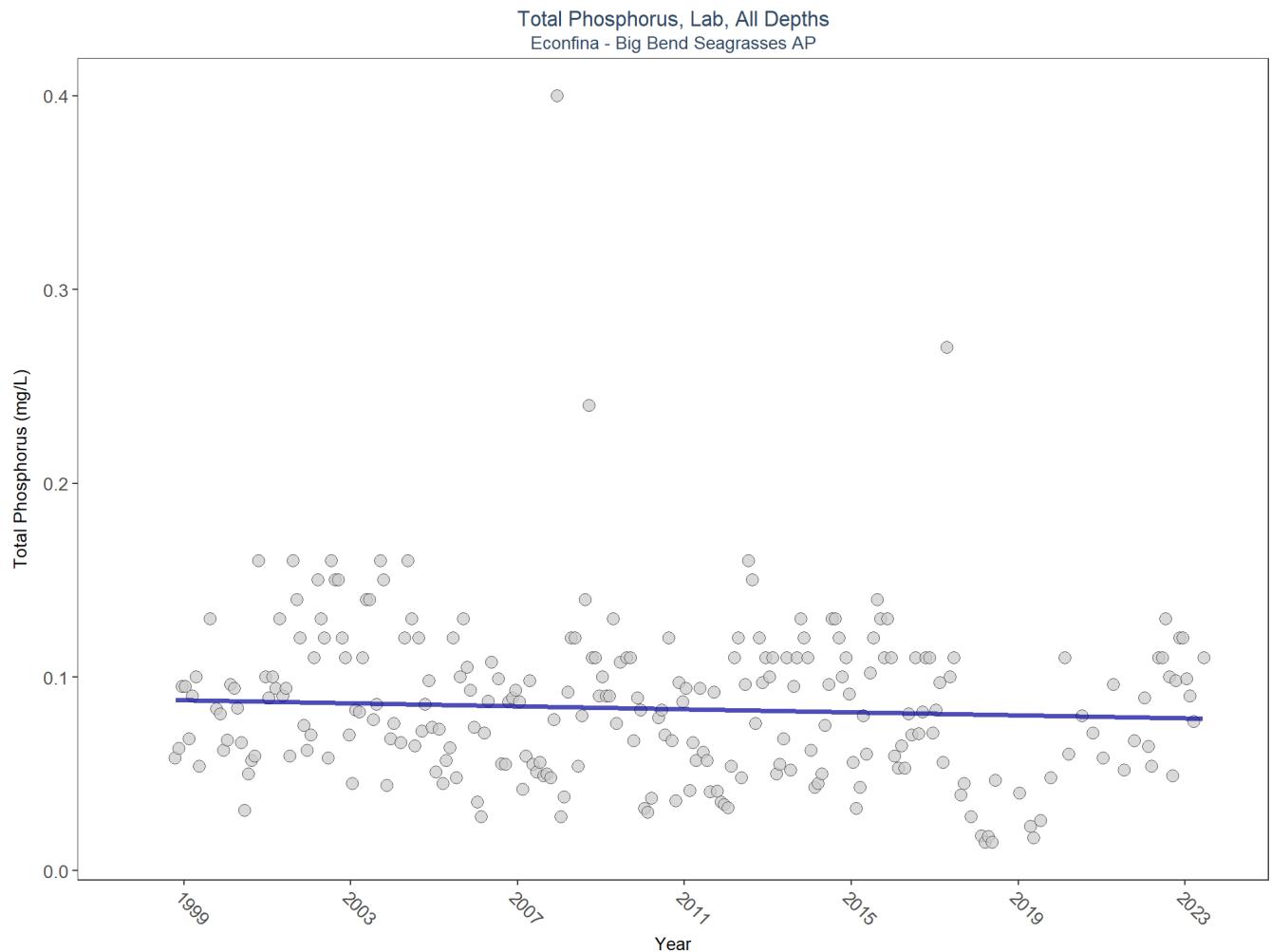
## pH



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

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

## Total Phosphorus

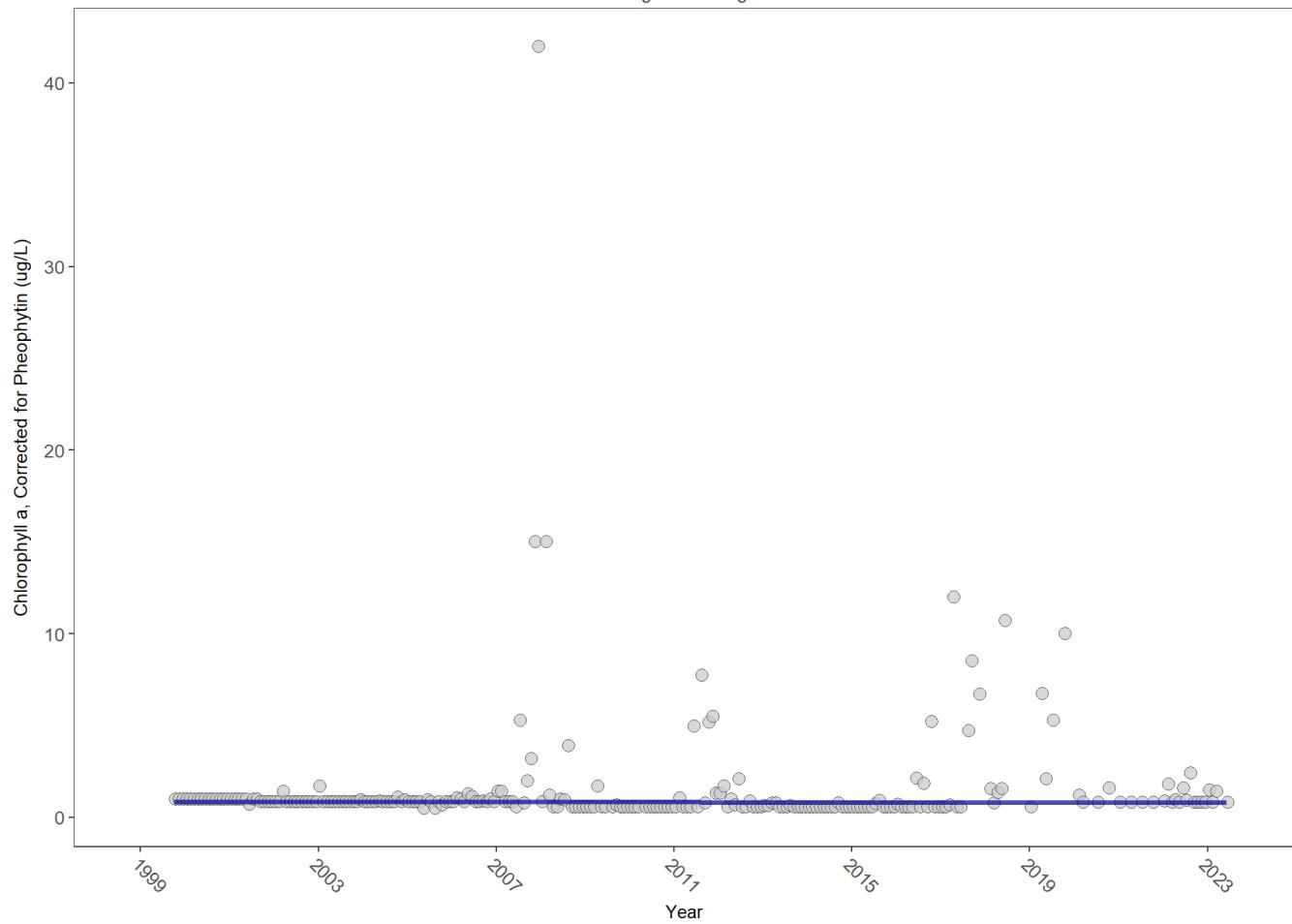


*p < 0.00005 appear as 0 due to rounding.*

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

## Chlorophyll a, Corrected for Pheophytin

Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Econfina - Big Bend Seagrasses AP



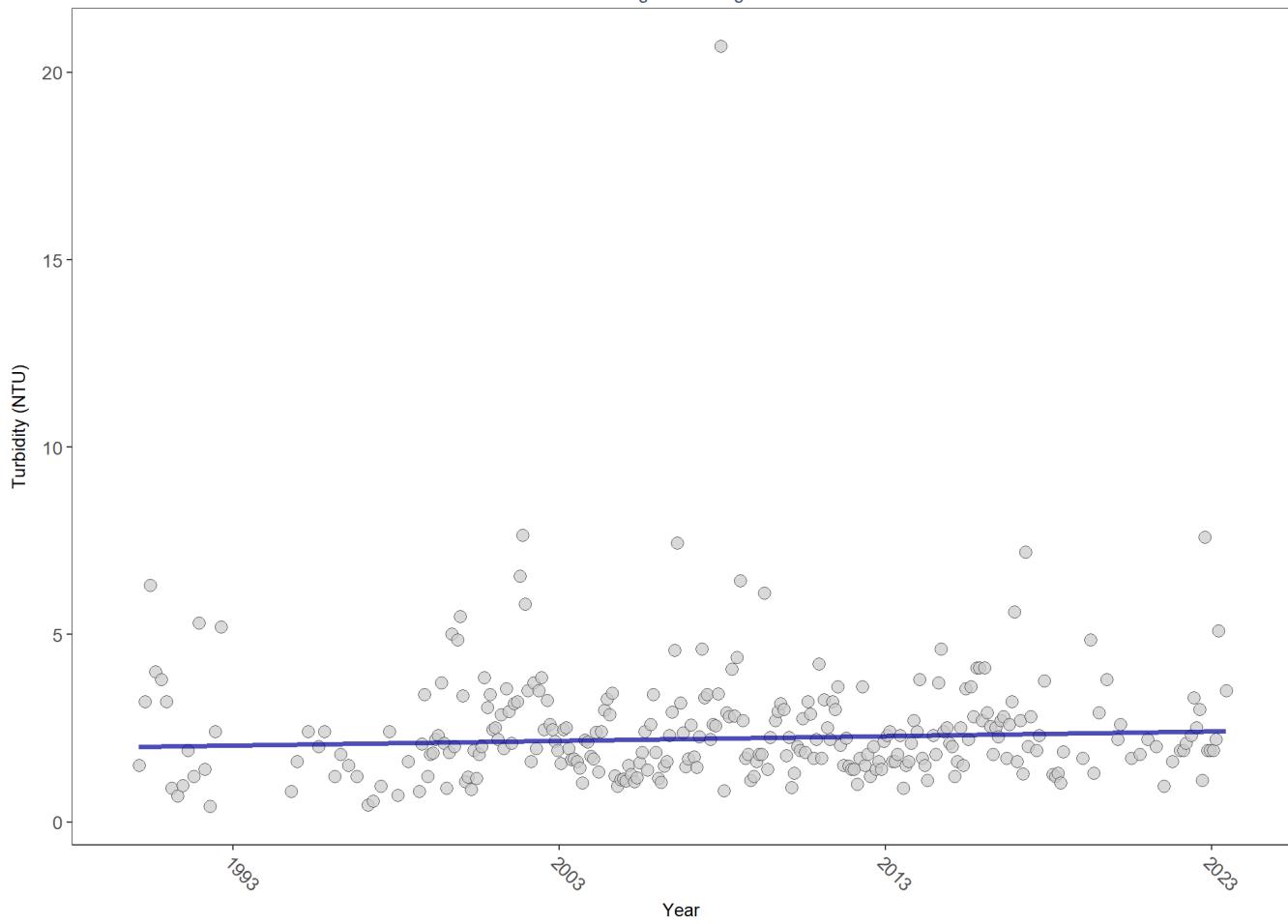
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	319	25	0.85	TRUE	-0.1609	0.0004	-0.001764706	0.8653084	9.113	0.6115	-1

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

SennIntercept is intercept value at beginning of record for monitoring location

## Turbidity

Turbidity, Lab, All Depths  
Econfina - Big Bend Seagrasses AP

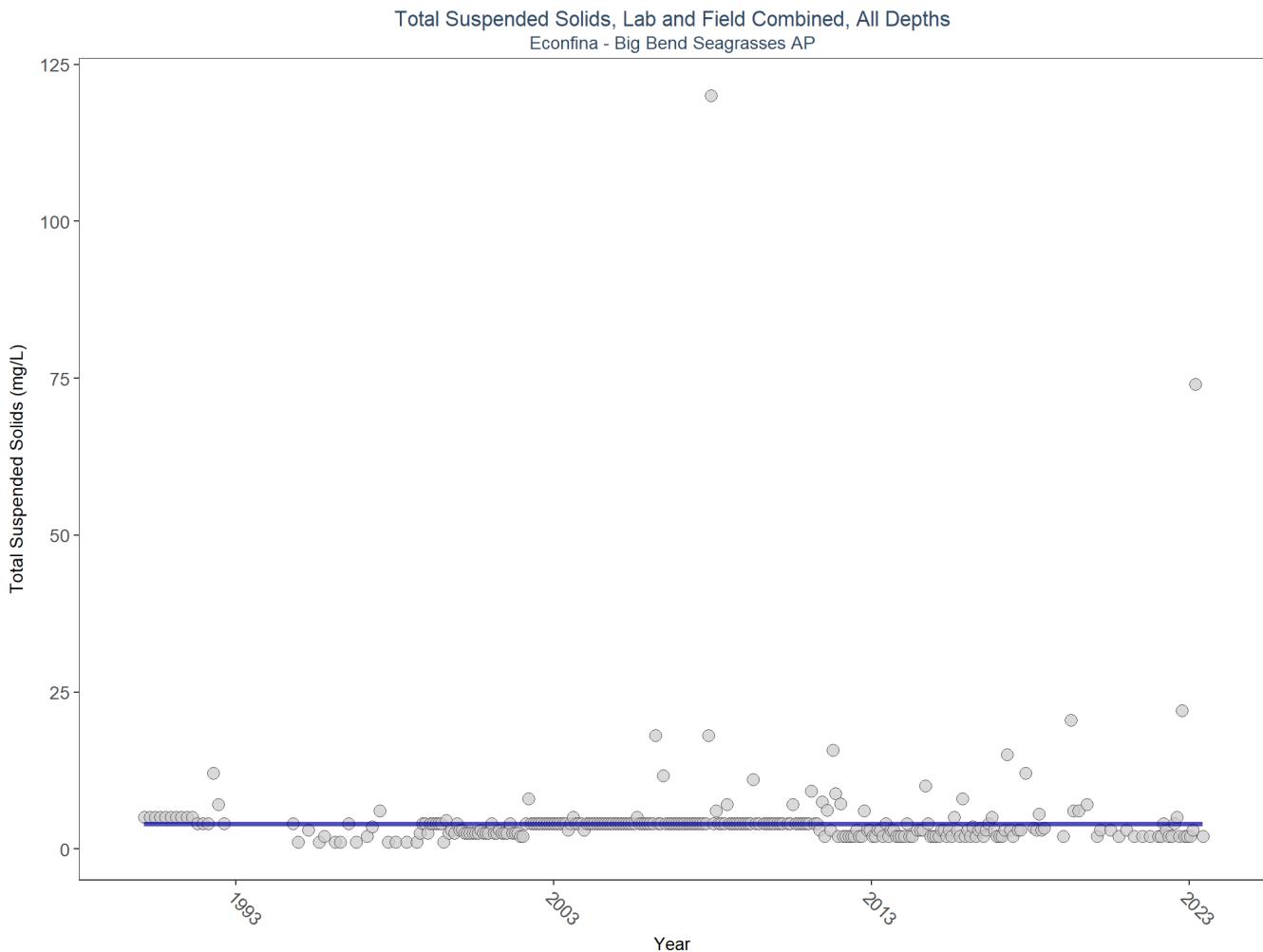


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	495	33	2.15	TRUE	0.0636	0.0723	0.0125	2.005353	11.3641	0.4133	0

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

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

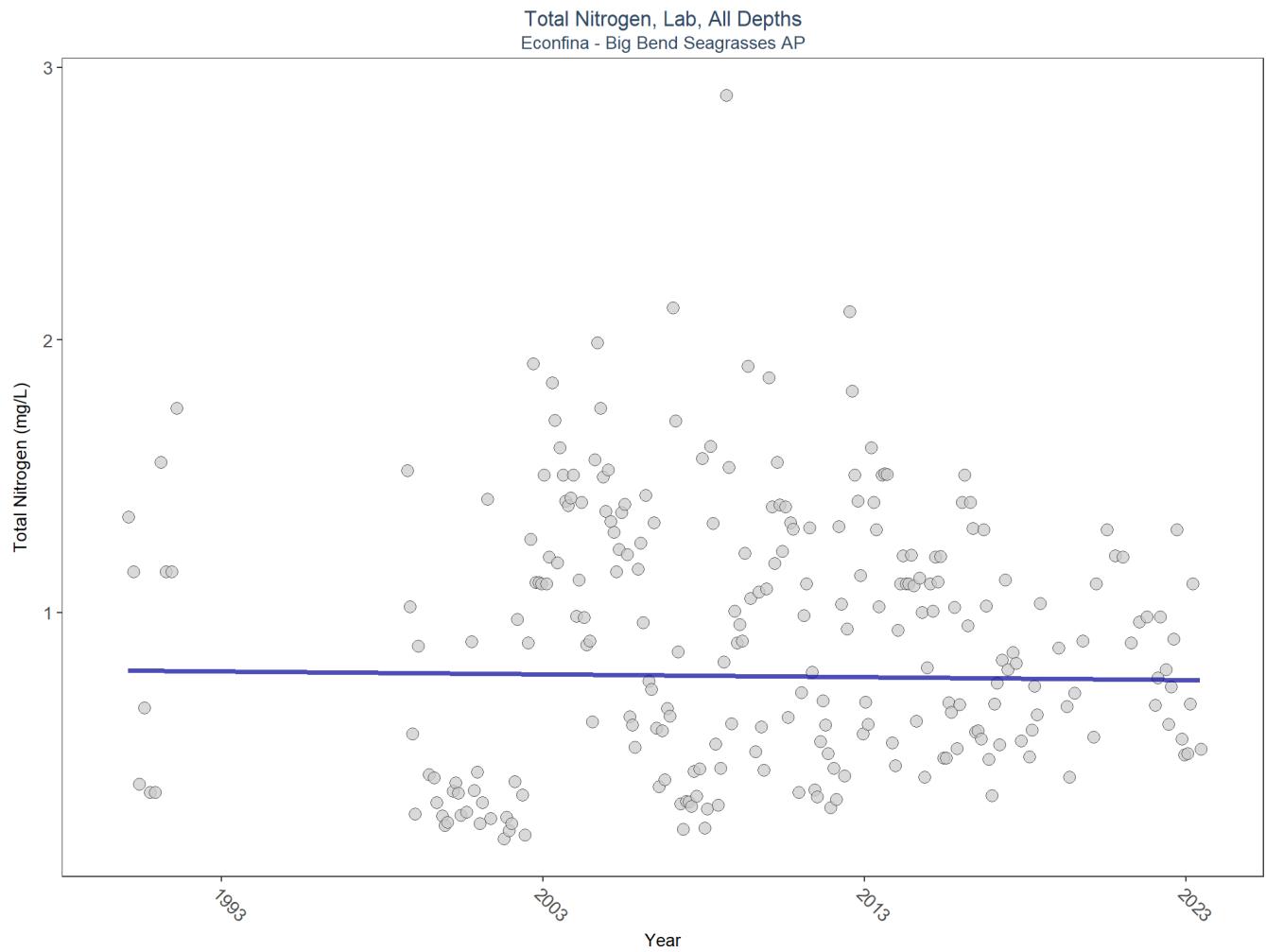
## Total Suspended Solids



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

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

## Total Nitrogen



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

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

## Aucilla

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

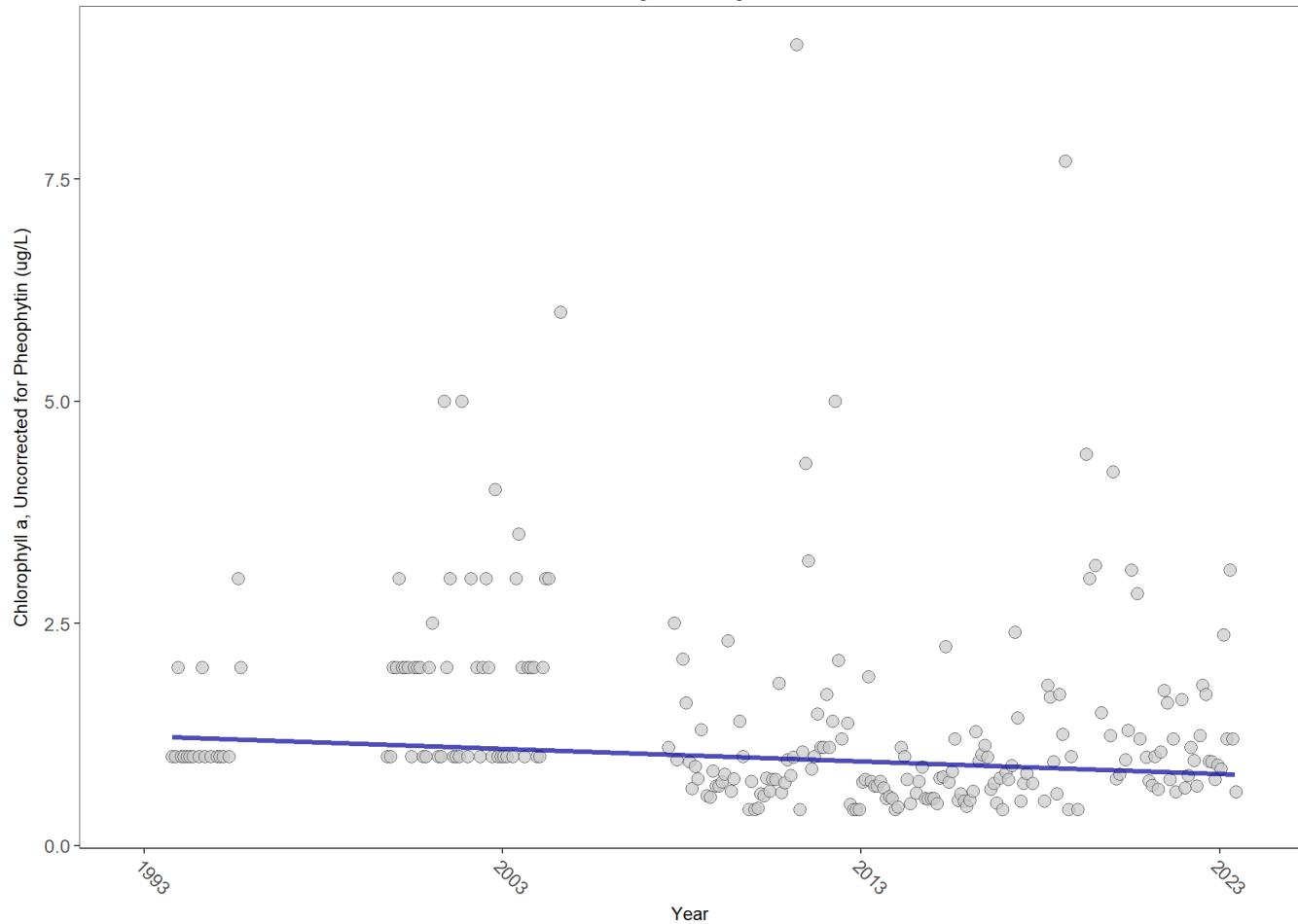
Table 11: Seasonal Kendall-Tau Results for Aucilla

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	1993 - 2023	26	347	TRUE	-0.01	1.23	0.0001	↓
Dissolved Oxygen	1994 - 2023	30	1590	TRUE	-0.03	6.62	0.0009	↓
Dissolved Oxygen Saturation	2002 - 2023	14	281	TRUE	0.12	66.24	0.6551	0
Salinity	1995 - 2023	23	1101	TRUE	0.00	0.10	0.0017	↑
Water Temperature	1994 - 2023	30	1592	TRUE	0.09	20.38	0.0000	↑
Secchi Depth	1993 - 2023	24	1069	TRUE	-0.02	1.59	0.0197	↓
pH	1994 - 2023	30	1583	TRUE	0.02	7.15	0.0000	↑
Total Phosphorus	1993 - 2023	29	677	TRUE	0.00	0.02	0.0000	↑
Colored Dissolved Organic Matter	2001 - 2023	12	93	TRUE	-0.47	37.41	0.5607	0
Chlorophyll a, Corrected for Pheophytin	1999 - 2023	25	404	TRUE	0.00	0.90	0.0226	↓
Turbidity	1994 - 2023	30	868	TRUE	0.01	1.09	0.2104	0
Total Suspended Solids	1994 - 2023	30	564	TRUE	0.00	3.75	0.1201	0
Total Nitrogen	1993 - 2023	29	742	TRUE	0.01	0.20	0.0000	↑

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin

Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths  
Aucilla - Big Bend Seagrasses AP

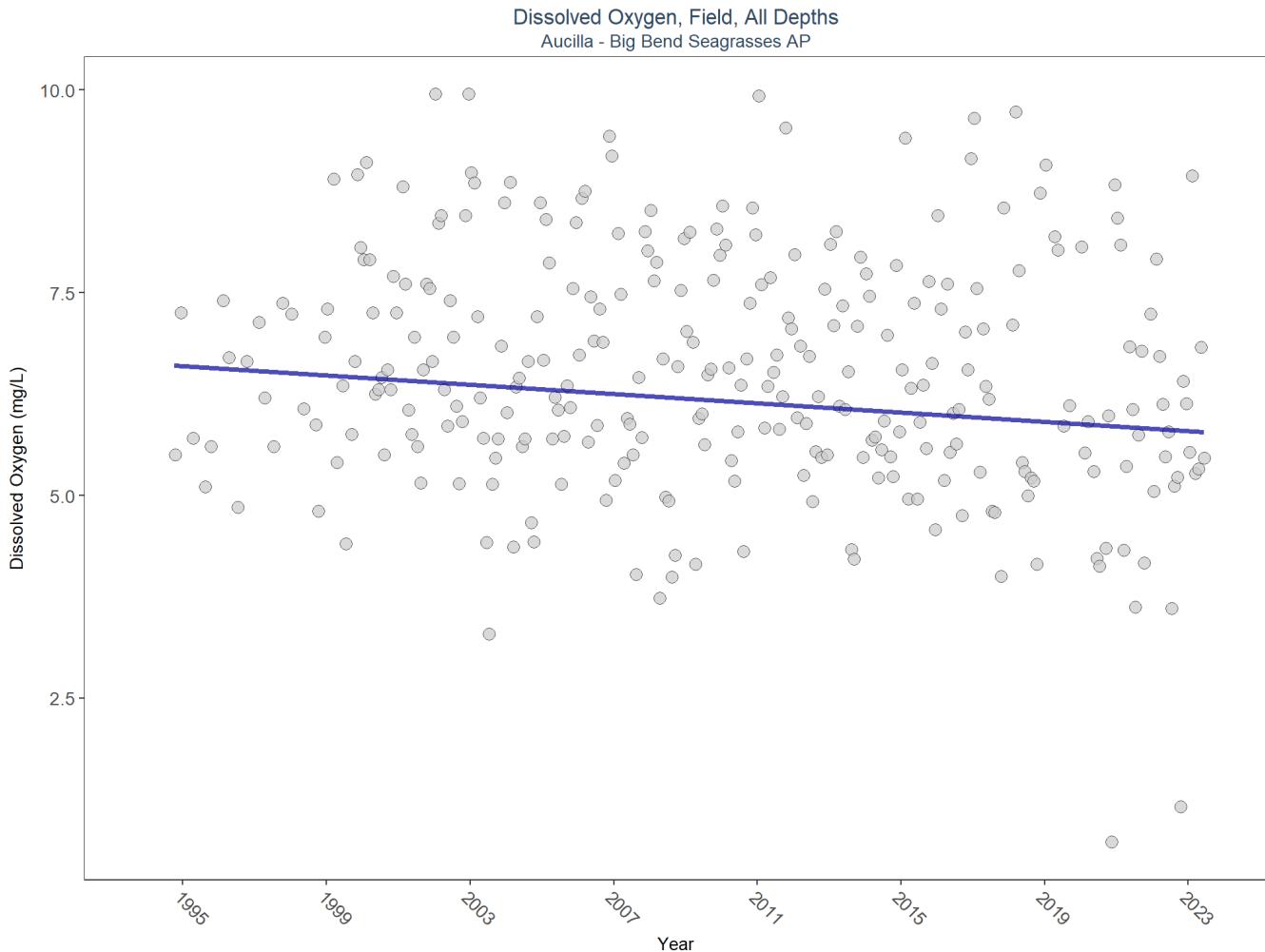


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	347	26	1	TRUE	-0.1829	0.0001	-0.01428571	1.233467	8.8729	0.6336	-1

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

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

## Dissolved Oxygen

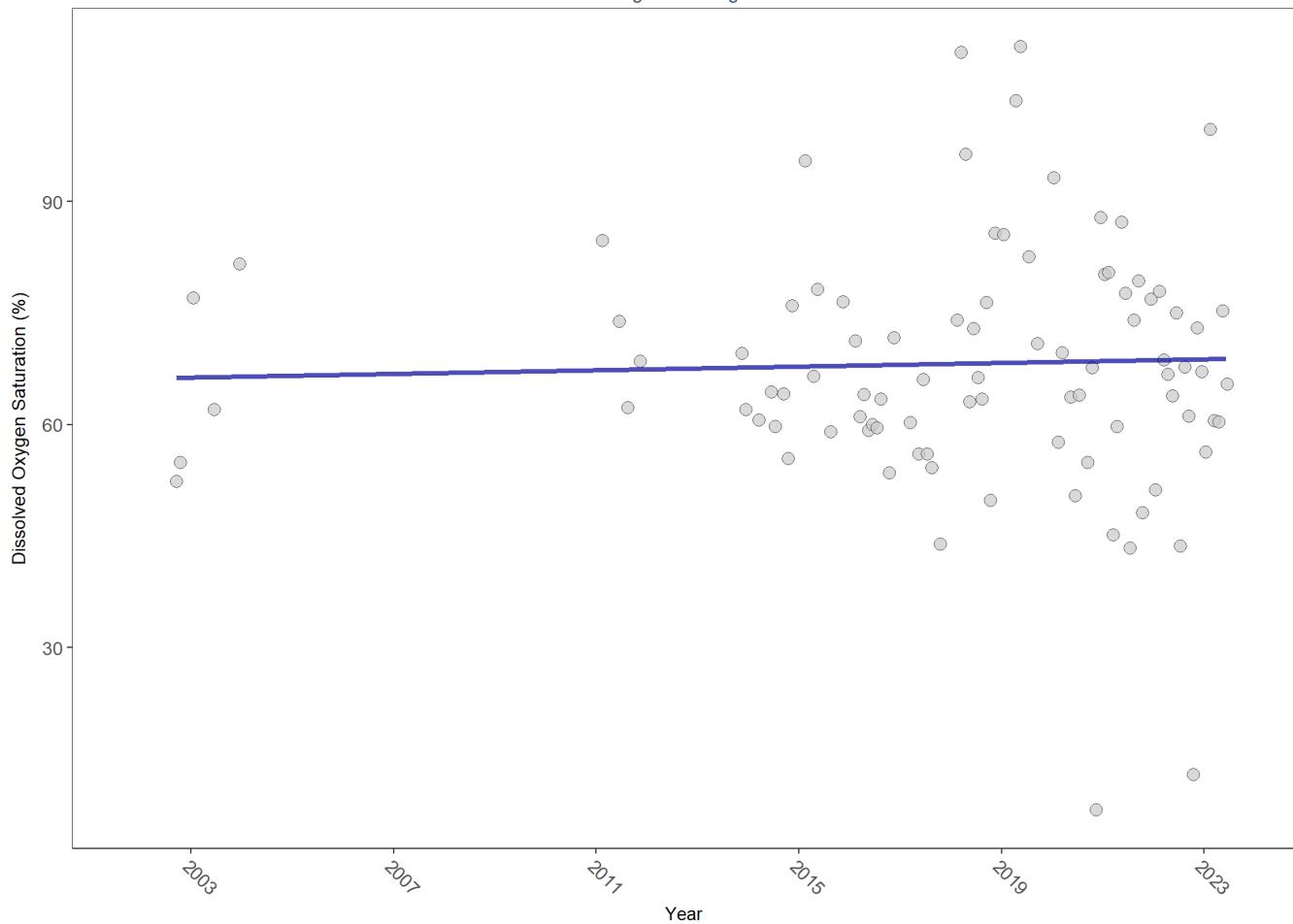


*p < 0.00005 appear as 0 due to rounding.*

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

## Dissolved Oxygen Saturation

Dissolved Oxygen Saturation, Field, All Depths  
Aucilla - Big Bend Seagrasses AP



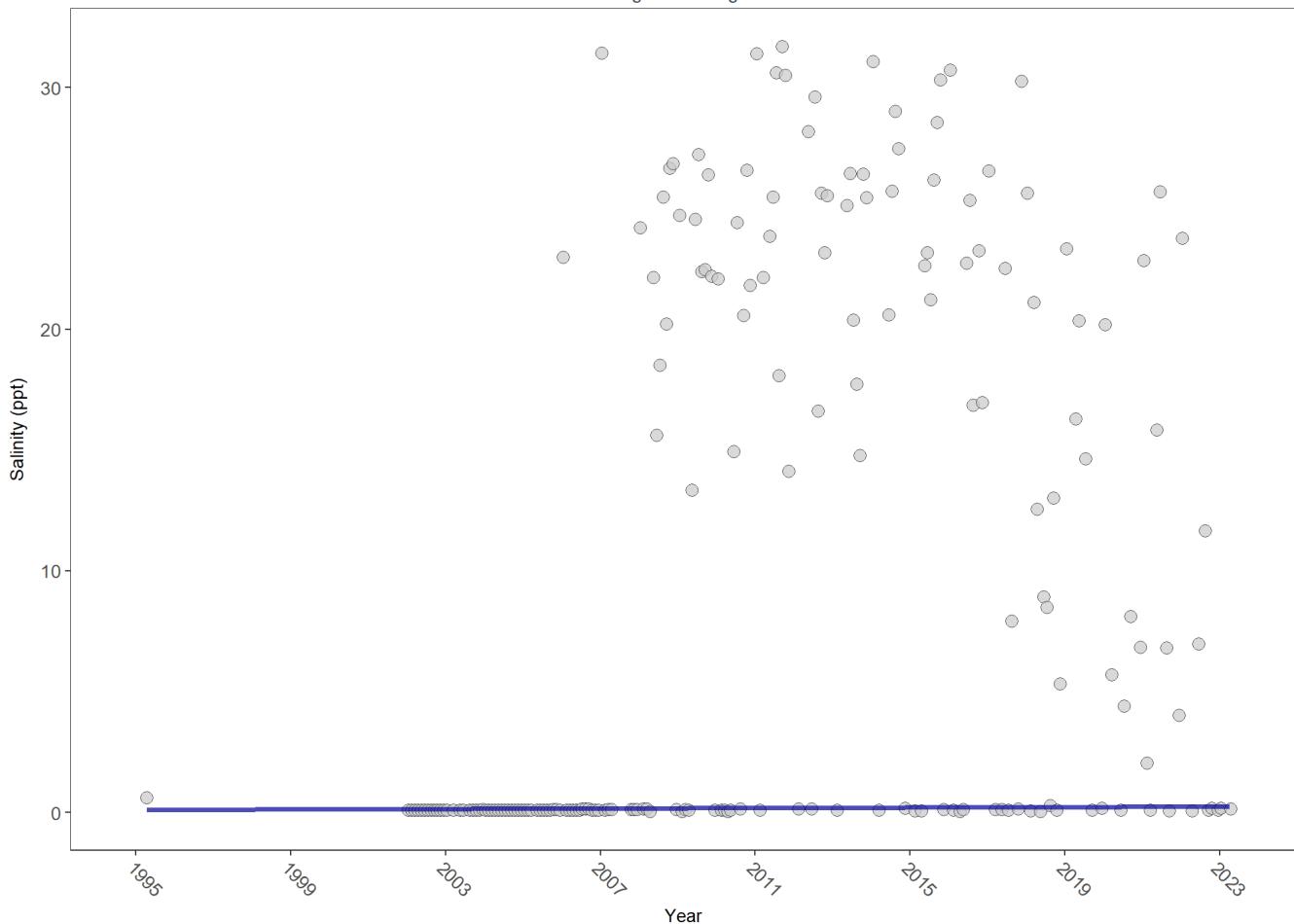
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	281	14	68	TRUE	0.0264	0.6551	0.1194444	66.24167	9.7167	0.556	0

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

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Aucilla - Big Bend Seagrasses AP

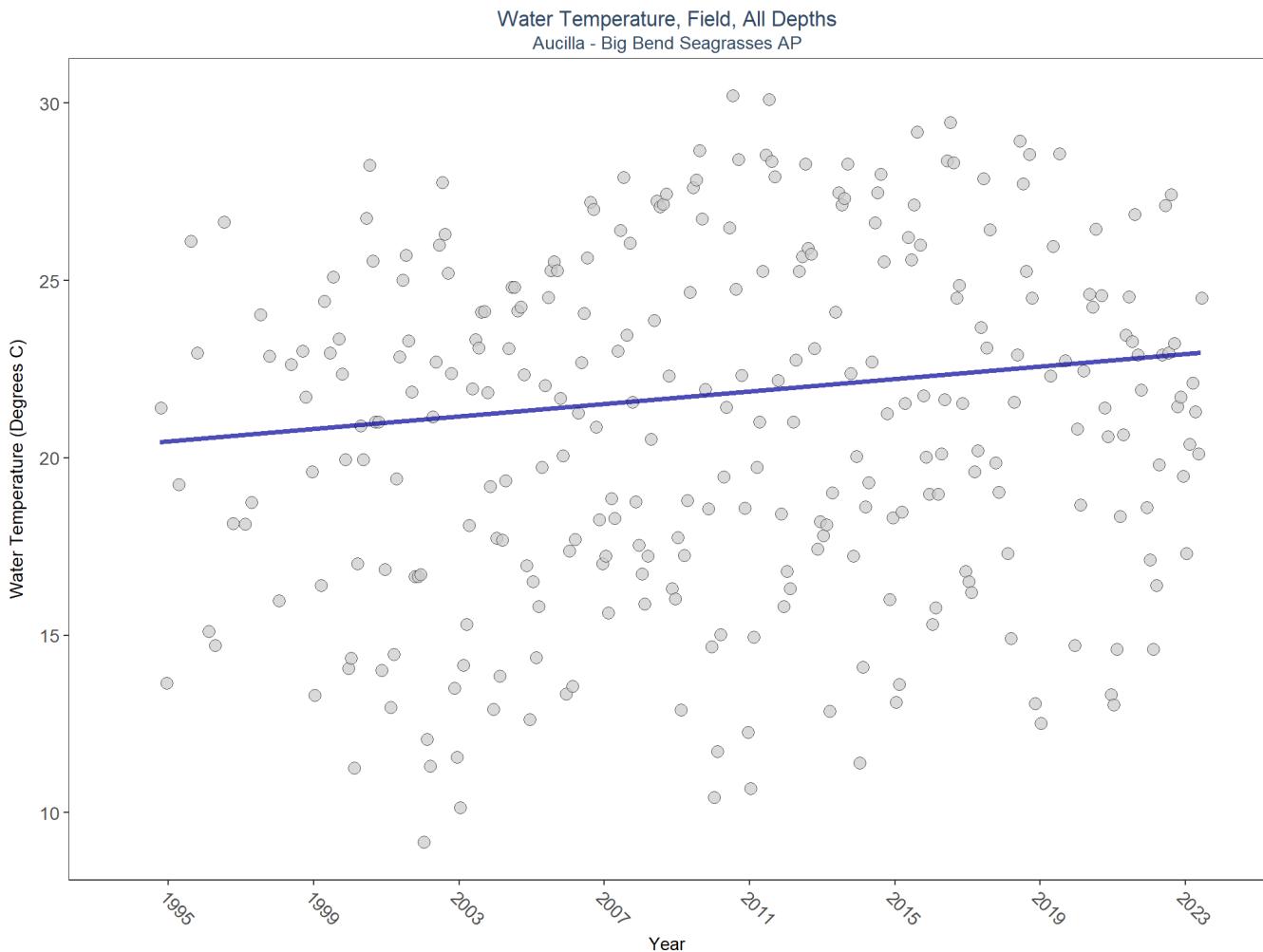


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1101	23	25.7	TRUE	0.1596	0.0017	0.005	0.1045513	8.1529	0.6995	1

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

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

## Water Temperature

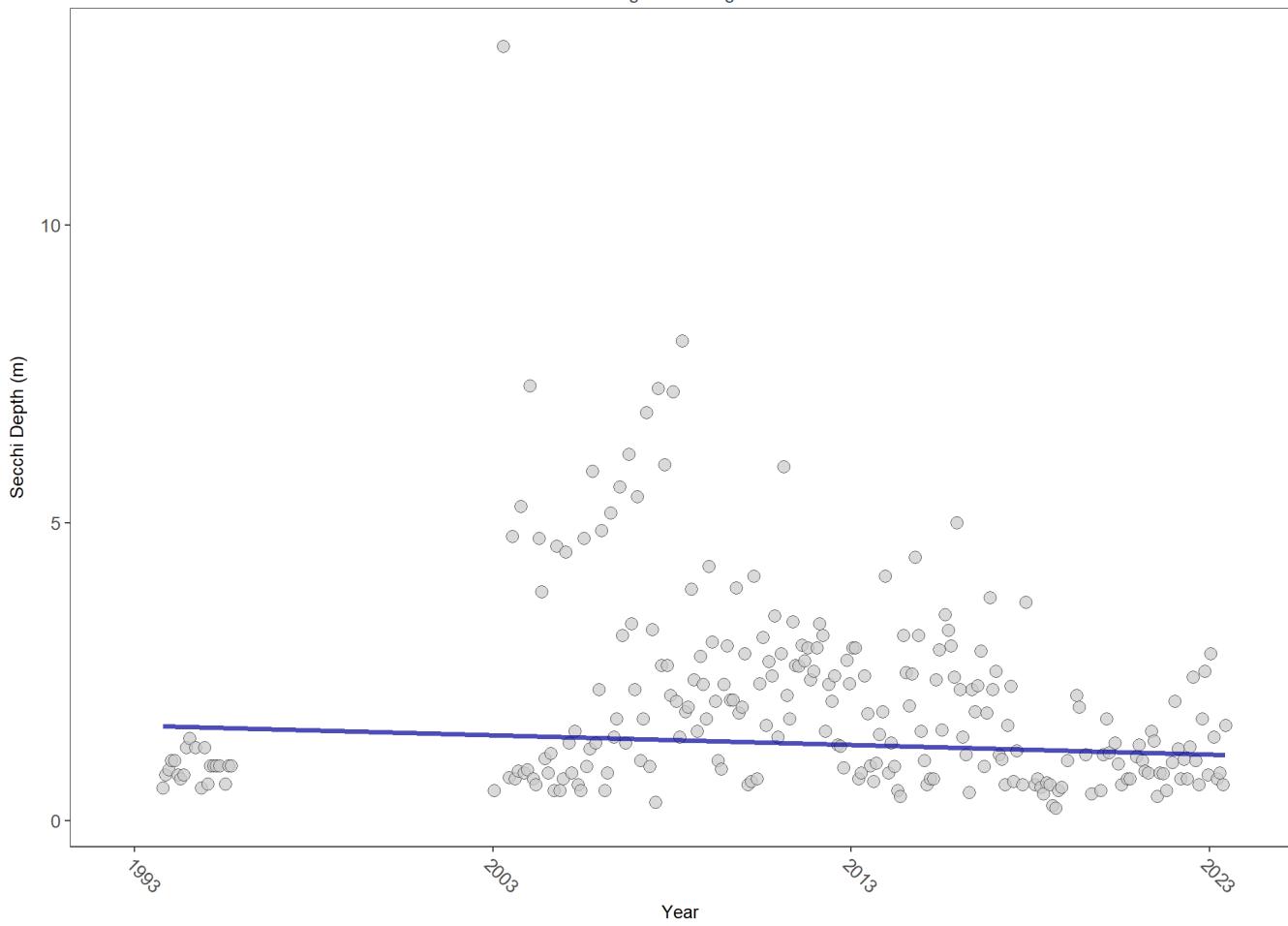


*p < 0.00005 appear as 0 due to rounding.*

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

## Secchi Depth

Secchi Depth, Field, Surface  
Aucilla - Big Bend Seagrasses AP

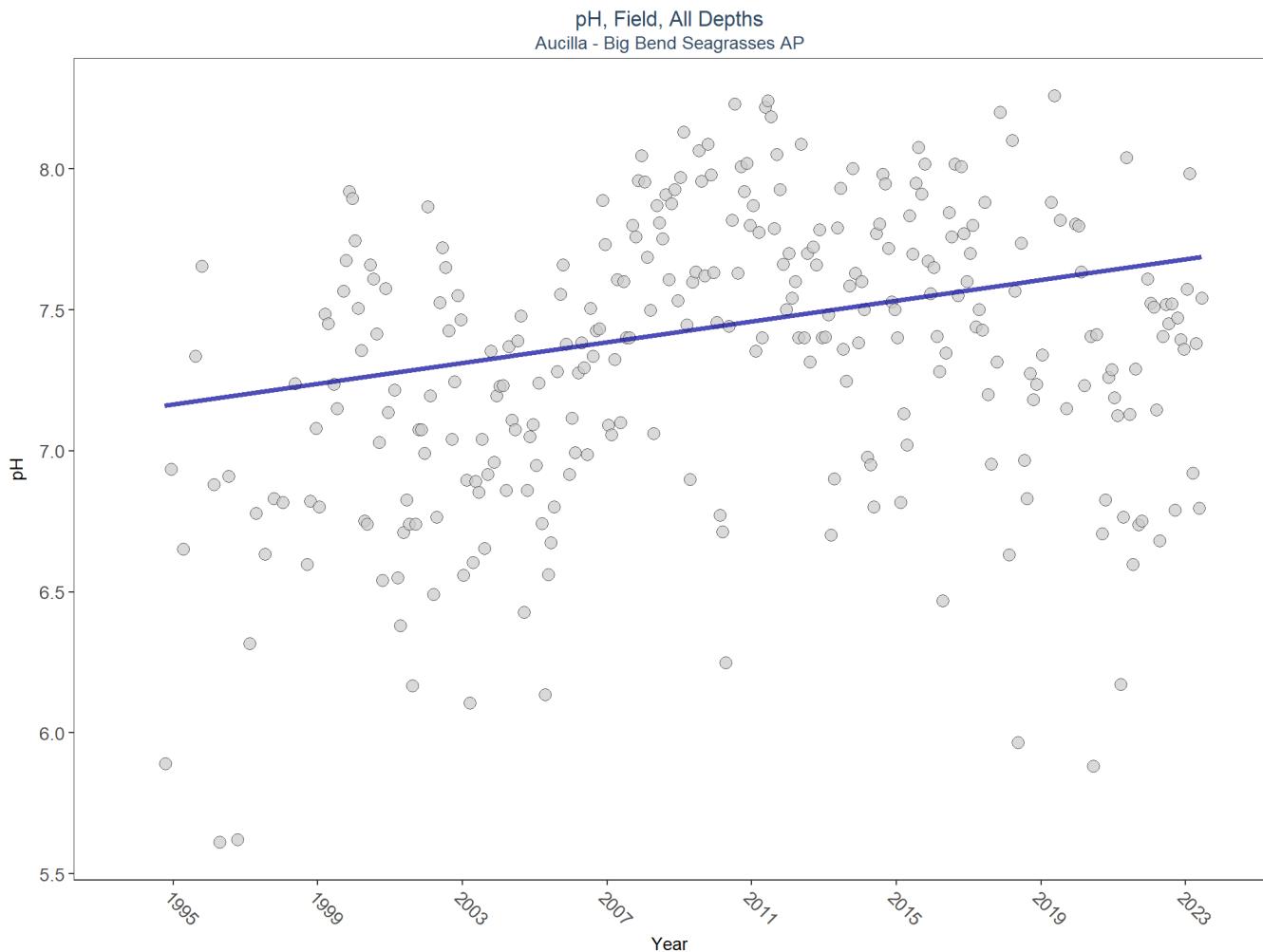


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
Surface	1069	24	1.9	TRUE	-0.1015	0.0197	-0.01599386	1.592254	22.7682	0.0191	-1

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

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

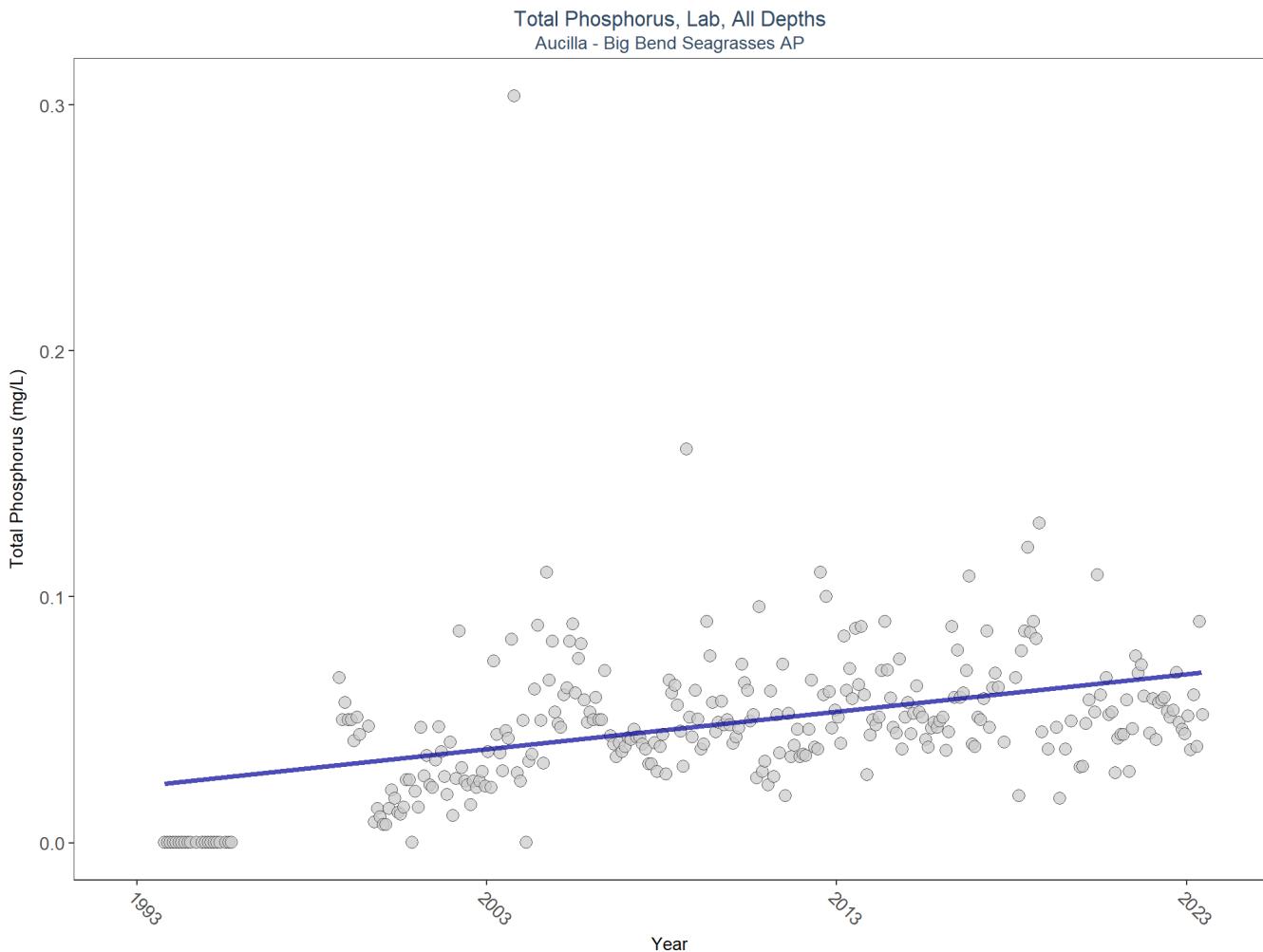
## pH



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

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

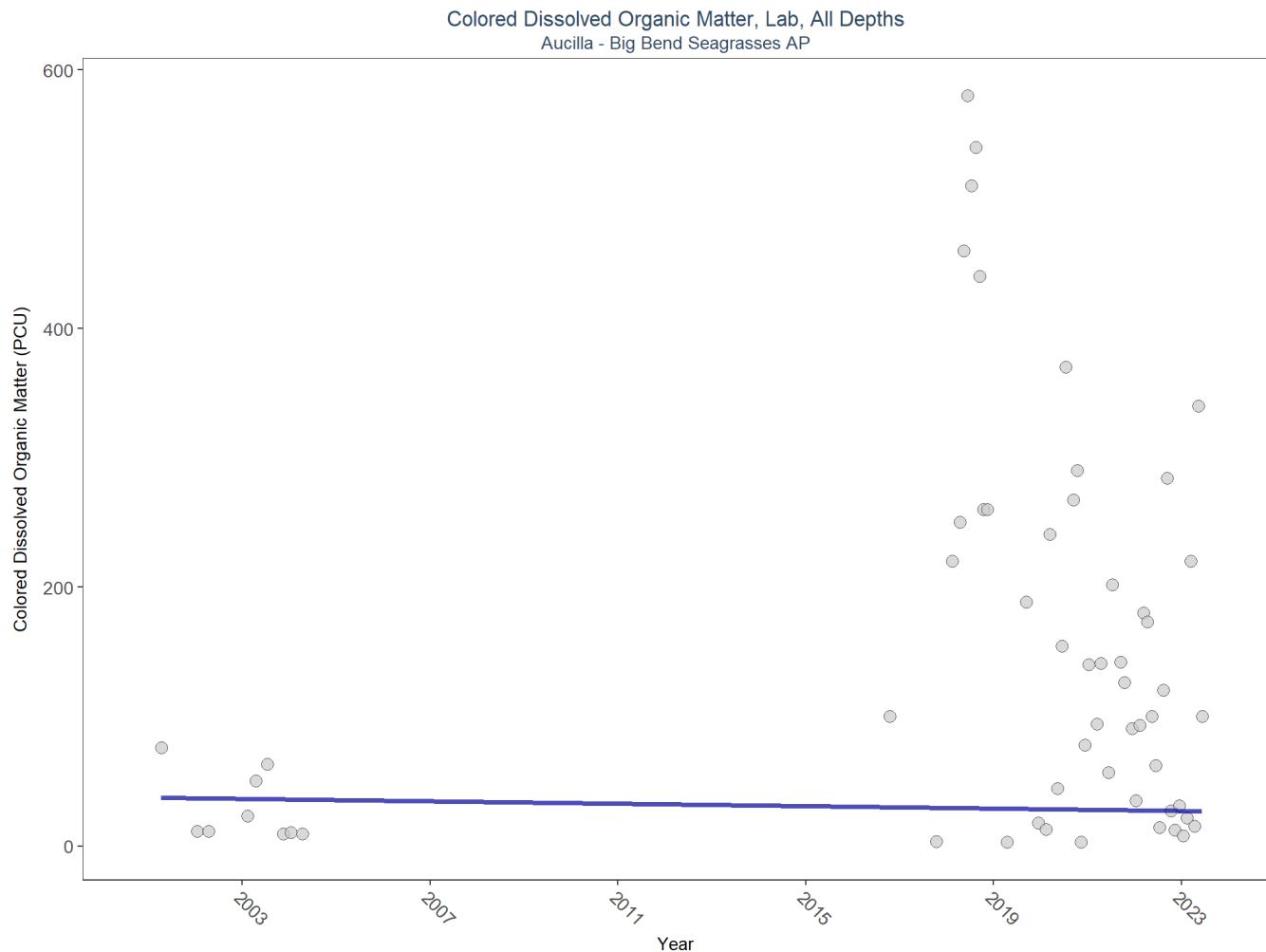
## Total Phosphorus



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

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

## Colored Dissolved Organic Matter

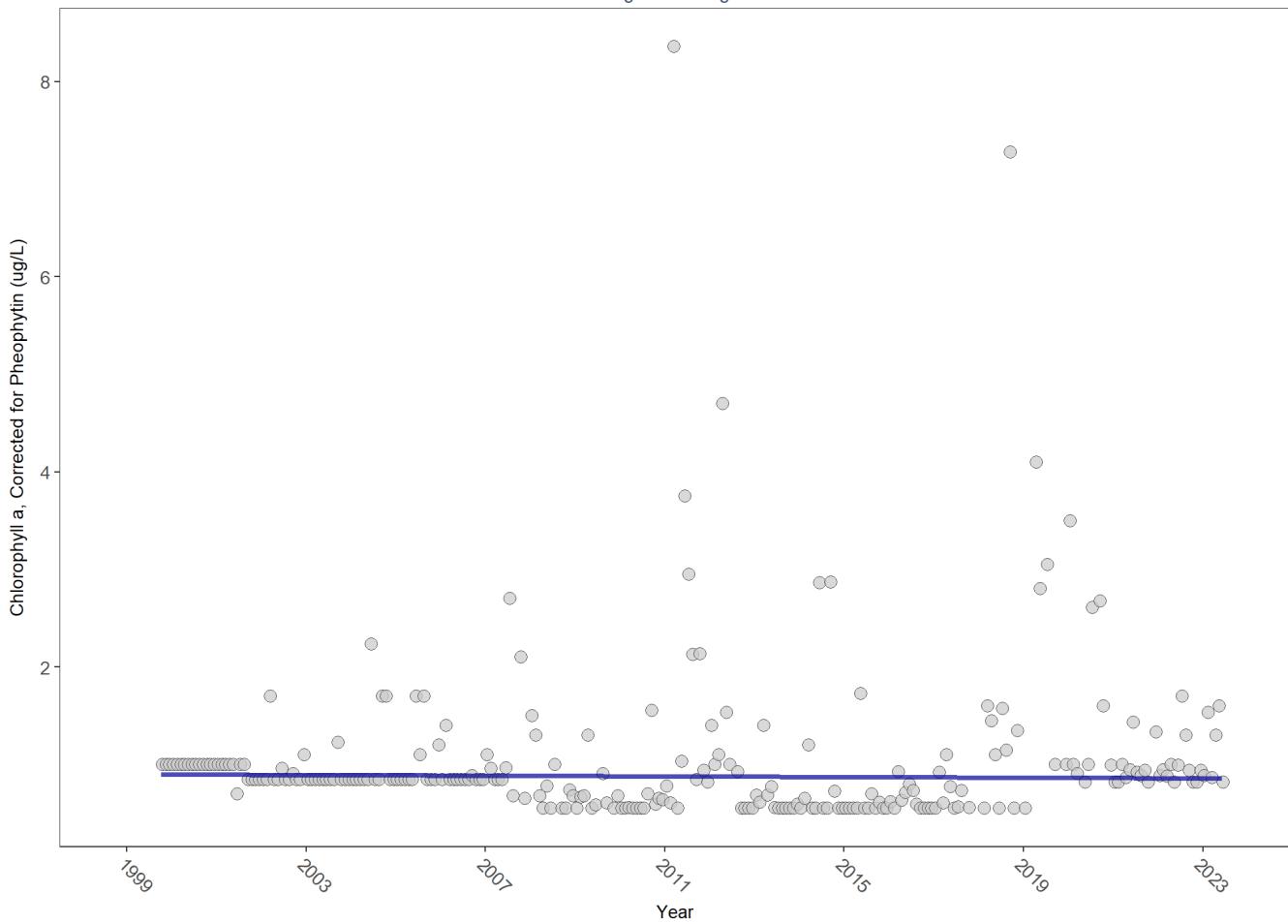


*p < 0.00005 appear as 0 due to rounding.*

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

## Chlorophyll a, Corrected for Pheophytin

Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Aucilla - Big Bend Seagrasses AP

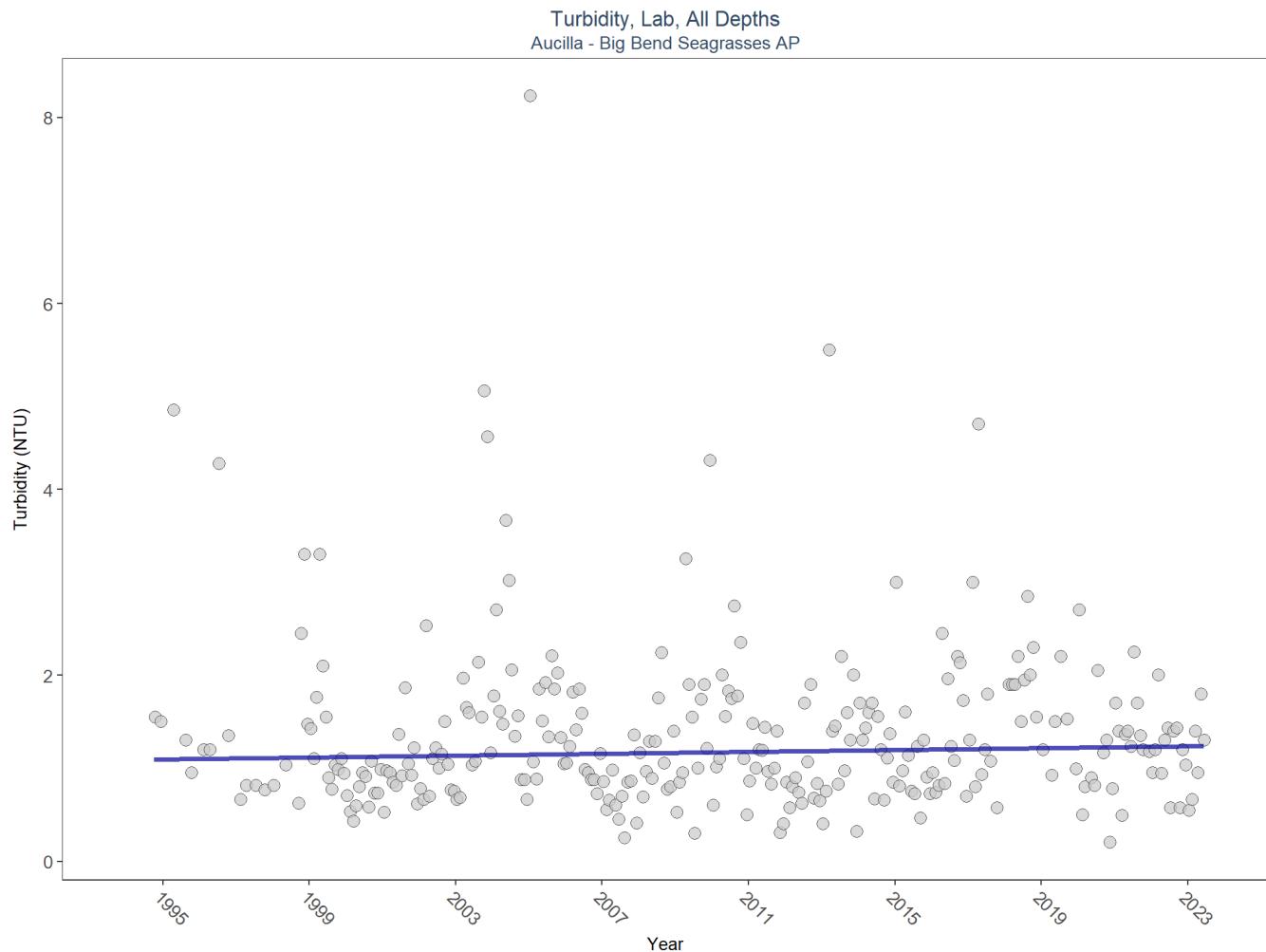


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	404	25	0.85	TRUE	-0.1036	0.0226	-0.001666667	0.9015	11.0153	0.442	-1

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

SennIntercept is intercept value at beginning of record for monitoring location

## Turbidity

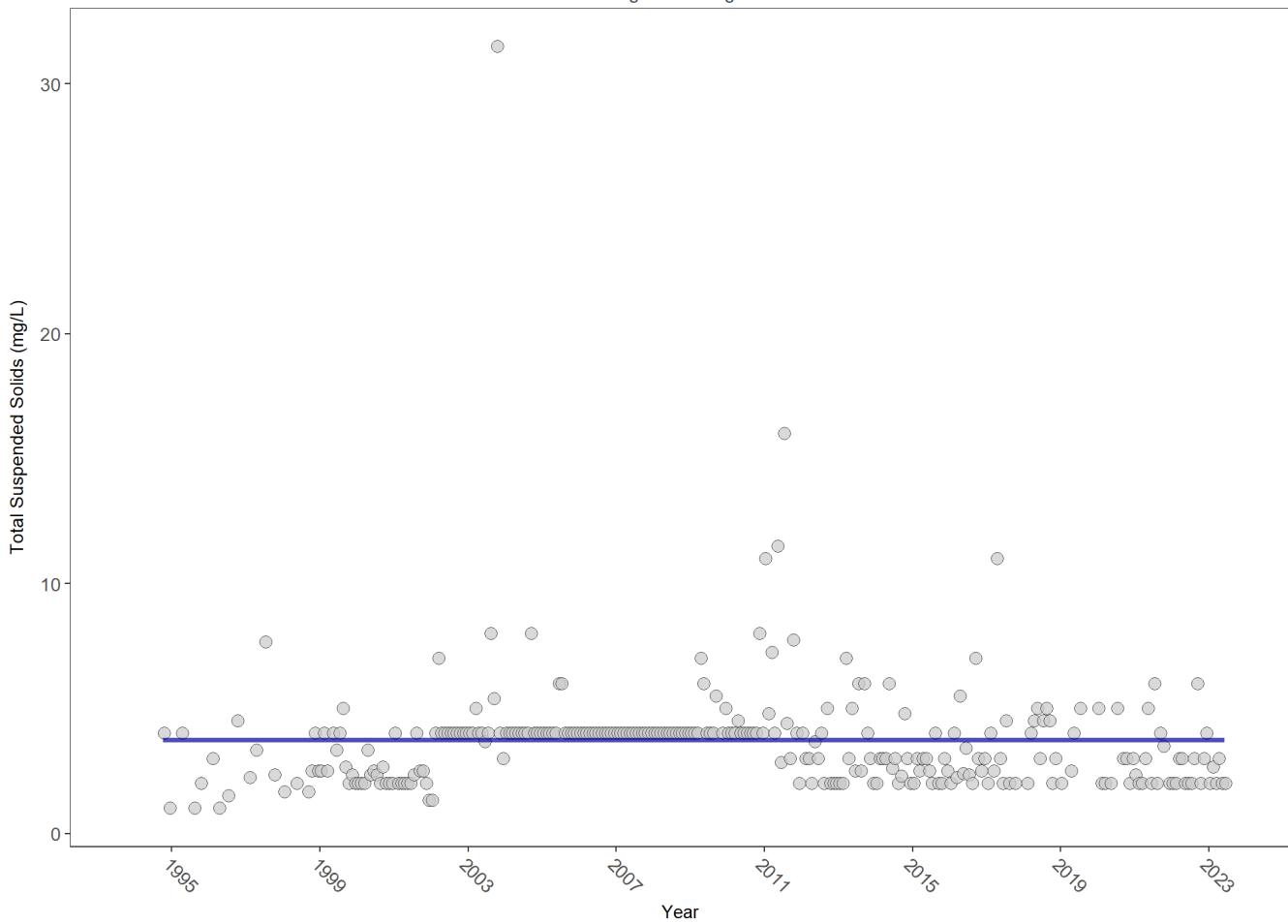


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Suspended Solids

Total Suspended Solids, Lab and Field Combined, All Depths  
Aucilla - Big Bend Seagrasses AP

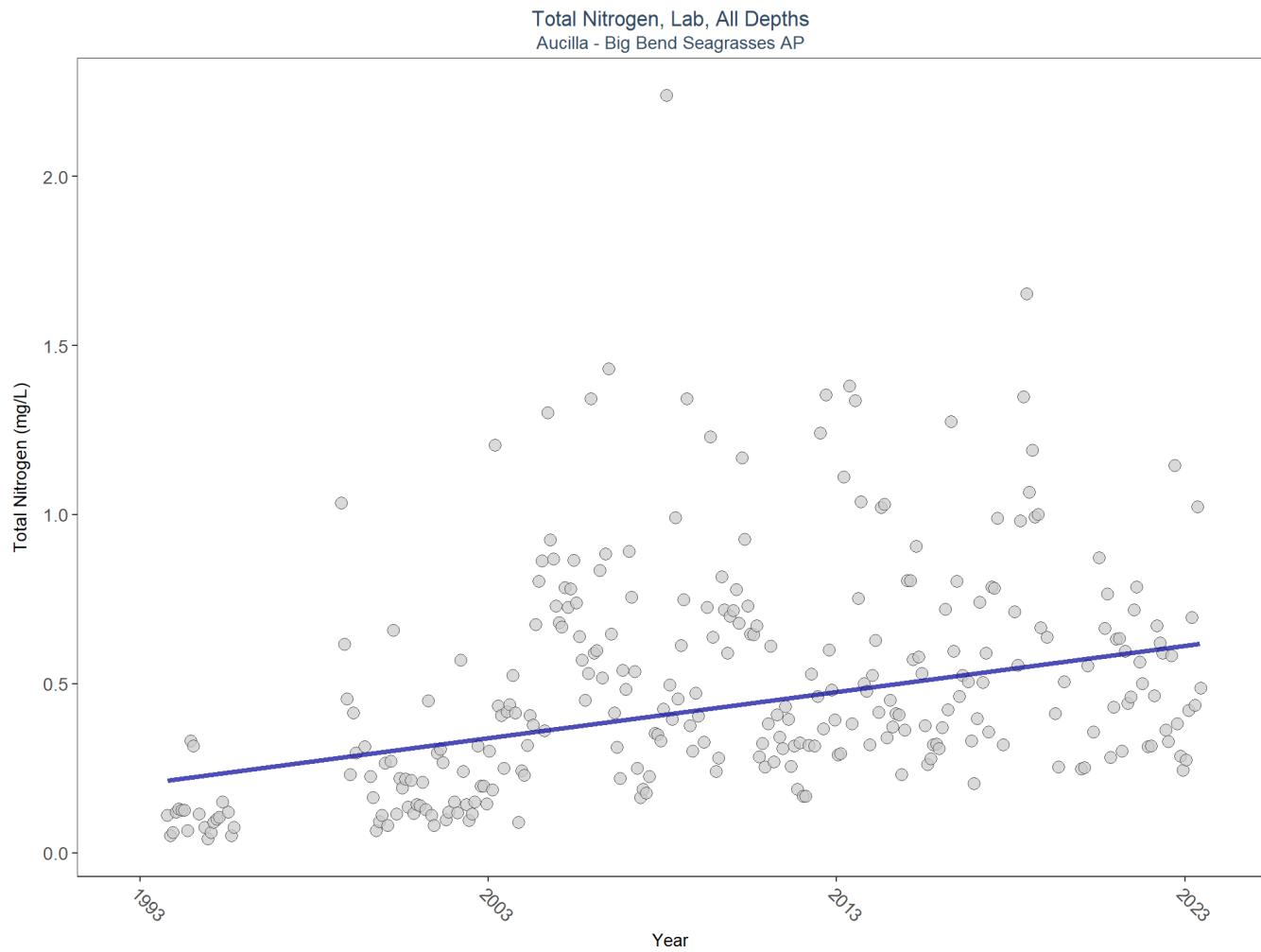


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	564	30	4	TRUE	-0.0647	0.1201	0	3.75	16.4993	0.1236	0

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

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

## Total Nitrogen



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

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

## Submerged Aquatic Vegetation

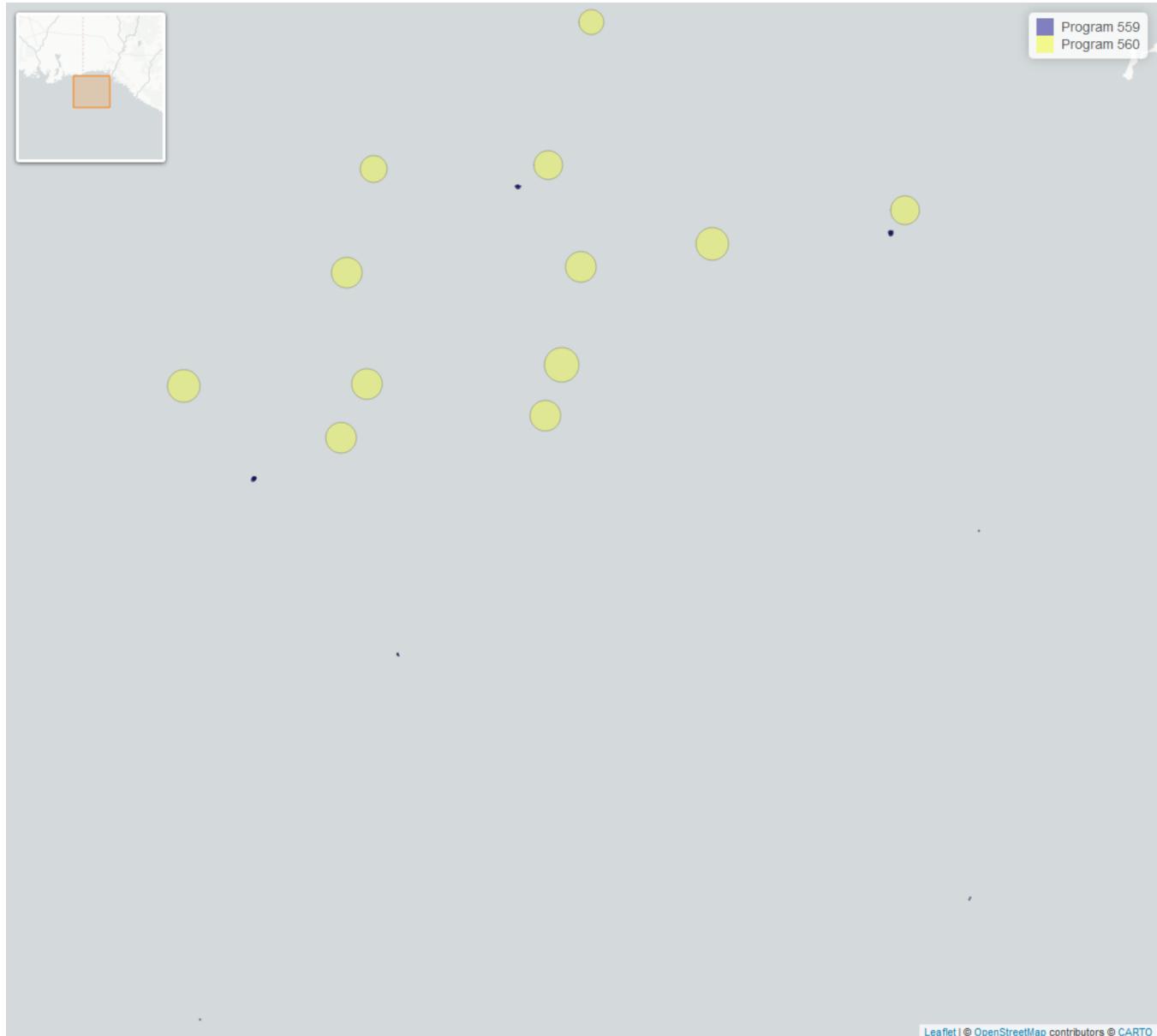


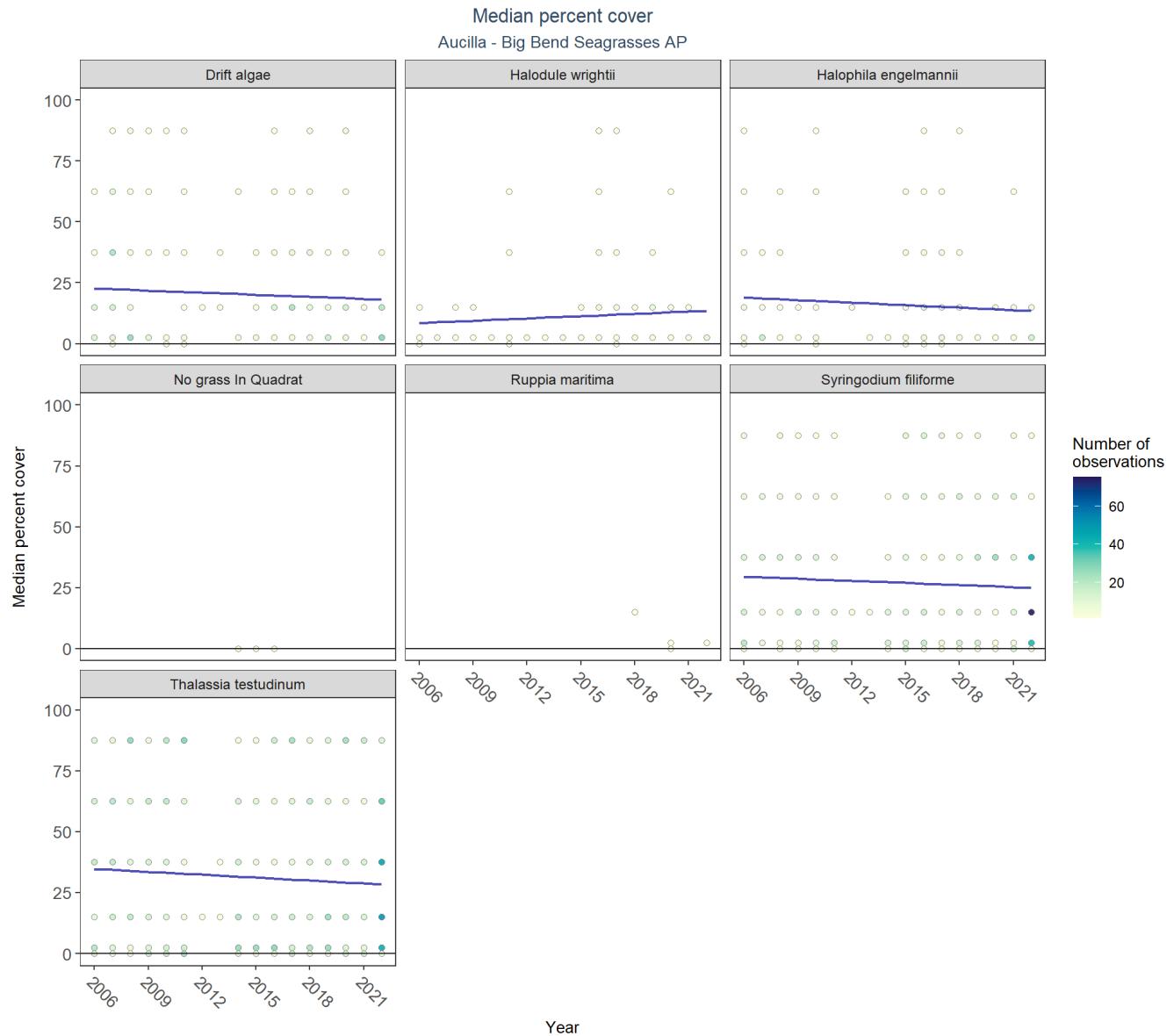
Table 12: Northern Big Bend Seagrass Monitoring - *Program 559*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
70	2012	2018	Modified Braun Blanquet	29

Table 13: Big Bend Seagrasses & Nature Coast Aquatic Preserves  
- Seagrass Monitoring - *Program 560*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
2725	2006	2022	Modified Braun Blanquet	12
249	2022	2022	Percent Cover	12

## Median Percent Cover - Species Trends



## Median Percent Cover - Species Trend Table

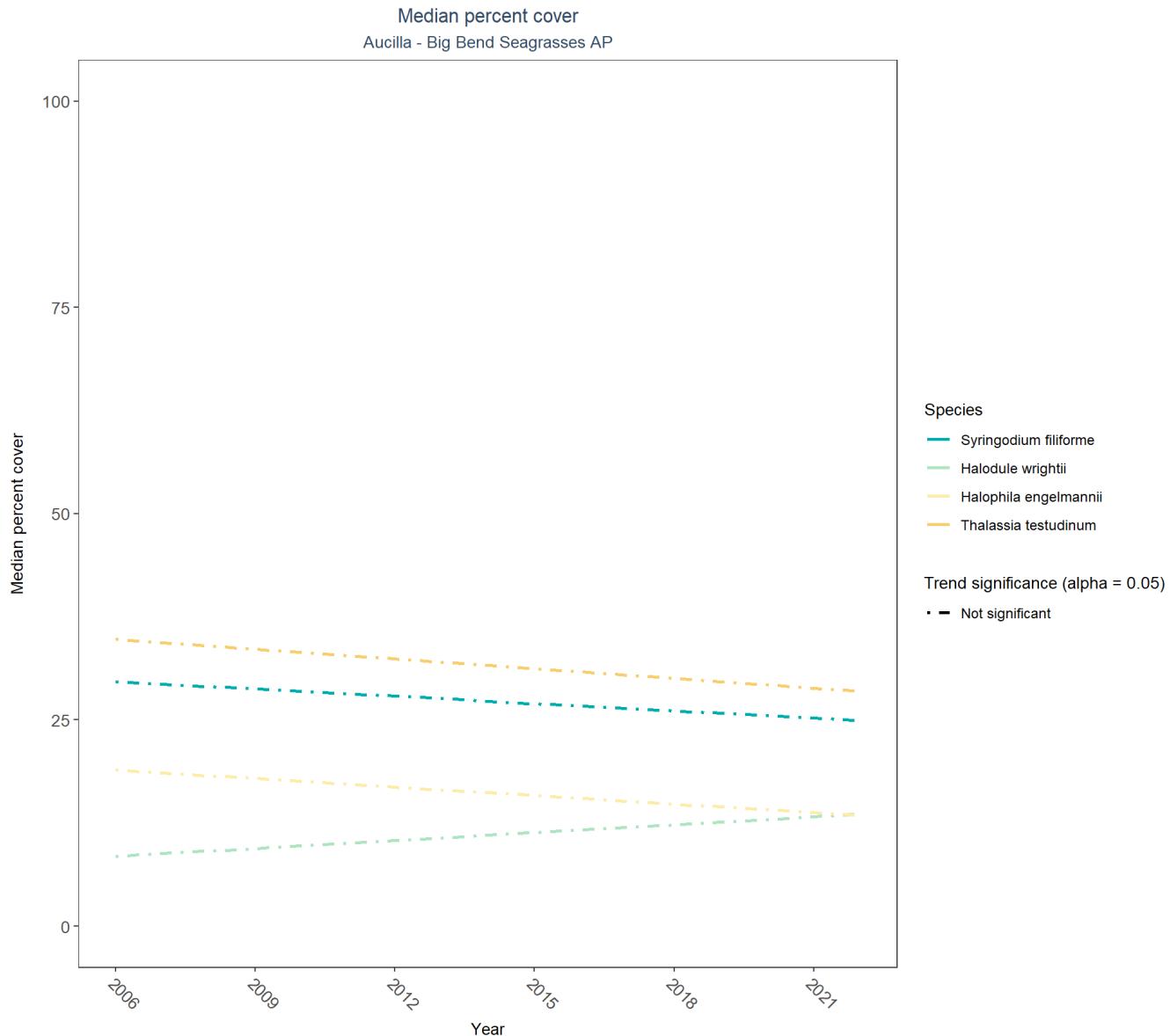
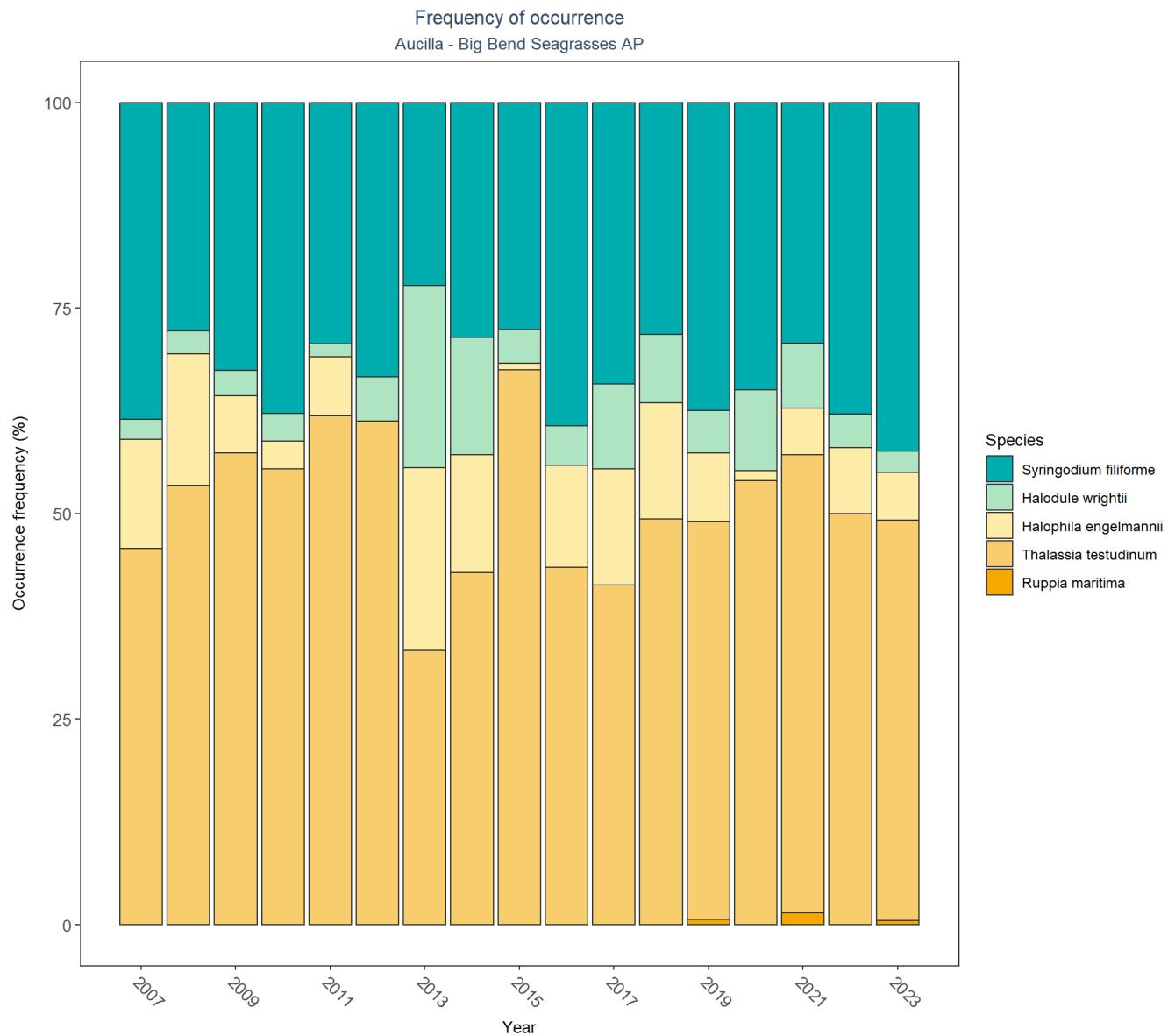


Table 14: Percent Cover Trend Analysis for Aucilla

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	No significant trend	2006 - 2022	24.3940	-0.2846	0.3844
Halodule wrightii	No significant trend	2006 - 2022	6.5741	0.3177	0.3869
Halophila engelmannii	No significant trend	2006 - 2022	21.0062	-0.3442	0.3246
No grass In Quadrat	Insufficient data to calculate trend	-	-	-	-
Ruppia maritima	Insufficient data to calculate trend	-	-	-	-
Syringodium filiforme	No significant trend	2006 - 2022	31.3395	-0.2891	0.3122
Thalassia testudinum	No significant trend	2006 - 2022	37.1703	-0.3966	0.1319

## Frequency of Occurrence Barplots



## Keaton Beach

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

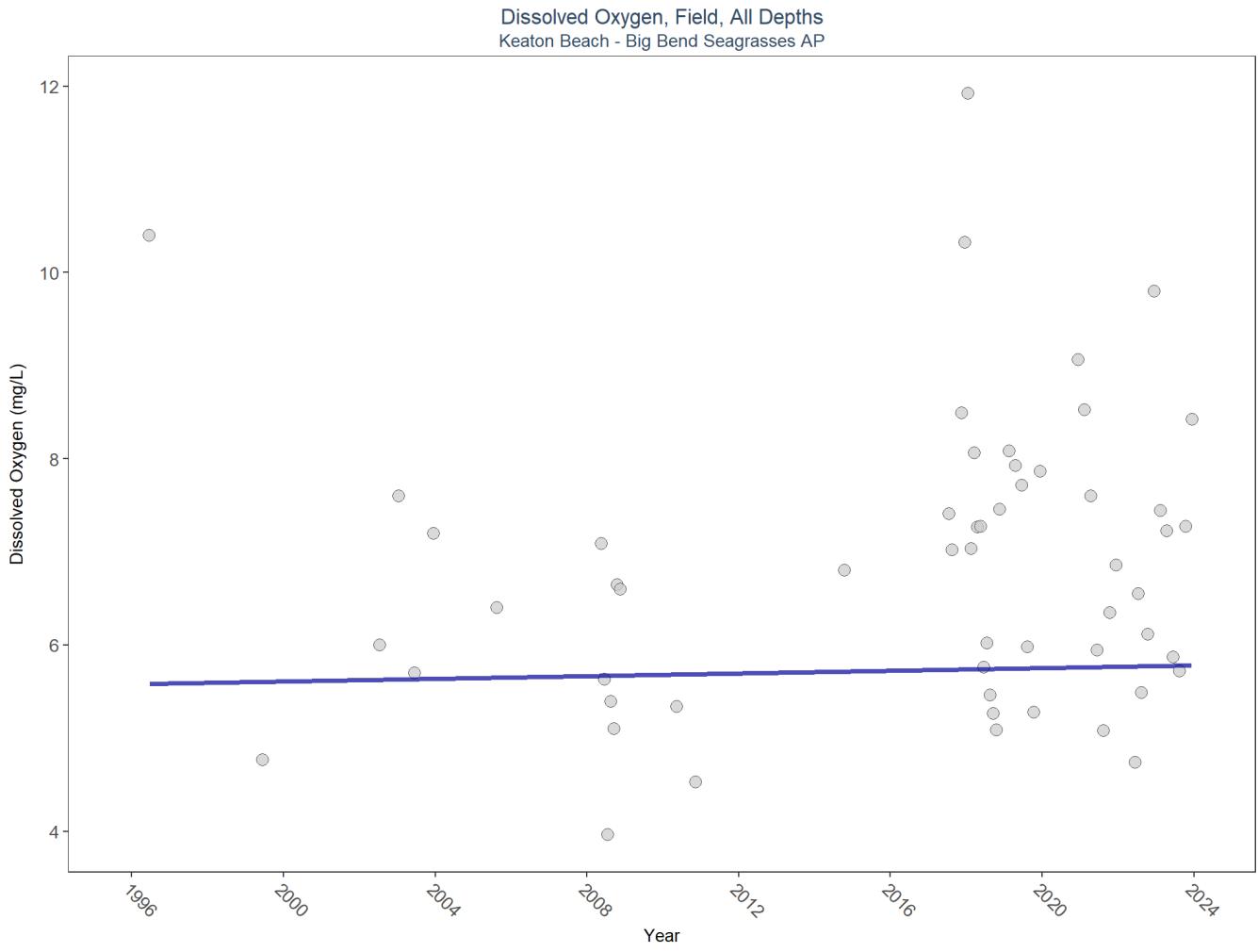
Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

Table 15: Seasonal Kendall-Tau Results for Keaton Beach

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	2010 - 2023	8	148	FALSE	-	-	-	-
Dissolved Oxygen	1996 - 2023	15	387	TRUE	0.01	5.58	0.6410	0
Dissolved Oxygen Saturation	2003 - 2022	2	4	FALSE	-	-	-	-
Salinity	1996 - 2023	15	548	TRUE	-0.29	36.71	0.0387	↓
Water Temperature	1996 - 2023	17	398	TRUE	-0.05	27.40	0.1437	0
Secchi Depth	2002 - 2022	5	241	FALSE	-	-	-	-
pH	1999 - 2023	13	388	TRUE	-0.02	8.33	0.2284	0
Total Phosphorus	2010 - 2023	8	137	FALSE	-	-	-	-
Colored Dissolved Organic Matter	2022 - 2022	1	1	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	2010 - 2023	8	125	FALSE	-	-	-	-
Turbidity	2010 - 2023	6	51	FALSE	-	-	-	-
Total Suspended Solids	2010 - 2022	2	3	FALSE	-	-	-	-
Total Nitrogen	2010 - 2023	8	126	FALSE	-	-	-	-

## Discrete WQ

### Dissolved Oxygen

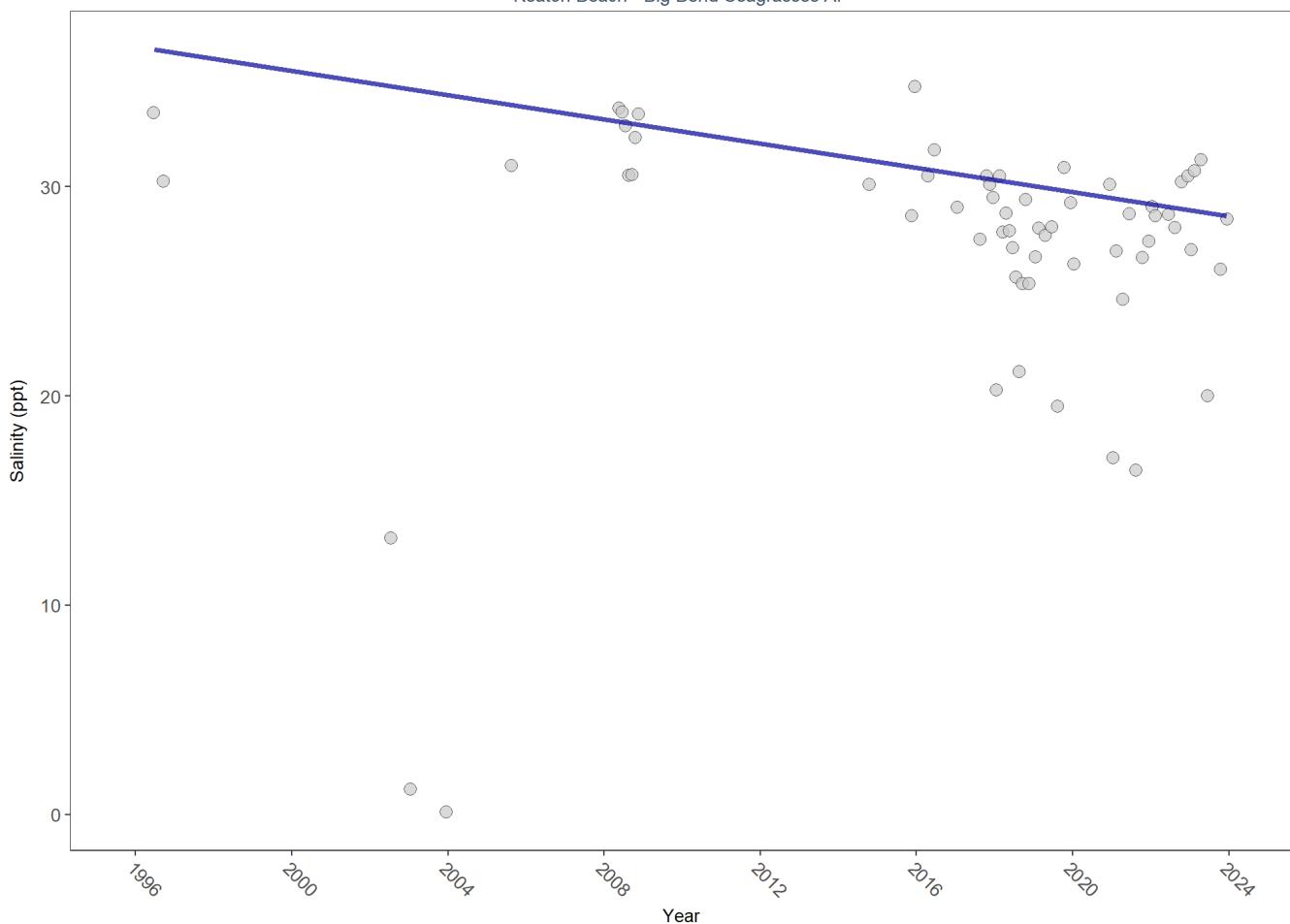


*p < 0.00005 appear as 0 due to rounding.*

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Keaton Beach - Big Bend Seagrasses AP



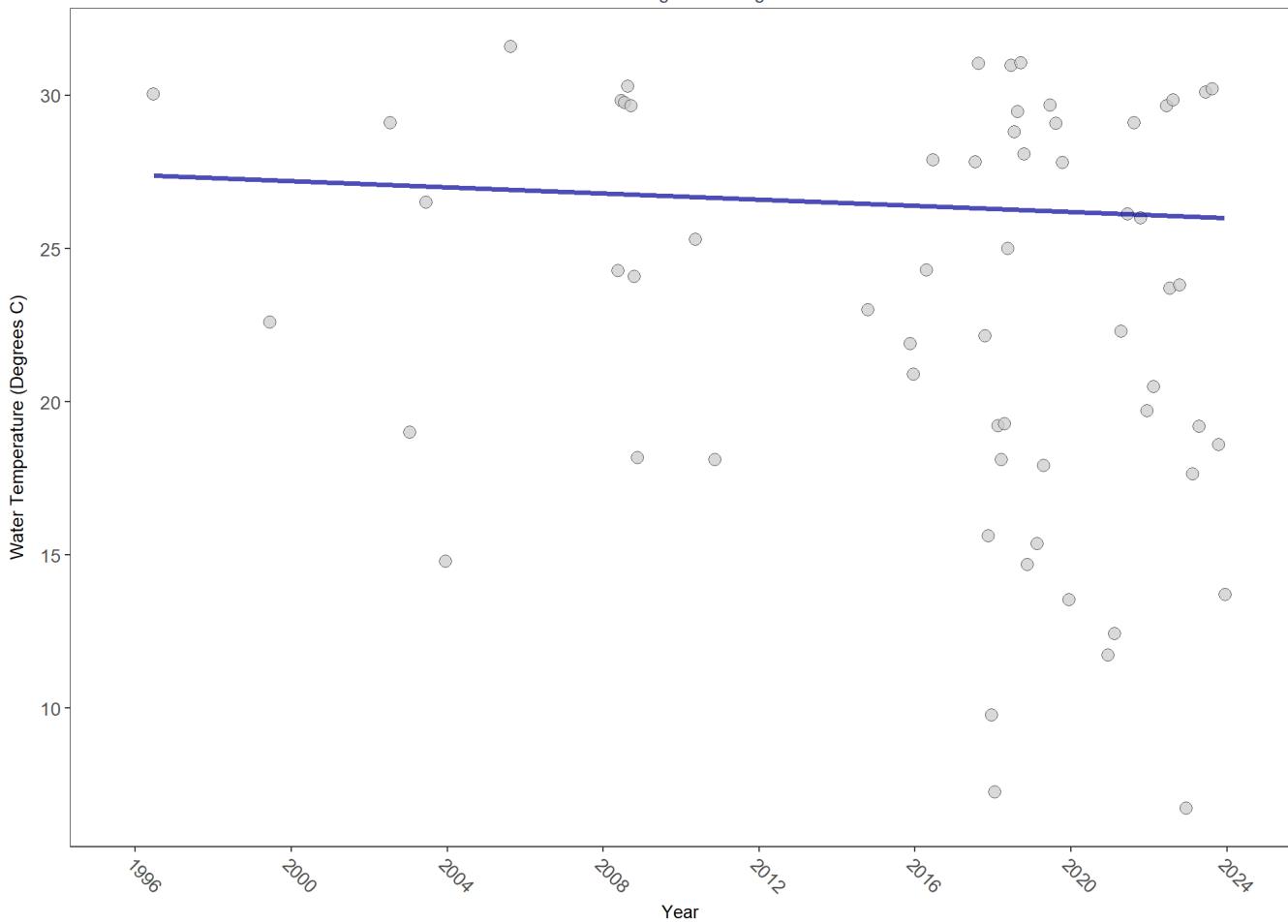
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	548	15	30.035	TRUE	-0.2506	0.0387	-0.2895833	36.71332	11.085	0.3509	-1

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

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

## Water Temperature

Water Temperature, Field, All Depths  
Keaton Beach - Big Bend Seagrasses AP

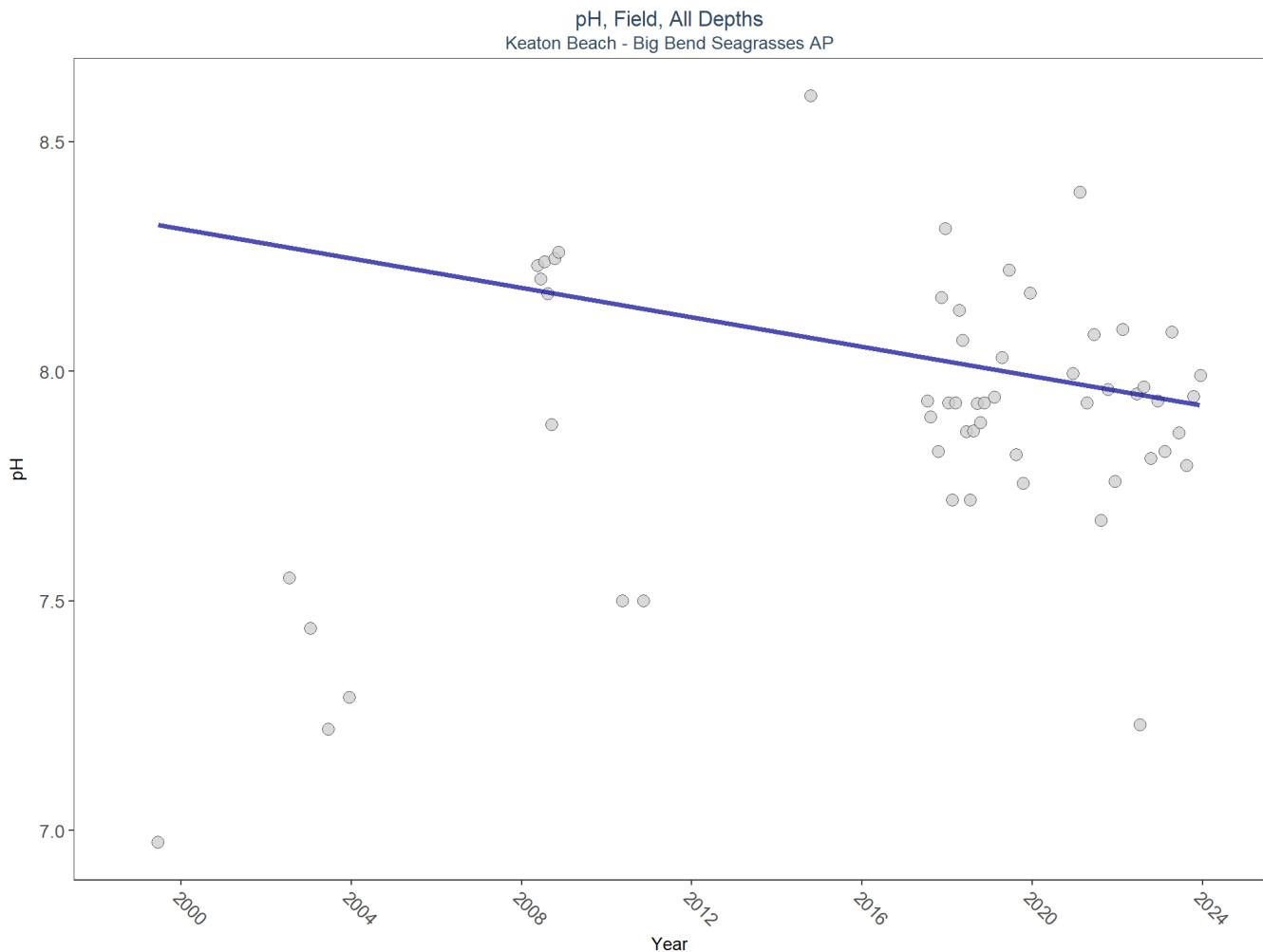


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	398	17	26.65	TRUE	-0.1923	0.1437	-0.05041667	27.39796	7.8347	0.645	0

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

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

## pH



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

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

## Submerged Aquatic Vegetation

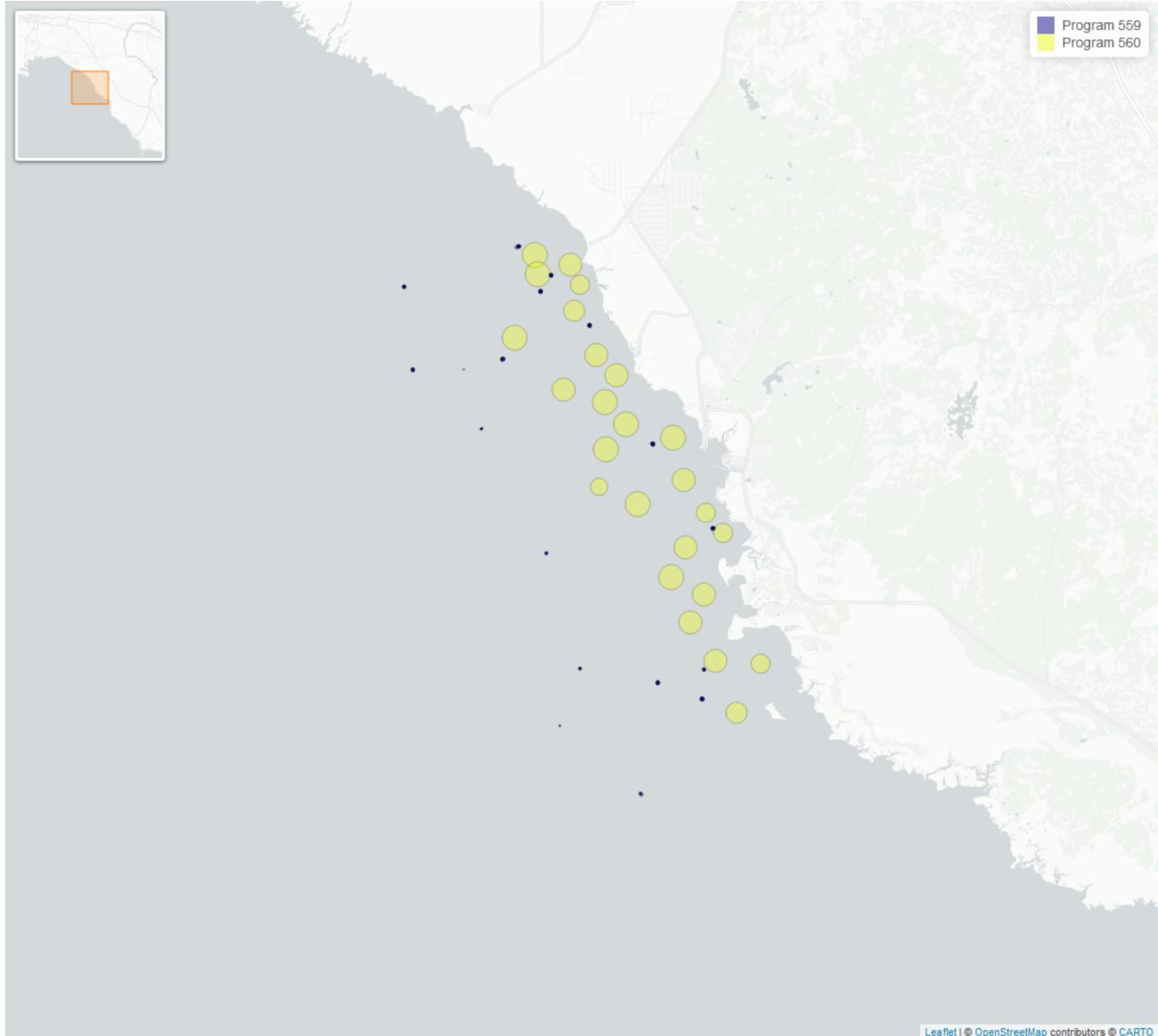


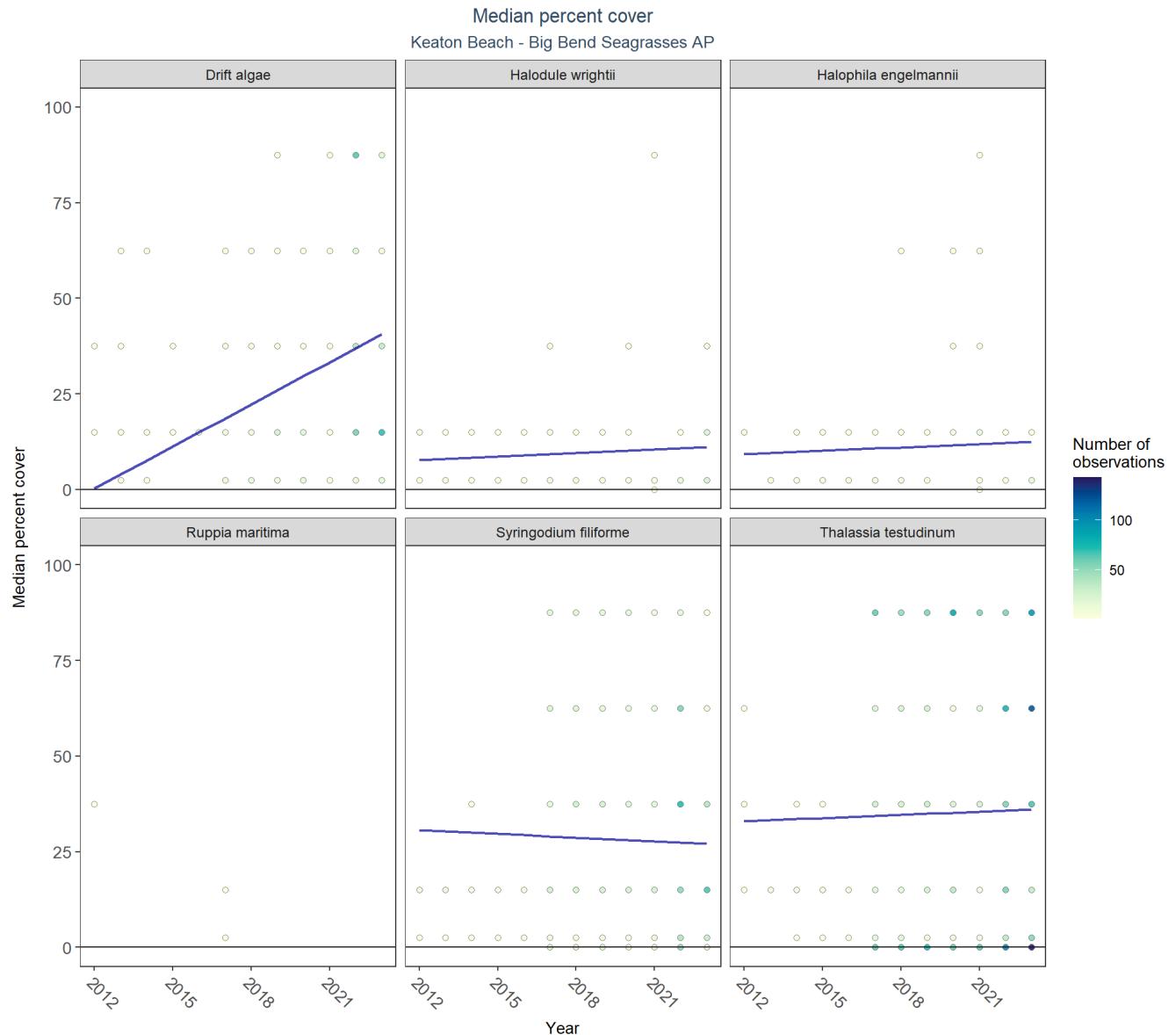
Table 16: Northern Big Bend Seagrass Monitoring - *Program 559*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
324	2012	2018	Modified Braun Blanquet	109

Table 17: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
2624	2017	2023	Modified Braun Blanquet	25
923	2022	2023	Percent Cover	25

## Median Percent Cover - Species Trends



## Median Percent Cover - Species Trend Table

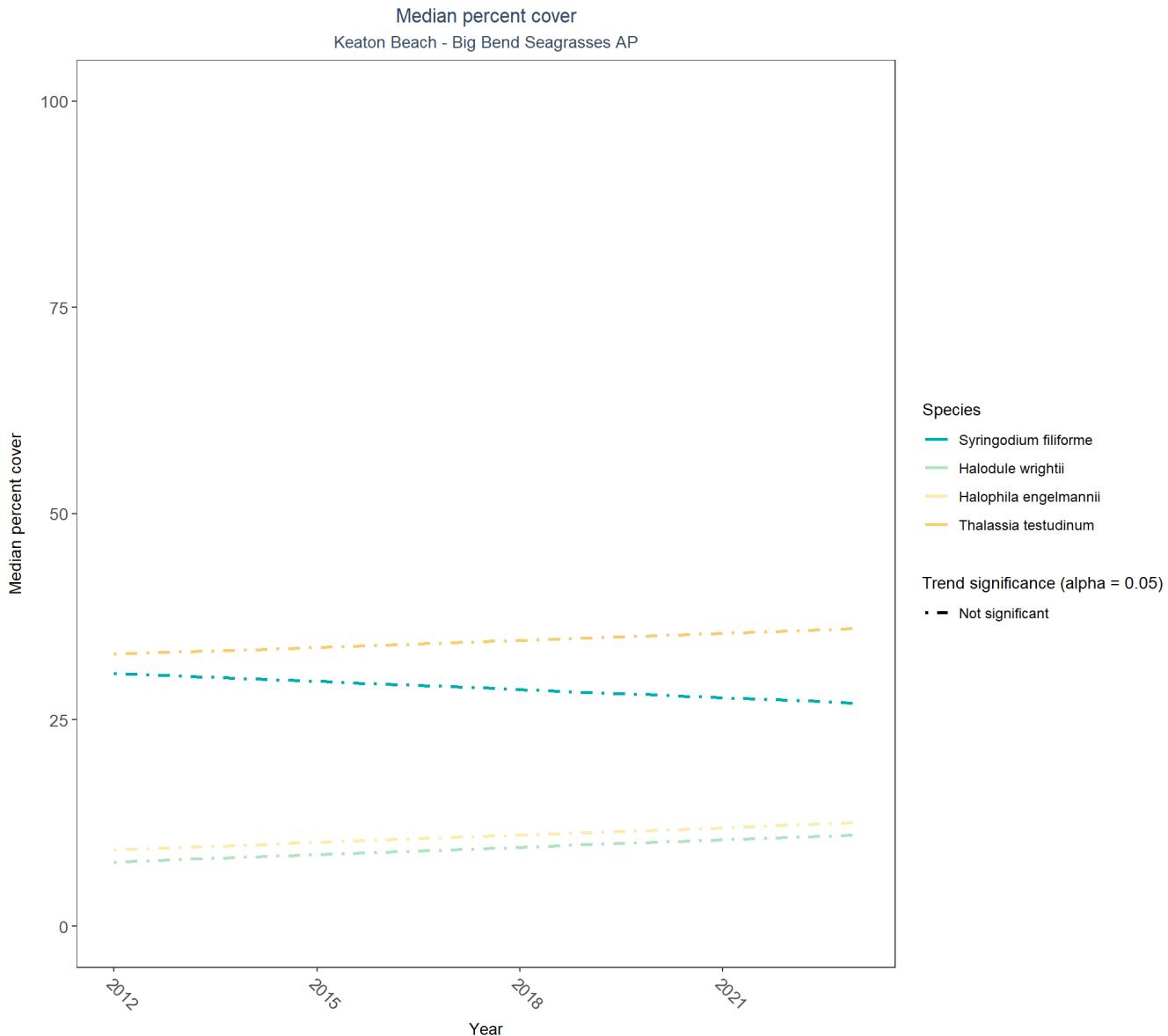
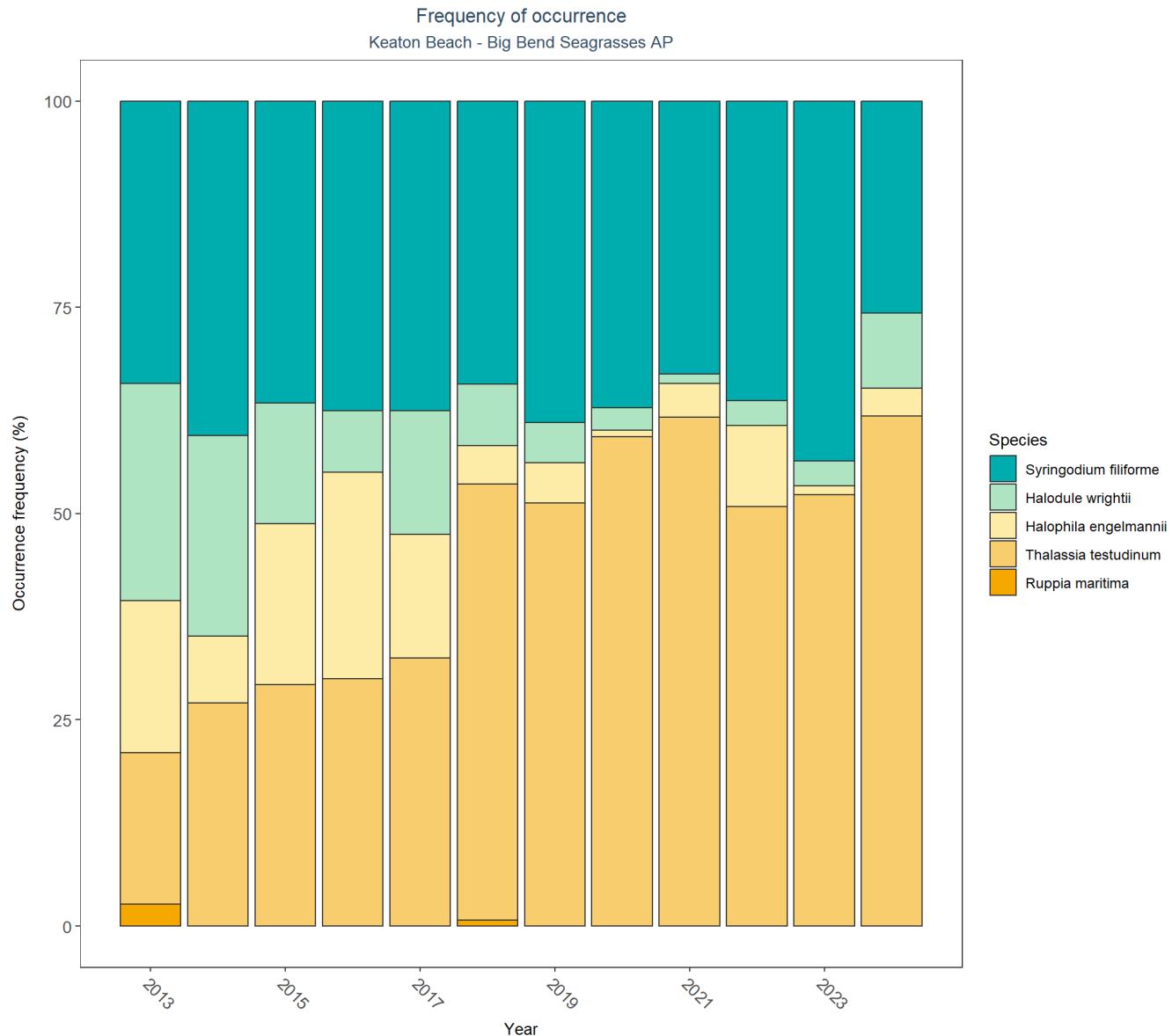


Table 18: Percent Cover Trend Analysis for Keaton Beach

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	Significantly increasing trend	2012 - 2023	-43.6145	3.6603	0.0000
<i>Halodule wrightii</i>	No significant trend	2012 - 2023	4.1773	0.2999	0.3295
<i>Halophila engelmannii</i>	No significant trend	2012 - 2023	5.6832	0.2979	0.4728
<i>Ruppia maritima</i>	Insufficient data to calculate trend	-	-	-	-
<i>Syringodium filiforme</i>	No significant trend	2012 - 2023	34.5480	-0.3252	0.5980
<i>Thalassia testudinum</i>	No significant trend	2012 - 2023	29.6074	0.2800	0.5202

## Frequency of Occurrence Barplots



## Cedar Key

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

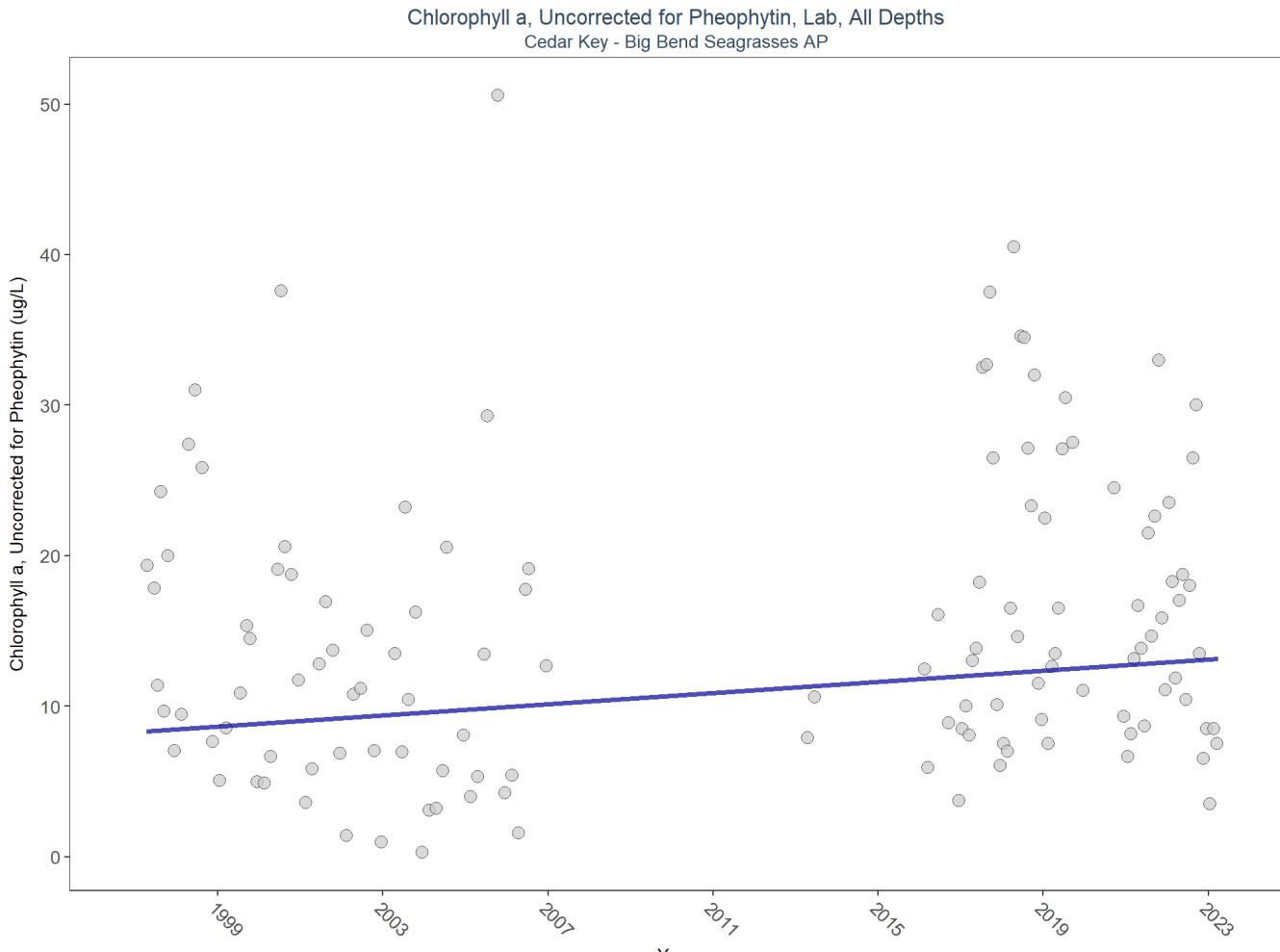
Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

Table 19: Seasonal Kendall-Tau Results for Cedar Key

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	1997 - 2023	19	466	TRUE	0.19	8.27	0.0217	↑
Dissolved Oxygen	1985 - 2022	29	41852	TRUE	-0.02	7.29	0.0143	↓
Dissolved Oxygen Saturation	2013 - 2016	2	8	FALSE	-	-	-	-
Salinity	1967 - 2023	33	44128	TRUE	0.00	26.68	0.8623	0
Water Temperature	1967 - 2022	31	43746	TRUE	0.03	22.55	0.0019	↑
Secchi Depth	1994 - 2023	29	16404	TRUE	-0.01	1.16	0.0013	↓
pH	1994 - 2022	28	29333	TRUE	-0.01	8.10	0.0000	↓
Total Phosphorus	2000 - 2023	15	482	TRUE	0.00	0.04	0.2148	0
Colored Dissolved Organic Matter	2017 - 2023	7	123	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	1997 - 2023	18	449	TRUE	-0.09	13.83	0.2205	0
Turbidity	1995 - 2022	24	10510	TRUE	0.04	7.64	0.2050	0
Total Suspended Solids	1995 - 2013	4	48	FALSE	-	-	-	-
Total Nitrogen	2000 - 2023	17	502	TRUE	-0.02	0.83	0.0008	↓

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin

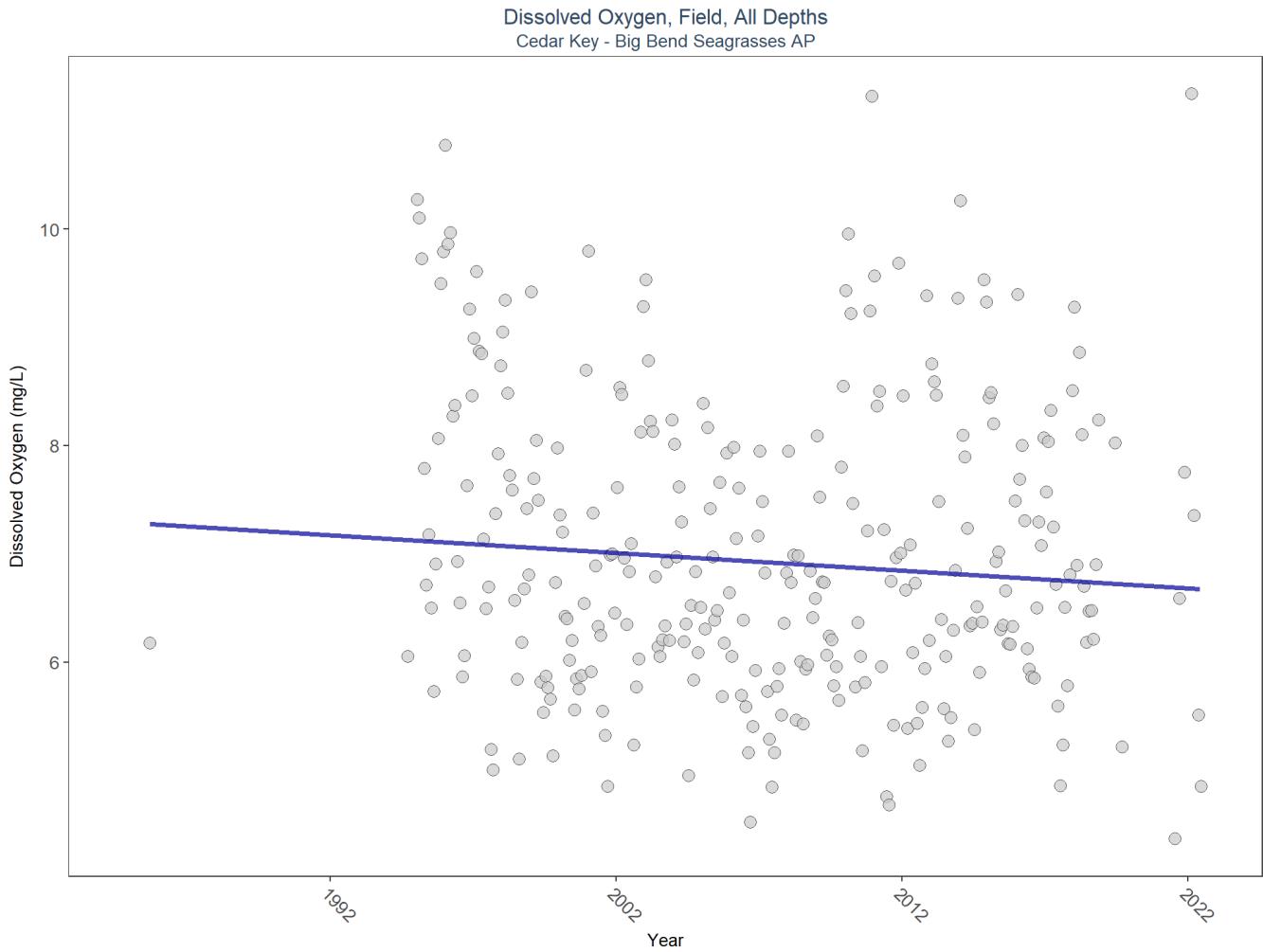


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	466	19	12	TRUE	0.1724	0.0217	0.1852632	8.269725	6.2839	0.8538	1

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

SennIntercept is intercept value at beginning of record for monitoring location

## Dissolved Oxygen

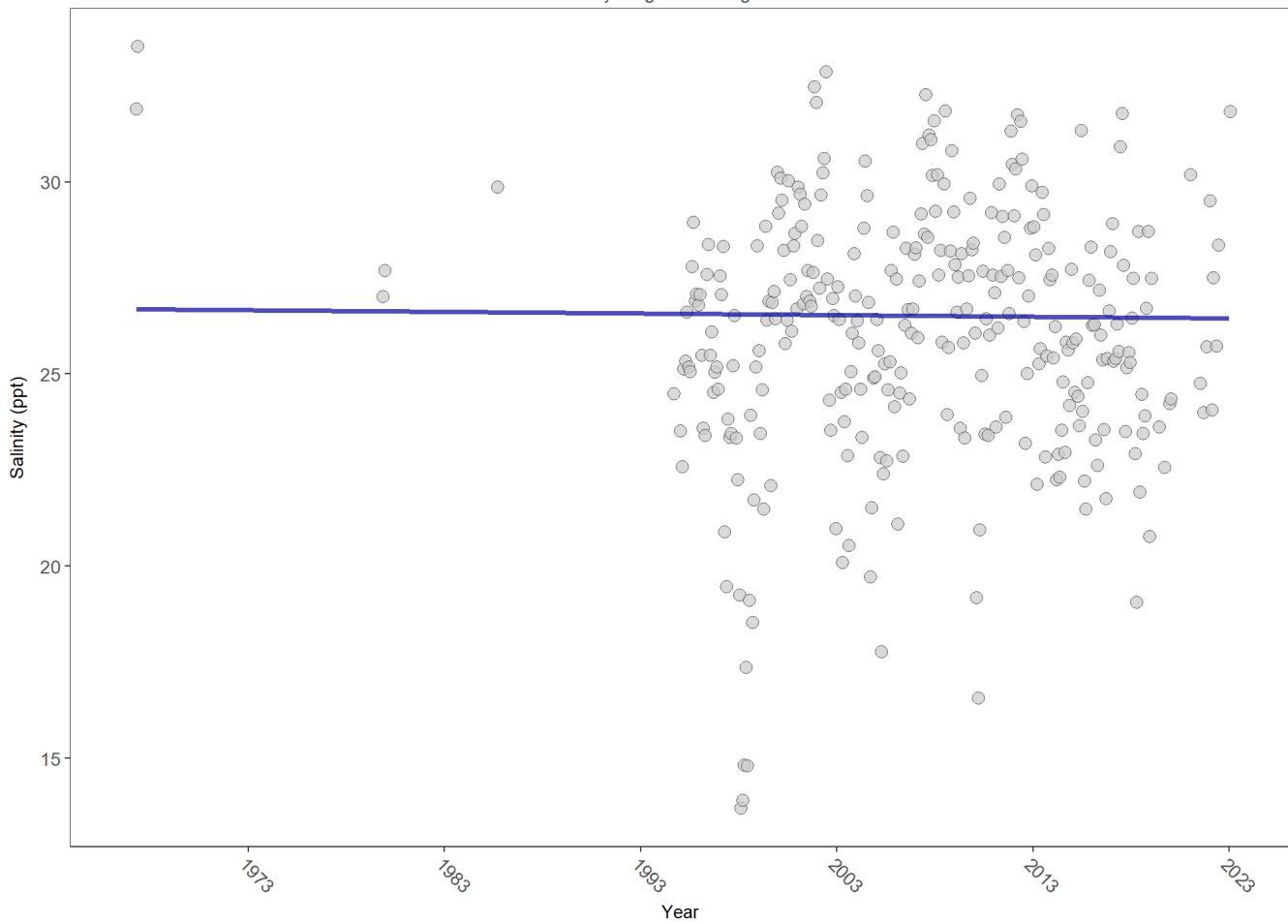


*p < 0.00005 appear as 0 due to rounding.*

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Cedar Key - Big Bend Seagrasses AP



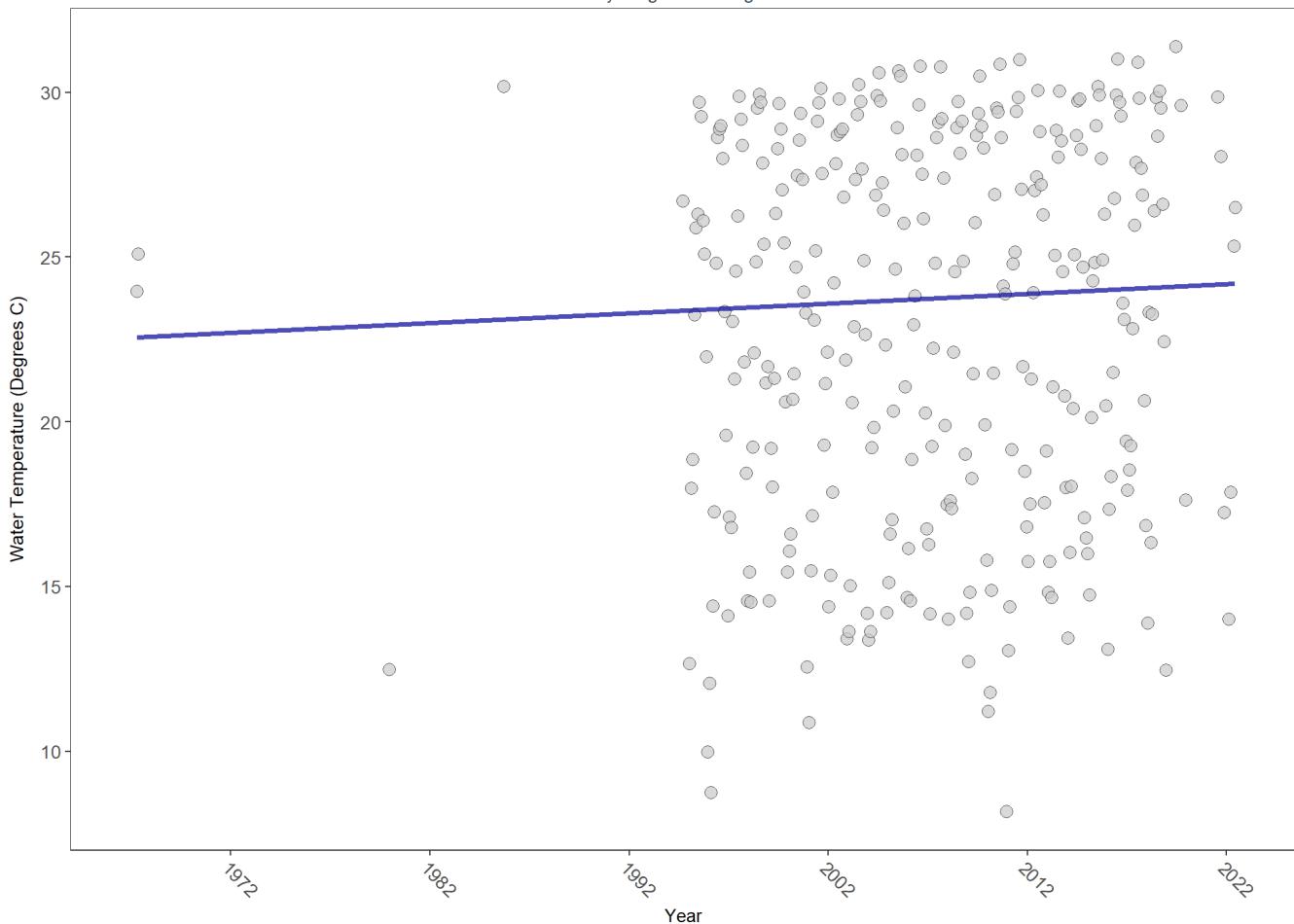
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	44128	33	26.5	TRUE	-0.0094	0.8623	-0.004163484	26.68353	9.4458	0.5808	0

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

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

## Water Temperature

Water Temperature, Field, All Depths  
Cedar Key - Big Bend Seagrasses AP

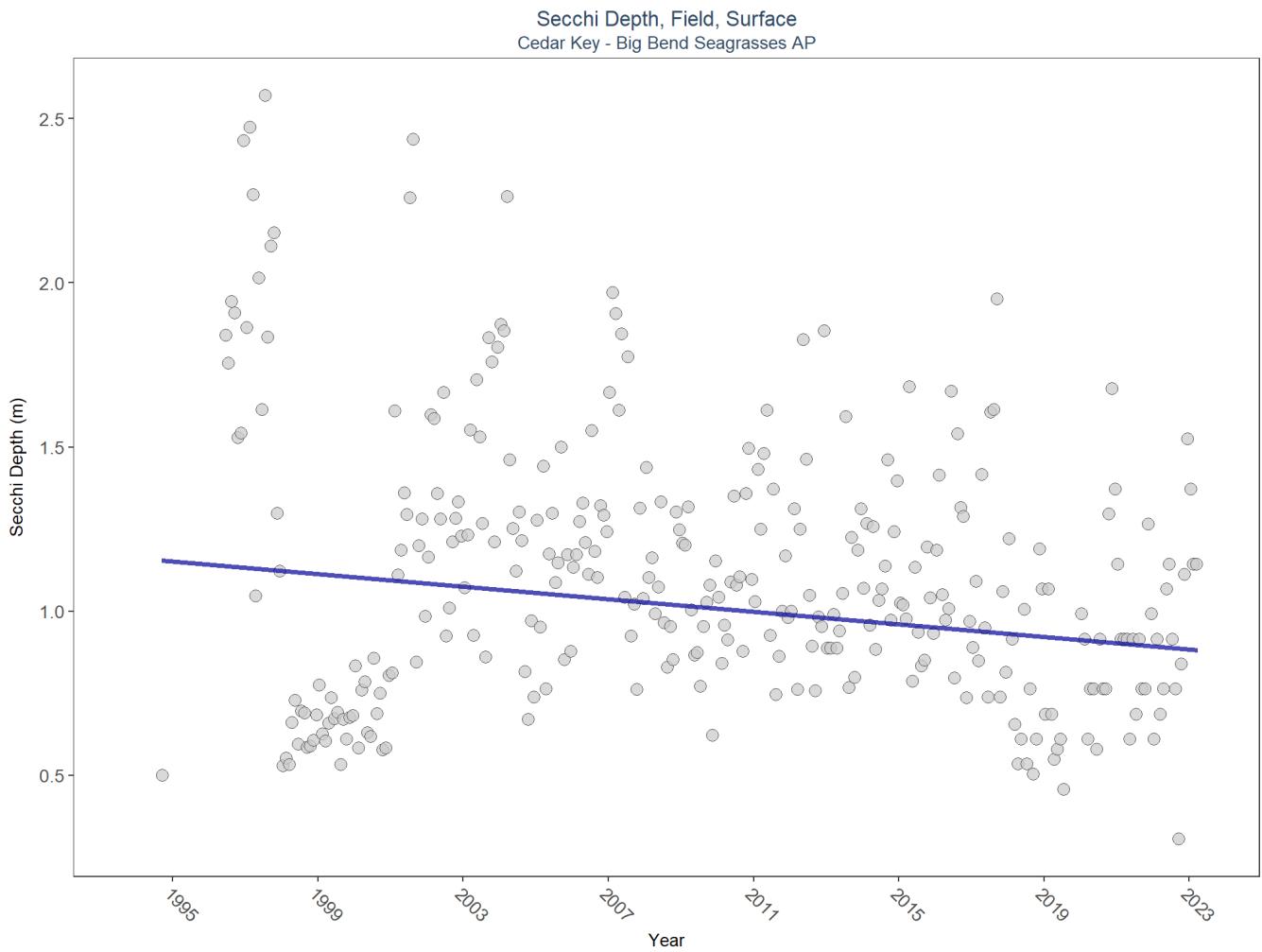


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	43746	31	24	TRUE	0.1253	0.0019	0.02954248	22.5494	10.002	0.5302	1

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

SennIntercept is intercept value at beginning of record for monitoring location

## Secchi Depth

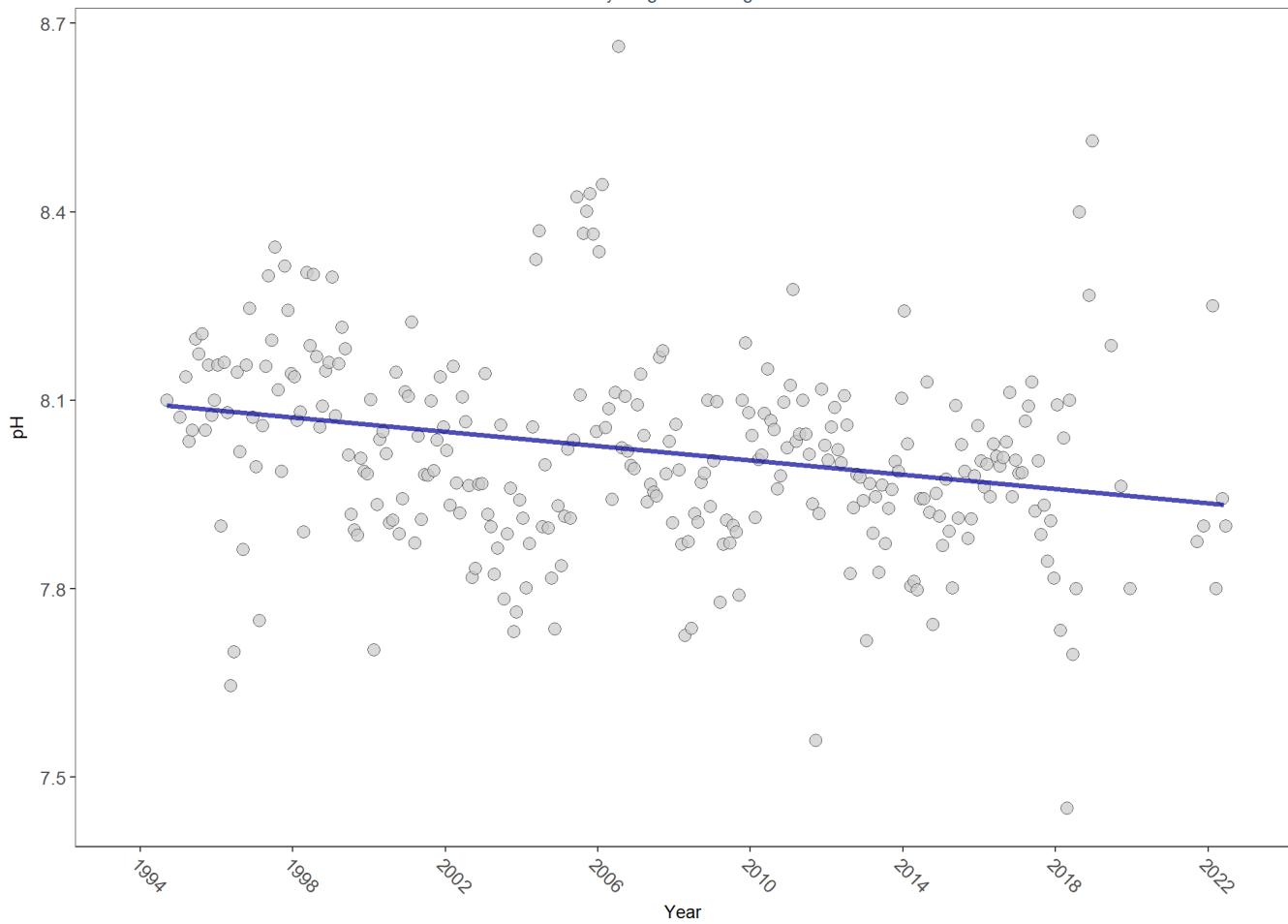


*p < 0.00005 appear as 0 due to rounding.*

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

## pH

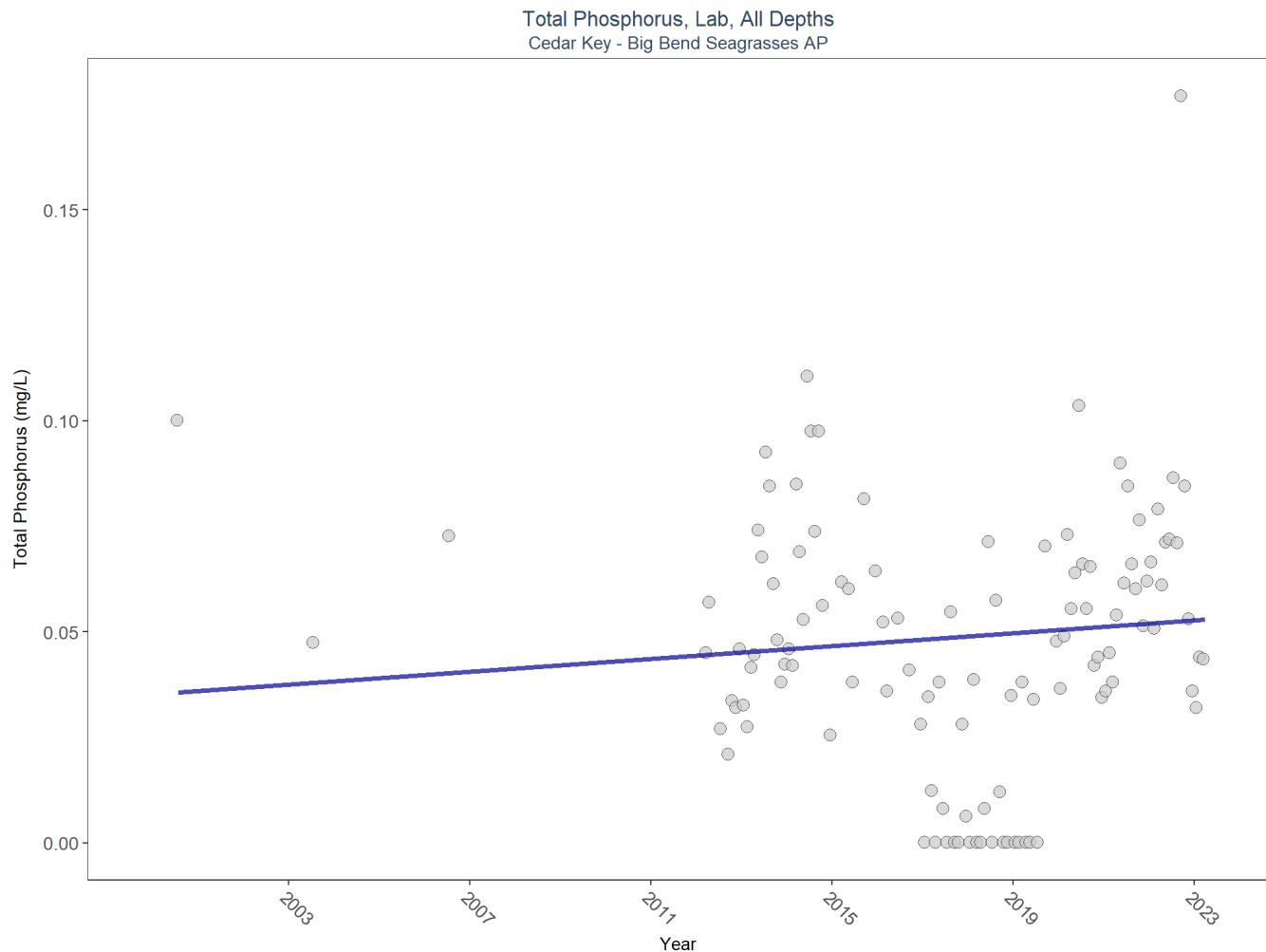
pH, Field, All Depths  
Cedar Key - Big Bend Seagrasses AP



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

SennIntercept is intercept value at beginning of record for monitoring location

## Total Phosphorus

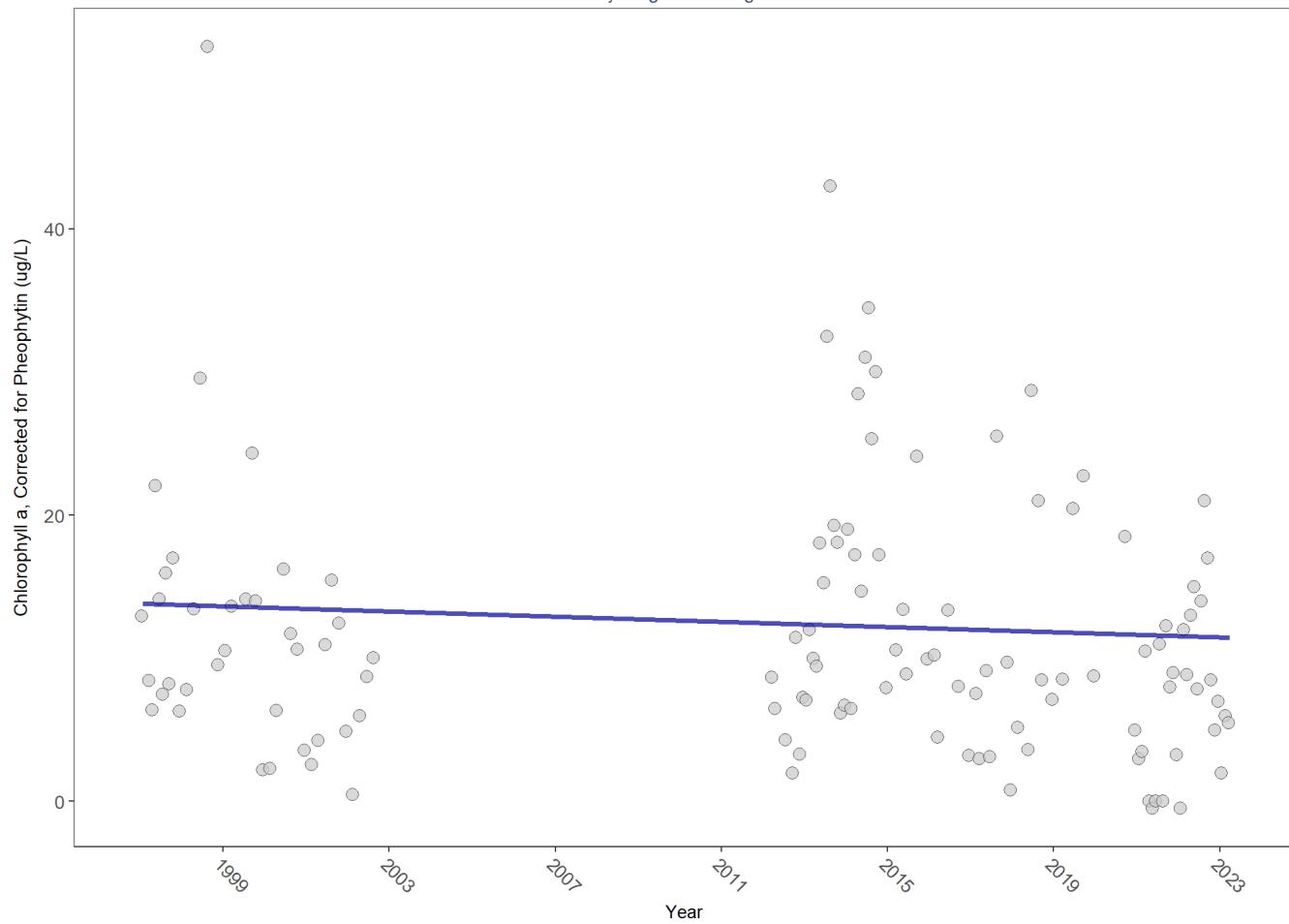


*p < 0.00005 appear as 0 due to rounding.*

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

## Chlorophyll a, Corrected for Pheophytin

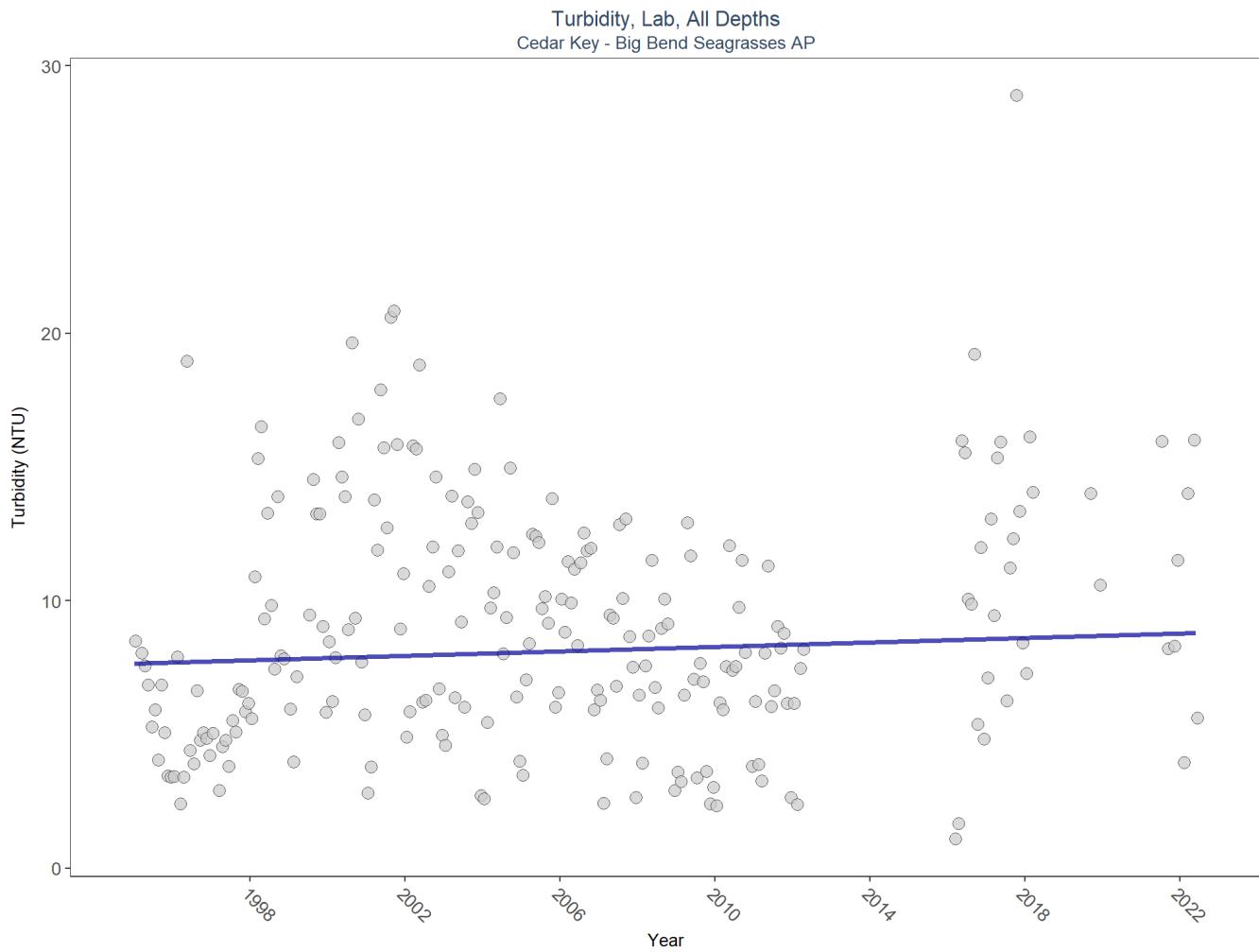
Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Cedar Key - Big Bend Seagrasses AP



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

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

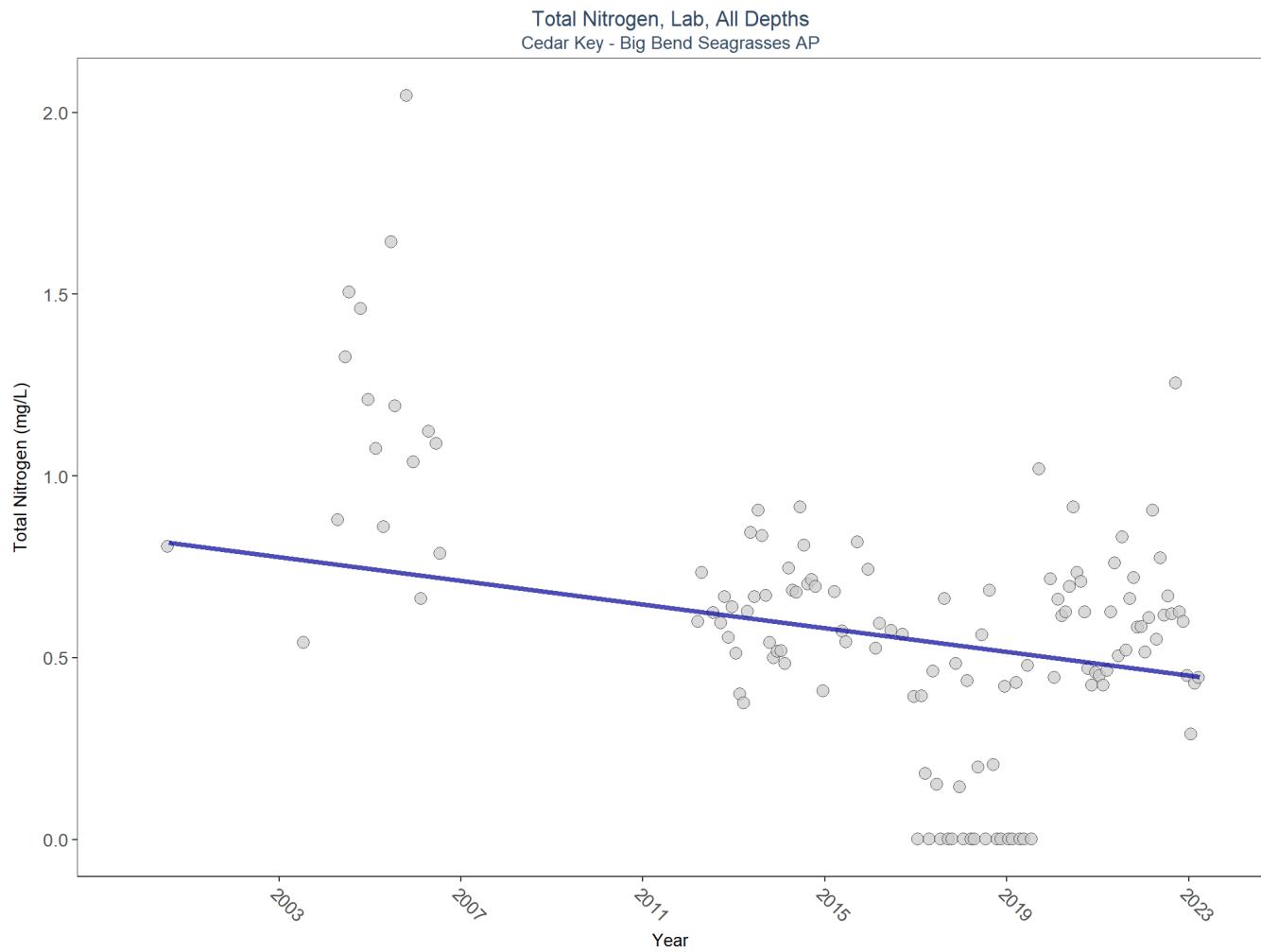
## Turbidity



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

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

## Total Nitrogen



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

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

## Submerged Aquatic Vegetation

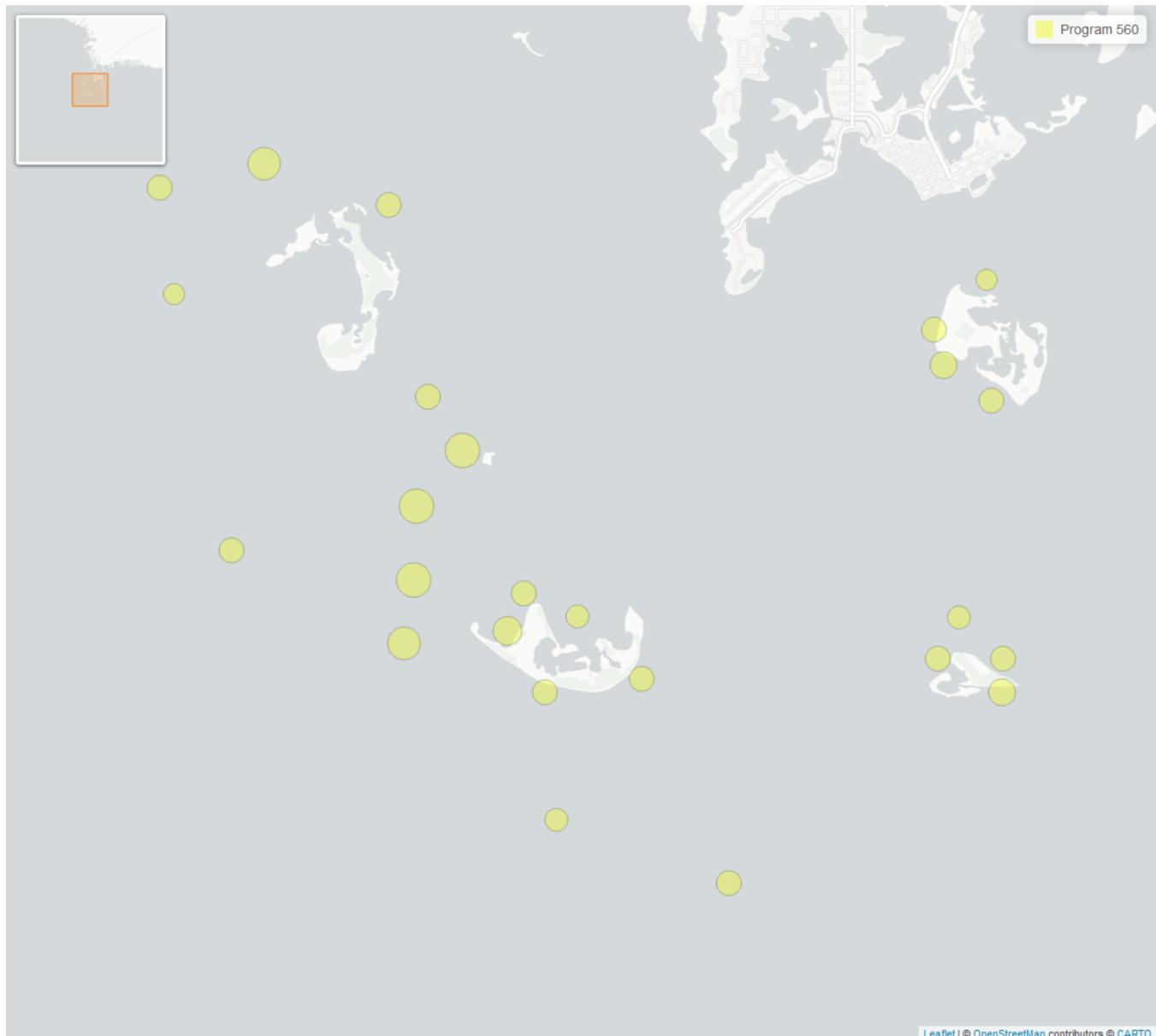
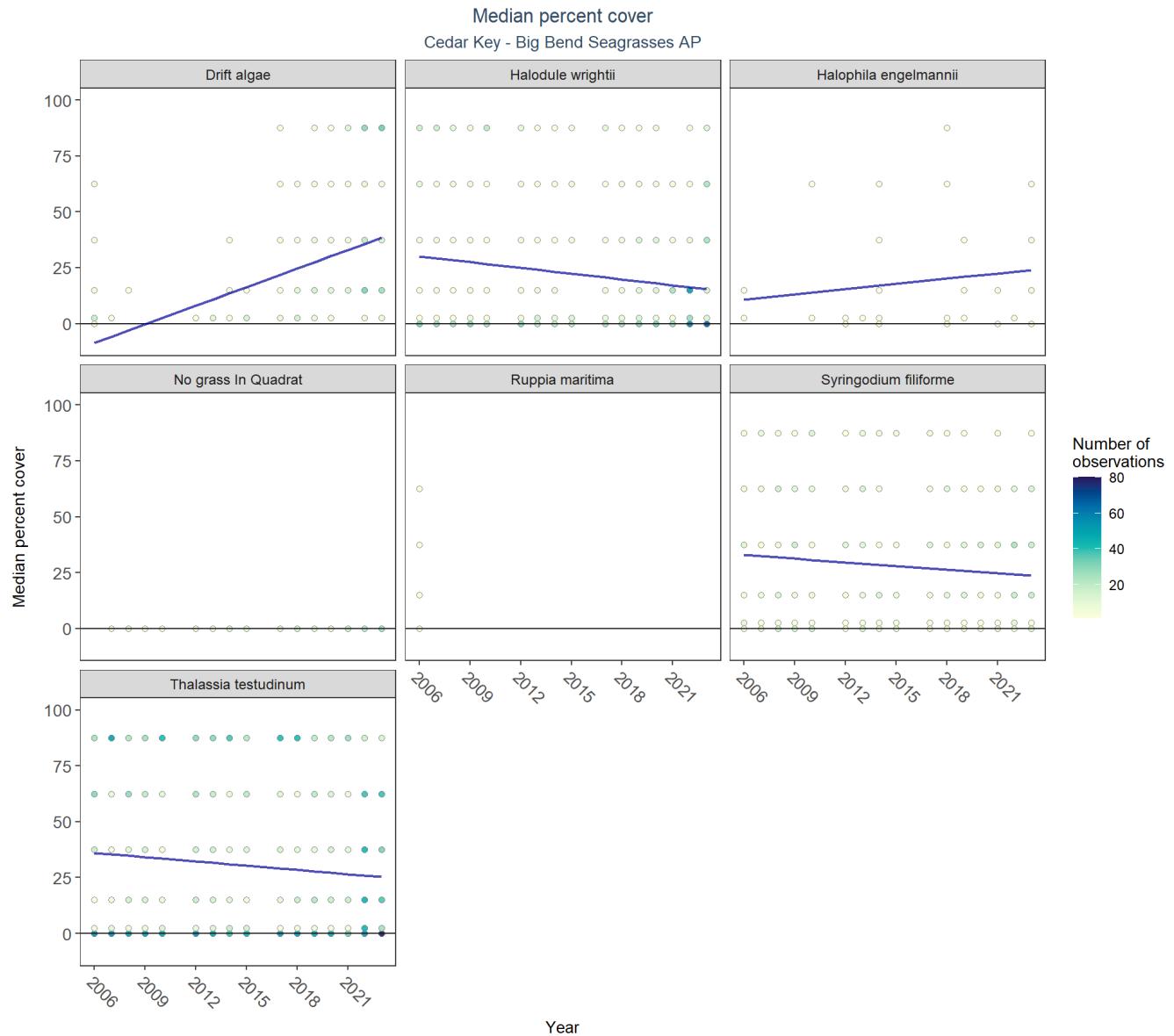


Table 20: Big Bend Seagrasses & Nature Coast Aquatic Preserves  
- Seagrass Monitoring - *Program 560*

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
4284	2006	2023	Modified Braun Blanquet	25
604	2022	2023	Percent Cover	25

## Median Percent Cover - Species Trends



## Median Percent Cover - Species Trend Table

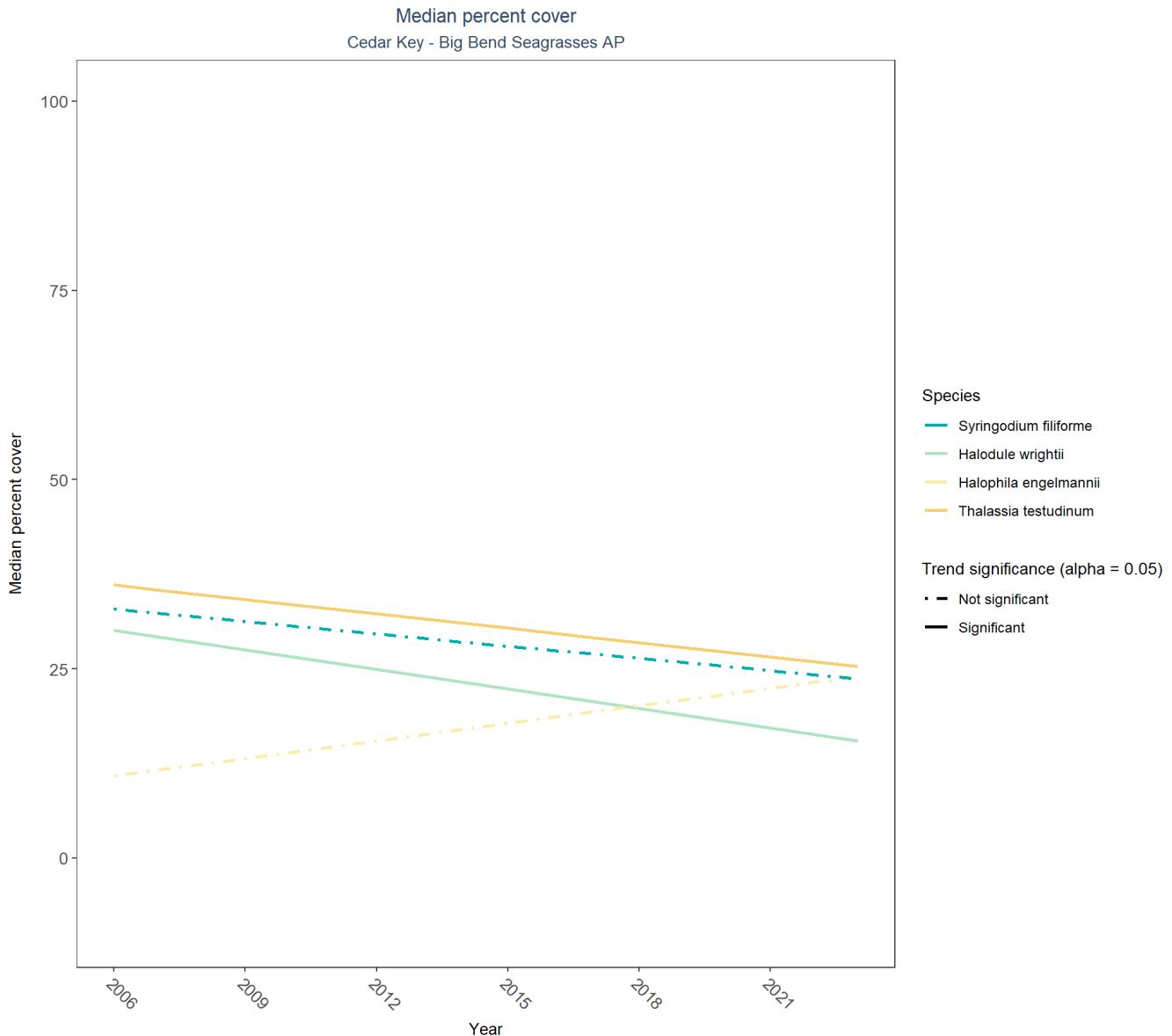
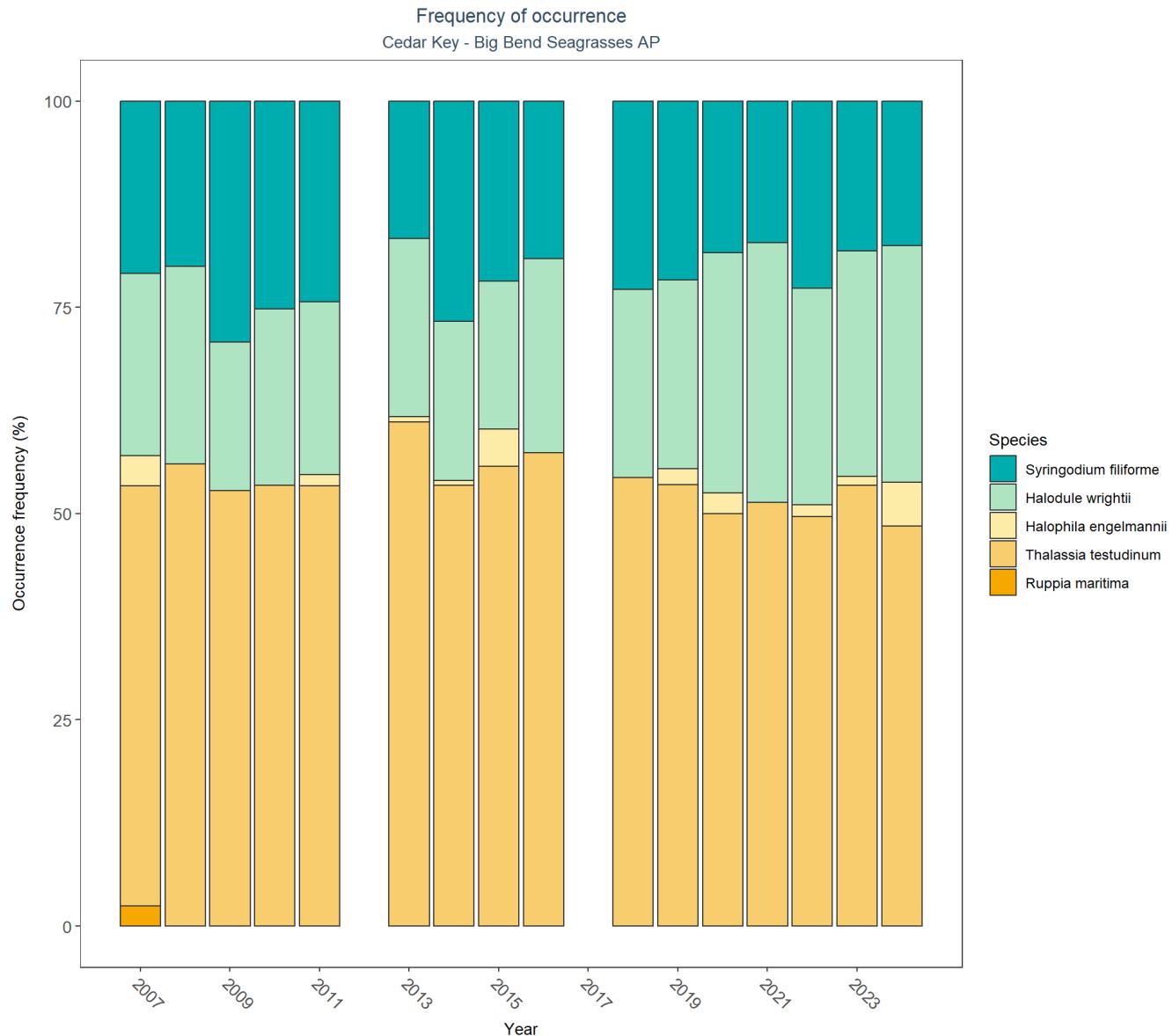


Table 21: Percent Cover Trend Analysis for Cedar Key

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	Significantly increasing trend	2006 - 2023	-25.1735	2.7656	0.0004
Halodule wrightii	Significantly decreasing trend	2006 - 2023	35.3026	-0.8630	0.0000
Halophila engelmannii	No significant trend	2006 - 2023	6.1752	0.7753	0.1595
No grass In Quadrat	Model did not fit the available data	2007 - 2023	-	-	-
Ruppia maritima	Insufficient data to calculate trend	-	-	-	-
Syringodium filiforme	No significant trend	2006 - 2023	36.1352	-0.5411	0.0829
Thalassia testudinum	Significantly decreasing trend	2006 - 2023	39.8845	-0.6344	0.0000

## Frequency of Occurrence Barplots



## Suwanee

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

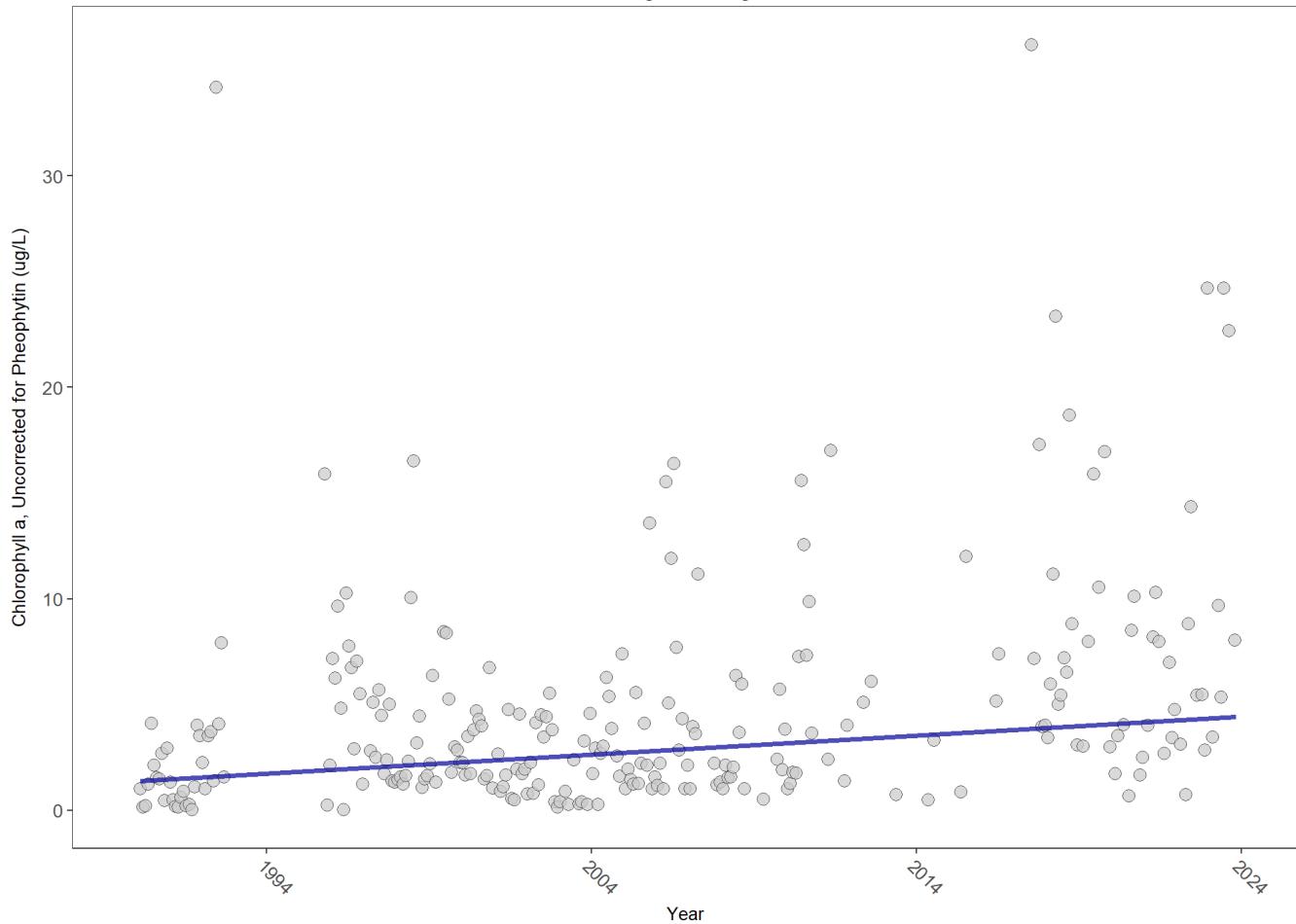
Table 22: Seasonal Kendall-Tau Results for Suwanee

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	1990 - 2023	32	1269	TRUE	0.09	1.36	0.0000	↑
Dissolved Oxygen	1989 - 2023	35	47898	TRUE	-0.01	6.65	0.0368	↓
Dissolved Oxygen Saturation	2013 - 2023	10	174	TRUE	-6.70	83.16	0.0227	↓
Salinity	1990 - 2023	33	49523	TRUE	-0.01	15.14	0.7712	0
Water Temperature	1989 - 2023	35	50187	TRUE	0.03	23.12	0.0135	↑
Secchi Depth	1991 - 2023	28	20031	TRUE	0.00	0.90	0.3905	0
pH	1989 - 2023	35	35320	TRUE	0.00	7.93	0.2062	0
Total Phosphorus	2001 - 2023	23	541	TRUE	0.00	0.09	0.0214	↑
Colored Dissolved Organic Matter	2002 - 2023	6	124	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	1995 - 2023	24	795	TRUE	0.07	1.68	0.0004	↑
Turbidity	1990 - 2023	34	13484	TRUE	0.00	3.96	0.9031	0
Total Suspended Solids	1990 - 2023	31	605	TRUE	-0.08	5.09	0.0000	↓
Total Nitrogen	1990 - 2023	25	746	TRUE	0.00	1.19	0.4314	0

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin

Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths  
Suwanee - Big Bend Seagrasses AP

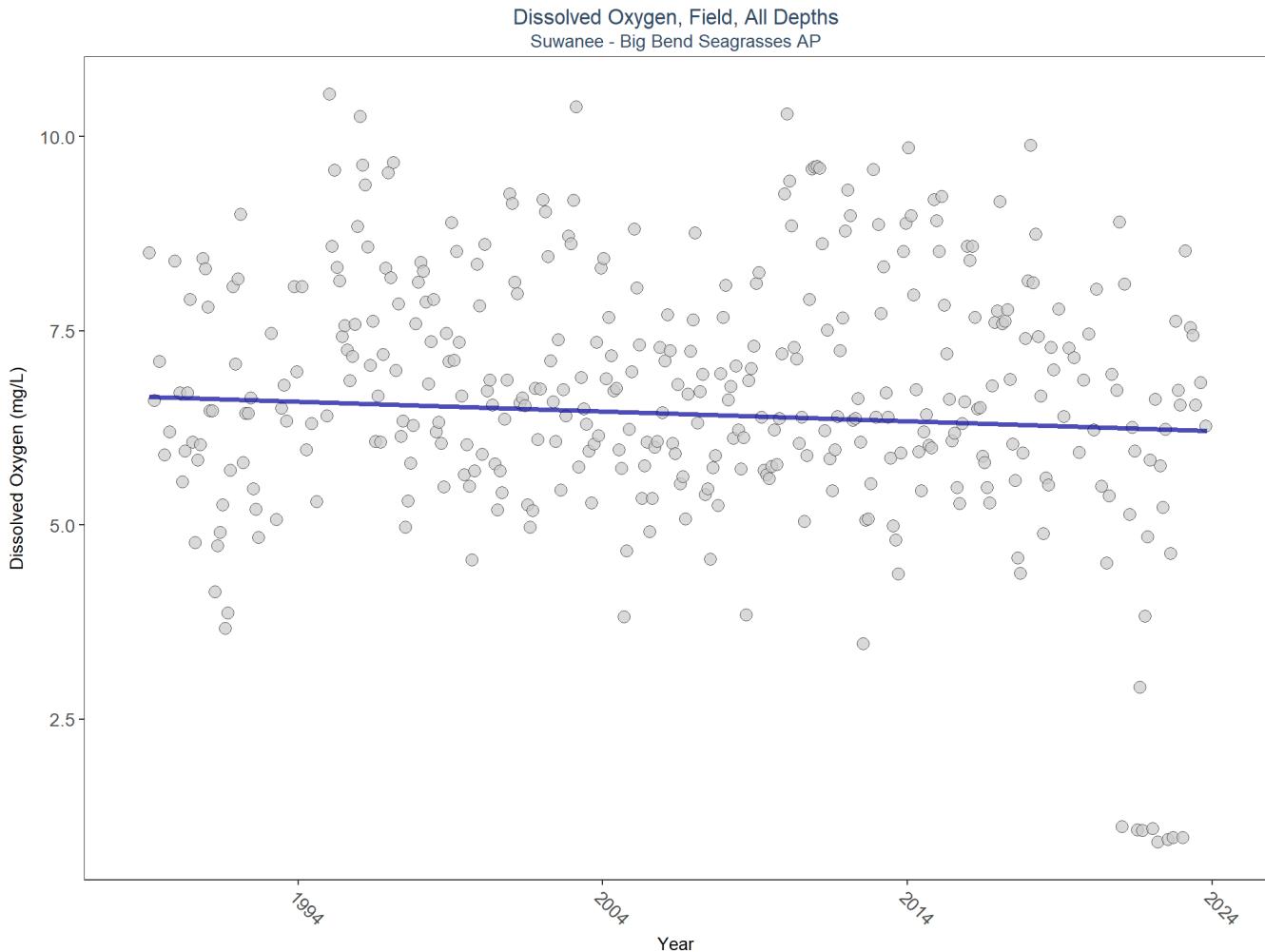


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	1269	32	2.3	TRUE	0.2514	0.0000	0.09065972	1.36038	11.6409	0.3912	1

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

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

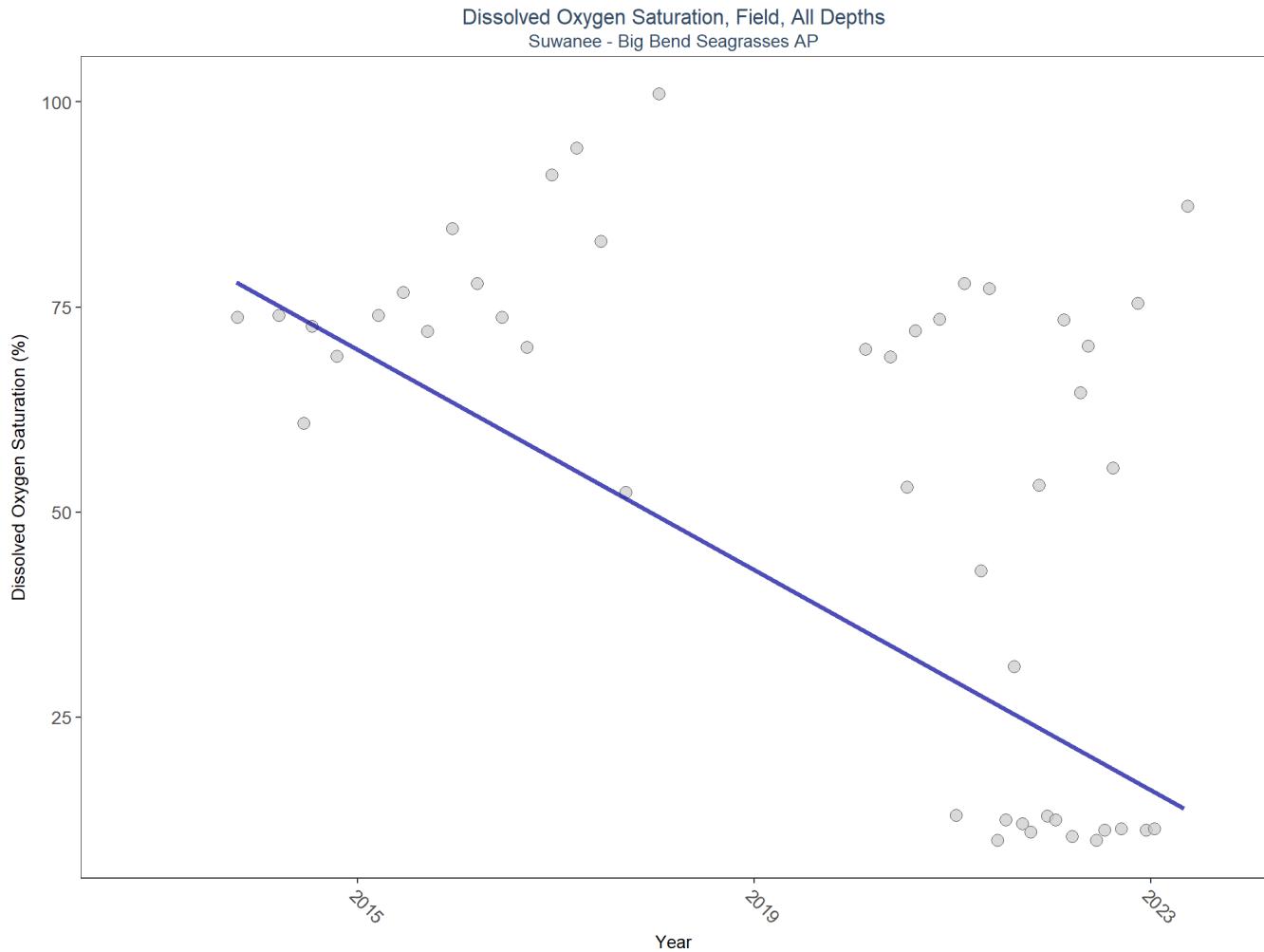
## Dissolved Oxygen



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

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

## Dissolved Oxygen Saturation

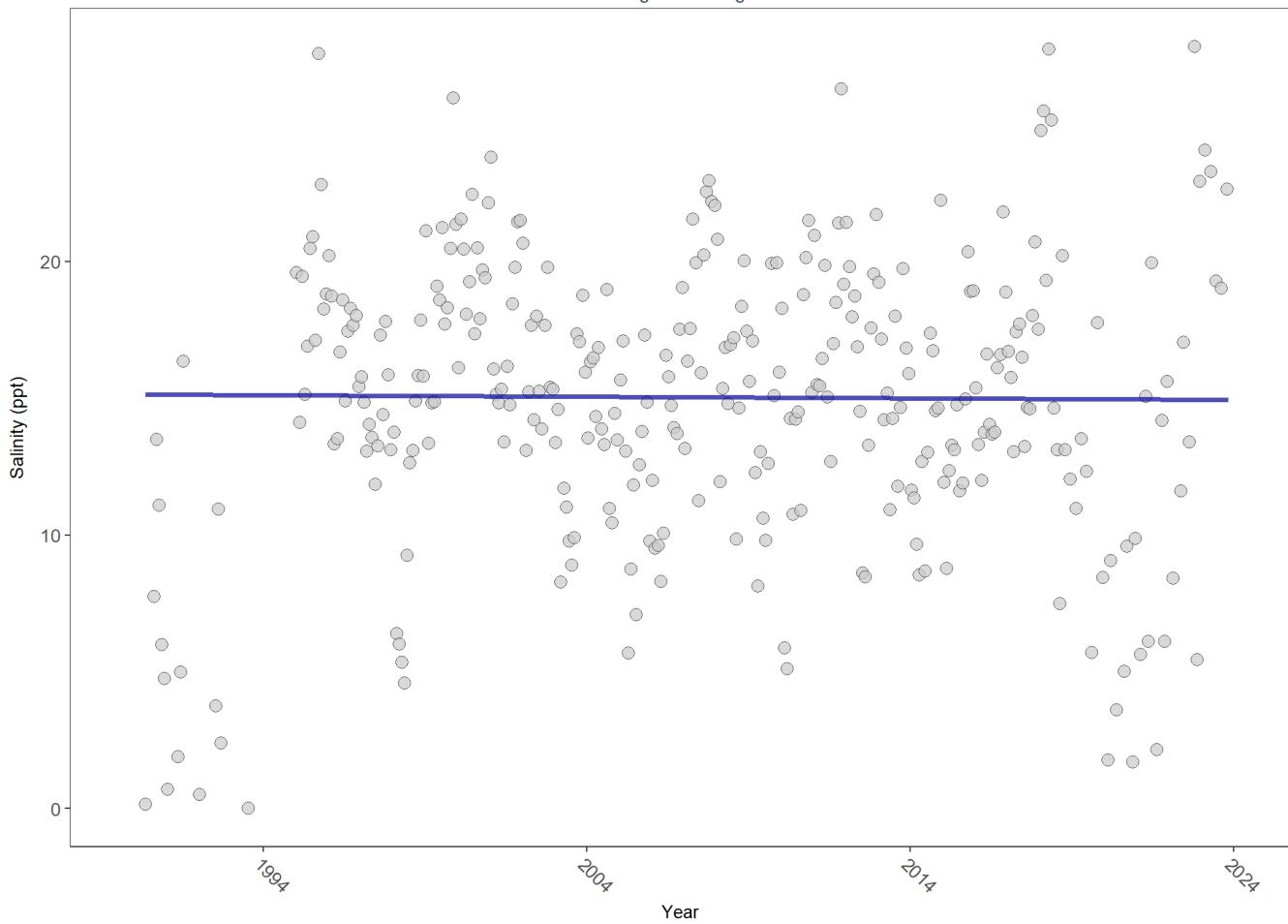


*p < 0.00005 appear as 0 due to rounding.*

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Suwanee - Big Bend Seagrasses AP

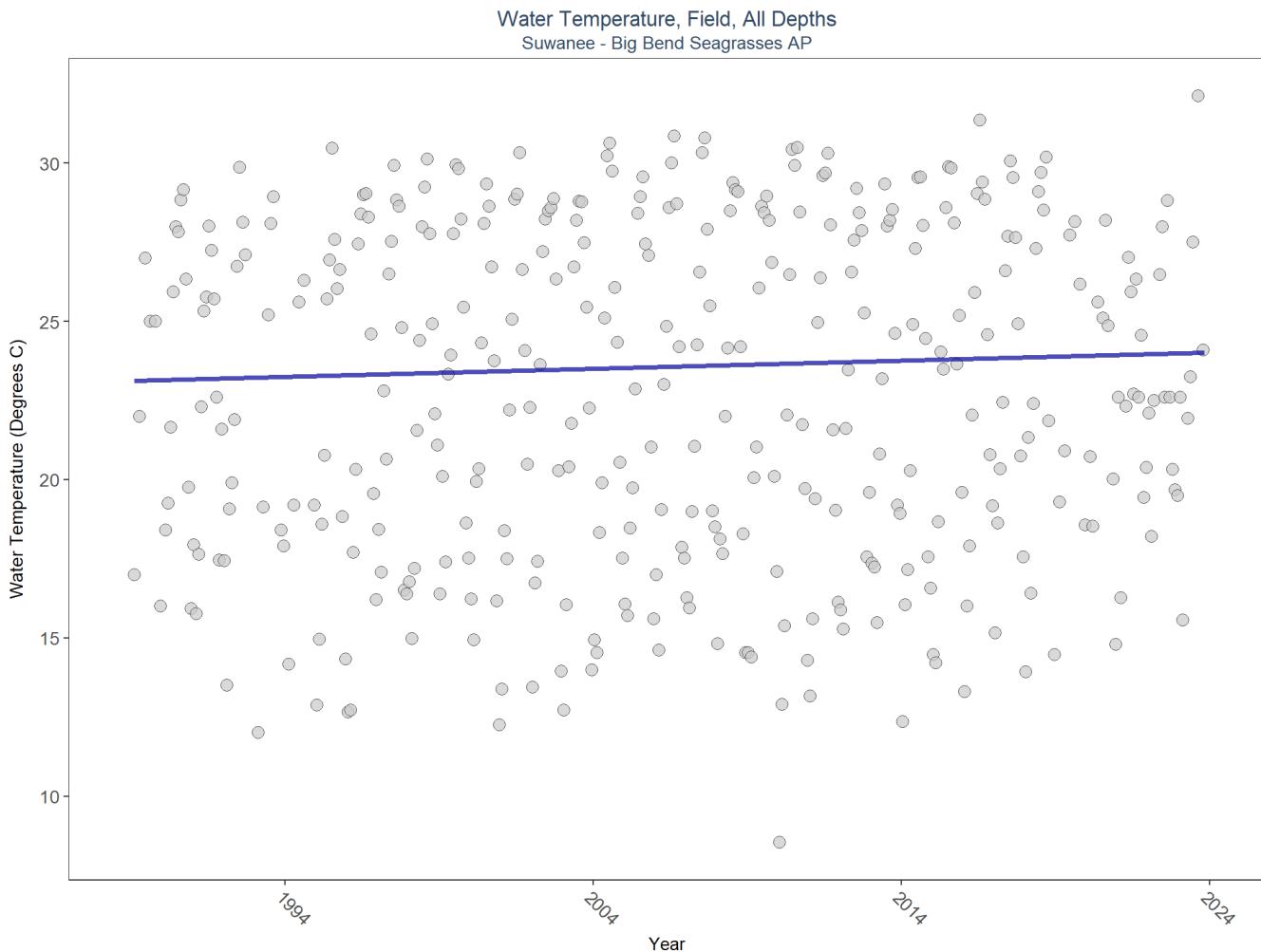


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	49523	33	17.7	TRUE	-0.0098	0.7712	-0.006050164	15.14193	7.8512	0.7266	0

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

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

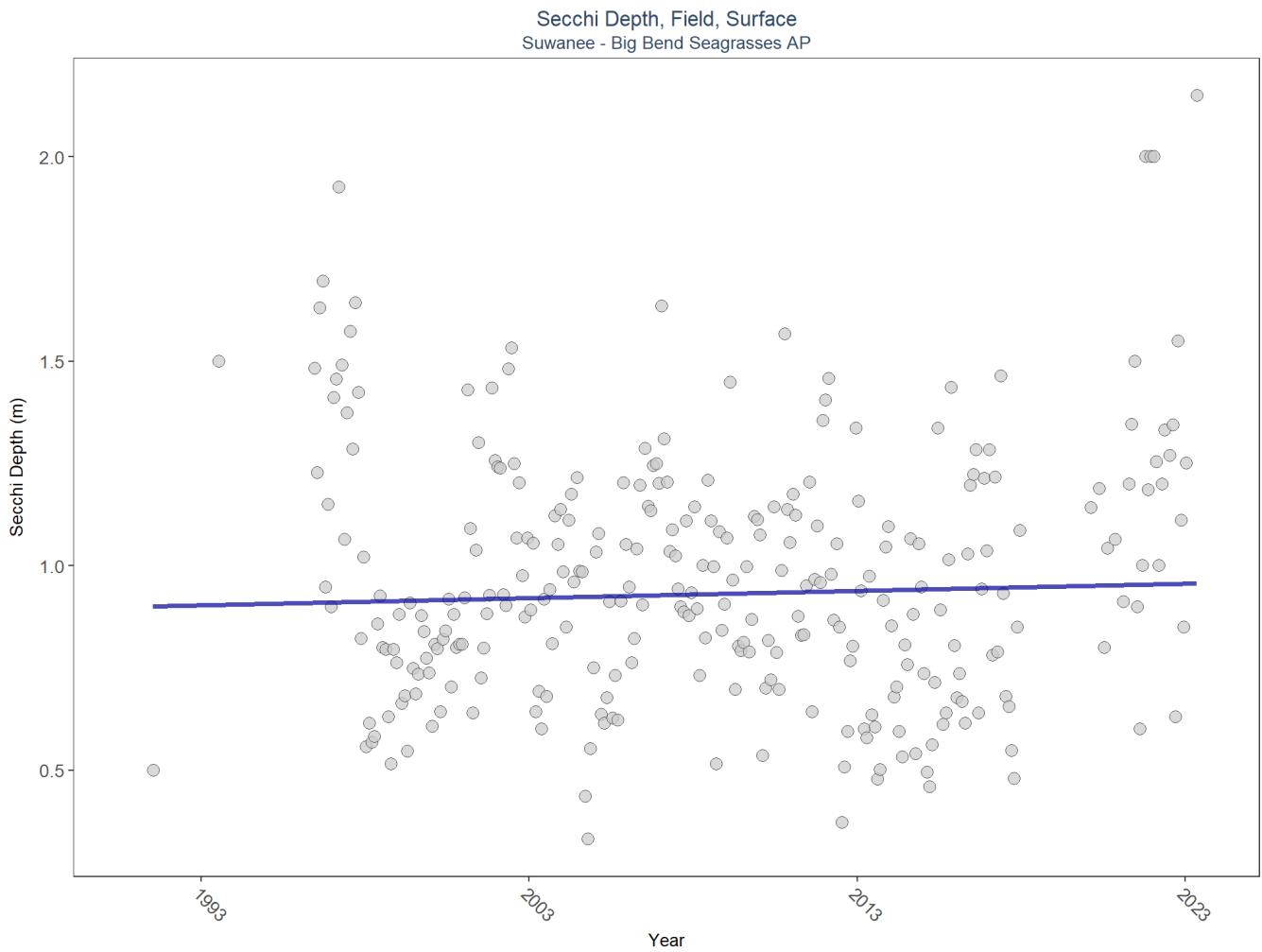
## Water Temperature



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

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

## Secchi Depth

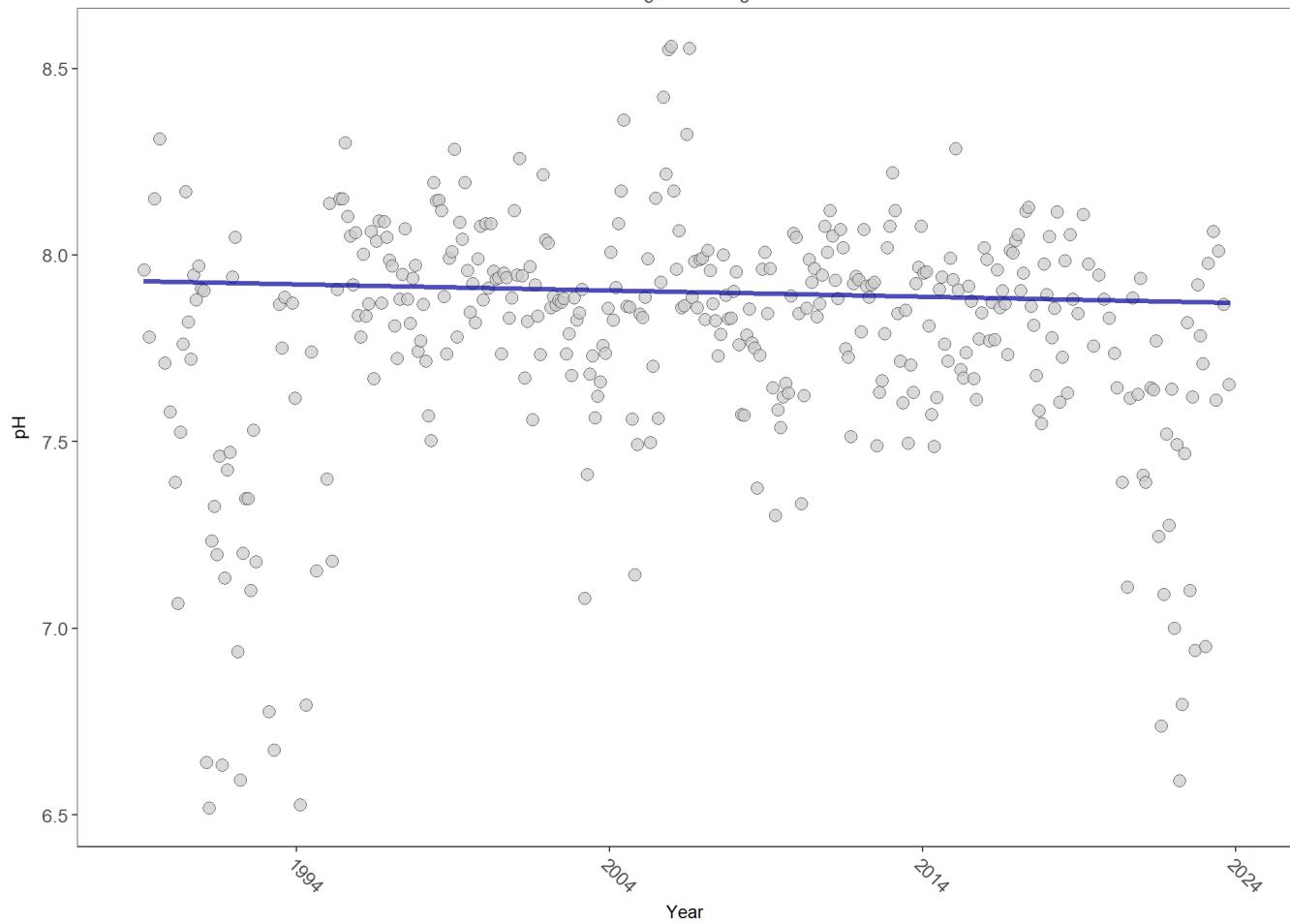


*p < 0.00005 appear as 0 due to rounding.*

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

## pH

pH, Field, All Depths  
Suwanee - Big Bend Seagrasses AP

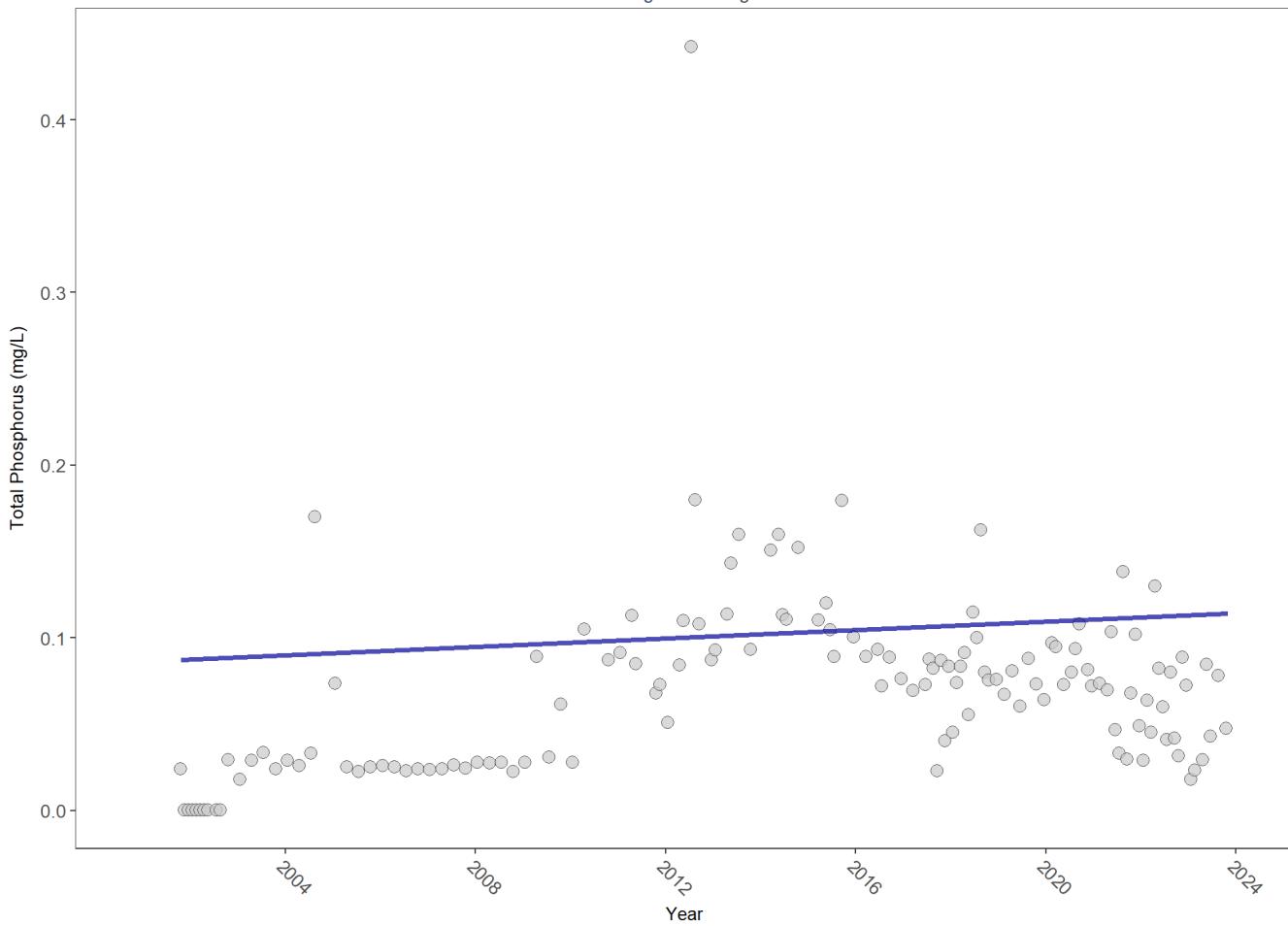


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Phosphorus

Total Phosphorus, Lab, All Depths  
Suwanee - Big Bend Seagrasses AP



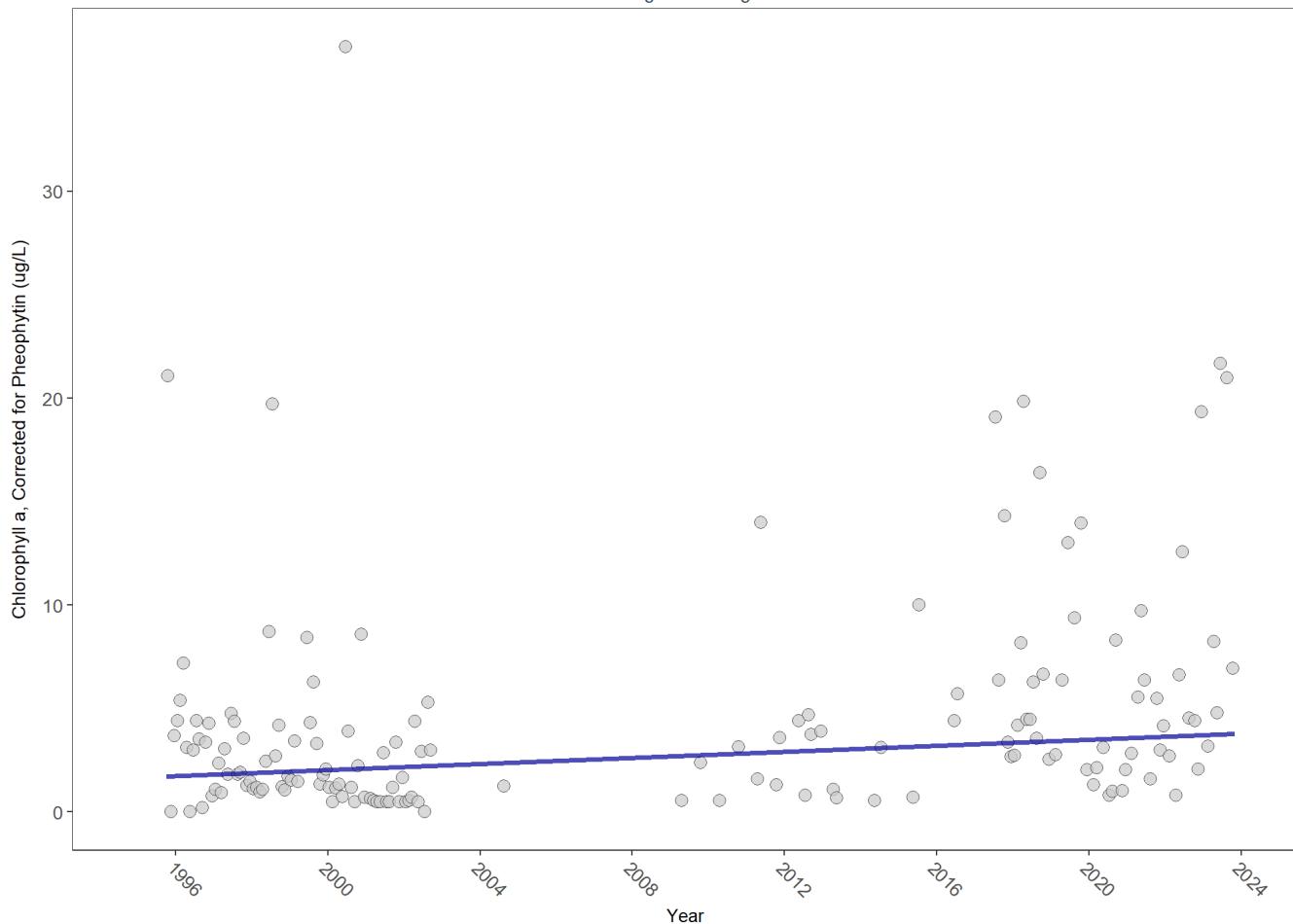
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	541	23	0.0764	TRUE	0.0701	0.0214	0.00122037	0.08629833	32.7648	6e-04	1

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

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

## Chlorophyll a, Corrected for Pheophytin

Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Suwanee - Big Bend Seagrasses AP

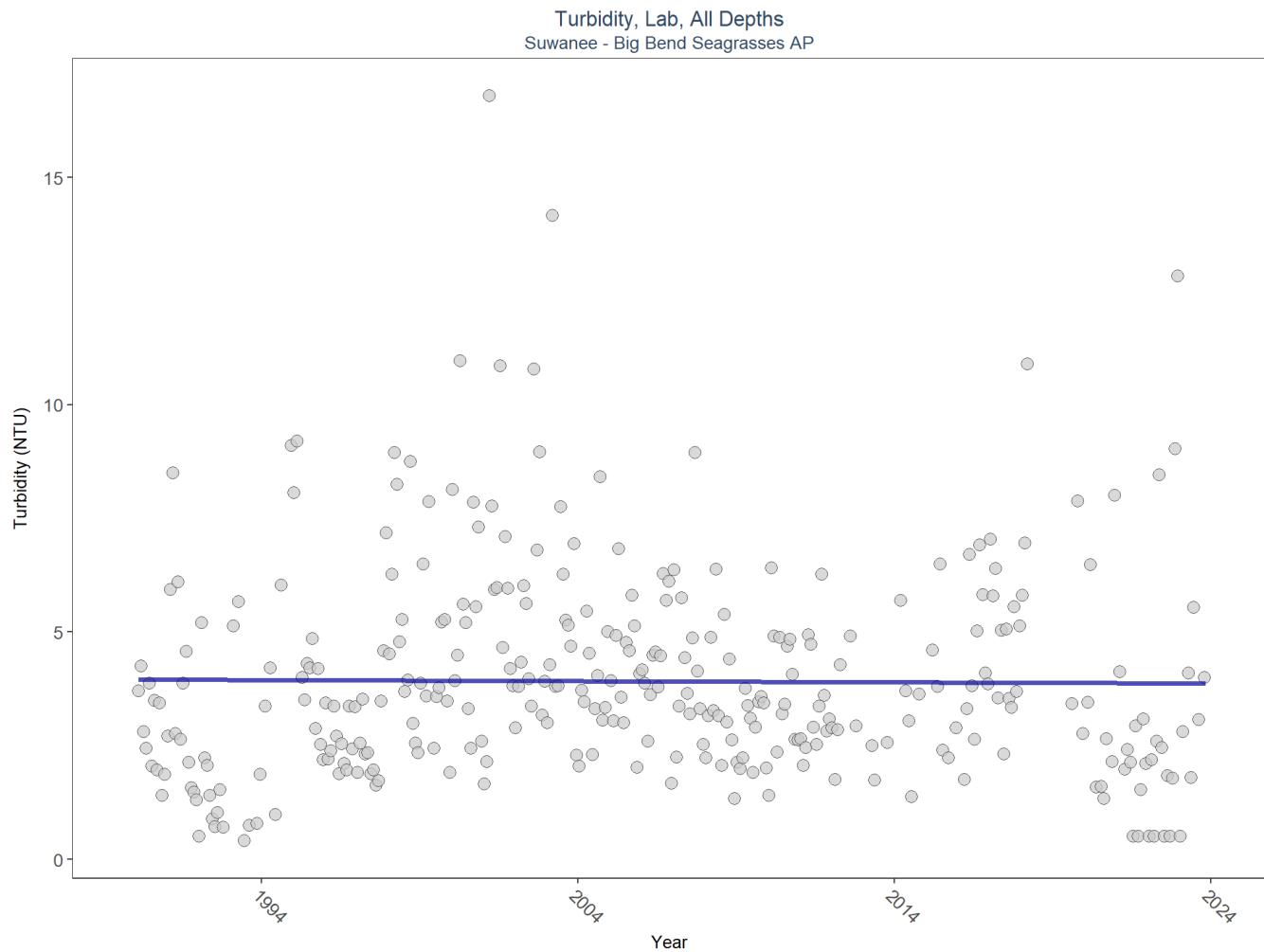


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	795	24	1.9	TRUE	0.2113	0.0004	0.07328125	1.679112	7.7879	0.7322	1

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

SennIntercept is intercept value at beginning of record for monitoring location

## Turbidity

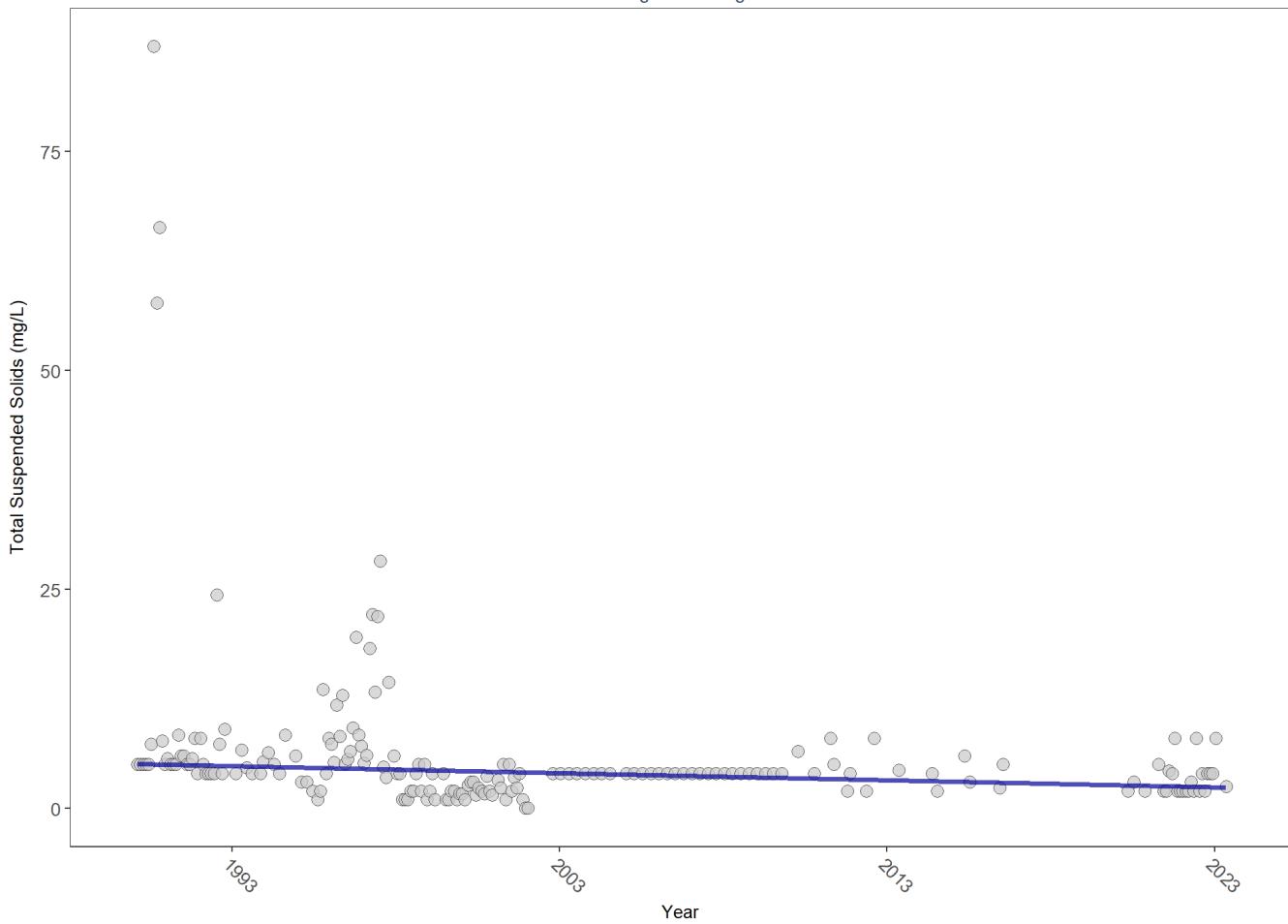


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Suspended Solids

Total Suspended Solids, Lab and Field Combined, All Depths  
Suwanee - Big Bend Seagrasses AP

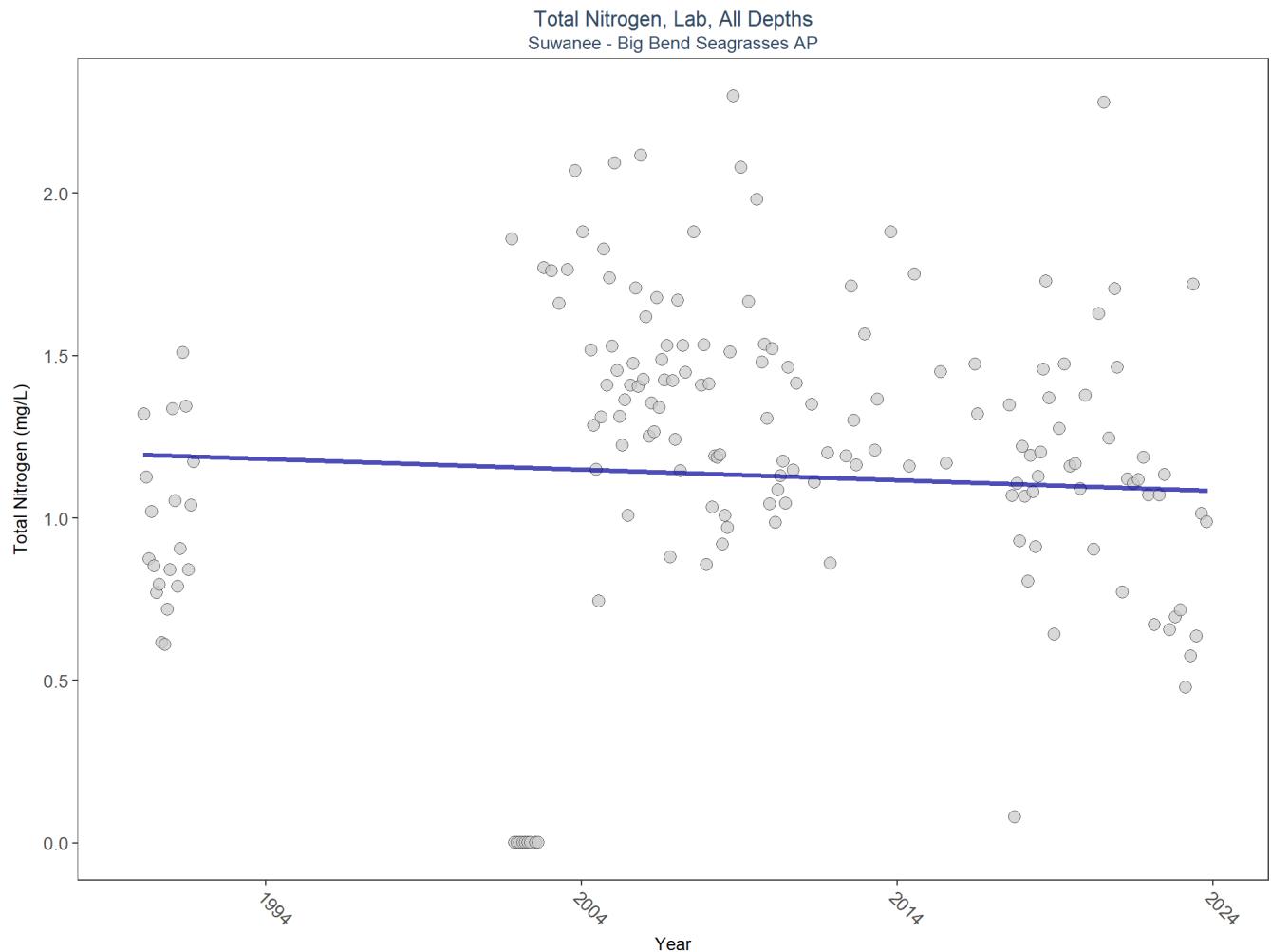


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	605	31	5	TRUE	-0.2669	0.0000	-0.08080808	5.092593	2.5426	0.9955	-1

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

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

## Total Nitrogen



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

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

## Waccasassa

Seasonal Kendall-Tau trend plots will be produced below for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 5% and the slope is less than 10% of the median value.

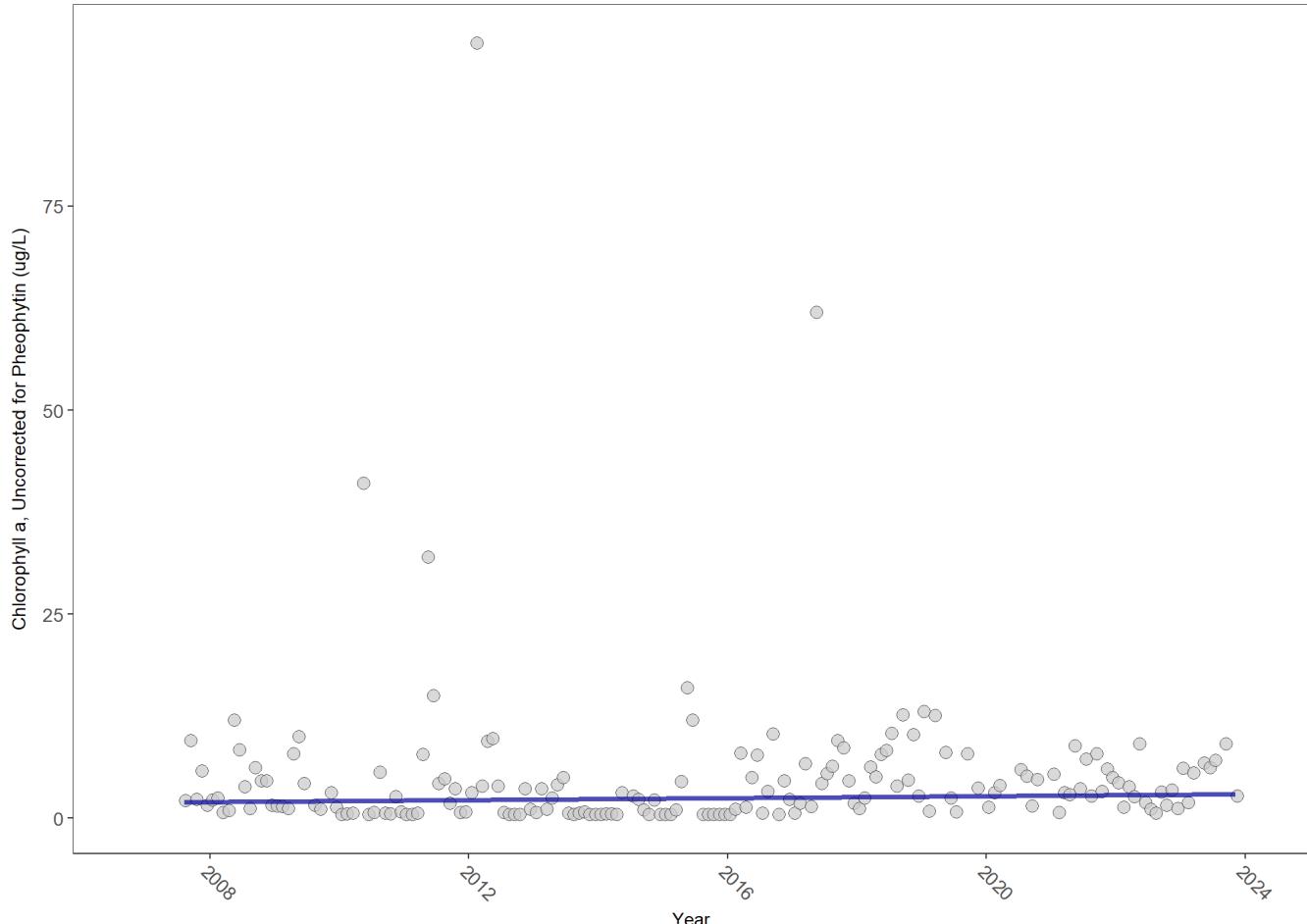
Table 23: Seasonal Kendall-Tau Results for Waccasassa

ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Chlorophyll a, Uncorrected for Pheophytin	2007 - 2023	17	477	TRUE	0.06	1.98	0.0810	0
Dissolved Oxygen	1992 - 2023	31	12191	TRUE	-0.01	6.91	0.0413	↓
Dissolved Oxygen Saturation	2001 - 2023	8	214	FALSE	-	-	-	-
Salinity	1992 - 2023	31	12359	TRUE	-0.08	21.19	0.0855	0
Water Temperature	1992 - 2023	31	12901	TRUE	0.01	22.47	0.6544	0
Secchi Depth	1992 - 2023	24	547	TRUE	0.00	1.03	0.9911	0
pH	1992 - 2023	31	6997	TRUE	-0.01	8.06	0.0000	↓
Total Phosphorus	1998 - 2023	26	680	TRUE	0.00	0.07	0.0000	↓
Colored Dissolved Organic Matter	2017 - 2023	7	92	FALSE	-	-	-	-
Chlorophyll a, Corrected for Pheophytin	1999 - 2023	25	644	TRUE	0.06	0.89	0.0000	↑
Turbidity	1995 - 2023	29	5171	TRUE	-0.09	5.35	0.0000	↓
Total Suspended Solids	1998 - 2023	26	321	TRUE	-0.06	4.77	0.0000	↓
Total Nitrogen	1998 - 2023	26	636	TRUE	0.00	0.59	0.0116	↑↑

## Discrete WQ

### Chlorophyll a, Uncorrected for Pheophytin

Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths  
Waccasassa - Big Bend Seagrasses AP



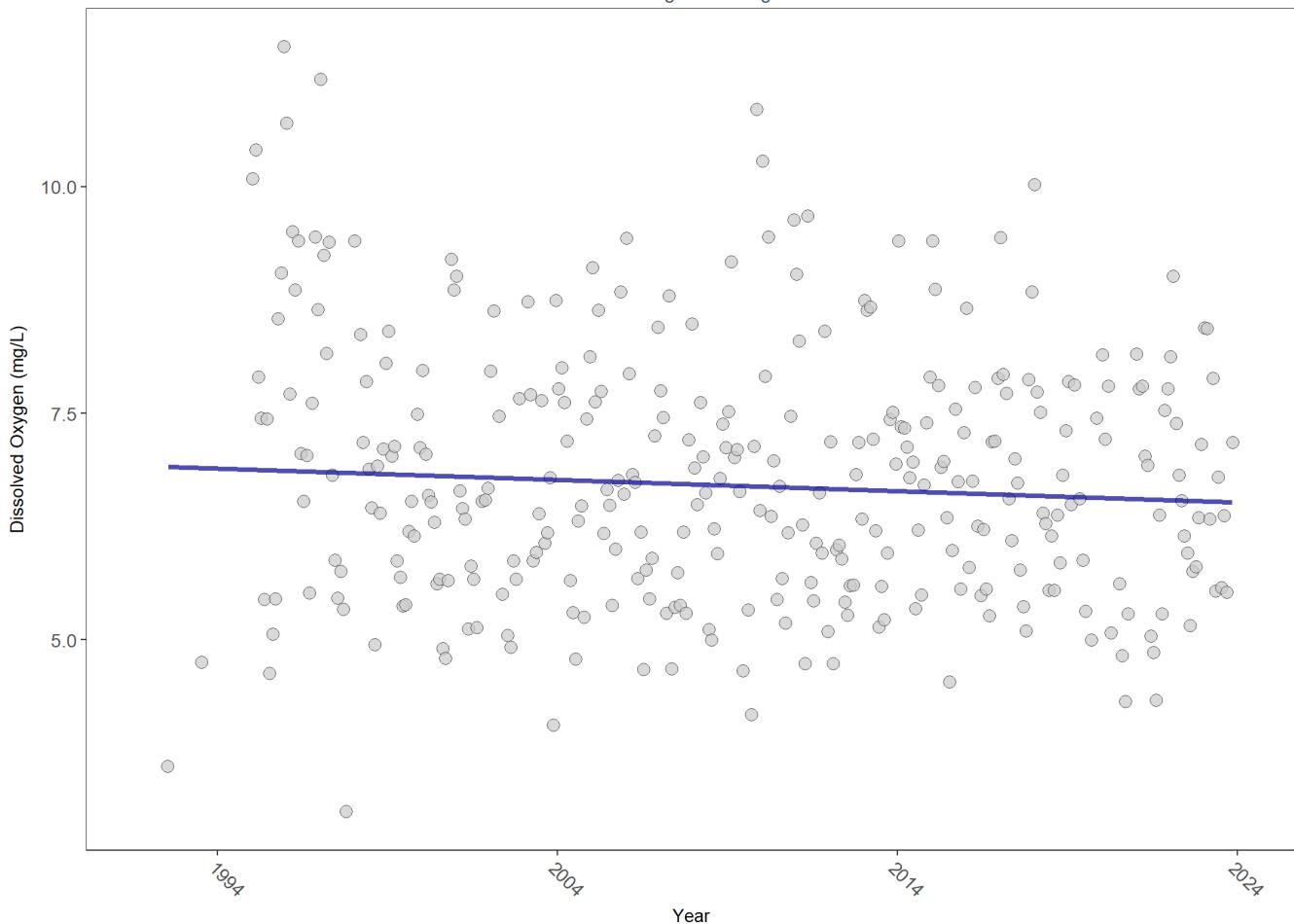
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	477	17	3.7	TRUE	0.0915	0.0810	0.05791667	1.975265	11.3885	0.4113	0

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

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

## Dissolved Oxygen

Dissolved Oxygen, Field, All Depths  
Waccasassa - Big Bend Seagrasses AP



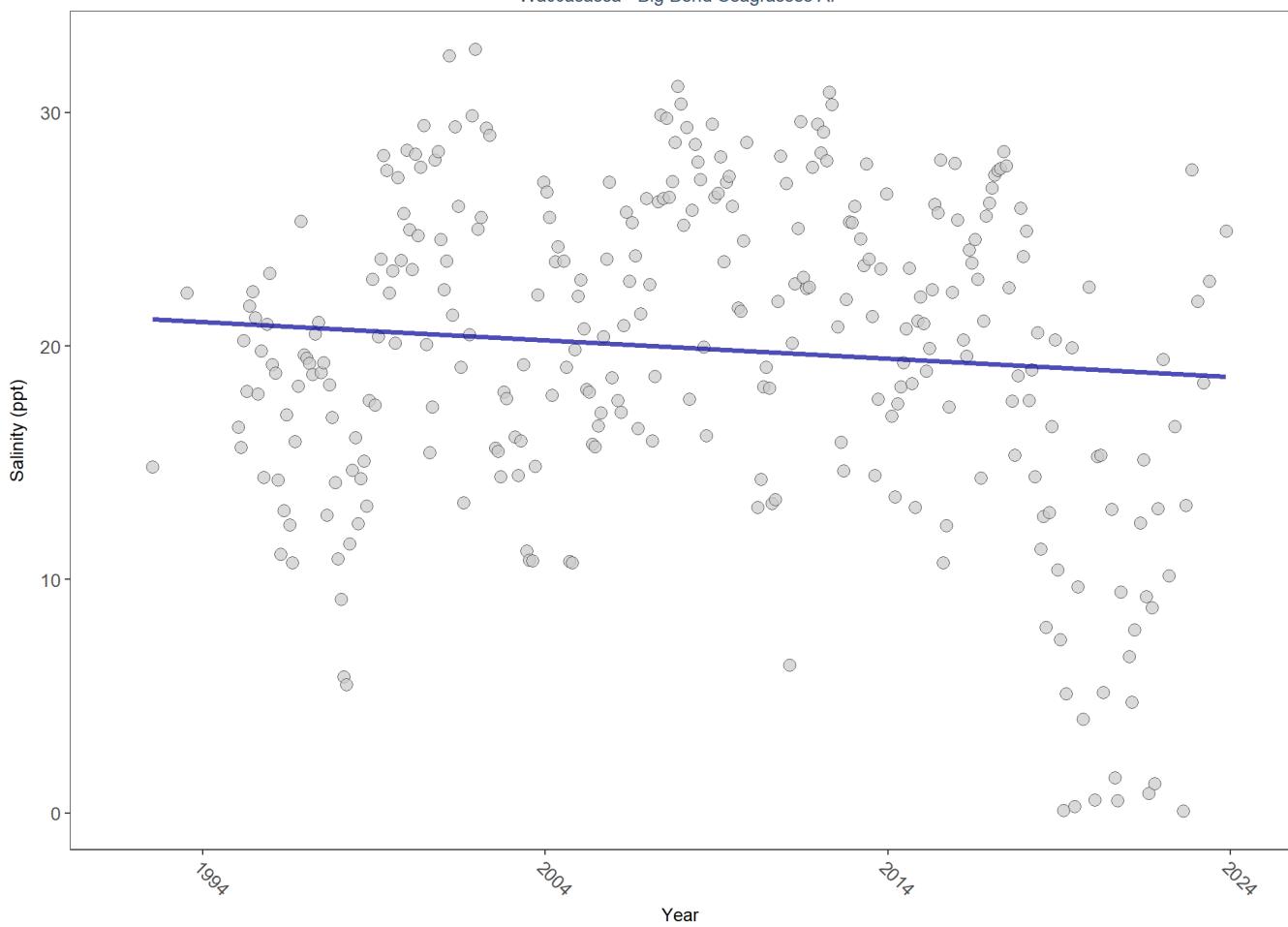
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	12191	31	6.6	TRUE	-0.0829	0.0413	-0.0122827	6.91168	6.3317	0.8503	-1

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

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

## Salinity

Salinity, Lab and Field Combined, All Depths  
Waccasassa - Big Bend Seagrasses AP

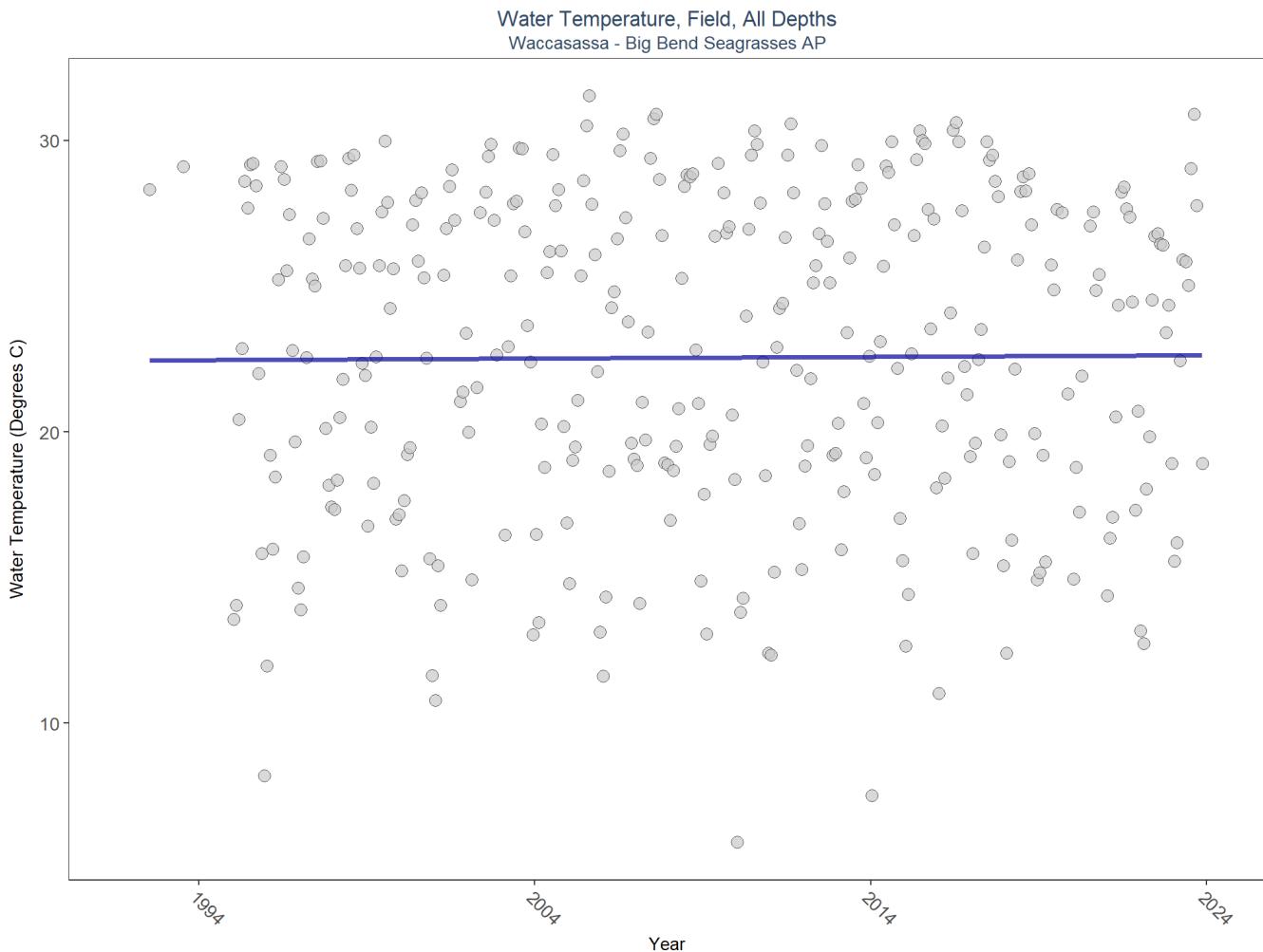


RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	12359	31	21.3	TRUE	-0.0666	0.0855	-0.07864277	21.19479	8.3546	0.6812	0

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

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

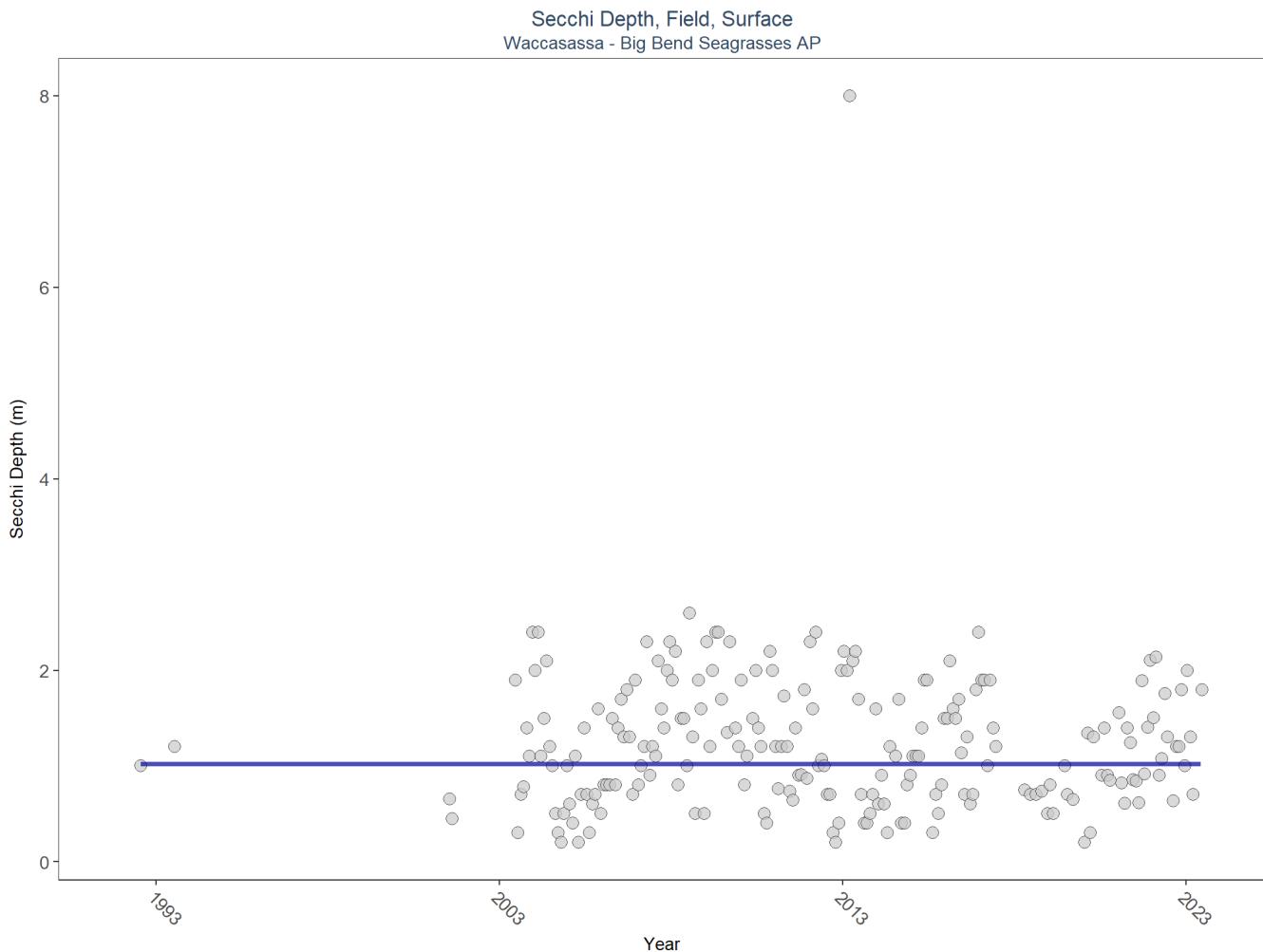
## Water Temperature



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

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

## Secchi Depth

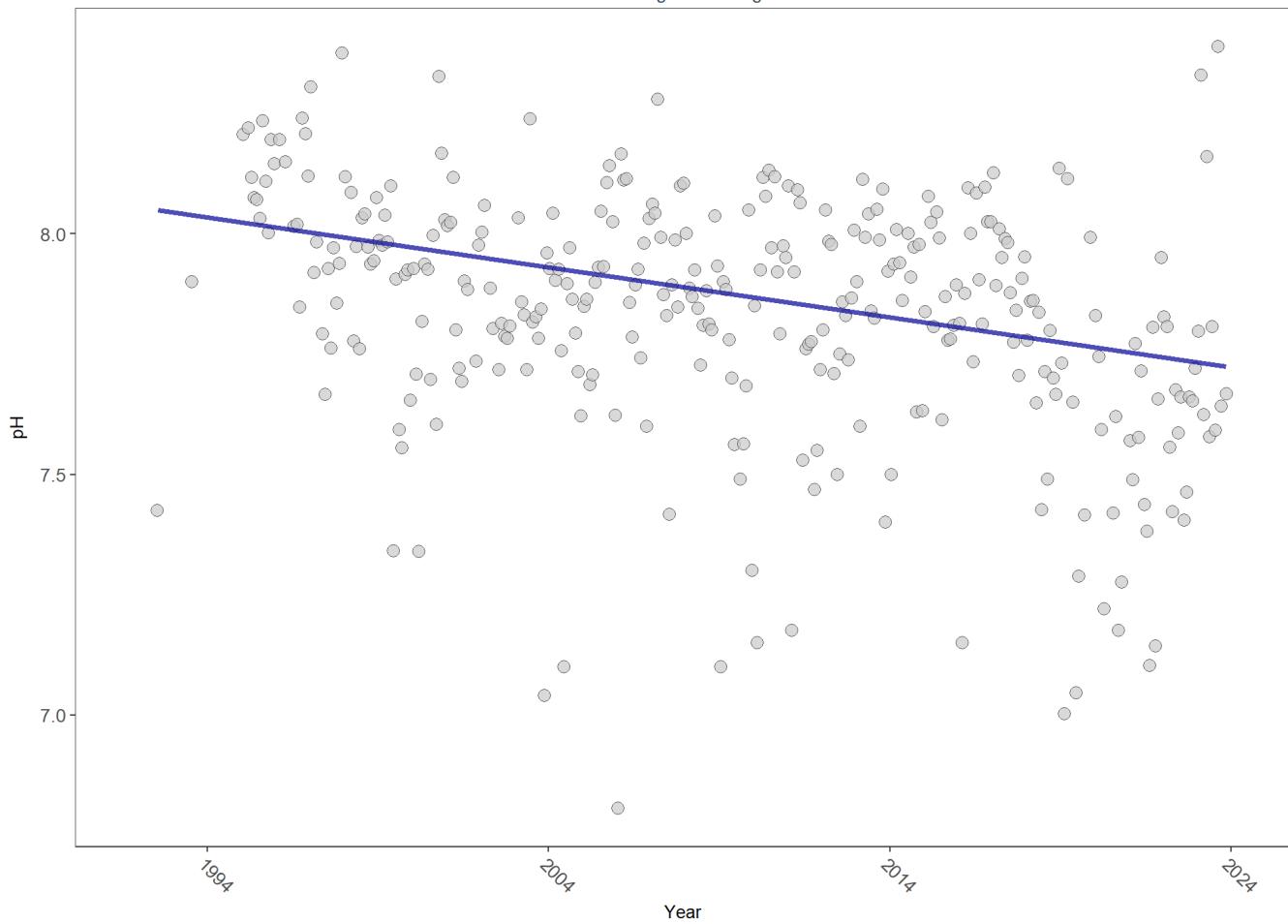


*p < 0.00005 appear as 0 due to rounding.*

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

## pH

pH, Field, All Depths  
Waccasassa - Big Bend Seagrasses AP

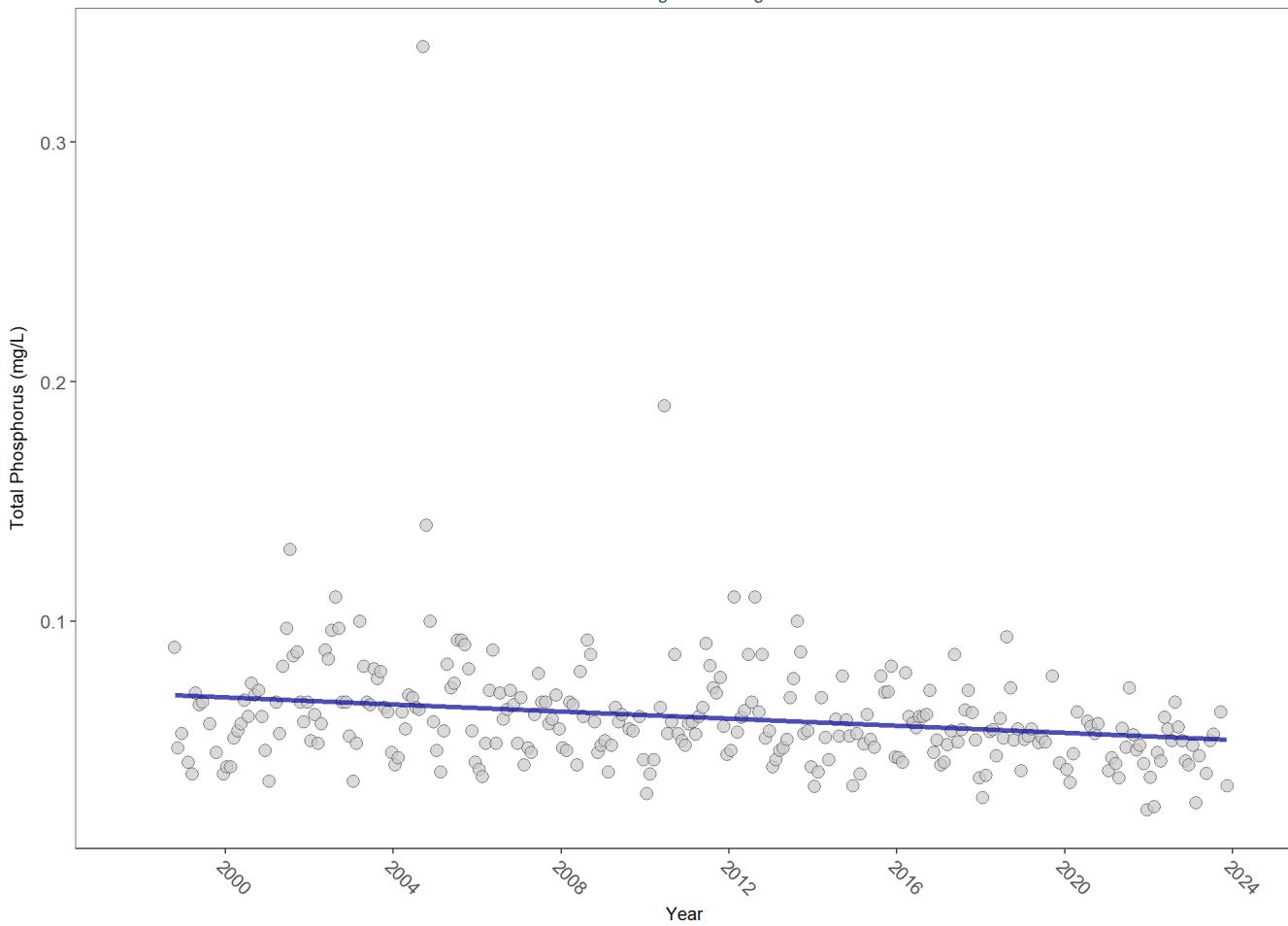


*p < 0.00005 appear as 0 due to rounding.*

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

## Total Phosphorus

Total Phosphorus, Lab, All Depths  
Waccasassa - Big Bend Seagrasses AP



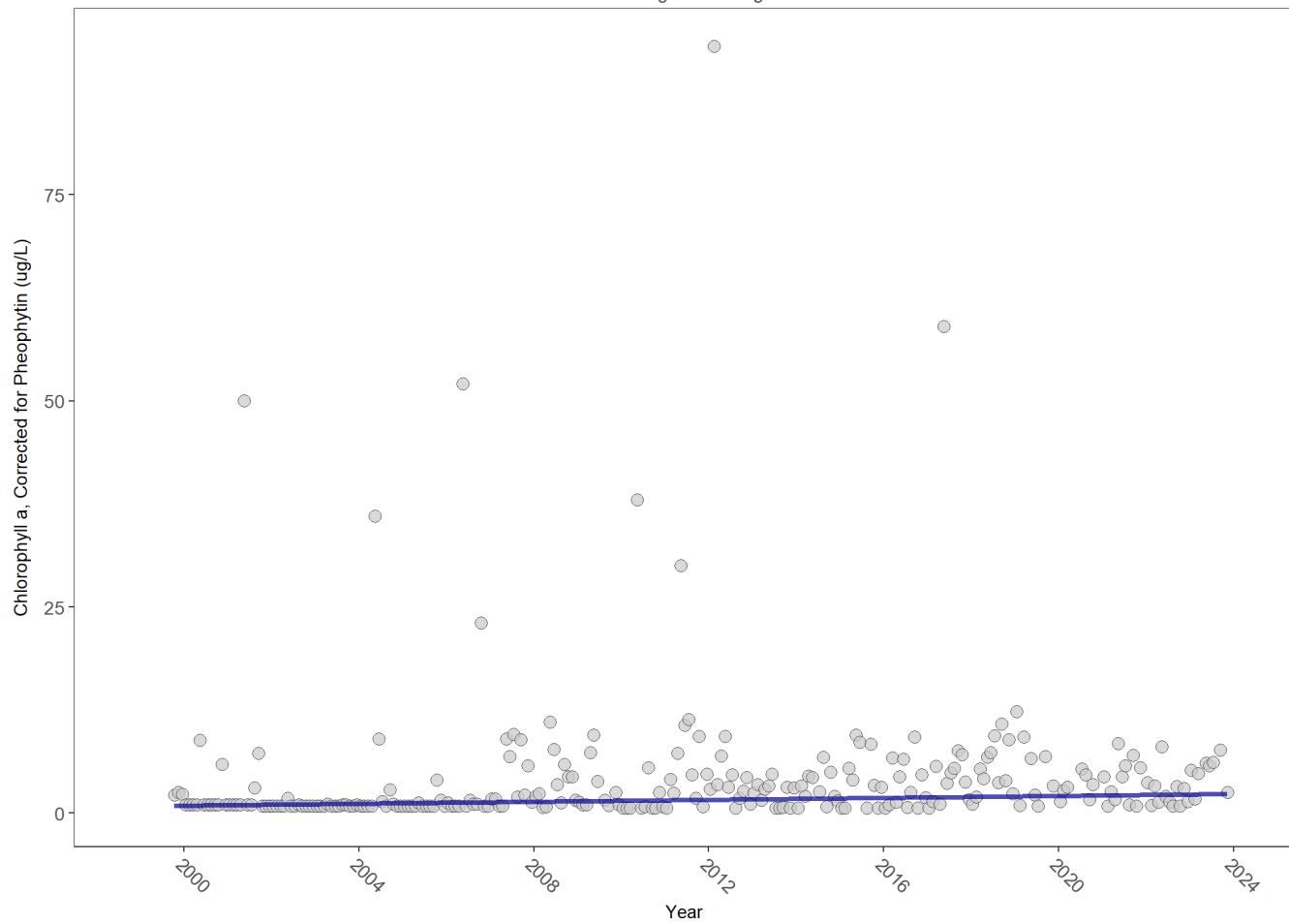
RelativeDepth	N_Data	N_Years	Median	Independent	tau	p	SennSlope	SennIntercept	ChiSquared	pChiSquared	Trend
All	680	26	0.054	TRUE	-0.31	0.0000	-0.00075	0.06984056	8.3605	0.6807	-1

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

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

## Chlorophyll a, Corrected for Pheophytin

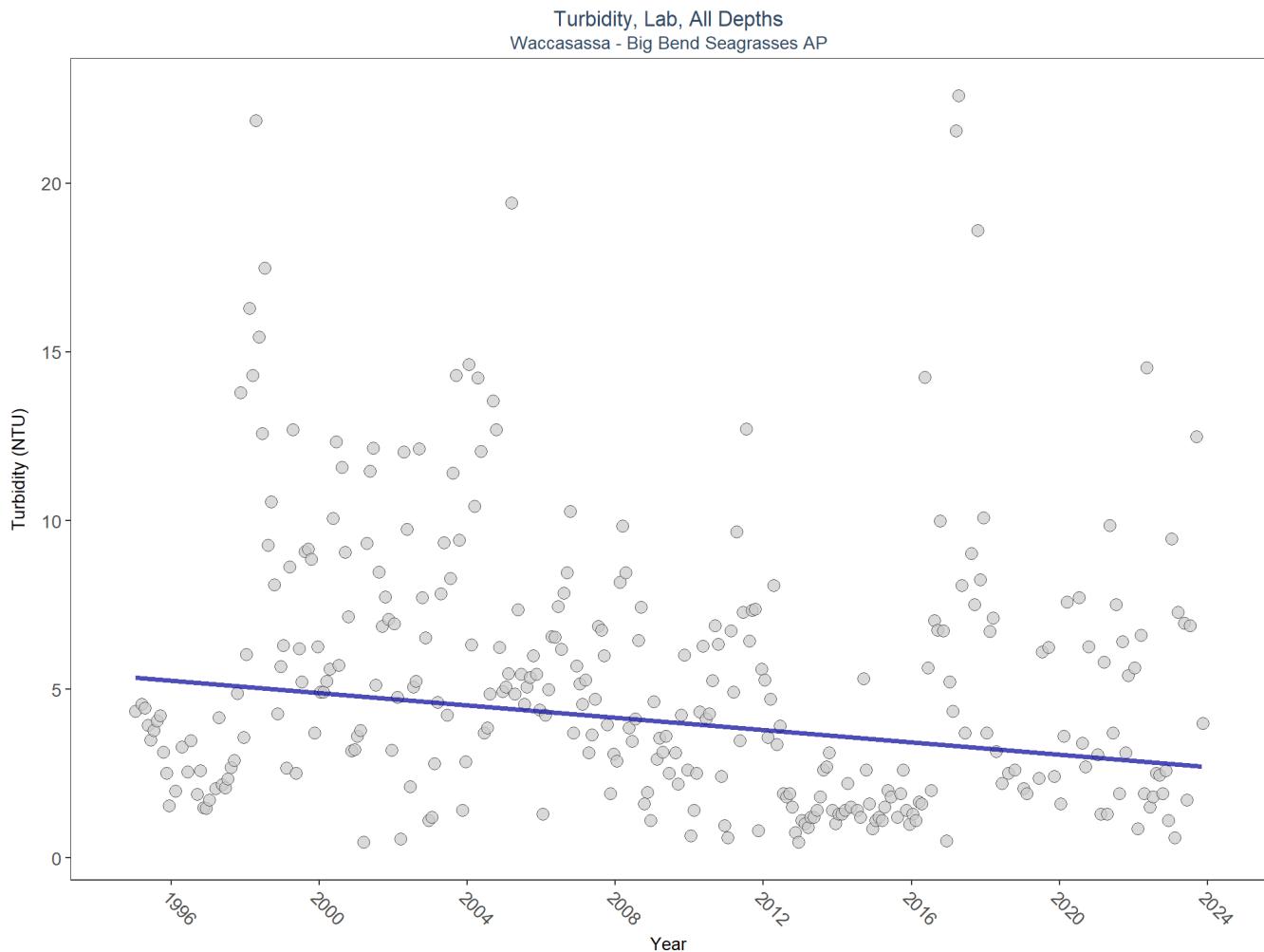
Chlorophyll a, Corrected for Pheophytin, Lab, All Depths  
Waccasassa - Big Bend Seagrasses AP



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

SennIntercept is intercept value at beginning of record for monitoring location

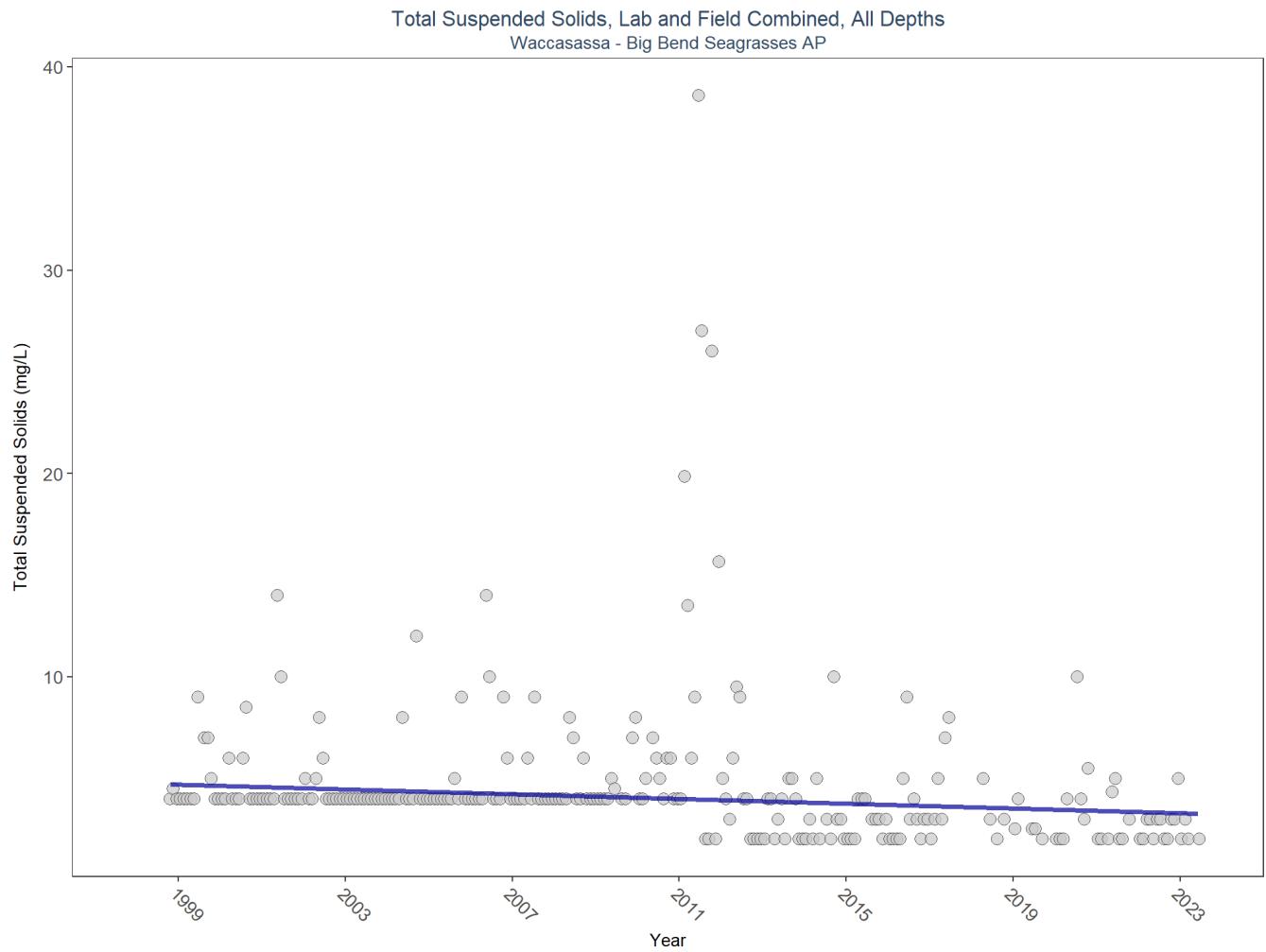
## Turbidity



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

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

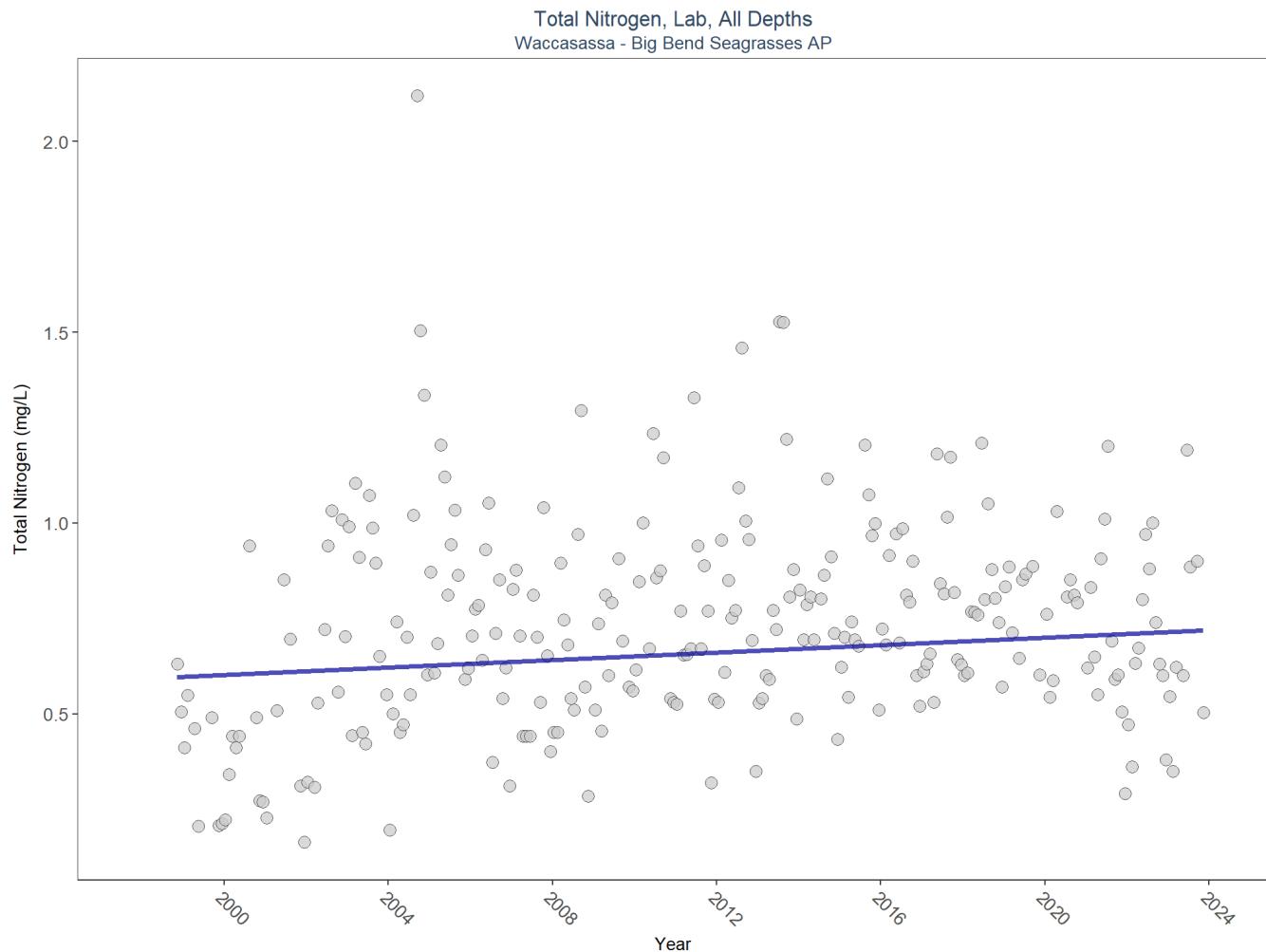
## Total Suspended Solids



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

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

## Total Nitrogen



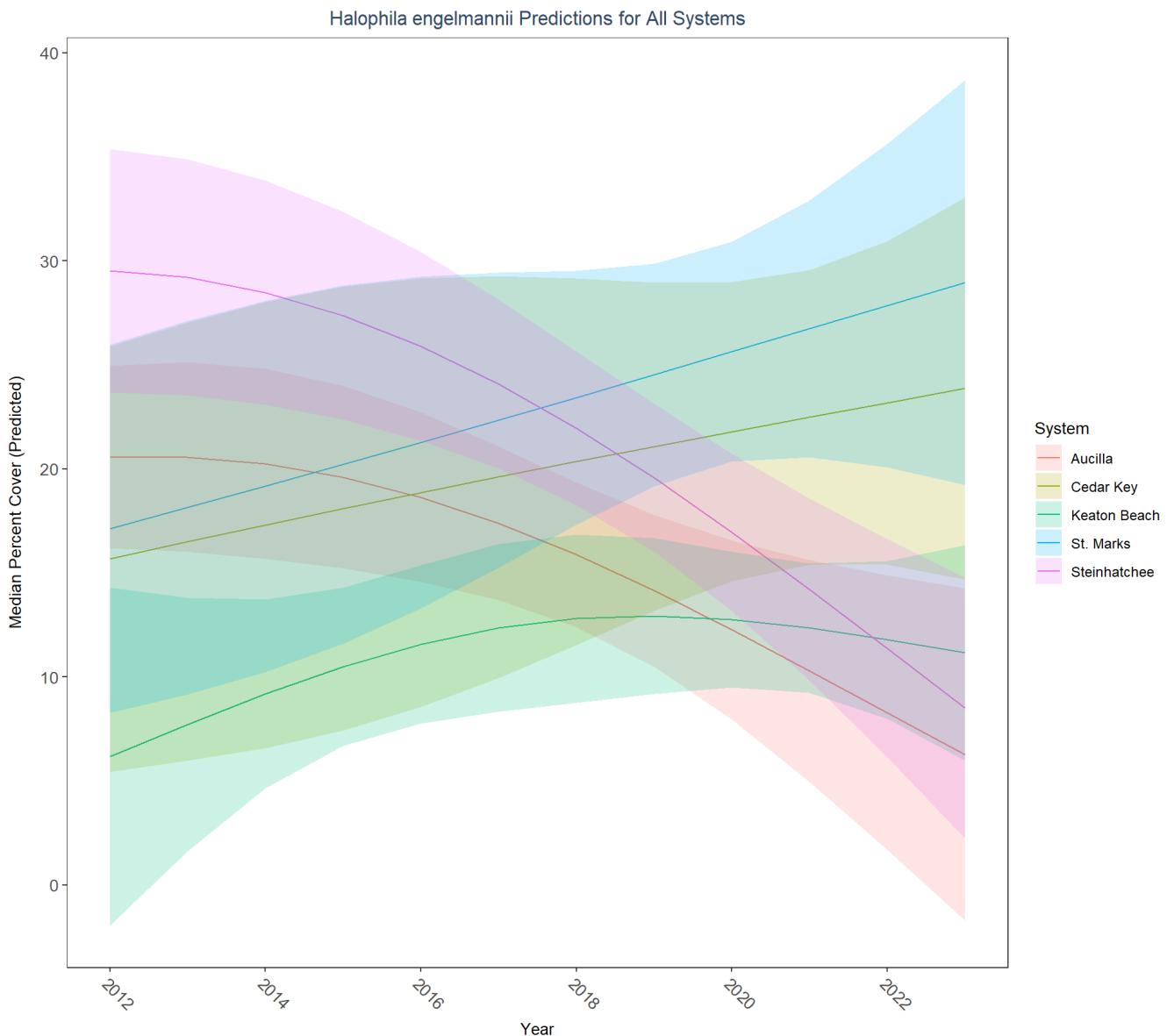
*p < 0.00005 appear as 0 due to rounding.*

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

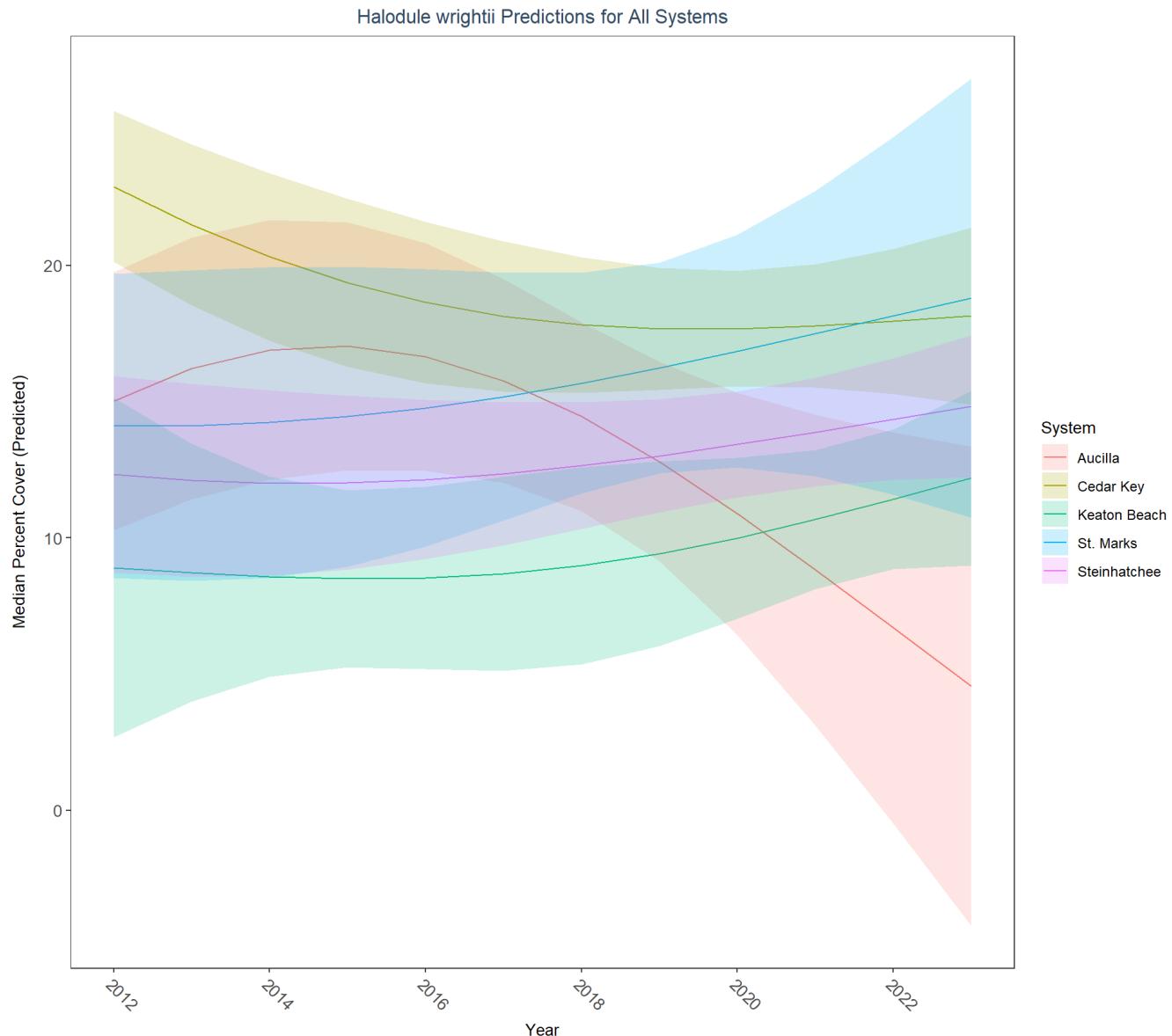
# Submerged Aquatic Vegetation - Generalized Additive Models

Models generated for all systems

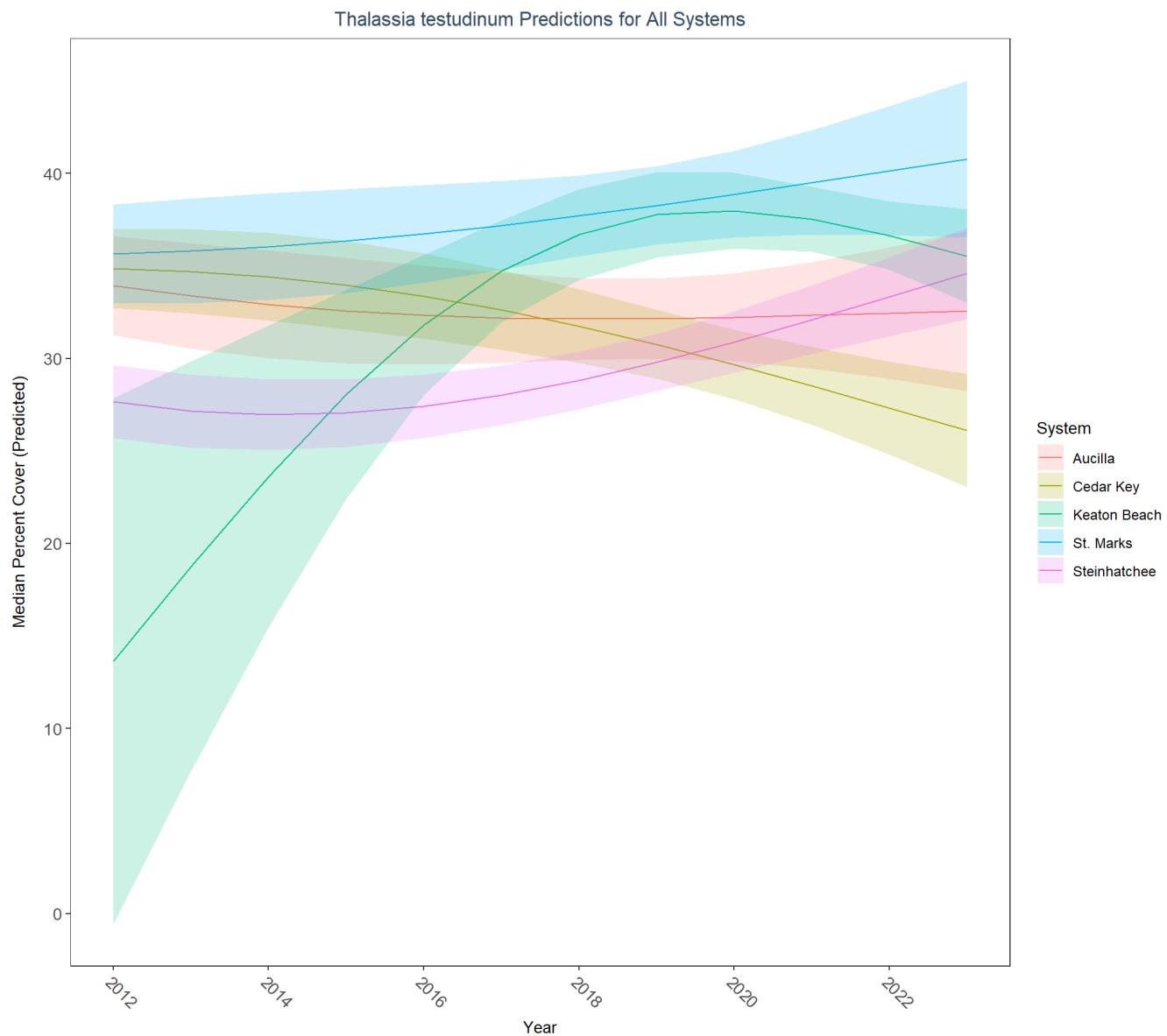
## Halophila engelmannii



## **Halodule wrightii**



## **Thalassia testudinum**



## Syringodium filiforme

