

Big Bend Seagrasses Aquatic Preserve (BBSAP)

Seagrass and Water Quality Trend Analysis

Florida Statewide Ecosystem Assessment of Coastal and Aquatic Resources (SEACAR)

2024-12-17

Contents

Funding & Acknowledgements	5
Watershed Designations	5
SEACAR Data Methods	5
Data Matching	5
Data De-duplication Process	5
Seasonal Kendall-Tau Analysis	5
Maps	7
Water Quality Discrete - Sample Locations - All Parameters	7
Water Quality Discrete - Sample Locations - Estuary and River Delineations	8
Submerged Aquatic Vegetation - Sample Locations	9
Horseshoe Beach	10
Chlorophyll a, Corrected for Pheophytin	12
Chlorophyll a, Uncorrected for Pheophytin	13
Colored Dissolved Organic Matter	14
Dissolved Oxygen Saturation	15
Dissolved Oxygen	16
pH	17
Salinity	18
Secchi Depth	19
Total Nitrogen	20
Total Phosphorus	21
Total Suspended Solids	22
Turbidity	23
Water Temperature	24
Steinhatchee	25
Chlorophyll a, Corrected for Pheophytin	28
Chlorophyll a, Uncorrected for Pheophytin	29
Colored Dissolved Organic Matter	30
Dissolved Oxygen Saturation	31
Dissolved Oxygen	32
pH	33
Salinity	34
Secchi Depth	35
Total Nitrogen	36
Total Phosphorus	37
Total Suspended Solids	38
Turbidity	39

Water Temperature	40
Submerged Aquatic Vegetation	41
Median Percent Cover - Species Trend Table	42
Frequency of Occurrence Barplots	43
St. Marks	44
Chlorophyll a, Corrected for Pheophytin	47
Chlorophyll a, Uncorrected for Pheophytin	48
Colored Dissolved Organic Matter	49
Dissolved Oxygen Saturation	50
Dissolved Oxygen	51
pH	52
Salinity	53
Secchi Depth	54
Total Nitrogen	55
Total Phosphorus	56
Total Suspended Solids	57
Turbidity	58
Water Temperature	59
Submerged Aquatic Vegetation	60
Median Percent Cover - Species Trend Table	61
Frequency of Occurrence Barplots	62
Econfina	63
Chlorophyll a, Corrected for Pheophytin	65
Chlorophyll a, Uncorrected for Pheophytin	66
Colored Dissolved Organic Matter	67
Dissolved Oxygen Saturation	68
Dissolved Oxygen	69
pH	70
Salinity	71
Secchi Depth	72
Total Nitrogen	73
Total Phosphorus	74
Total Suspended Solids	75
Turbidity	76
Water Temperature	77
Aucilla	78
Chlorophyll a, Corrected for Pheophytin	81
Chlorophyll a, Uncorrected for Pheophytin	82
Colored Dissolved Organic Matter	83
Dissolved Oxygen Saturation	84
Dissolved Oxygen	85
pH	86
Salinity	87
Secchi Depth	88
Total Nitrogen	89
Total Phosphorus	90
Total Suspended Solids	91
Turbidity	92
Water Temperature	93
Keaton Beach	94
Chlorophyll a, Corrected for Pheophytin	96
Chlorophyll a, Uncorrected for Pheophytin	97
Colored Dissolved Organic Matter	98
Dissolved Oxygen Saturation	99

Dissolved Oxygen	100
pH	101
Salinity	102
Secchi Depth	103
Total Nitrogen	104
Total Phosphorus	105
Total Suspended Solids	106
Turbidity	107
Water Temperature	108
Submerged Aquatic Vegetation	109
Median Percent Cover - Species Trend Table	110
Frequency of Occurrence Barplots	111
Cedar Key	112
Chlorophyll a, Corrected for Pheophytin	115
Chlorophyll a, Uncorrected for Pheophytin	116
Colored Dissolved Organic Matter	117
Dissolved Oxygen Saturation	118
Dissolved Oxygen	119
pH	120
Salinity	121
Secchi Depth	122
Total Nitrogen	123
Total Phosphorus	124
Total Suspended Solids	125
Turbidity	126
Water Temperature	127
Submerged Aquatic Vegetation	128
Median Percent Cover - Species Trend Table	129
Frequency of Occurrence Barplots	130
Suwannee	131
Chlorophyll a, Corrected for Pheophytin	134
Chlorophyll a, Uncorrected for Pheophytin	135
Colored Dissolved Organic Matter	136
Dissolved Oxygen Saturation	137
Dissolved Oxygen	138
pH	139
Salinity	140
Secchi Depth	141
Total Nitrogen	142
Total Phosphorus	143
Total Suspended Solids	144
Turbidity	145
Water Temperature	146
Waccasassa	147
Chlorophyll a, Corrected for Pheophytin	150
Chlorophyll a, Uncorrected for Pheophytin	151
Colored Dissolved Organic Matter	152
Dissolved Oxygen Saturation	153
Dissolved Oxygen	154
pH	155
Salinity	156
Secchi Depth	157
Total Nitrogen	158
Total Phosphorus	159

Total Suspended Solids	160
Turbidity	161
Water Temperature	162
Submerged Aquatic Vegetation - Generalized Additive Models	163
<i>Halodule wrightii</i>	163
<i>Halophila engelmannii</i>	164
<i>Thalassia testudinum</i>	165
<i>Syringodium filiforme</i>	166
SEACAR Files used in the analysis	167
References	168

Funding & Acknowledgements

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

With respect to documents and information available from SEACAR DDI, neither the State of Florida nor the Florida Department of Environmental Protection makes any warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose arising out of the use or inability to use the data, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

This report was funded in part, through a grant agreement from the Florida Department of Environmental Protection, Florida Coastal Management Program, by a grant provided by the Office for Coastal Management under the Coastal Zone Management Act of 1972, as amended, National Oceanic and Atmospheric Administration. The views, statements, findings, conclusions and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida, NOAA or any of their sub agencies.

Published: 2024-12-17



Watershed Designations

Water quality sampling locations were divided into watershed designations based on recommendations from BBSAP staff, with influence from *Seagrass Integrated Mapping and Monitoring Program Mapping and Monitoring Report No. 2*¹. Submerged Aquatic Vegetation sampling locations contain watershed-based prefixes within their location names and naturally fall within these boundaries. BBSAP staff considered salinity, tidal exchange, and seasonal variation when designating sample locations as river or estuary.

SEACAR Data Methods

Data Matching

Data accessed through the Florida Department of Environmental Protection (FDEP) Watershed Information Network (WIN) are matched to a specific SEACAR program, when possible, based on a combination of multiple fields (e.g., WIN OrgID, ProjectID, SamplingAgency, MonitoringLocationID, etc.). WIN datasets that are not matched to a specific program page in the SEACAR DDI are maintained in the generic *Florida STORET/WIN*² program.

Data De-duplication Process

Coordination and overlap between monitoring programs in data collection activities has led to cases where datasets from two or more programs/data sources include some of the same result records (i.e., data from the same sampling event), leading to some risk of data duplication in the SEACAR data export tables. To mitigate this risk, a de-duplication process is run on the final export tables to check for and identify duplicate records (i.e., those with the same location, date, parameter, activity depth, species, quad/site identifier, and result values) before the tables are made public.

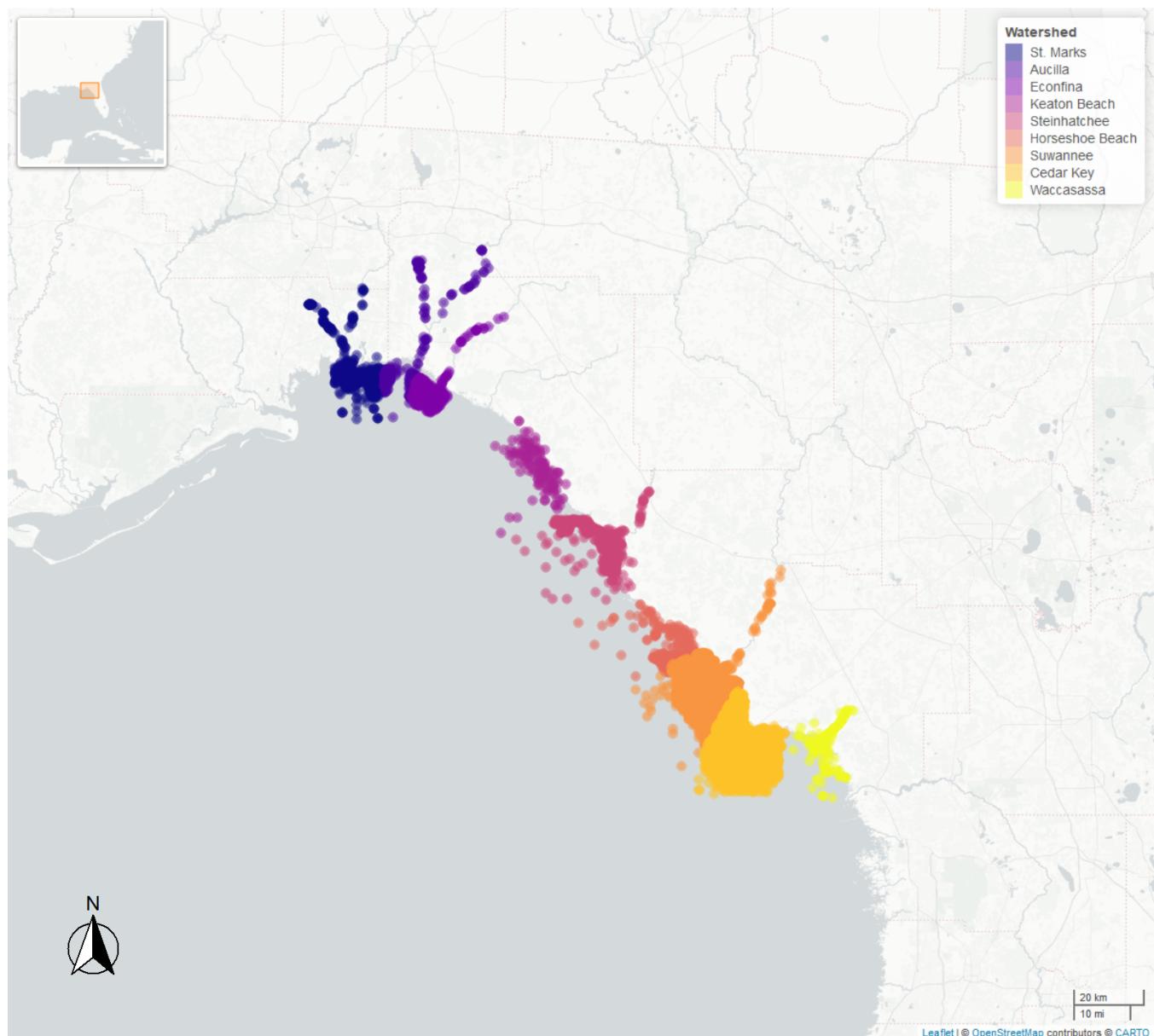
Seasonal Kendall-Tau Analysis

For discrete Water Quality data, indicators must have a minimum of ten years of data within the geographic range of the analysis to be included in the analysis. If there are insufficient years of data, the number of years of data

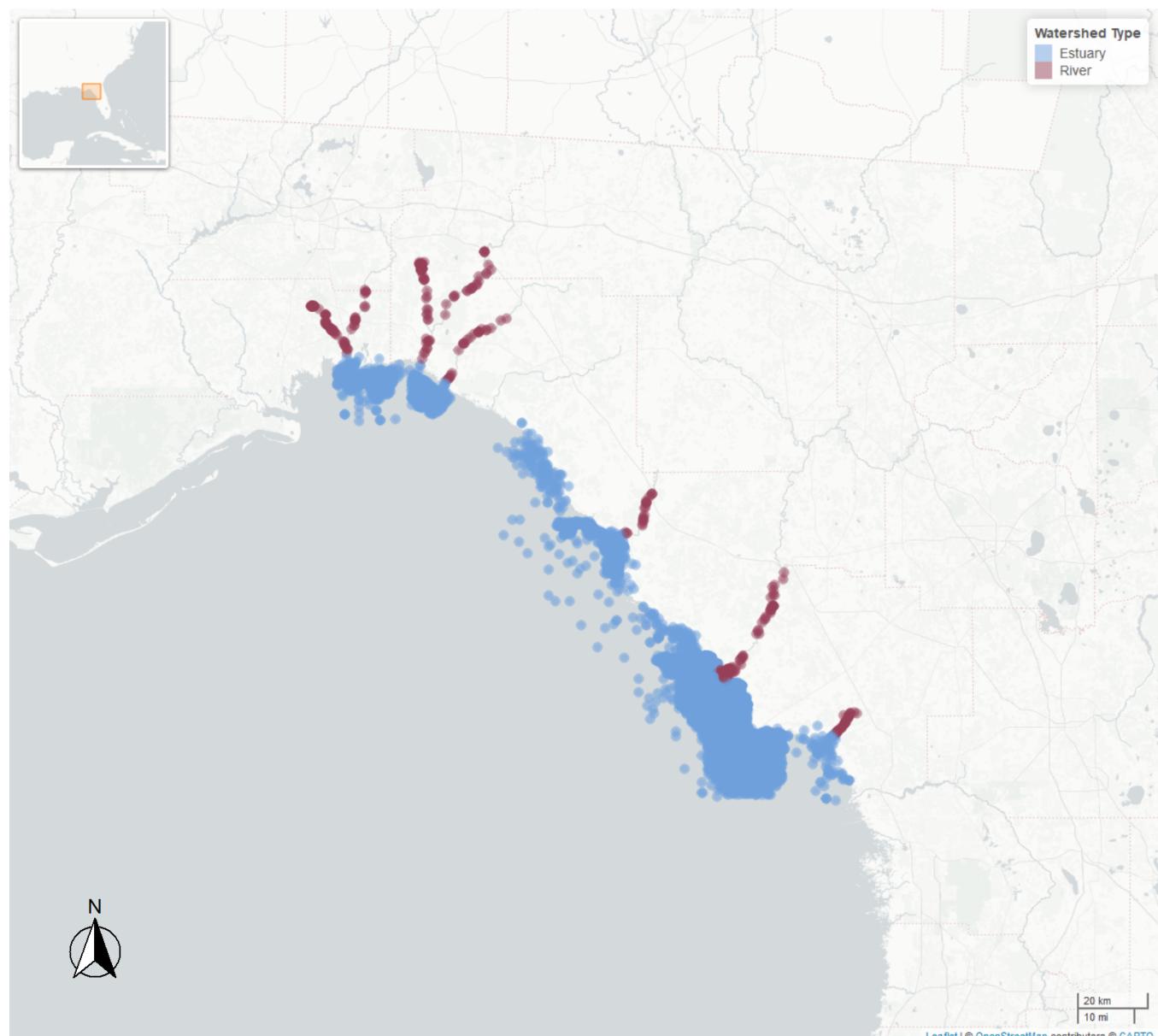
available will be noted and labeled as “insufficient data to conduct analysis”. Further, for the preferred Seasonal Kendall-Tau test, there must be data from at least two months in common across at least two consecutive years within the RCP managed area being analyzed. Values that pass both of these tests will be included in the analysis and be labeled as *Use_In_Analysis* = **TRUE**. Any that fail either test will be excluded from the analyses and labeled as *Use_In_Analysis* = **FALSE**. The points for all Water Quality plots displayed in this report are monthly averages. Trend significance will be denoted as “Significant Trend” (when $p < 0.05$), or “Non-significant Trend” (when $p \geq 0.05$). Any parameters with insufficient data to perform Seasonal Kendall-Tau test will have their monthly averages plotted without a corresponding trend line.

Maps

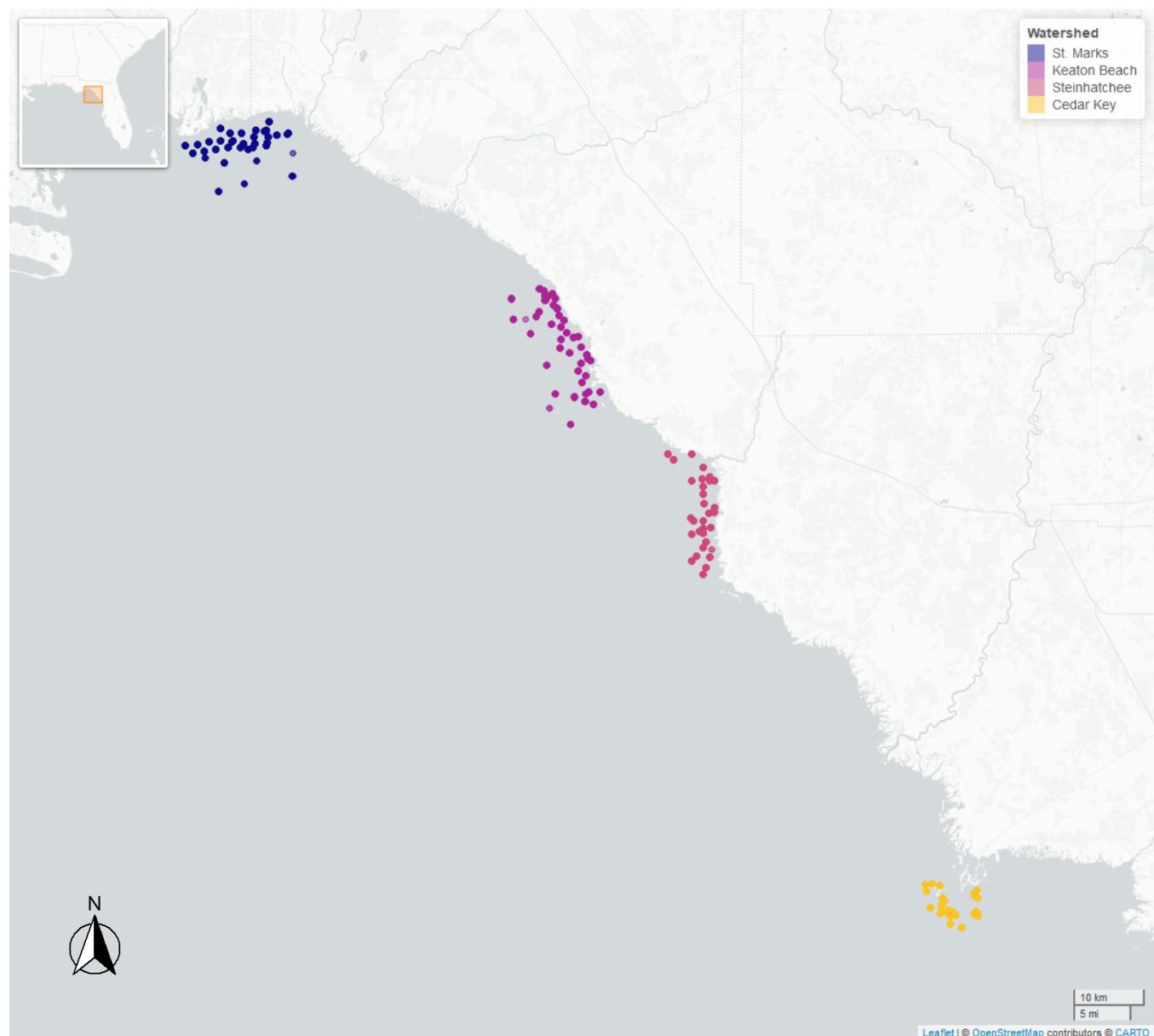
Water Quality Discrete - Sample Locations - All Parameters



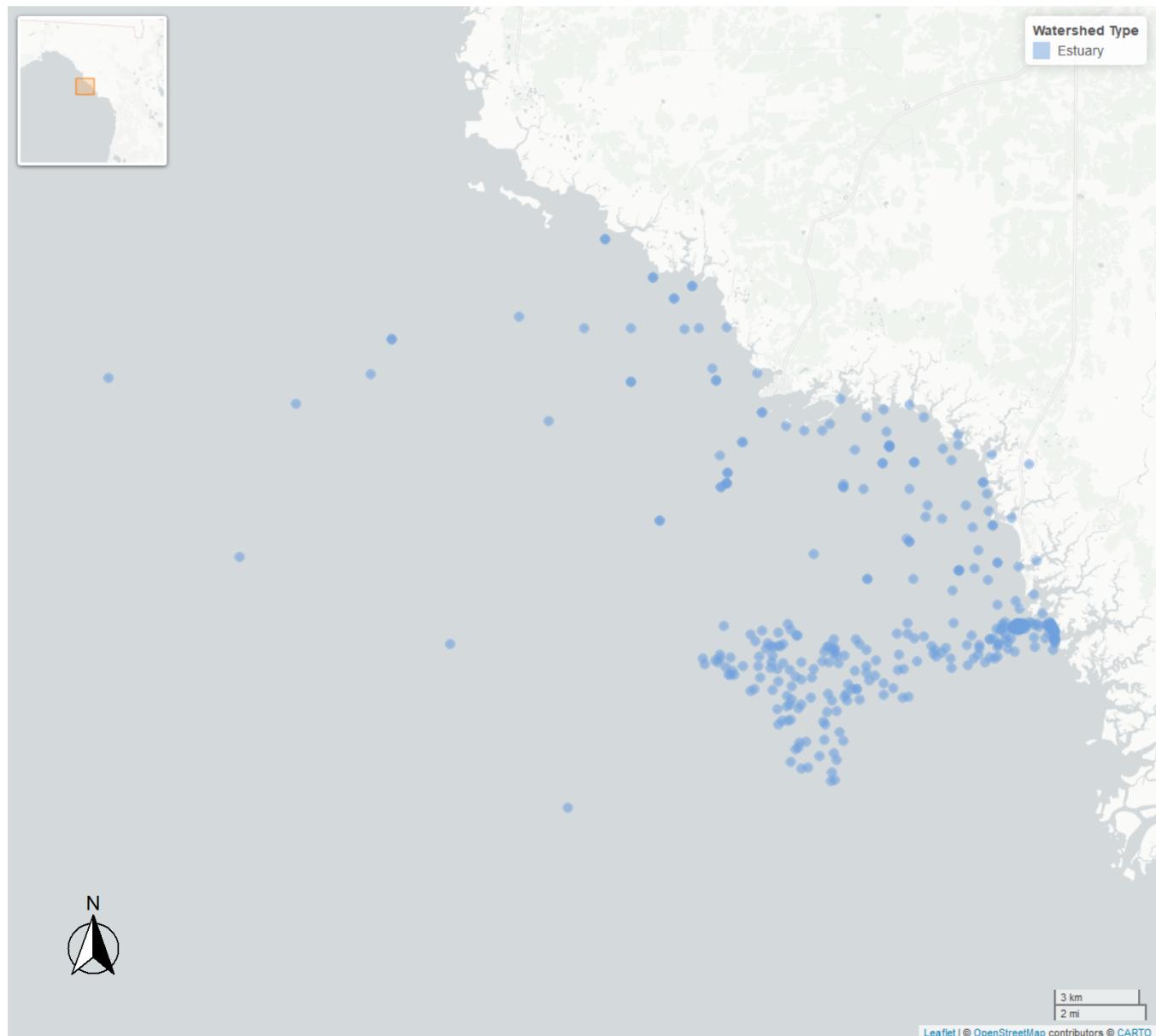
Water Quality Discrete - Sample Locations - Estuary and River Delineations



Submerged Aquatic Vegetation - Sample Locations



Horseshoe Beach



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 1: Seasonal Kendall-Tau Results for Horseshoe Beach

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2012 - 2024	10	208	TRUE	0.20	5.85	0.6218	0
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2002 - 2024	9	244	FALSE	-	-	-	-
Estuary	Colored Dissolved Organic Matter	2020 - 2021	2	9	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1993 - 2024	31	25912	TRUE	-0.01	7.18	0.4533	0
Estuary	Dissolved Oxygen Saturation	2017 - 2017	1	3	FALSE	-	-	-	-
Estuary	Salinity	1993 - 2024	31	27463	TRUE	0.03	23.04	0.3940	0
Estuary	Secchi Depth	1993 - 2021	25	928	TRUE	-0.01	1.17	0.0208	↓
Estuary	Total Nitrogen	2002 - 2024	11	219	TRUE	-0.02	1.09	0.0392	↓
Estuary	Total Phosphorus	2002 - 2024	11	232	TRUE	0.00	0.03	1.0000	0
Estuary	Total Suspended Solids	2017 - 2017	1	2	FALSE	-	-	-	-
Estuary	Turbidity	1995 - 2024	27	10406	TRUE	0.01	3.61	0.6116	0
Estuary	Water Temperature	1993 - 2024	31	27456	TRUE	0.04	22.38	0.0022	↑
Estuary	pH	1993 - 2024	31	14195	TRUE	0.00	8.00	0.1837	0

Table containing overview of Programs contributing data for Horseshoe Beach

Table 2: Overview of Program Data for Horseshoe Beach

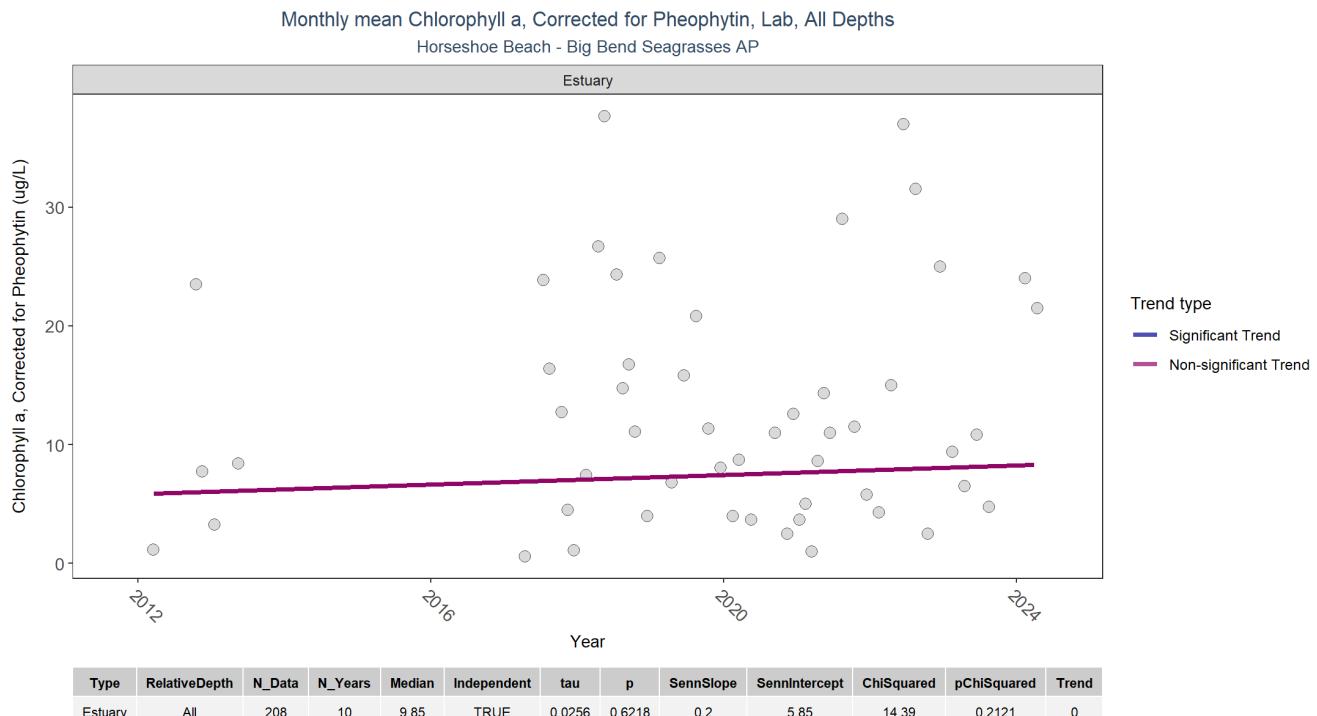
ParameterName	ProgramID	n-data-Estuary	n-data-River
Ammonium, Filtered (NH4)	103	1	-
Ammonium, Filtered (NH4)	115	1	-
Ammonium, Filtered (NH4)	5002	2	-
Chlorophyll a, Corrected for Pheophytin	514	24	-
Chlorophyll a, Corrected for Pheophytin	5002	192	-
Chlorophyll a, Uncorrected for Pheophytin	60	3	-
Chlorophyll a, Uncorrected for Pheophytin	103	54	-
Chlorophyll a, Uncorrected for Pheophytin	115	1	-
Chlorophyll a, Uncorrected for Pheophytin	514	27	-
Chlorophyll a, Uncorrected for Pheophytin	5002	169	-
Colored Dissolved Organic Matter	103	6	-
Colored Dissolved Organic Matter	514	9	-
Dissolved Oxygen	60	6	-
Dissolved Oxygen	69	884	-
Dissolved Oxygen	95	258	-
Dissolved Oxygen	103	12	-
Dissolved Oxygen	115	3	-
Dissolved Oxygen	5002	24749	-
Dissolved Oxygen Saturation	60	3	-
Dissolved Oxygen Saturation	5002	3	-
NO2+3, Filtered	115	1	-
NO2+3, Filtered	5002	183	-
Phosphate, Filtered (PO4)	103	1	-
Phosphate, Filtered (PO4)	115	1	-
Phosphate, Filtered (PO4)	5002	1	-
Salinity	60	6	-
Salinity	69	890	-
Salinity	95	277	-
Salinity	115	3	-
Salinity	5002	26287	-
Secchi Depth	69	890	-
Secchi Depth	115	2	-
Secchi Depth	514	33	-
Secchi Depth	5002	3	-
Specific Conductivity	69	883	-
Specific Conductivity	95	1	-
Specific Conductivity	514	9	-
Specific Conductivity	5002	5	-
Total Kjeldahl Nitrogen	5002	191	-
Total Nitrogen	103	2	-
Total Nitrogen	115	1	-
Total Nitrogen	514	33	-
Total Nitrogen	5002	191	-
Total Phosphorus	103	28	-
Total Phosphorus	115	1	-
Total Phosphorus	514	21	-
Total Phosphorus	5002	187	-
Total Suspended Solids	5002	2	-
Turbidity	103	12	-
Turbidity	5002	10407	-

Water Temperature	60	6	-
Water Temperature	69	889	-
Water Temperature	95	260	-
Water Temperature	103	12	-
Water Temperature	115	3	-
Water Temperature	5002	26286	-
pH	69	882	-
pH	95	187	-
pH	103	12	-
pH	115	3	-
pH	5002	13111	-

Program names:

- 60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey -³
- 69 - Fisheries-Independent Monitoring (FIM) Program -⁴
- 95 - Harmful Algal Bloom Marine Observation Network -⁵
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶
- 115 - Environmental Monitoring Assessment Program -⁷
- 514 - Florida LAKEWATCH Program -⁸
- 5002 - Florida STORET / WIN -²

Chlorophyll a, Corrected for Pheophytin

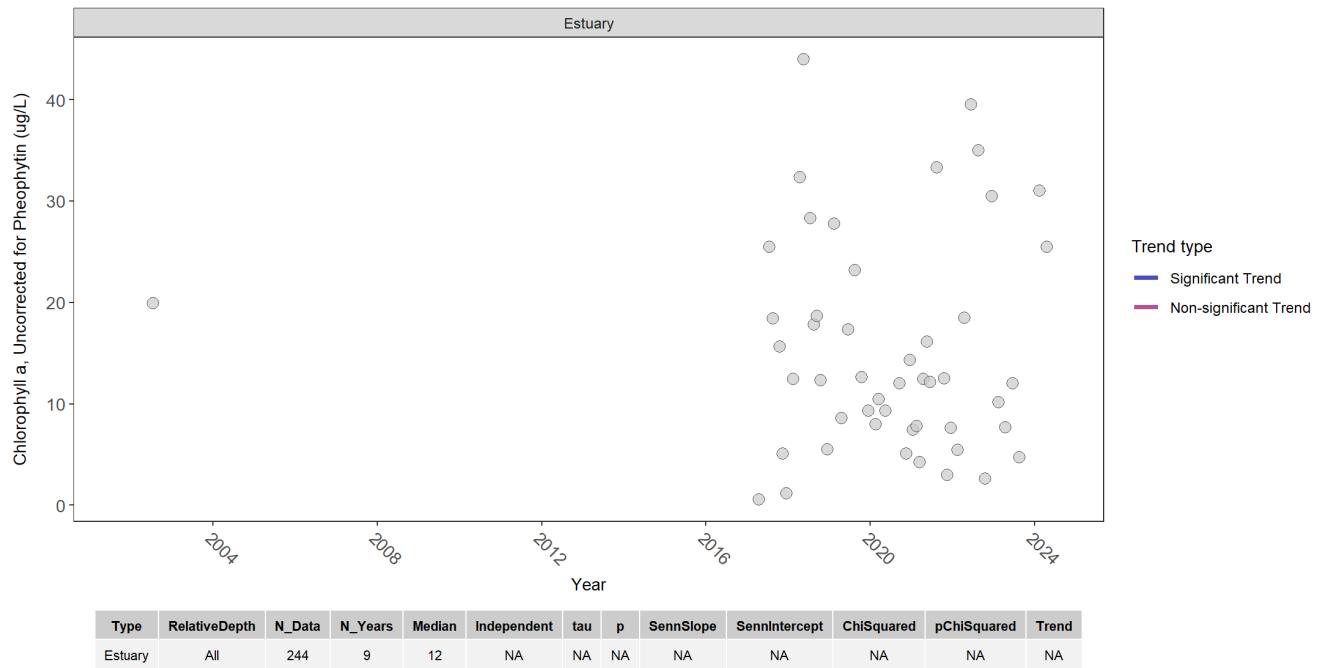


p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Chlorophyll a, Uncorrected for Pheophytin

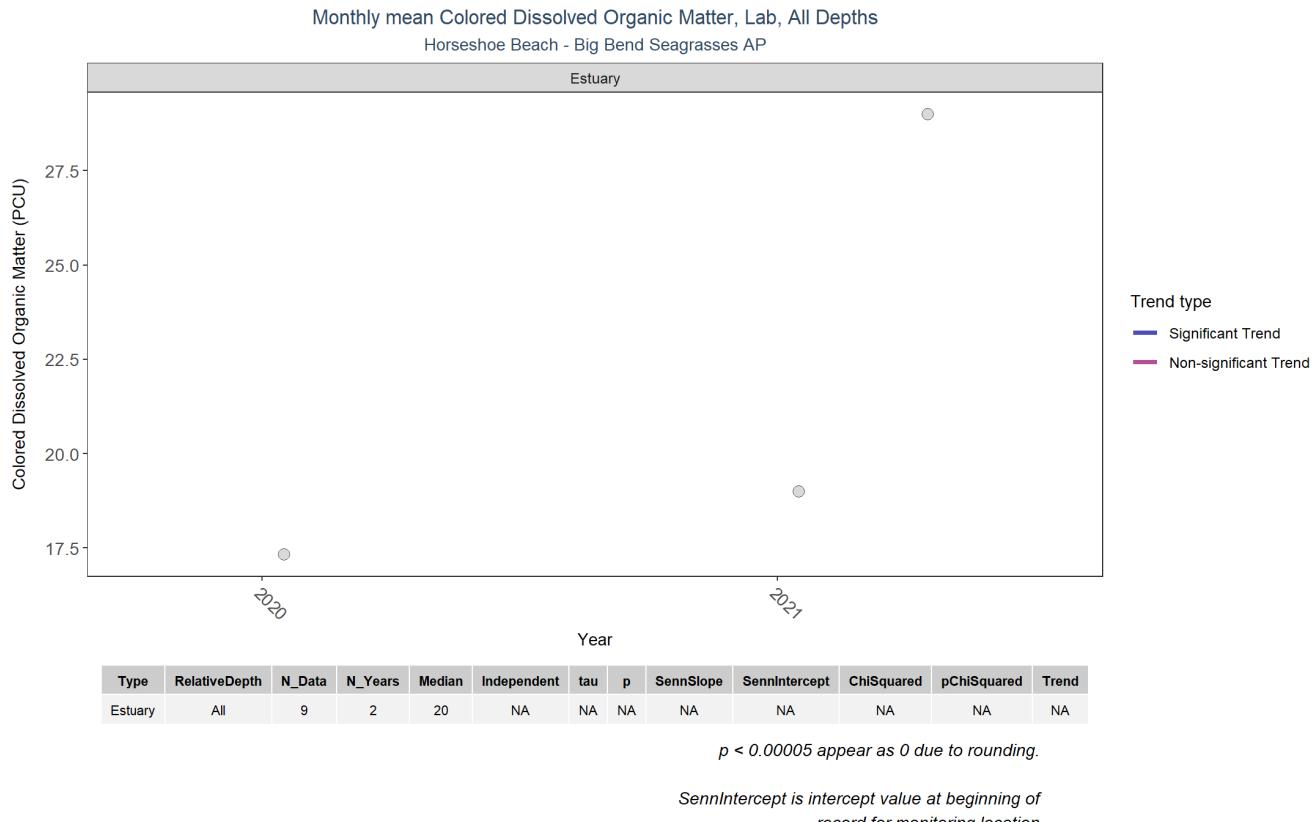
Monthly mean Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths
Horseshoe Beach - Big Bend Seagrasses AP



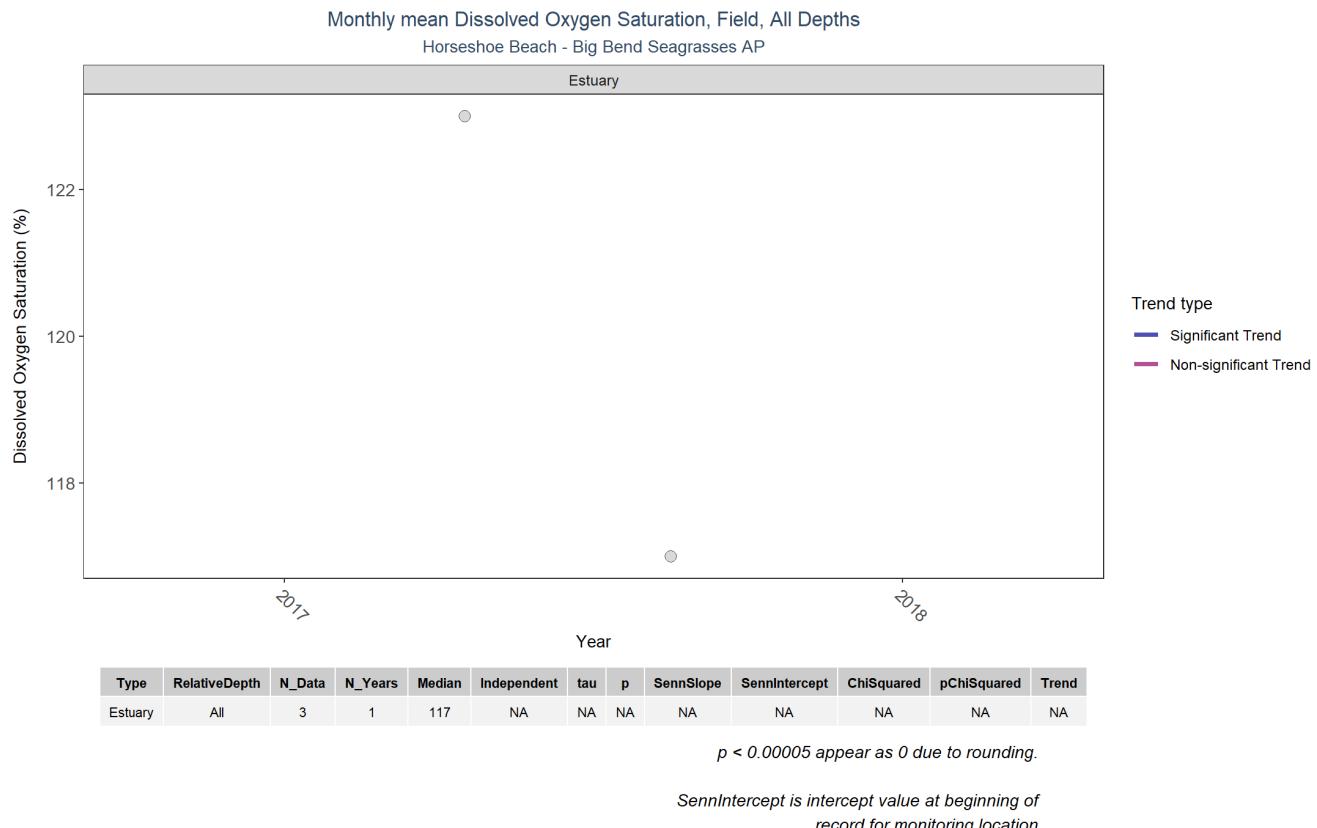
$p < 0.00005$ appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

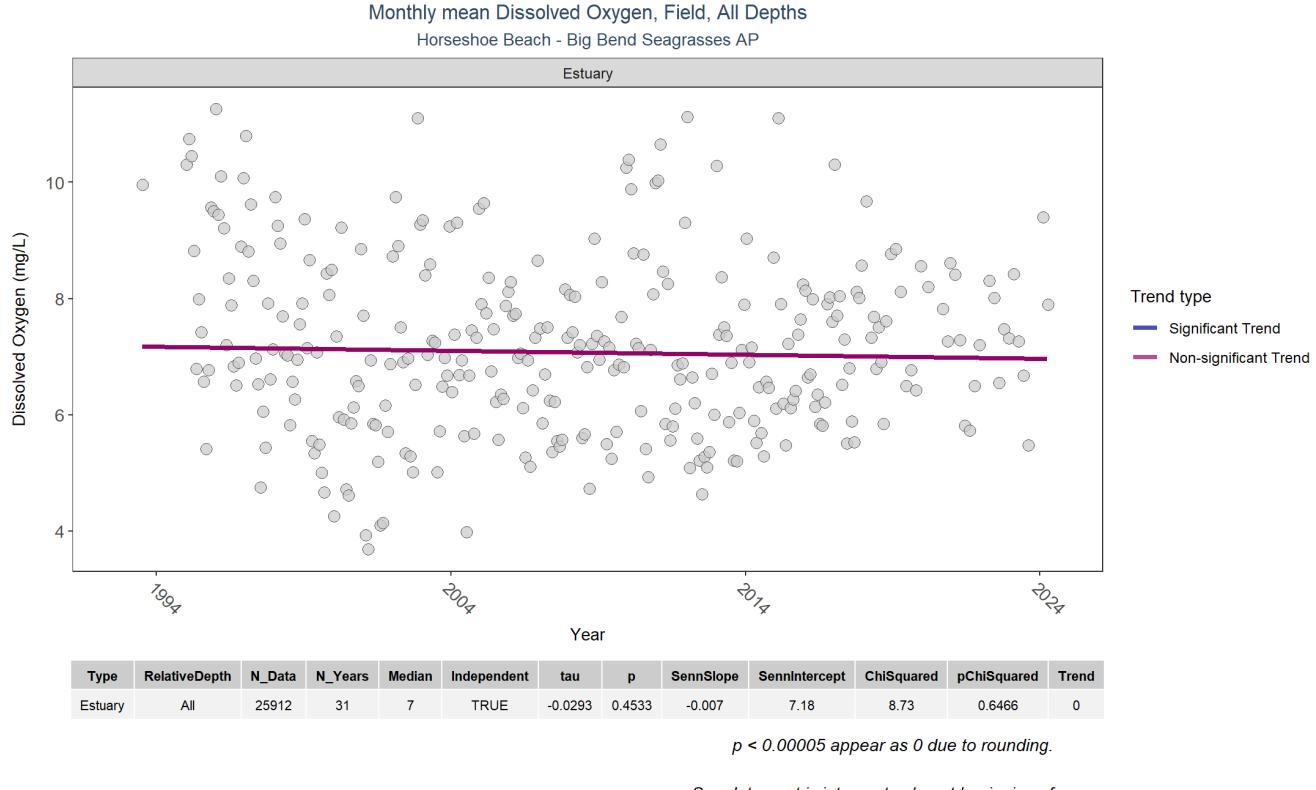
Colored Dissolved Organic Matter



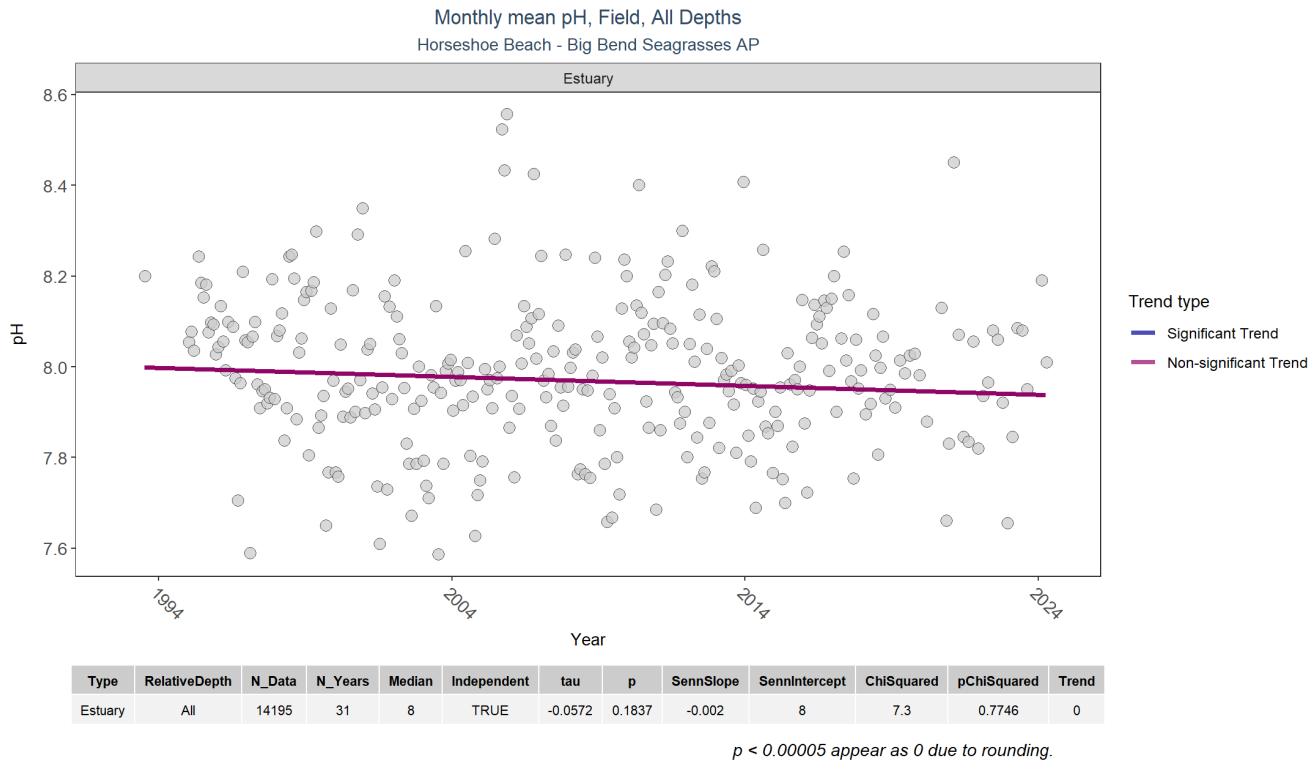
Dissolved Oxygen Saturation



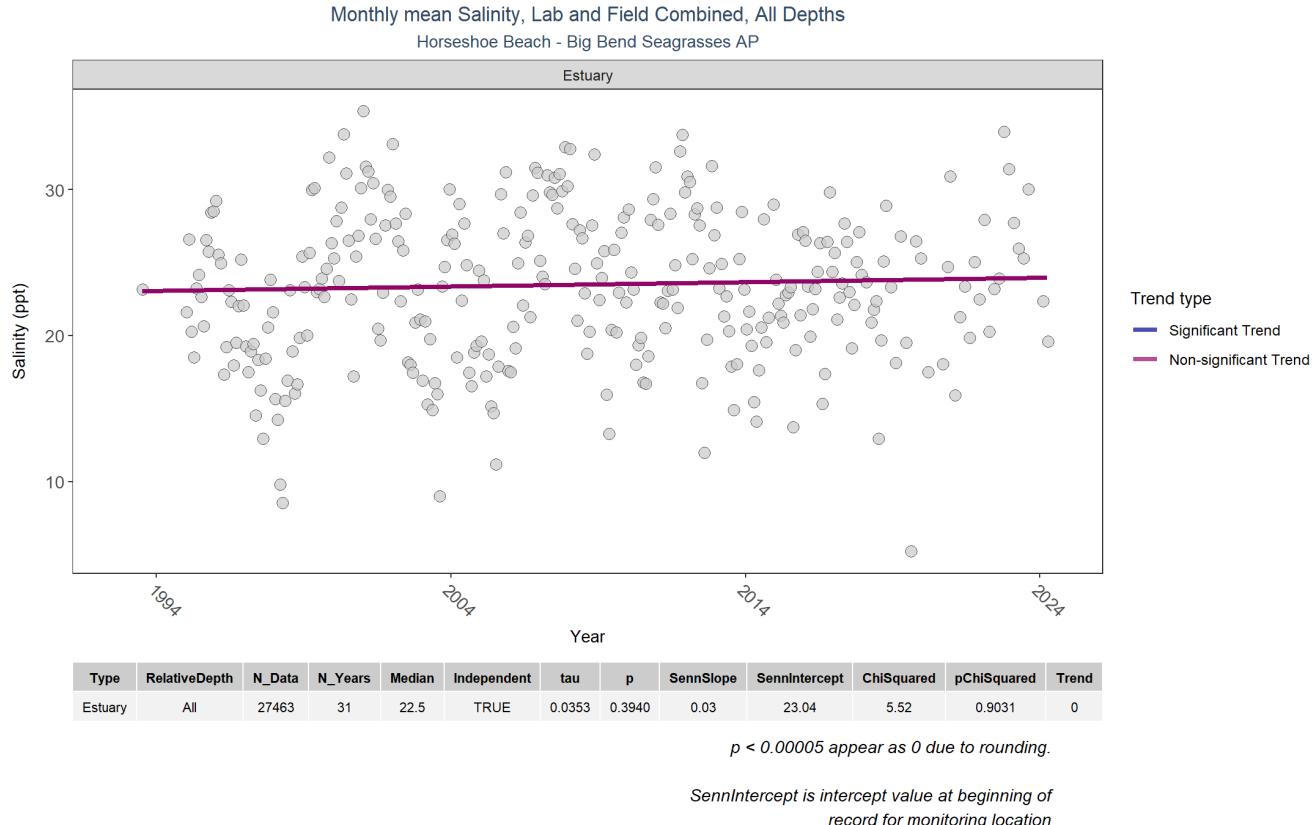
Dissolved Oxygen



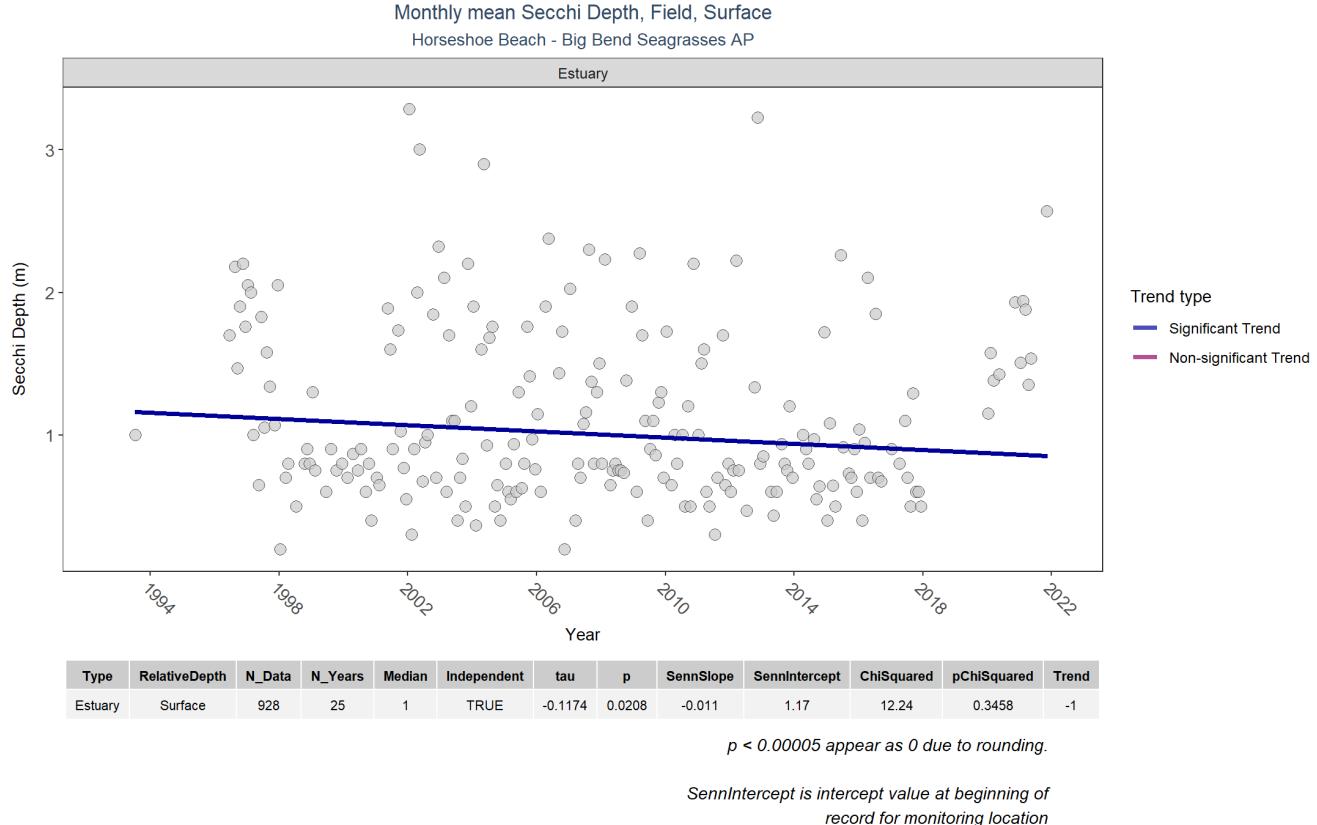
pH



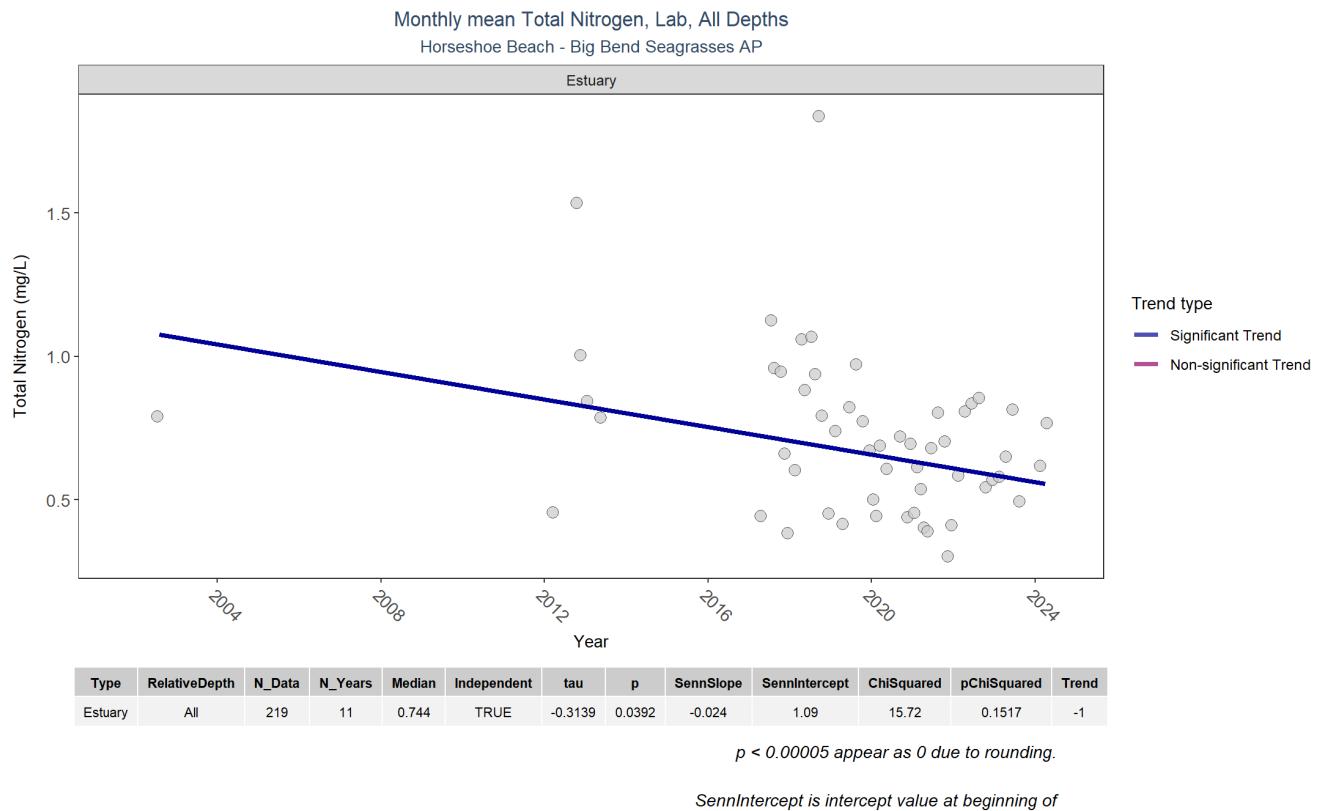
Salinity



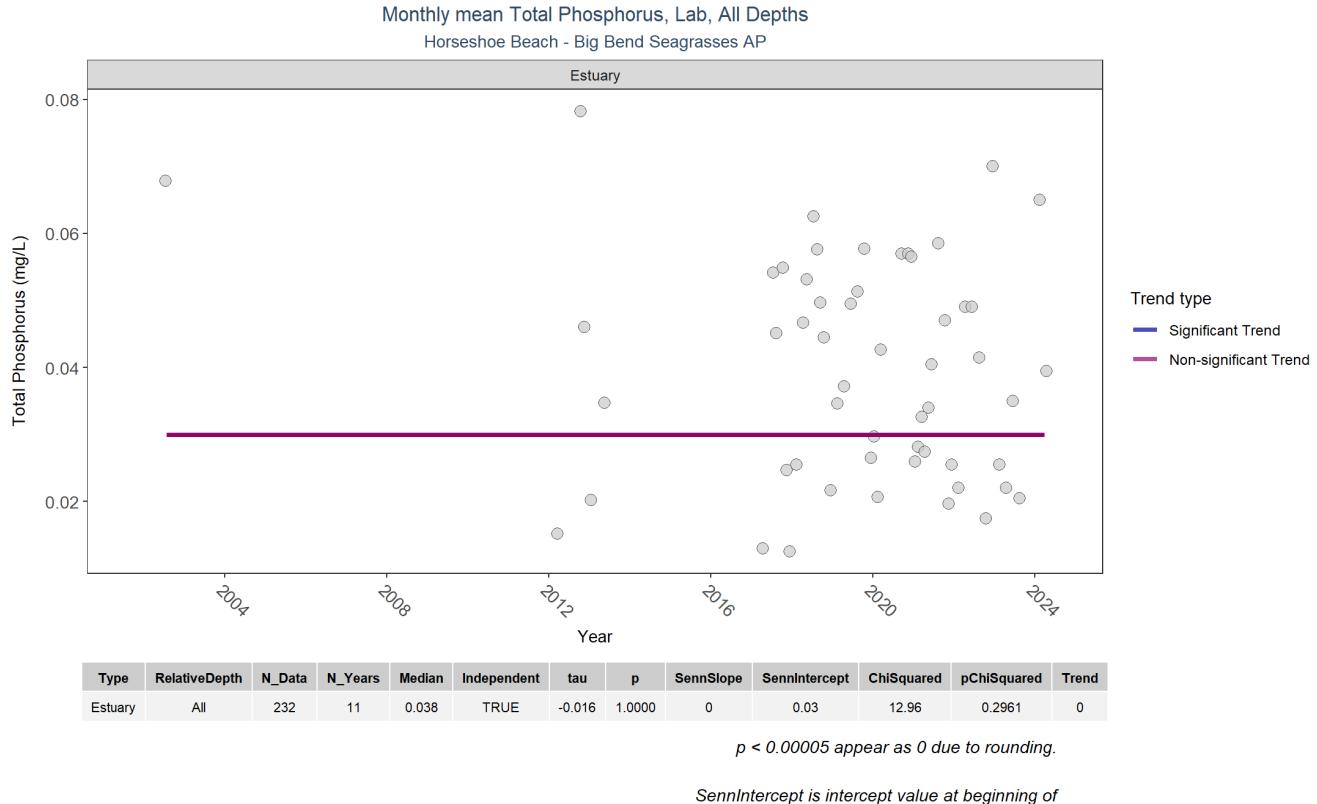
Secchi Depth



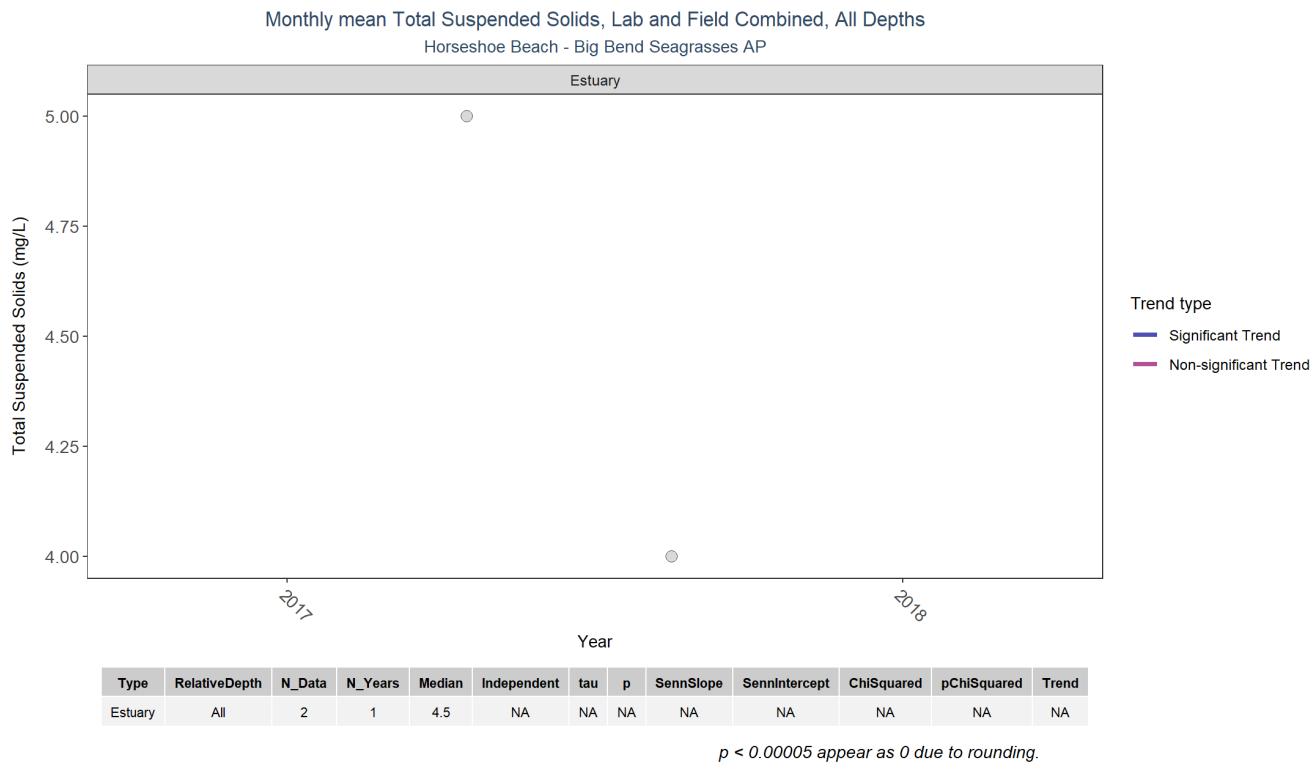
Total Nitrogen



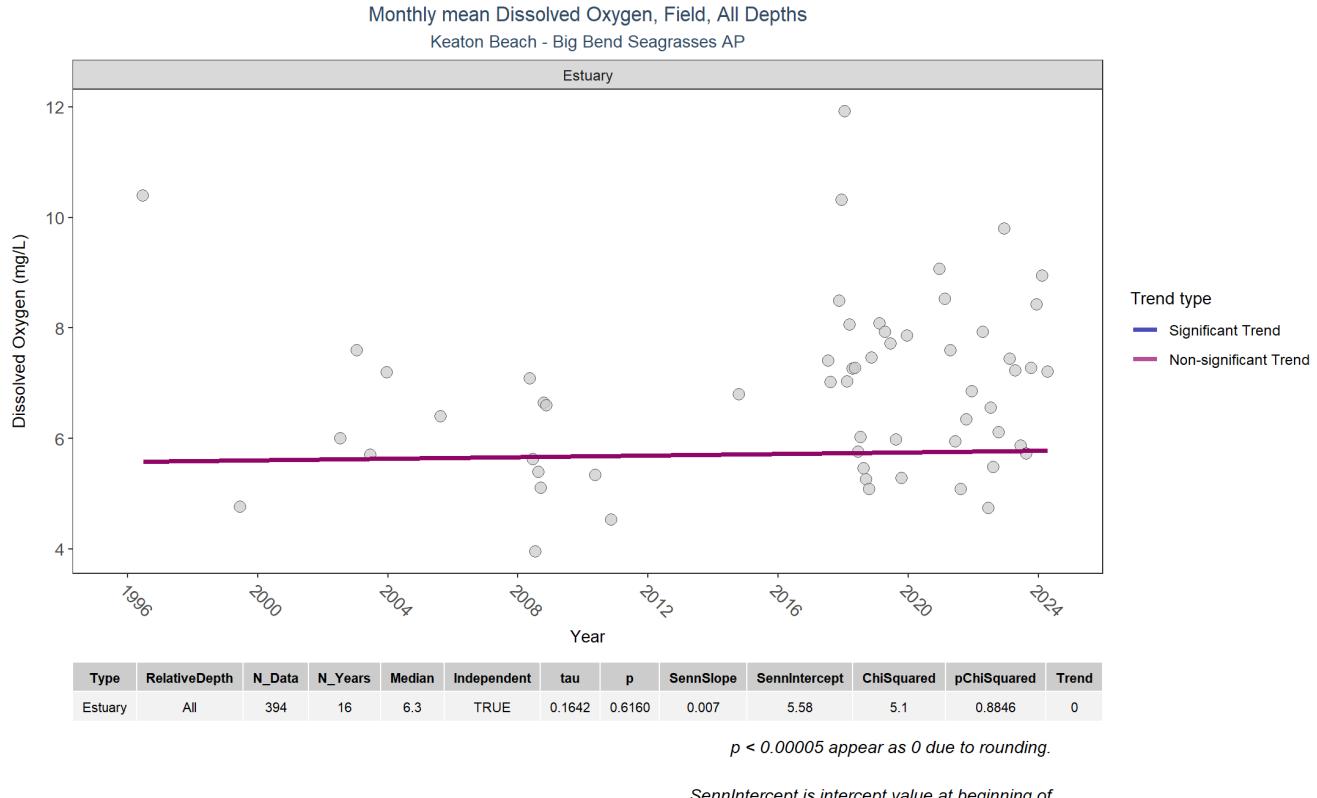
Total Phosphorus



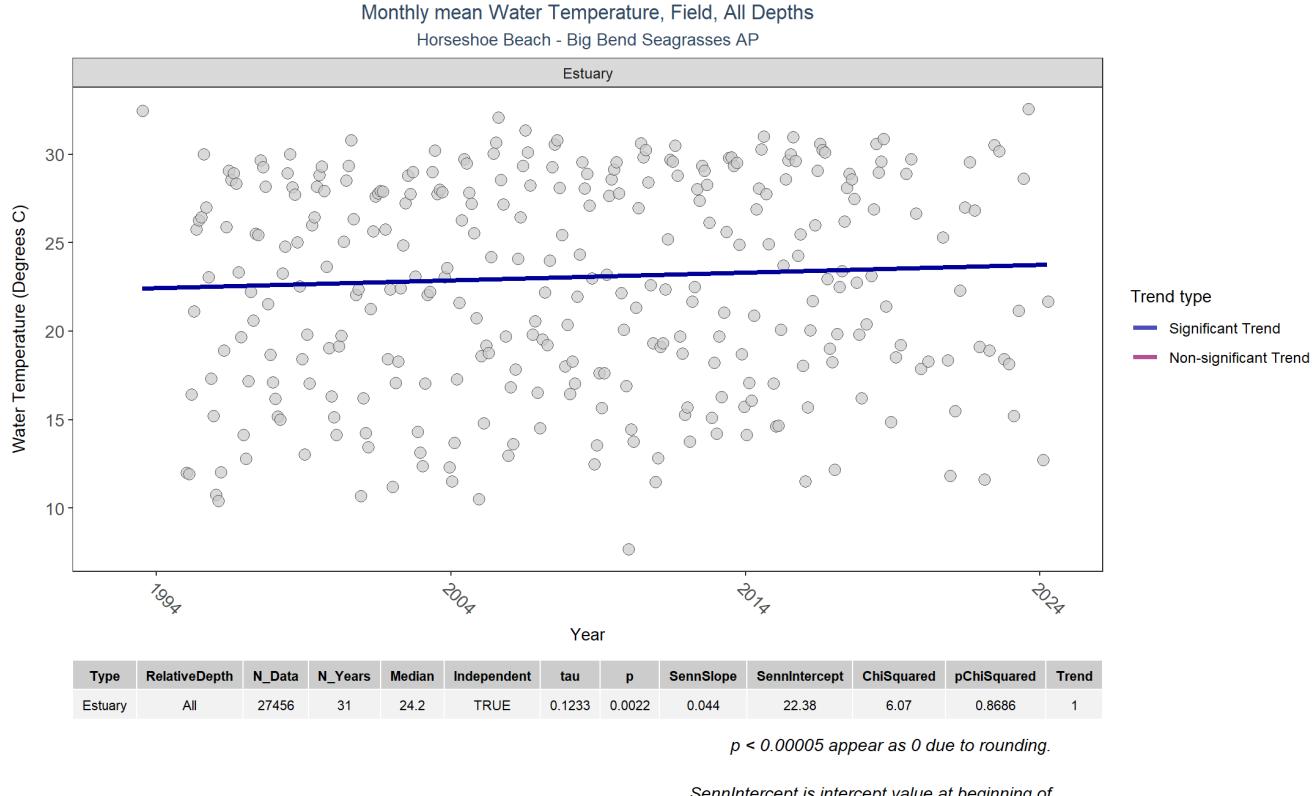
Total Suspended Solids



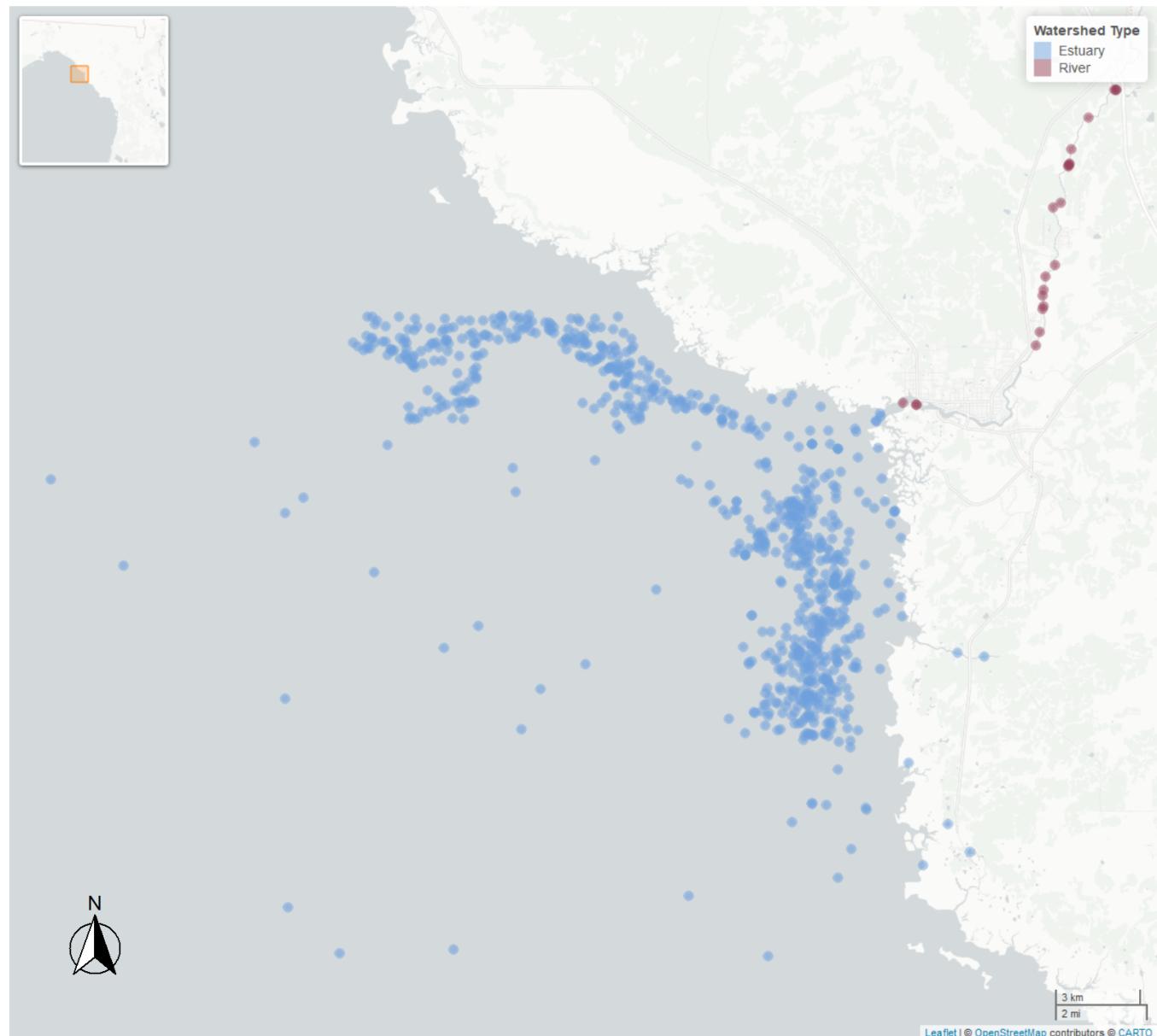
Turbidity



Water Temperature



Steinhatchee



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 3: Seasonal Kendall-Tau Results for Steinhatchee

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2001 - 2024	12	193	TRUE	0.03	1.16	0.3727	0
River	Chlorophyll a, Corrected for Pheophytin	2002 - 2023	12	79	TRUE	0.00	1.02	0.6296	0
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2001 - 2024	20	249	TRUE	0.04	2.30	0.1090	0
River	Chlorophyll a, Uncorrected for Pheophytin	2013 - 2023	9	72	FALSE	-	-	-	-
Estuary	Colored Dissolved Organic Matter	2016 - 2023	8	30	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2017 - 2023	7	29	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1993 - 2024	28	2653	TRUE	0.00	7.57	0.8356	0
River	Dissolved Oxygen	1999 - 2023	16	98	TRUE	0.05	3.14	0.2177	0
Estuary	Dissolved Oxygen Saturation	2013 - 2023	11	66	TRUE	-1.10	87.97	0.8561	0
River	Dissolved Oxygen Saturation	2001 - 2023	12	53	TRUE	0.20	13.21	1.0000	0
Estuary	Salinity	1990 - 2024	29	3110	TRUE	-0.16	34.18	0.0001	↓
River	Salinity	2001 - 2023	13	78	TRUE	0.00	0.44	0.6775	0
Estuary	Secchi Depth	1993 - 2023	26	2337	TRUE	0.00	1.37	0.9544	0
River	Secchi Depth	2001 - 2023	14	53	TRUE	-0.01	1.02	0.6375	0
Estuary	Total Nitrogen	2002 - 2024	18	192	TRUE	-0.01	0.84	0.0318	↓
River	Total Nitrogen	2001 - 2022	12	51	TRUE	0.02	0.24	0.0287	↑
Estuary	Total Phosphorus	2002 - 2024	16	229	TRUE	0.00	0.07	0.0001	↓
River	Total Phosphorus	2001 - 2023	14	91	TRUE	0.00	0.03	0.0521	0
Estuary	Total Suspended Solids	1994 - 2020	7	22	FALSE	-	-	-	-
River	Total Suspended Solids	2001 - 2022	7	23	FALSE	-	-	-	-
Estuary	Turbidity	1994 - 2024	26	197	TRUE	-0.01	2.21	0.5001	0
River	Turbidity	2001 - 2023	14	67	TRUE	0.01	2.06	0.7297	0
Estuary	Water Temperature	1990 - 2024	29	2668	TRUE	0.02	22.97	0.3354	0
River	Water Temperature	1999 - 2023	16	100	TRUE	0.09	21.61	0.2417	0
Estuary	pH	1993 - 2024	27	2632	TRUE	-0.01	8.07	0.0058	↓
River	pH	1999 - 2023	16	100	TRUE	0.00	7.06	0.7991	0

Table containing overview of Programs contributing data for Steinhatchee

Table 4: Overview of Program Data for Steinhatchee

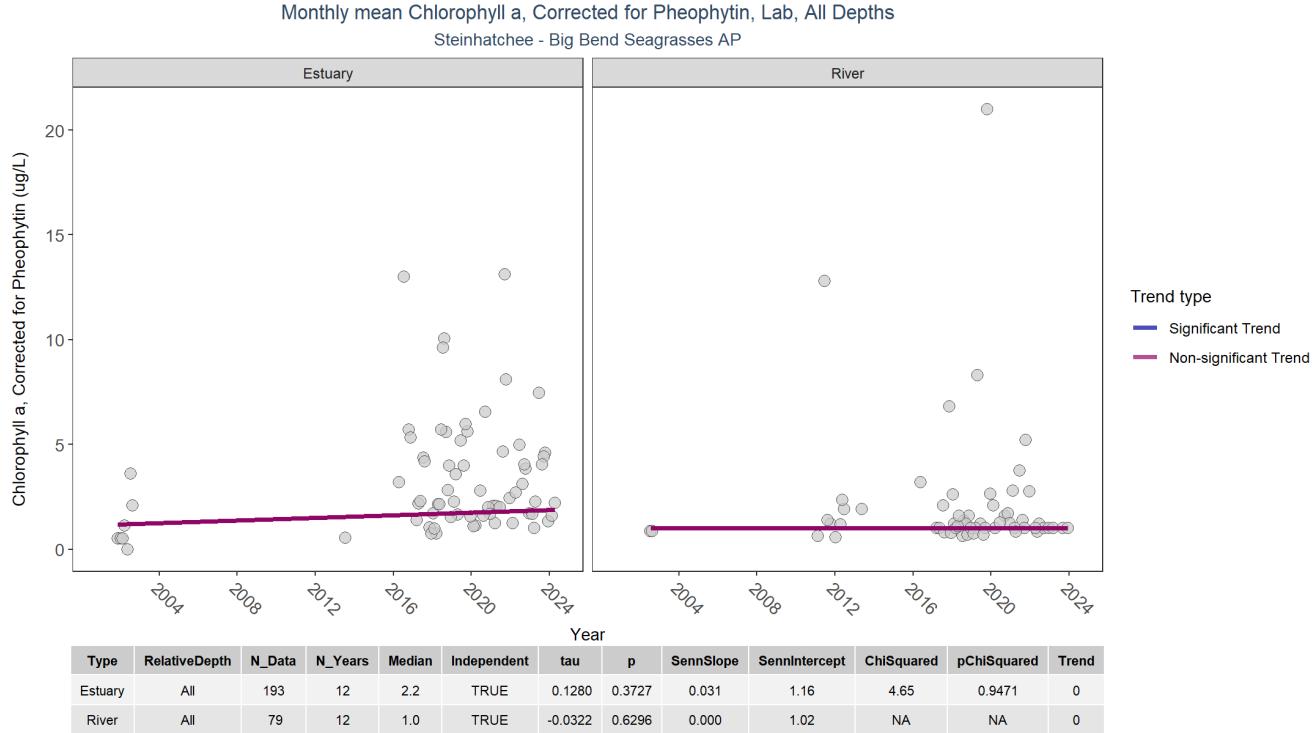
ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	477	29	29
Ammonium, Filtered (NH4)	5002	96	24
Chlorophyll a, Corrected for Pheophytin	103	2	-
Chlorophyll a, Corrected for Pheophytin	477	27	26
Chlorophyll a, Corrected for Pheophytin	5002	173	54
Chlorophyll a, Uncorrected for Pheophytin	60	6	-
Chlorophyll a, Uncorrected for Pheophytin	103	23	12
Chlorophyll a, Uncorrected for Pheophytin	118	1	-
Chlorophyll a, Uncorrected for Pheophytin	477	27	26
Chlorophyll a, Uncorrected for Pheophytin	5002	207	34
Colored Dissolved Organic Matter	103	2	-
Colored Dissolved Organic Matter	477	29	28
Colored Dissolved Organic Matter	5002	1	1
Dissolved Oxygen	60	12	-
Dissolved Oxygen	69	2255	2
Dissolved Oxygen	95	77	1
Dissolved Oxygen	103	14	6
Dissolved Oxygen	115	2	-
Dissolved Oxygen	118	4	-
Dissolved Oxygen	477	28	28
Dissolved Oxygen	560	447	-
Dissolved Oxygen	5002	263	75
Dissolved Oxygen Saturation	60	6	-
Dissolved Oxygen Saturation	477	28	28
Dissolved Oxygen Saturation	5002	38	25
NO2+3, Filtered	477	29	29
NO2+3, Filtered	5002	240	58
Nitrate (NO3)	5002	-	1
Phosphate, Filtered (PO4)	5002	81	21
Salinity	60	12	-
Salinity	69	2255	2
Salinity	95	91	1
Salinity	115	2	-
Salinity	118	6	-
Salinity	477	26	27
Salinity	560	468	-
Salinity	5002	250	48

Secchi Depth	60	2	-
Secchi Depth	69	2255	2
Secchi Depth	103	2	-
Secchi Depth	115	1	-
Secchi Depth	118	2	-
Secchi Depth	477	29	29
Secchi Depth	560	50	-
Secchi Depth	5002	50	30
Specific Conductivity	69	2255	1
Specific Conductivity	95	13	-
Specific Conductivity	103	4	-
Specific Conductivity	477	55	55
Specific Conductivity	5002	167	56
Total Kjeldahl Nitrogen	477	29	29
Total Kjeldahl Nitrogen	5002	261	54
Total Nitrogen	118	1	-
Total Nitrogen	5002	205	52
Total Phosphorus	103	14	6
Total Phosphorus	118	1	-
Total Phosphorus	477	29	29
Total Phosphorus	5002	196	56
Total Suspended Solids	5002	22	23
Turbidity	103	16	6
Turbidity	477	49	49
Turbidity	5002	179	40
Water Temperature	60	11	-
Water Temperature	69	2255	2
Water Temperature	95	91	1
Water Temperature	103	14	6
Water Temperature	115	2	-
Water Temperature	118	6	-
Water Temperature	477	29	29
Water Temperature	560	469	-
Water Temperature	5002	268	76
pH	69	2255	2
pH	95	70	1
pH	103	14	6
pH	115	2	-
pH	118	4	-
pH	477	29	29
pH	560	356	-
pH	5002	278	78

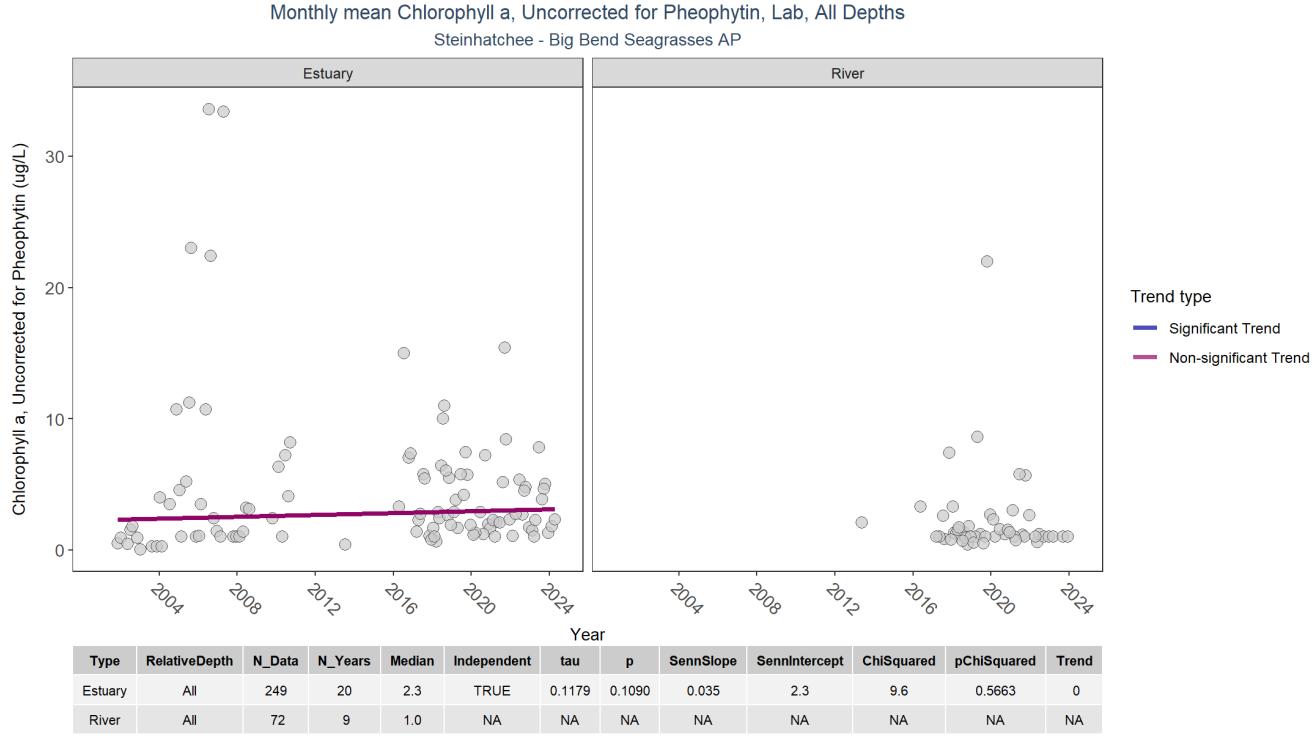
Program names:

- 60 - Southeast Area Monitoring and Assessment Program (SEAMAP) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey ⁻³
- 69 - Fisheries-Independent Monitoring (FIM) Program ⁻⁴
- 95 - Harmful Algal Bloom Marine Observation Network ⁻⁵
- 103 - EPA STOrage and RETrieval Data Warehouse (STORET) ⁻⁶
- 115 - Environmental Monitoring Assessment Program ⁻⁷
- 118 - National Aquatic Resource Surveys, National Coastal Condition Assessment ⁻⁹
- 477 - Suwannee River Water Management District Water Resource Monitoring Program ⁻¹⁰
- 560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring ⁻¹¹
- 5002 - Florida STORET / WIN ⁻²

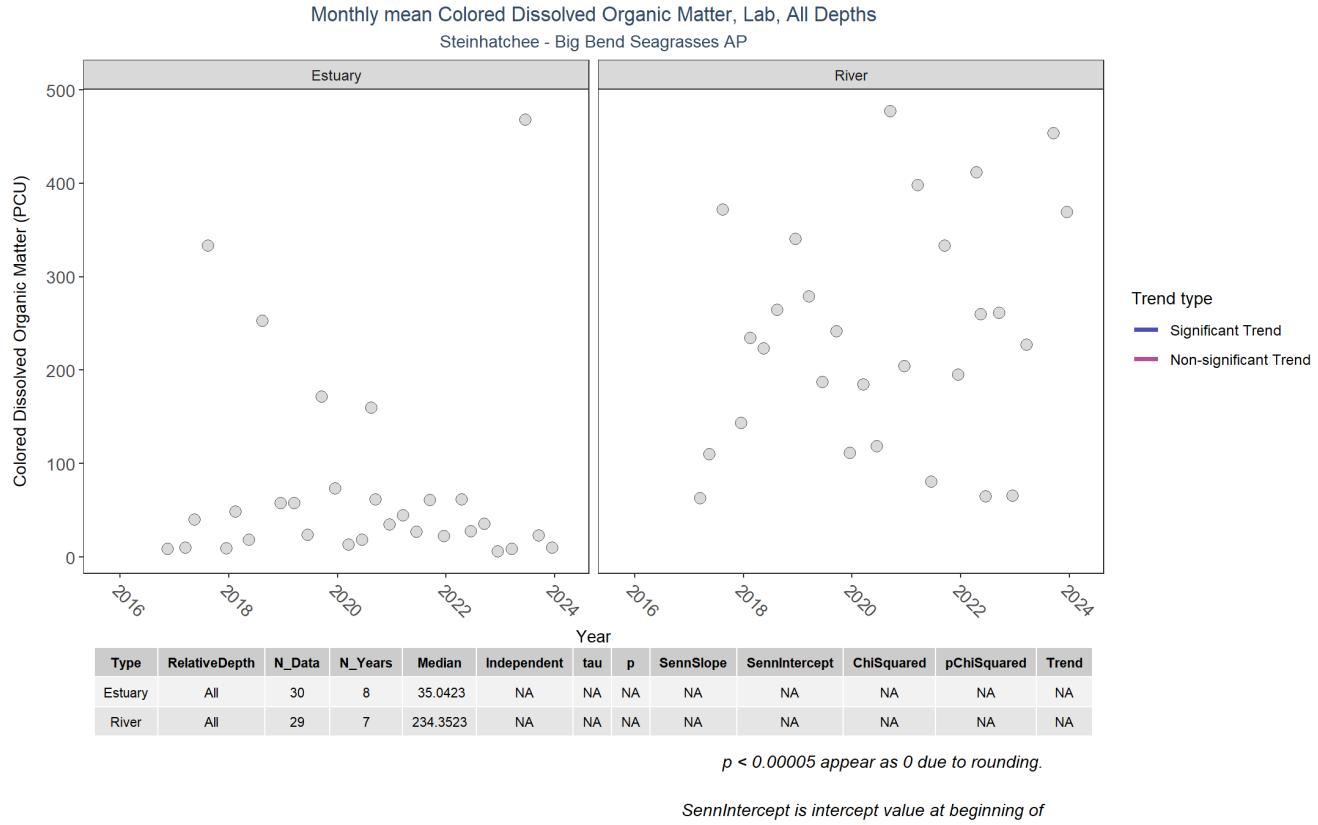
Chlorophyll a, Corrected for Pheophytin



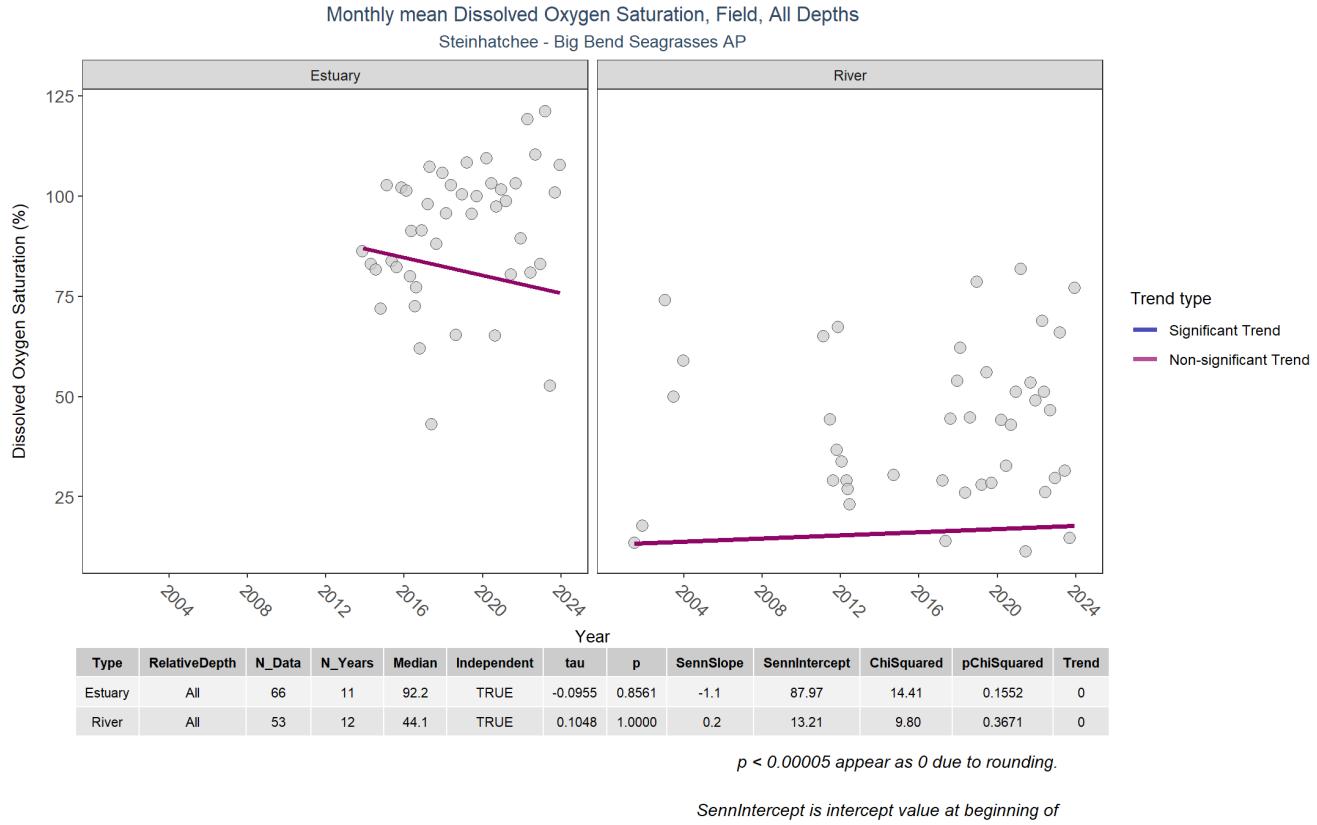
Chlorophyll a, Uncorrected for Pheophytin



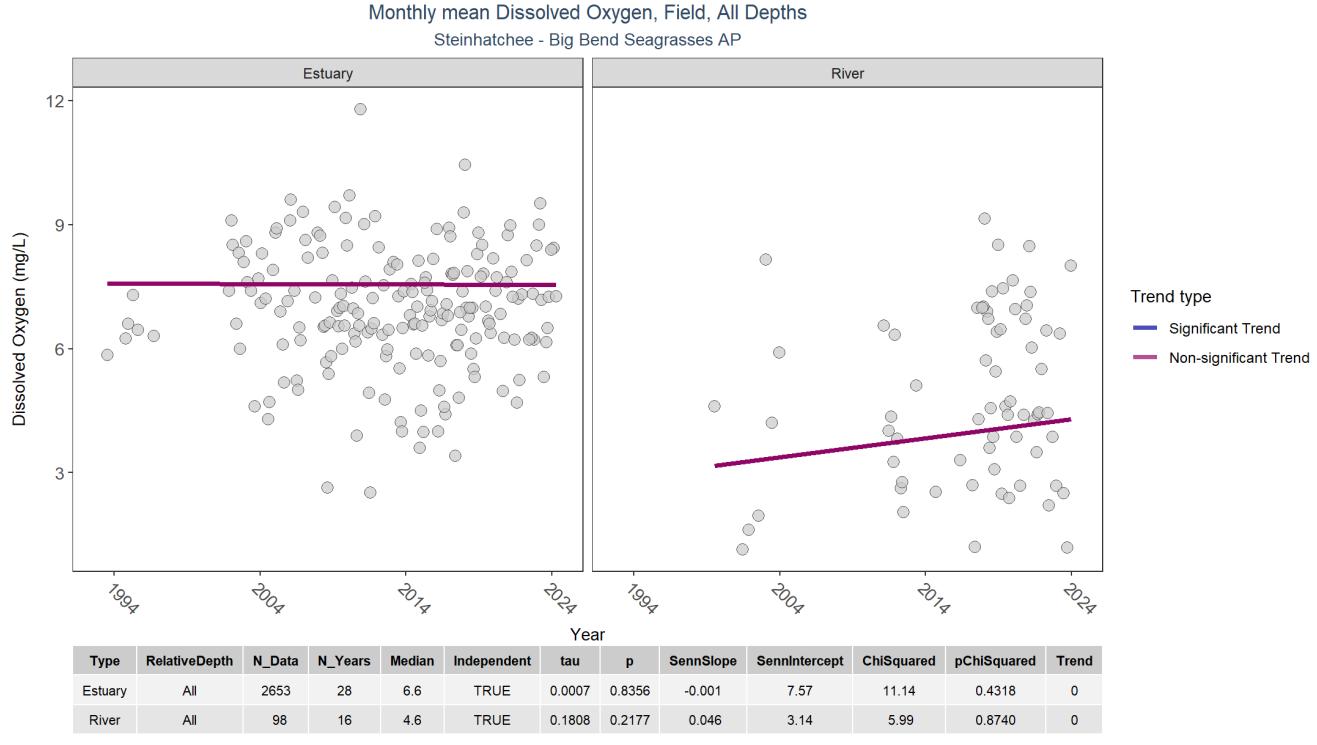
Colored Dissolved Organic Matter



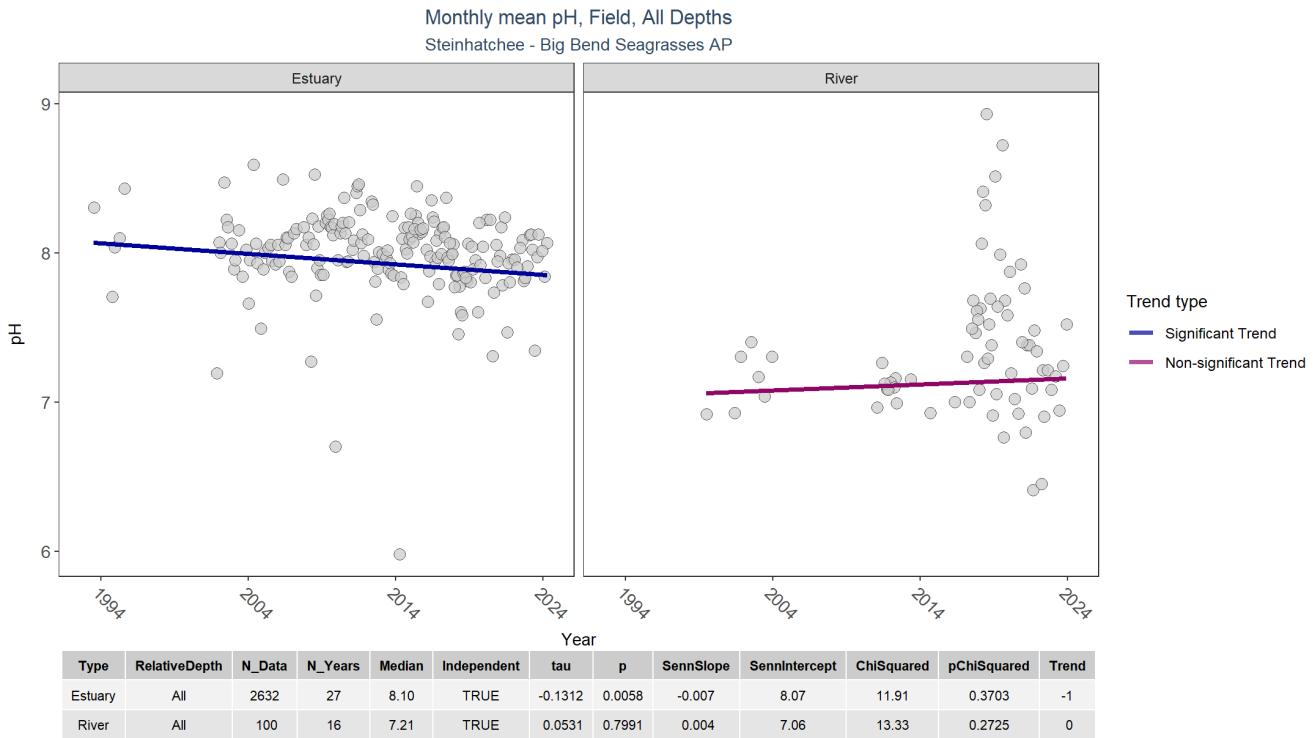
Dissolved Oxygen Saturation



Dissolved Oxygen



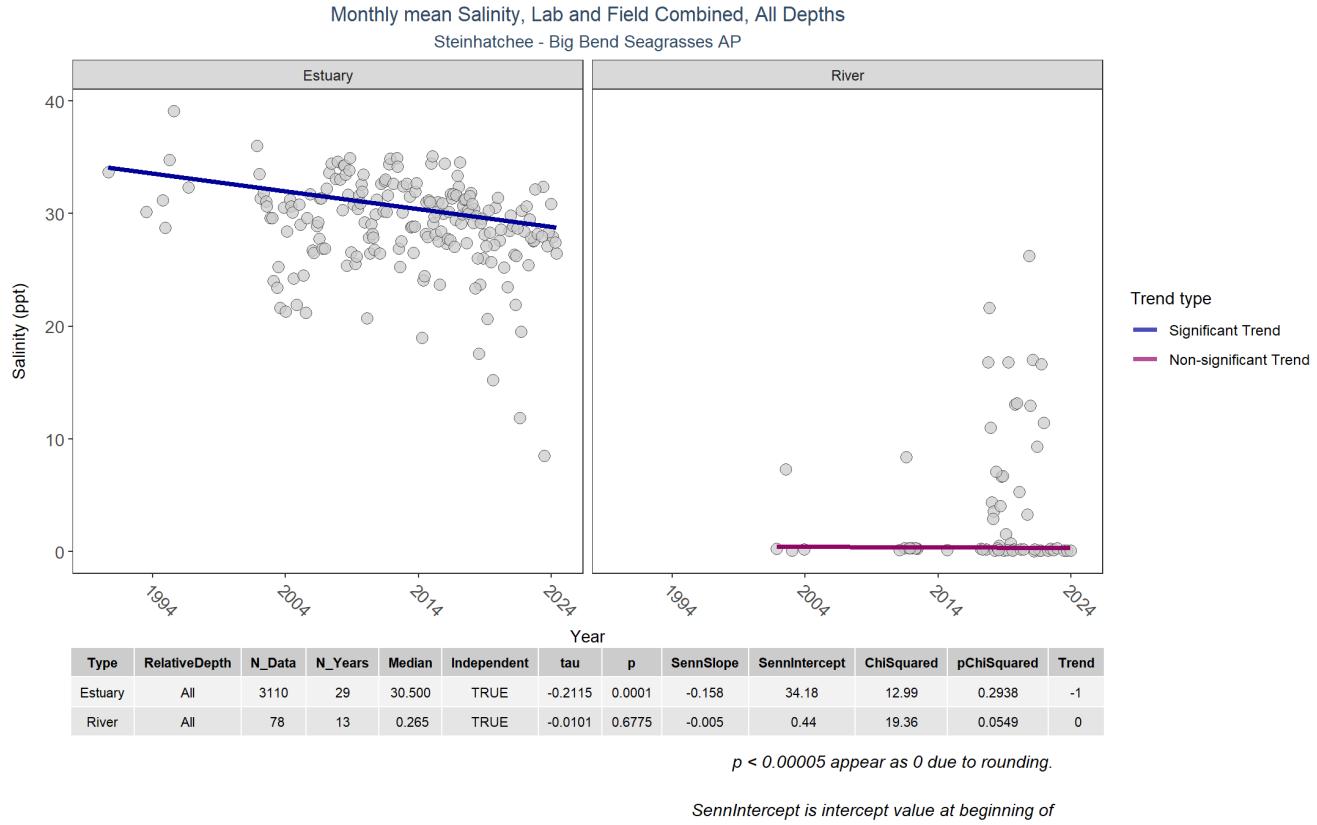
pH



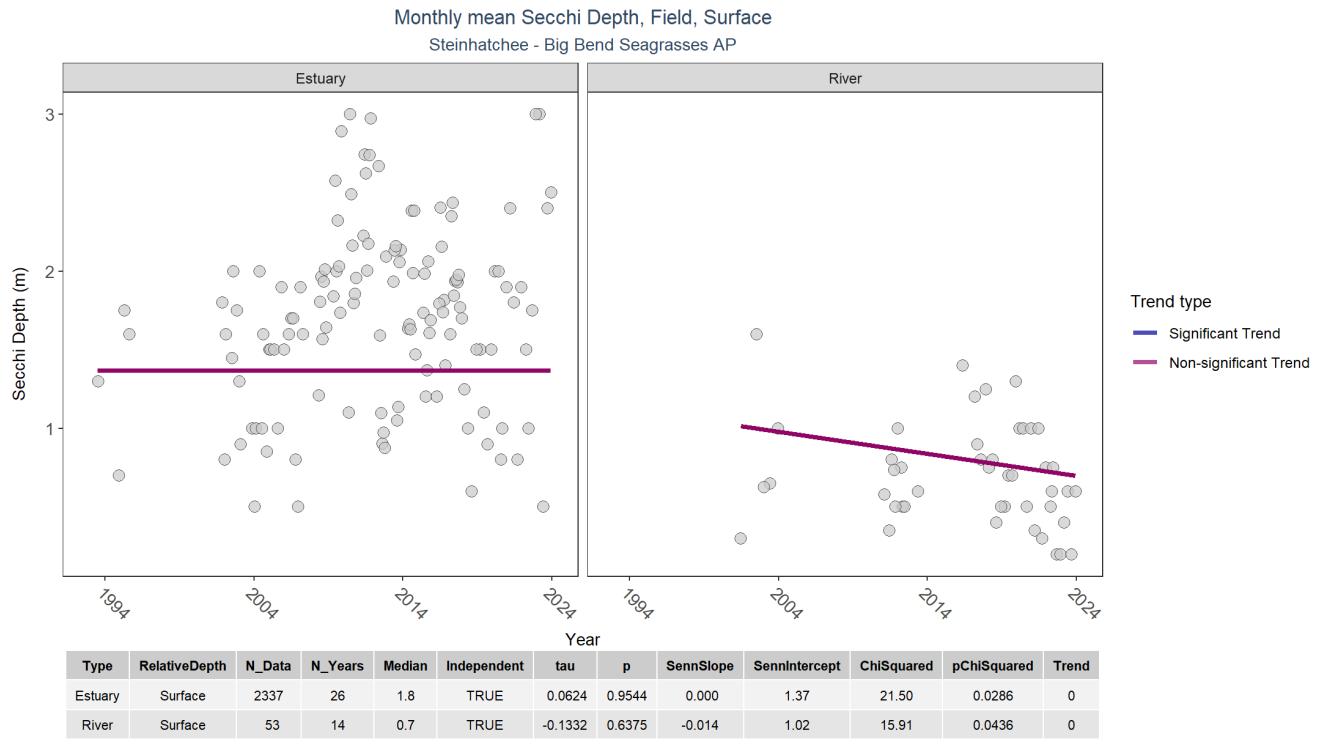
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

Salinity

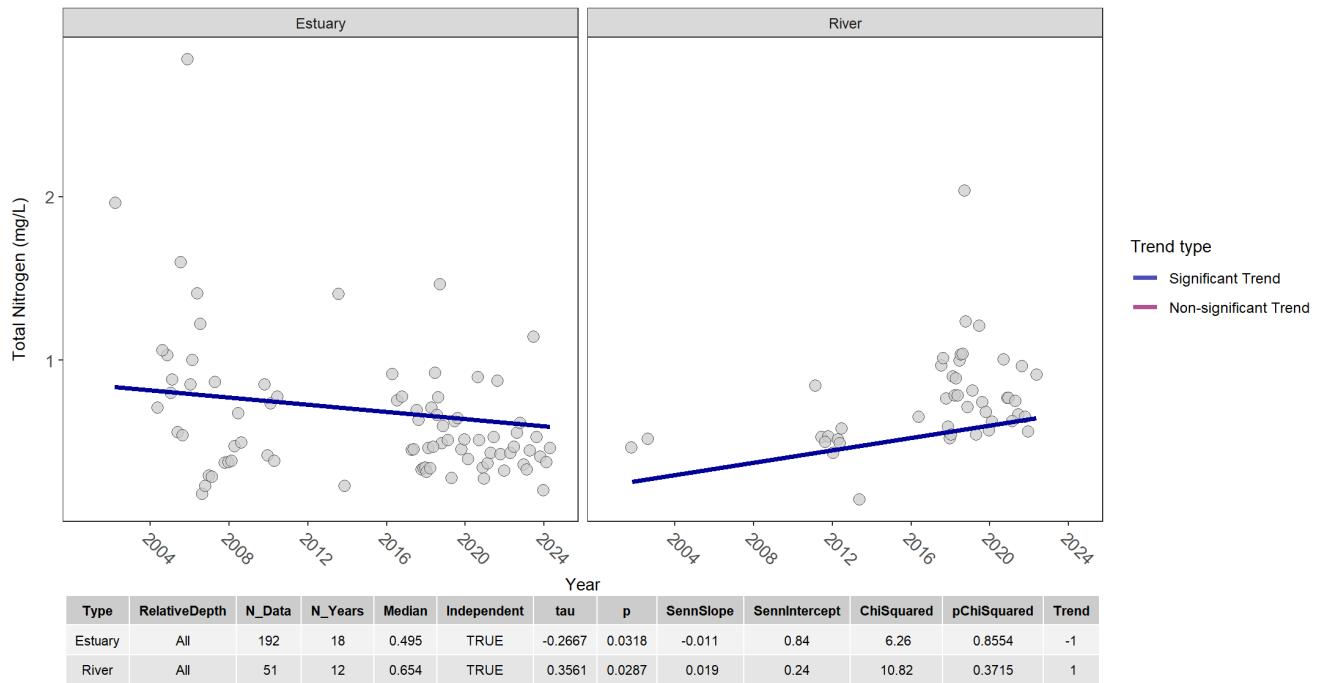


Secchi Depth



Total Nitrogen

Monthly mean Total Nitrogen, Lab, All Depths
Steinhatchee - Big Bend Seagrasses AP



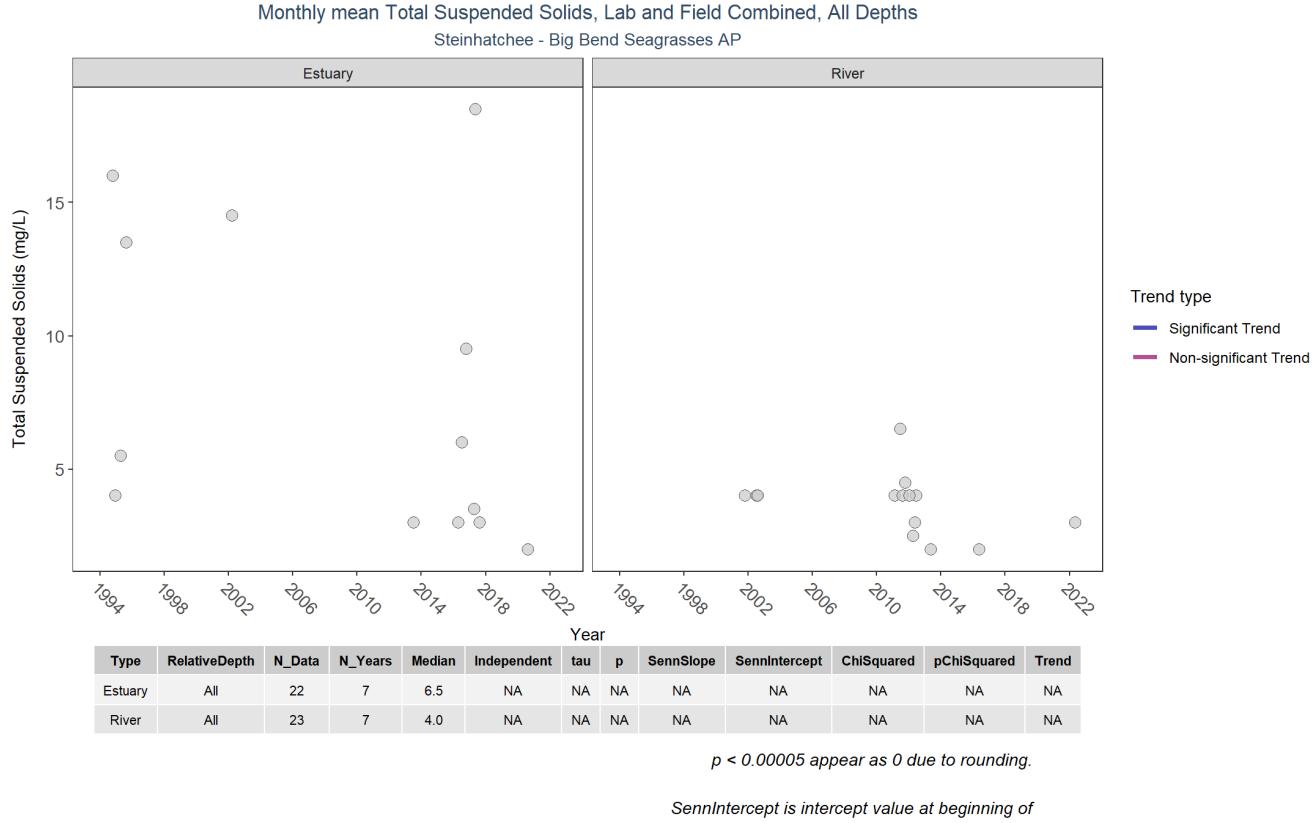
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

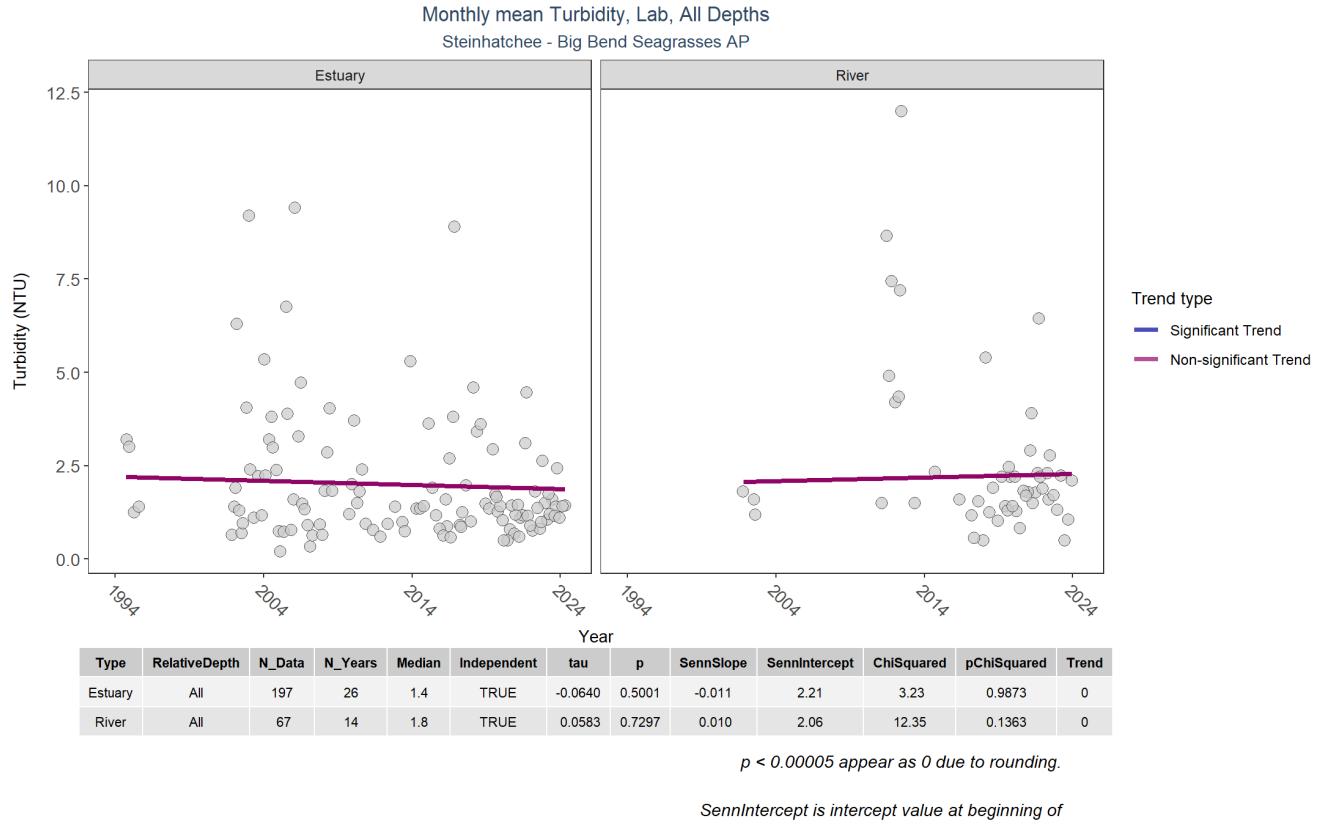
Total Phosphorus



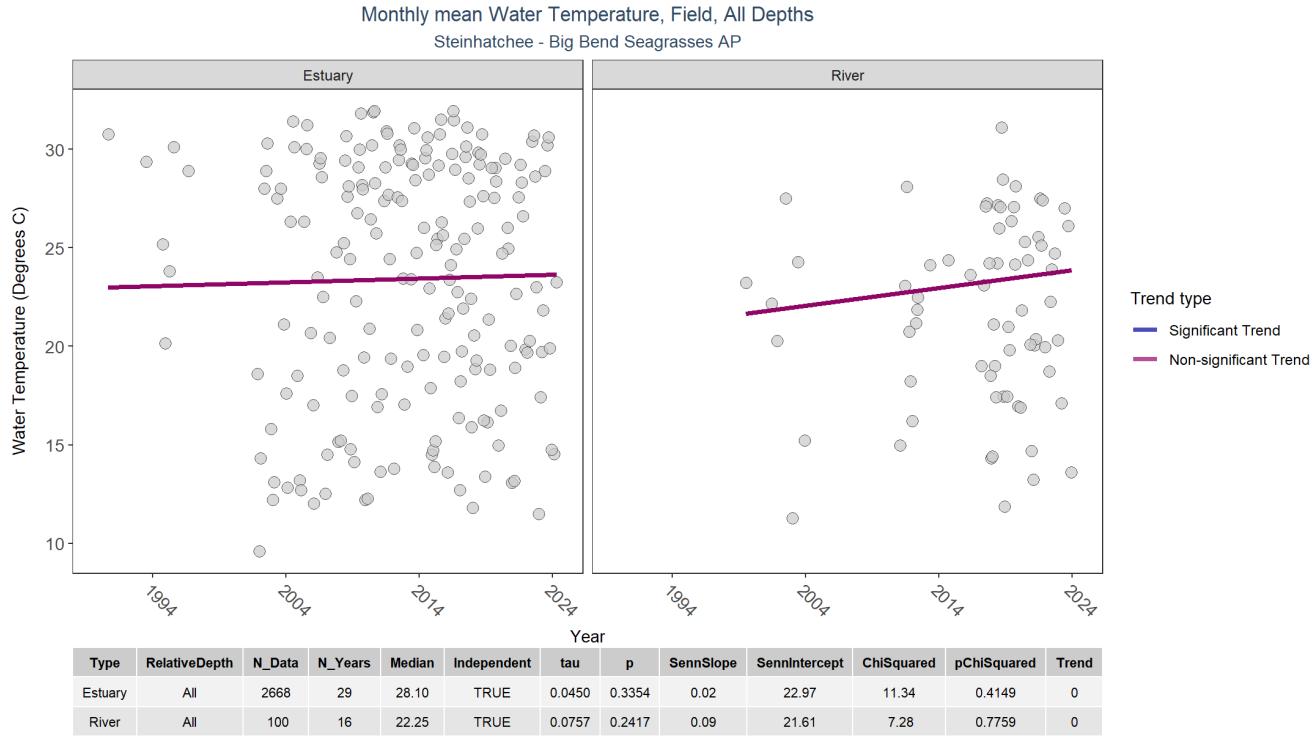
Total Suspended Solids



Turbidity



Water Temperature



Submerged Aquatic Vegetation

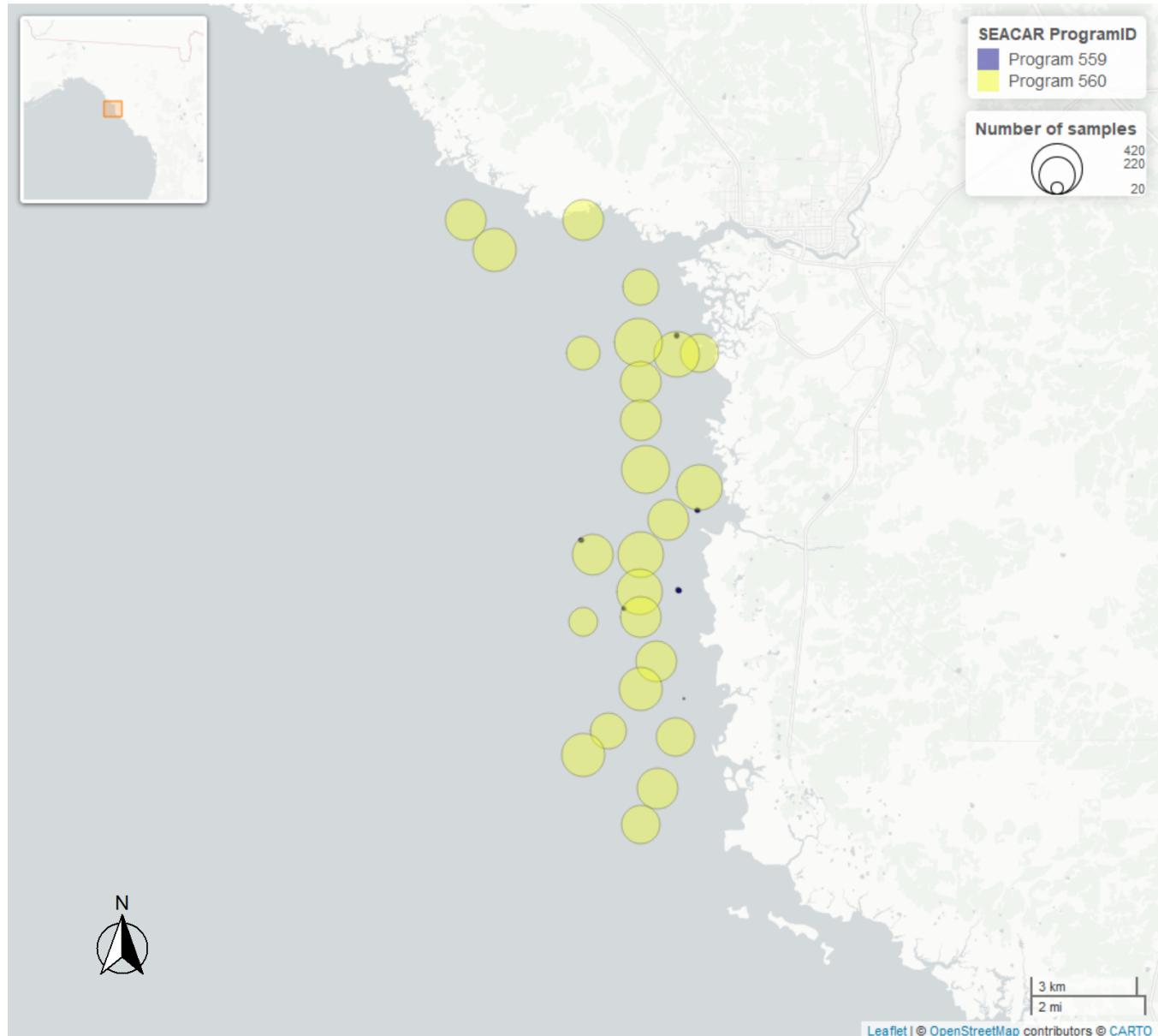


Table 5: Northern Big Bend Seagrass Monitoring - *Program 559*¹²

<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 6: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*¹¹

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
6268	2000	2024	Modified Braun Blanquet	25
1038	2022	2024	Percent Cover	25

Median Percent Cover - Species Trend Table

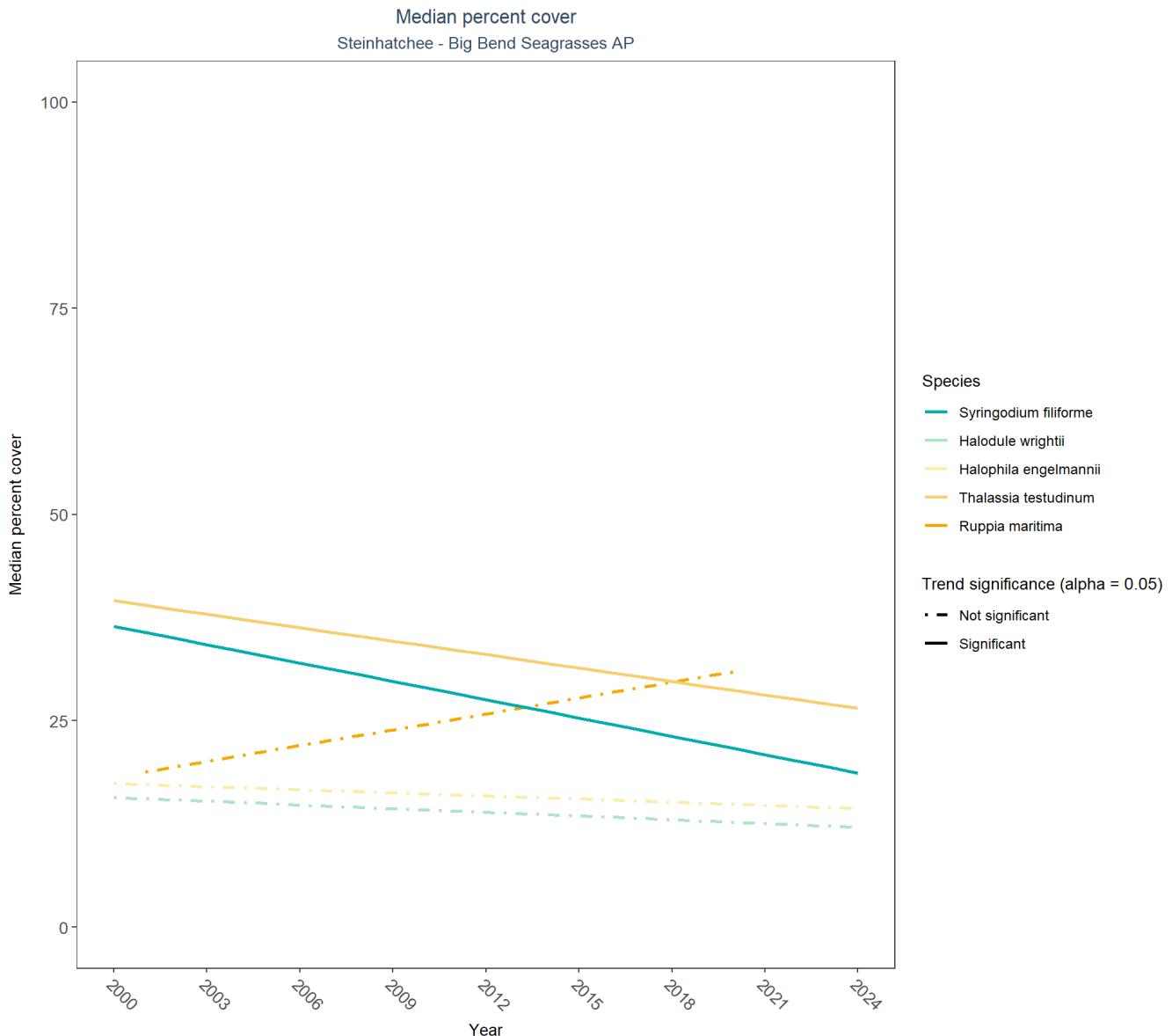
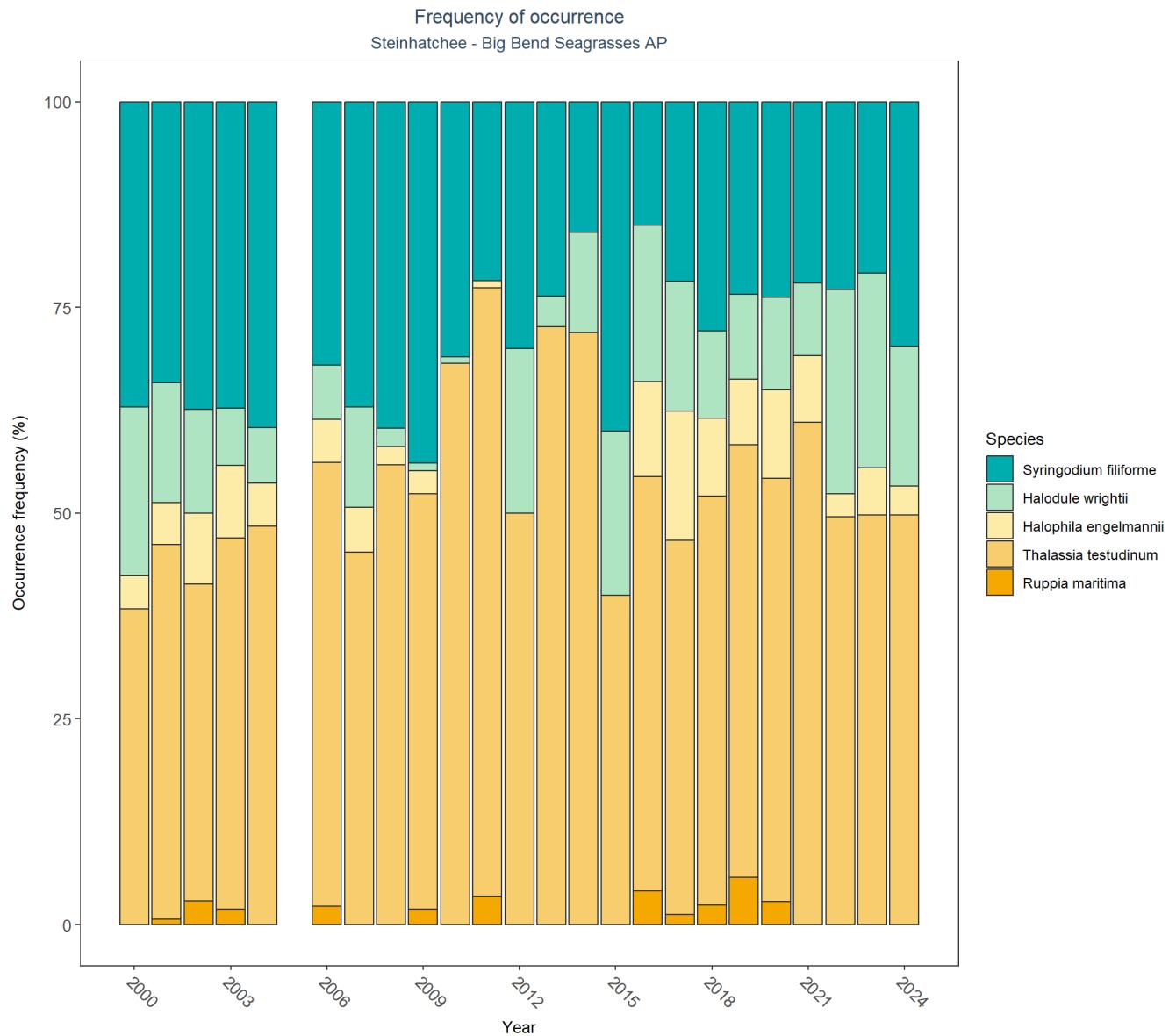


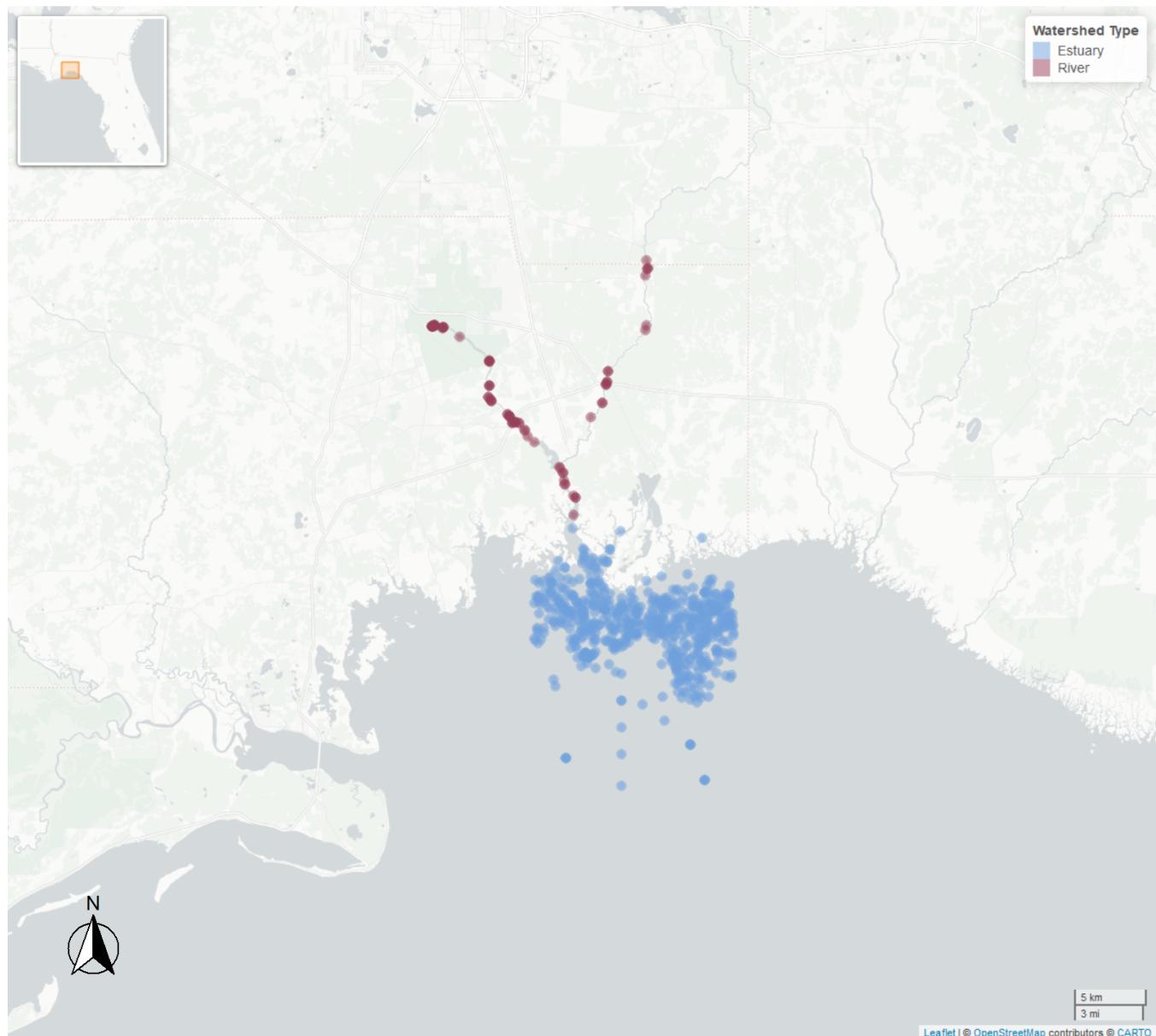
Table 7: Percent Cover Trend Analysis for Steinhatchee

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	Significantly increasing trend	2000 - 2024	12.2254	0.8203	0.0000
Halodule wrightii	No significant trend	2000 - 2024	15.7036	-0.1492	0.4049
Halophila engelmannii	No significant trend	2000 - 2024	17.4130	-0.1259	0.5401
No grass in quadrat	Model did not fit the available data	2004 - 2024	-	-	-
Ruppia maritima	No significant trend	2001 - 2020	18.1473	0.6401	0.2906
Syringodium filiforme	Significantly decreasing trend	2000 - 2024	36.4735	-0.7414	0.0000
Thalassia testudinum	Significantly decreasing trend	2000 - 2024	39.5638	-0.5440	0.0000

Frequency of Occurrence Barplots



St. Marks



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

St. Marks contains a *large trend*. Trends marked in blue \uparrow or \downarrow are deemed *large* trends, meaning the p value is less than 0.05 and the slope is greater than 10% of the median parameter value.

Table 8: Seasonal Kendall-Tau Results for St. Marks

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2005 - 2018	8	99	FALSE	-	-	-	-
River	Chlorophyll a, Corrected for Pheophytin	1999 - 2023	25	1167	TRUE	-0.02	1.00	0.0000	↓
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2001 - 2018	9	120	FALSE	-	-	-	-
River	Chlorophyll a, Uncorrected for Pheophytin	1996 - 2023	28	2442	TRUE	0.01	0.64	0.0613	0
Estuary	Colored Dissolved Organic Matter	2001 - 2018	3	8	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2001 - 2023	23	1981	TRUE	0.46	2.32	0.0000	↑
Estuary	Dissolved Oxygen	1993 - 2020	20	2266	TRUE	0.00	6.41	0.8882	0
River	Dissolved Oxygen	2001 - 2023	22	1095	TRUE	-0.09	6.15	0.0000	↓
Estuary	Dissolved Oxygen Saturation	2001 - 2018	7	80	FALSE	-	-	-	-
River	Dissolved Oxygen Saturation	2001 - 2023	13	288	TRUE	-2.26	110.66	0.0000	↓
Estuary	Salinity	1964 - 2024	27	2667	TRUE	-0.12	31.00	0.0212	↓
River	Salinity	2000 - 2023	19	867	TRUE	-0.16	3.36	0.0000	↓
Estuary	Secchi Depth	1993 - 2018	17	1908	TRUE	0.00	1.64	0.8713	0
River	Secchi Depth	1996 - 2023	28	2378	TRUE	-0.04	4.45	0.0000	↓
Estuary	Total Nitrogen	2001 - 2018	10	143	TRUE	0.00	0.33	0.8026	0
River	Total Nitrogen	1992 - 2023	29	4118	TRUE	0.00	0.32	0.2555	0
Estuary	Total Phosphorus	2001 - 2018	10	137	TRUE	0.00	0.01	0.2787	0
River	Total Phosphorus	1992 - 2023	29	2595	TRUE	0.00	0.00	0.0000	↑
Estuary	Total Suspended Solids	2005 - 2018	8	100	FALSE	-	-	-	-
River	Total Suspended Solids	1992 - 2023	27	772	TRUE	-0.10	5.80	0.0000	↓
Estuary	Turbidity	2005 - 2018	11	452	TRUE	0.04	1.61	0.2495	0
River	Turbidity	1992 - 2023	27	787	TRUE	0.00	0.77	0.4718	0
Estuary	Water Temperature	1964 - 2018	21	2594	TRUE	0.04	21.15	0.2015	0
River	Water Temperature	2001 - 2023	22	1092	TRUE	0.00	20.73	0.9749	0
Estuary	pH	1964 - 2018	19	2072	TRUE	0.00	7.54	0.6118	0
River	pH	2001 - 2023	22	1048	TRUE	0.00	7.52	0.6574	0

Table containing overview of Programs contributing data for St. Marks

Table 9: Overview of Program Data for St. Marks

ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	5002	96	688
Chlorophyll a, Corrected for Pheophytin	514	-	152
Chlorophyll a, Corrected for Pheophytin	5002	99	1016
Chlorophyll a, Uncorrected for Pheophytin	103	8	-
Chlorophyll a, Uncorrected for Pheophytin	115	1	-
Chlorophyll a, Uncorrected for Pheophytin	118	5	-
Chlorophyll a, Uncorrected for Pheophytin	514	28	1859
Chlorophyll a, Uncorrected for Pheophytin	5002	78	584
Colored Dissolved Organic Matter	514	8	763
Colored Dissolved Organic Matter	5002	-	1219
Dissolved Oxygen	69	1844	-
Dissolved Oxygen	95	4	-
Dissolved Oxygen	115	5	-
Dissolved Oxygen	118	16	3
Dissolved Oxygen	560	192	-
Dissolved Oxygen	5002	397	1254
Dissolved Oxygen Saturation	5002	80	288
NO2+3, Filtered	5002	98	1802
Nitrate (NO3)	5002	-	3
Nitrite (NO2)	5002	-	10
Phosphate, Filtered (PO4)	5002	44	296
Salinity	69	1851	-
Salinity	95	21	-
Salinity	115	5	-
Salinity	118	15	1
Salinity	560	194	-
Salinity	5002	581	866
Secchi Depth	69	1808	-
Secchi Depth	115	3	-
Secchi Depth	118	2	-
Secchi Depth	514	28	1842
Secchi Depth	560	13	-
Secchi Depth	5002	69	631
Specific Conductivity	69	1842	-
Specific Conductivity	514	8	66
Specific Conductivity	5002	108	2763
Total Kjeldahl Nitrogen	5002	96	706

Total Nitrogen	103	12	-
Total Nitrogen	118	2	-
Total Nitrogen	514	28	1903
Total Nitrogen	5002	103	2216
Total Phosphorus	103	12	-
Total Phosphorus	514	28	1881
Total Phosphorus	5002	97	715
Total Suspended Solids	5002	100	772
Turbidity	103	6	-
Turbidity	5002	452	792
Water Temperature	69	1851	-
Water Temperature	95	139	-
Water Temperature	115	5	-
Water Temperature	118	13	5
Water Temperature	560	193	-
Water Temperature	5002	599	1256
pH	69	1842	-
pH	95	1	-
pH	115	5	-
pH	118	8	3
pH	560	155	-
pH	5002	224	1202

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

115 - Environmental Monitoring Assessment Program -⁷

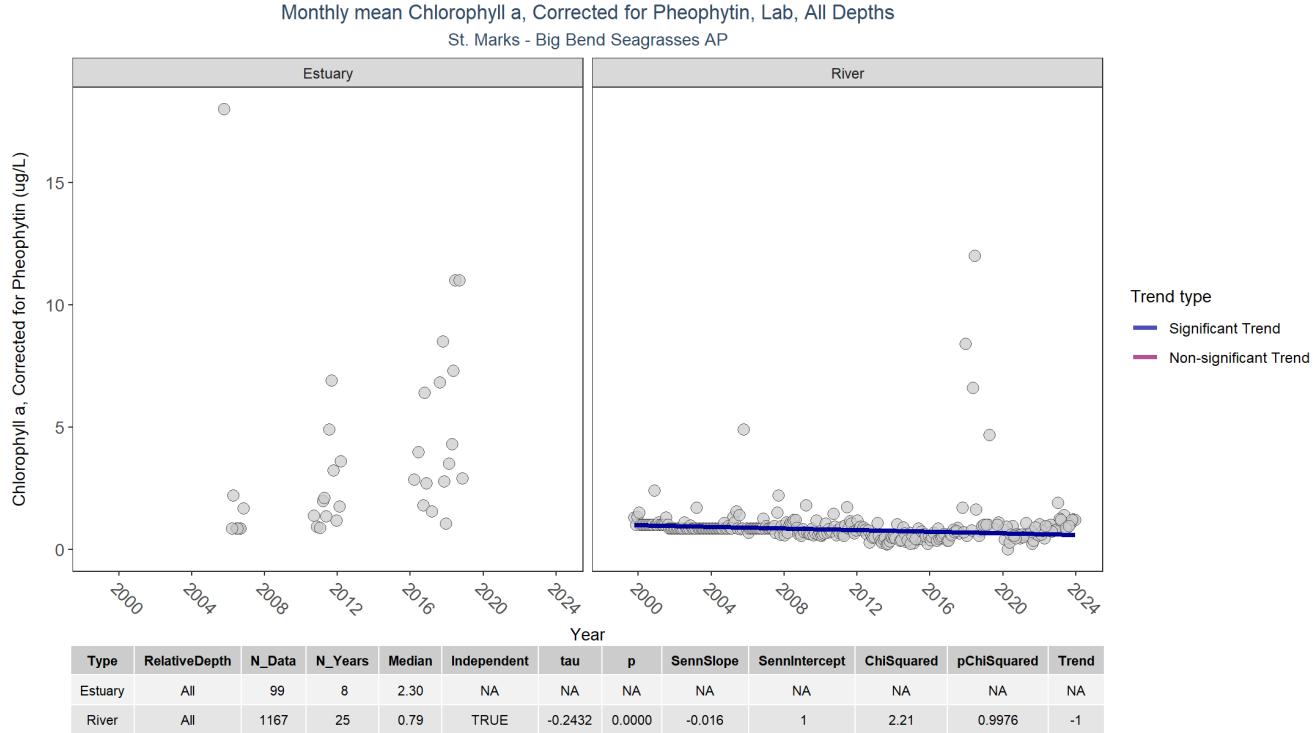
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

514 - Florida LAKEWATCH Program -⁸

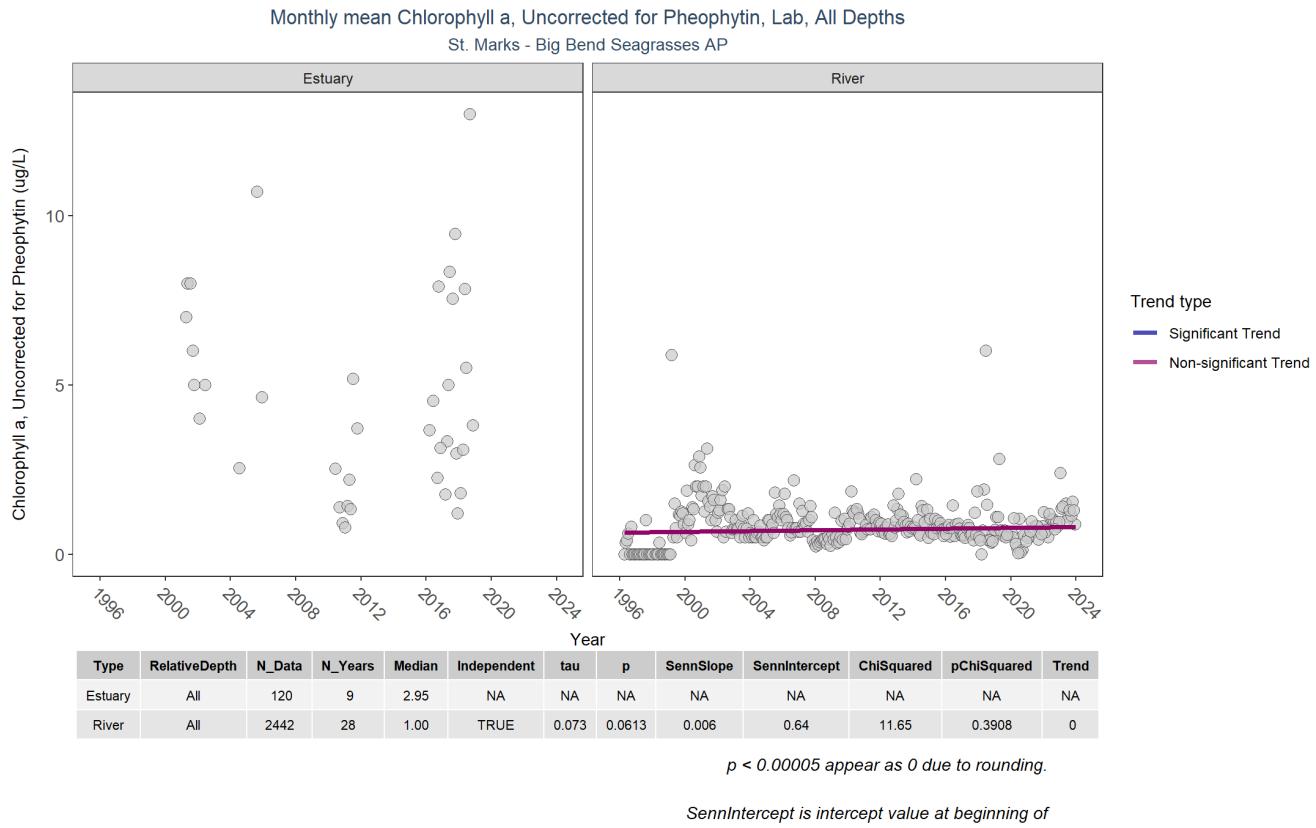
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring -¹¹

5002 - Florida STORET / WIN -²

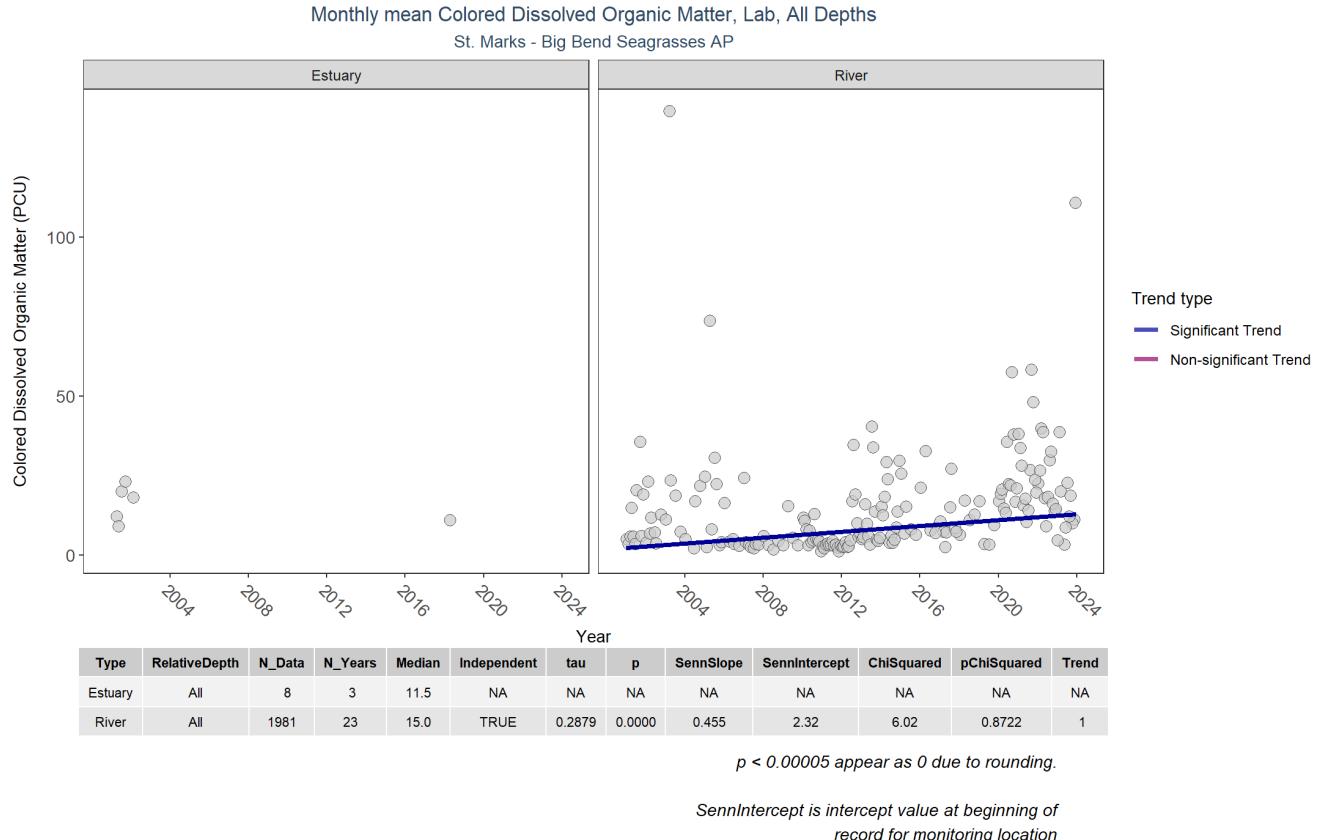
Chlorophyll a, Corrected for Pheophytin



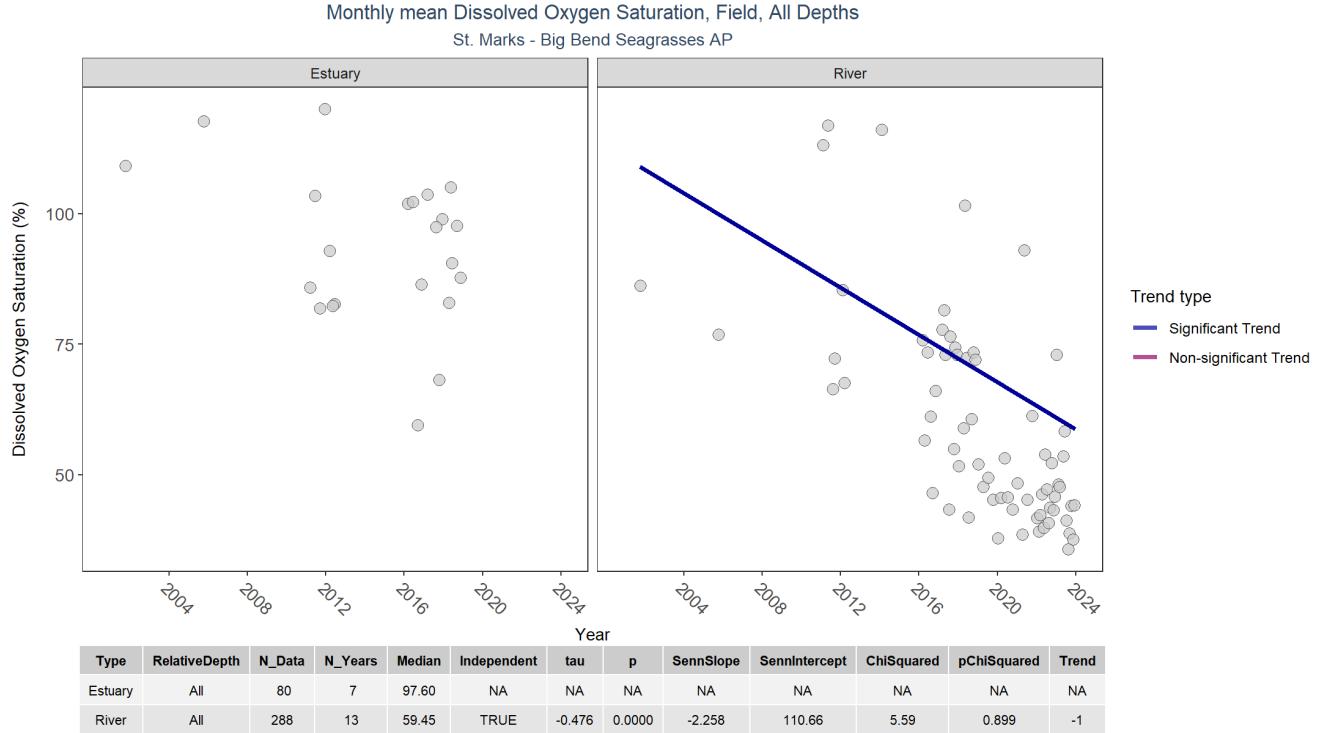
Chlorophyll a, Uncorrected for Pheophytin



Colored Dissolved Organic Matter



Dissolved Oxygen Saturation



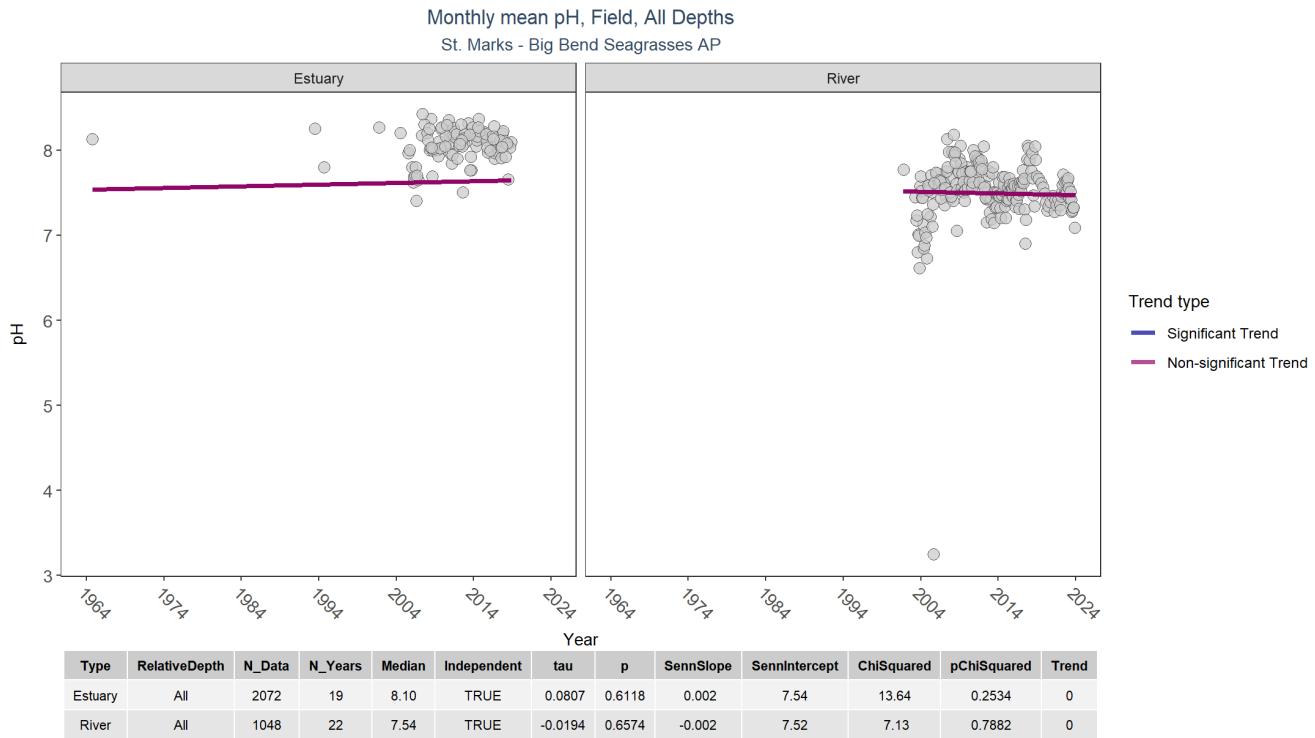
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

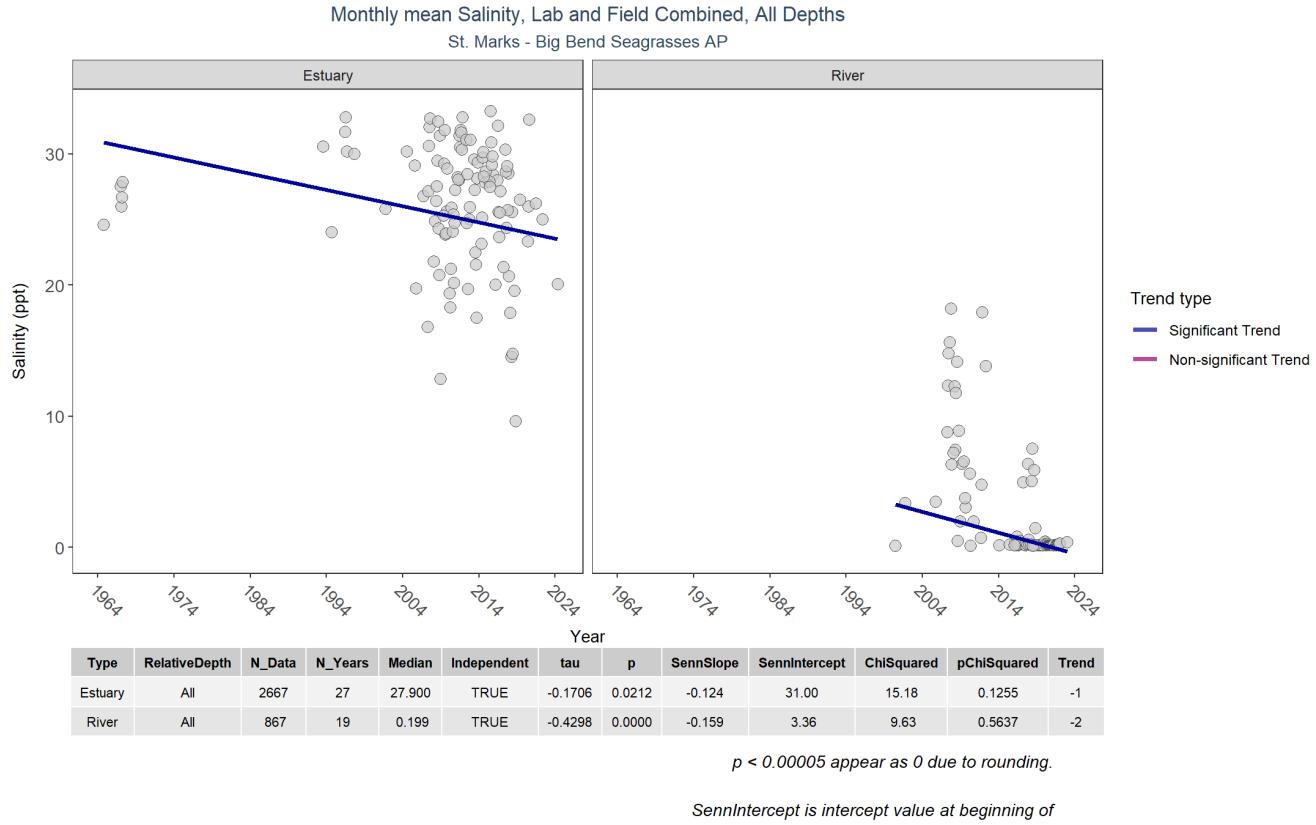
Dissolved Oxygen



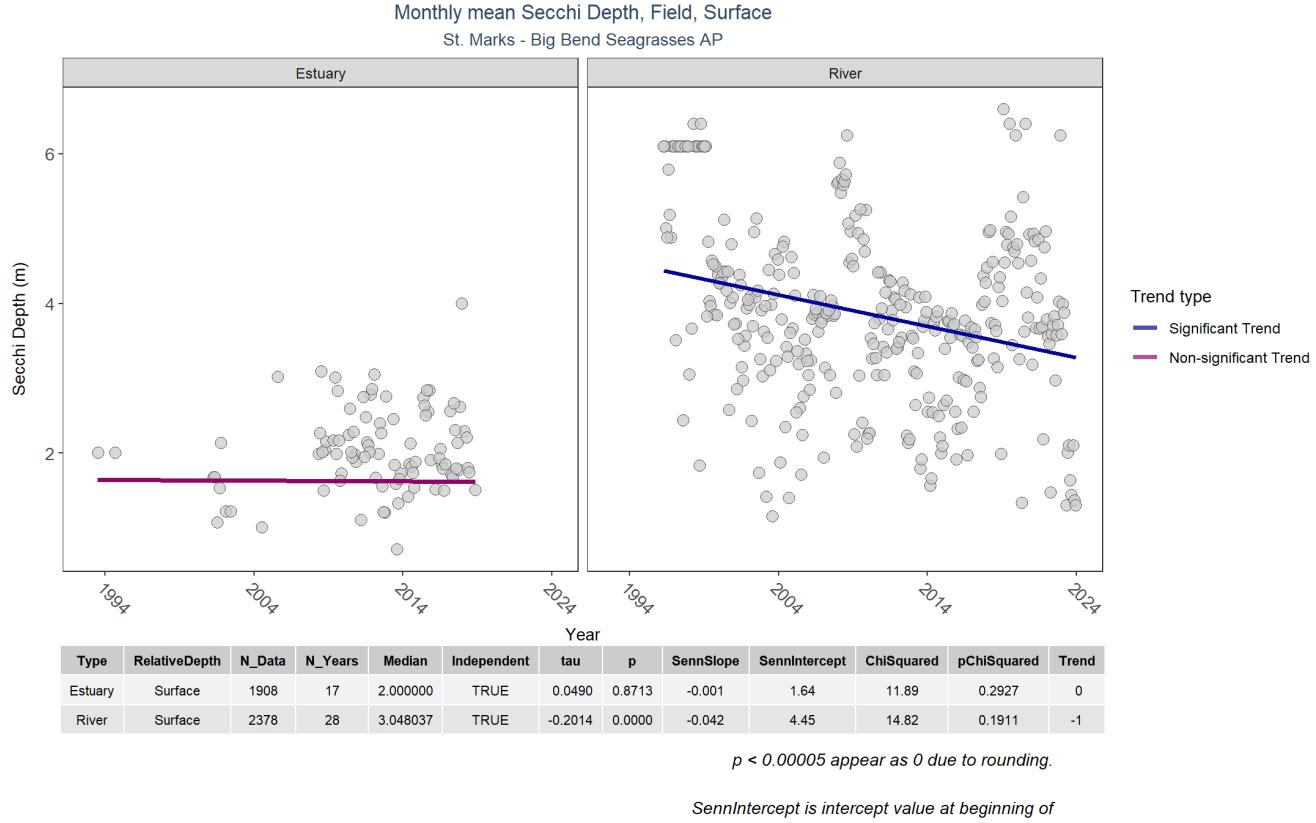
pH



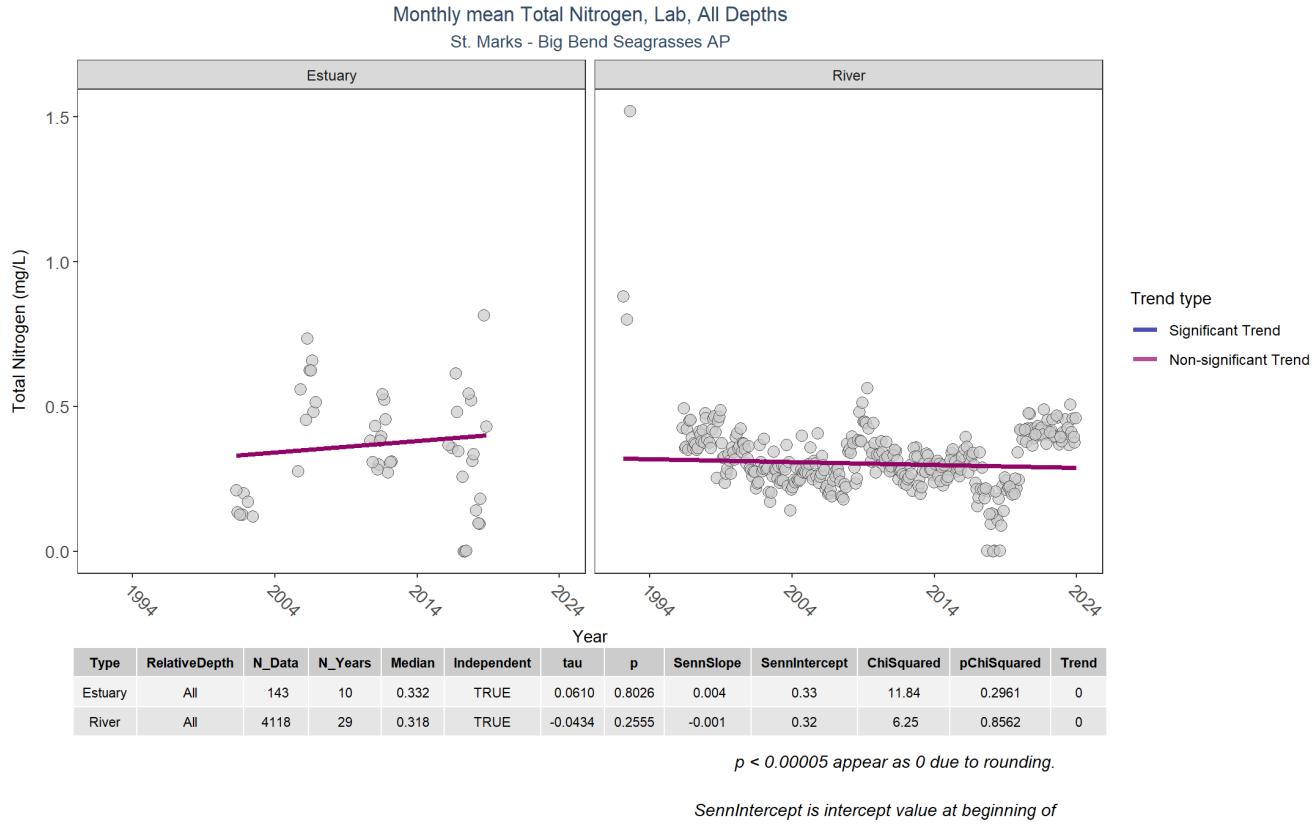
Salinity



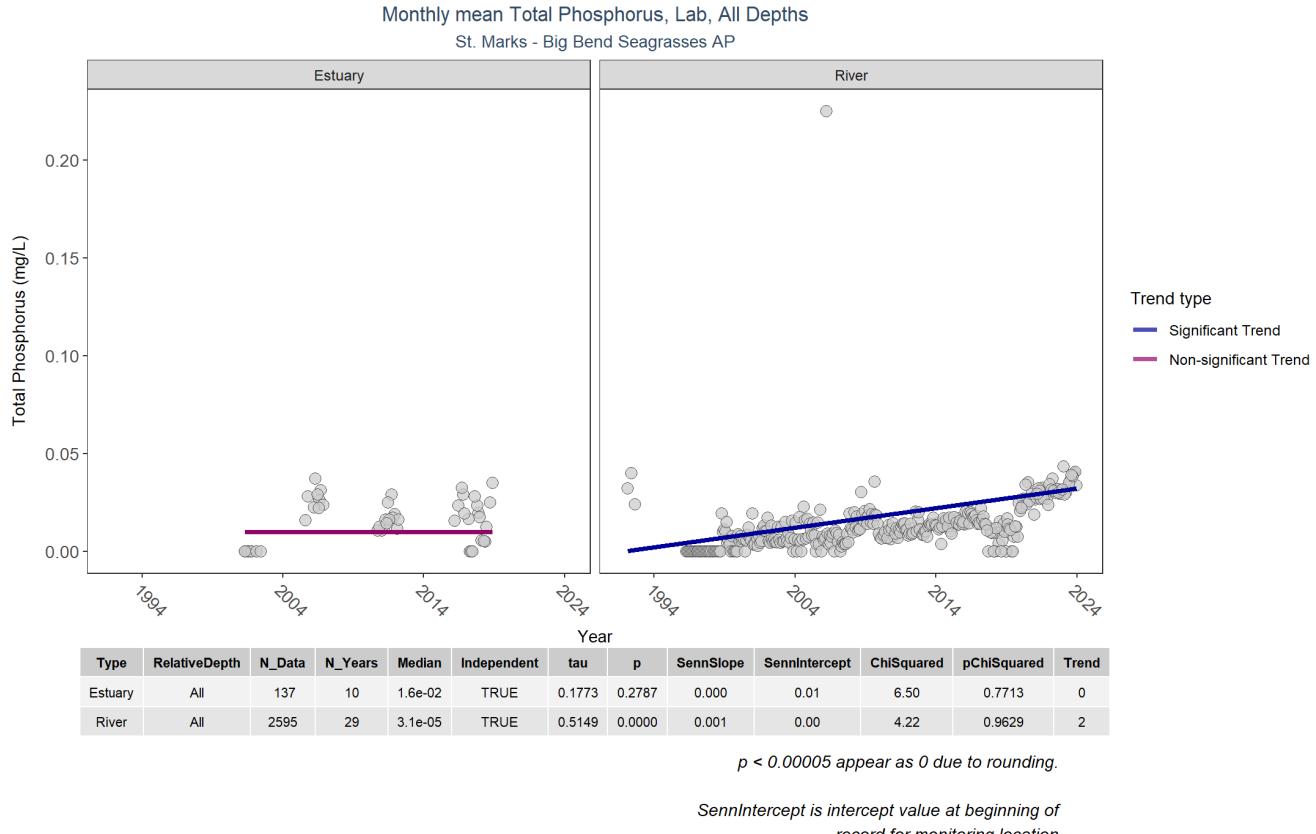
Secchi Depth



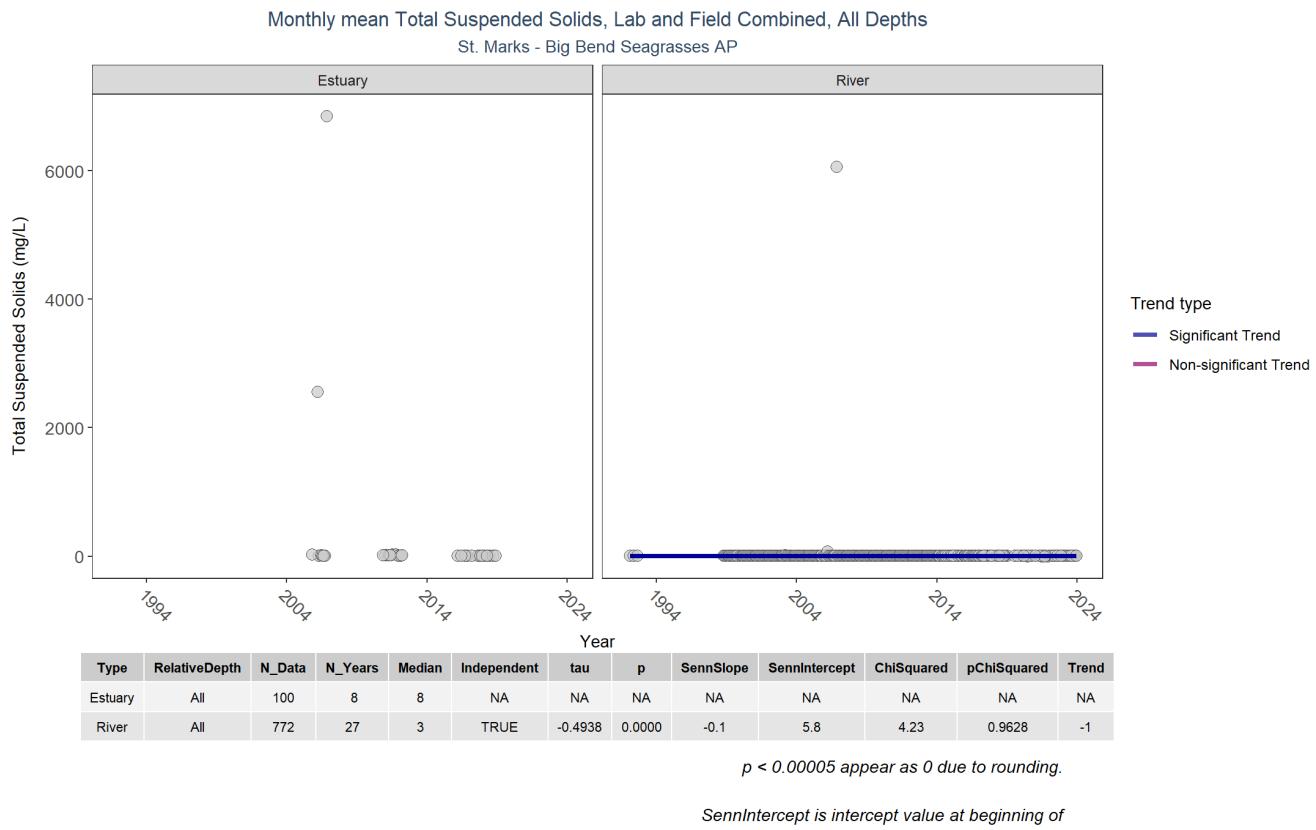
Total Nitrogen



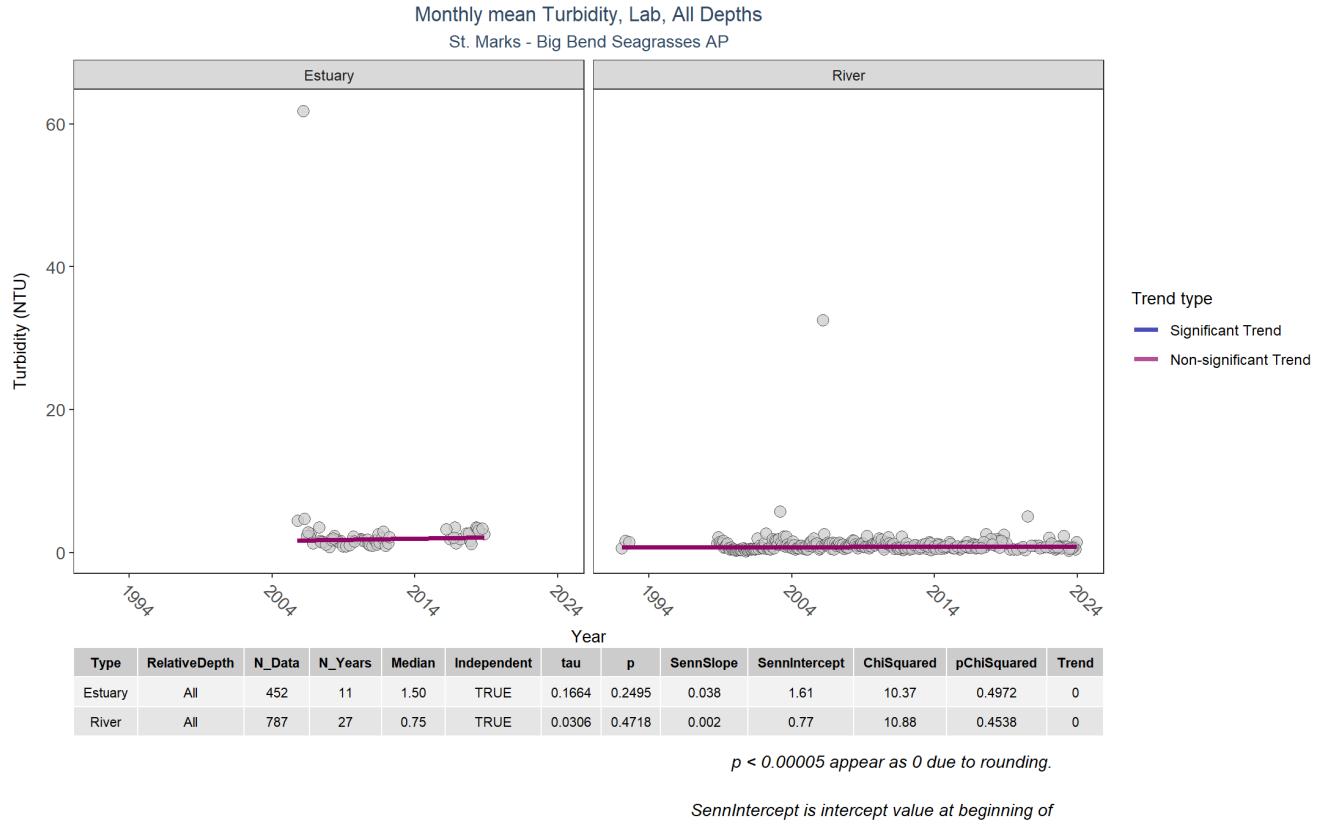
Total Phosphorus



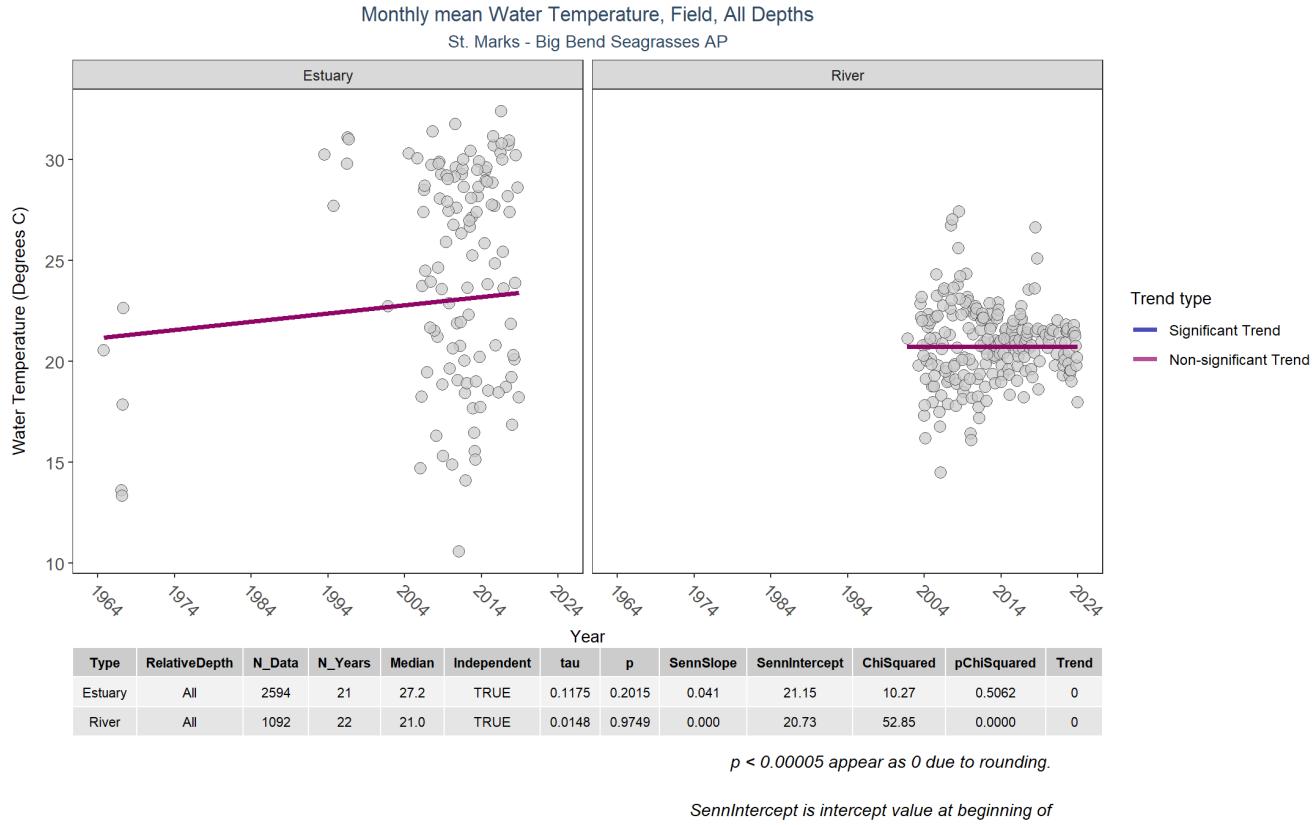
Total Suspended Solids



Turbidity



Water Temperature



Submerged Aquatic Vegetation

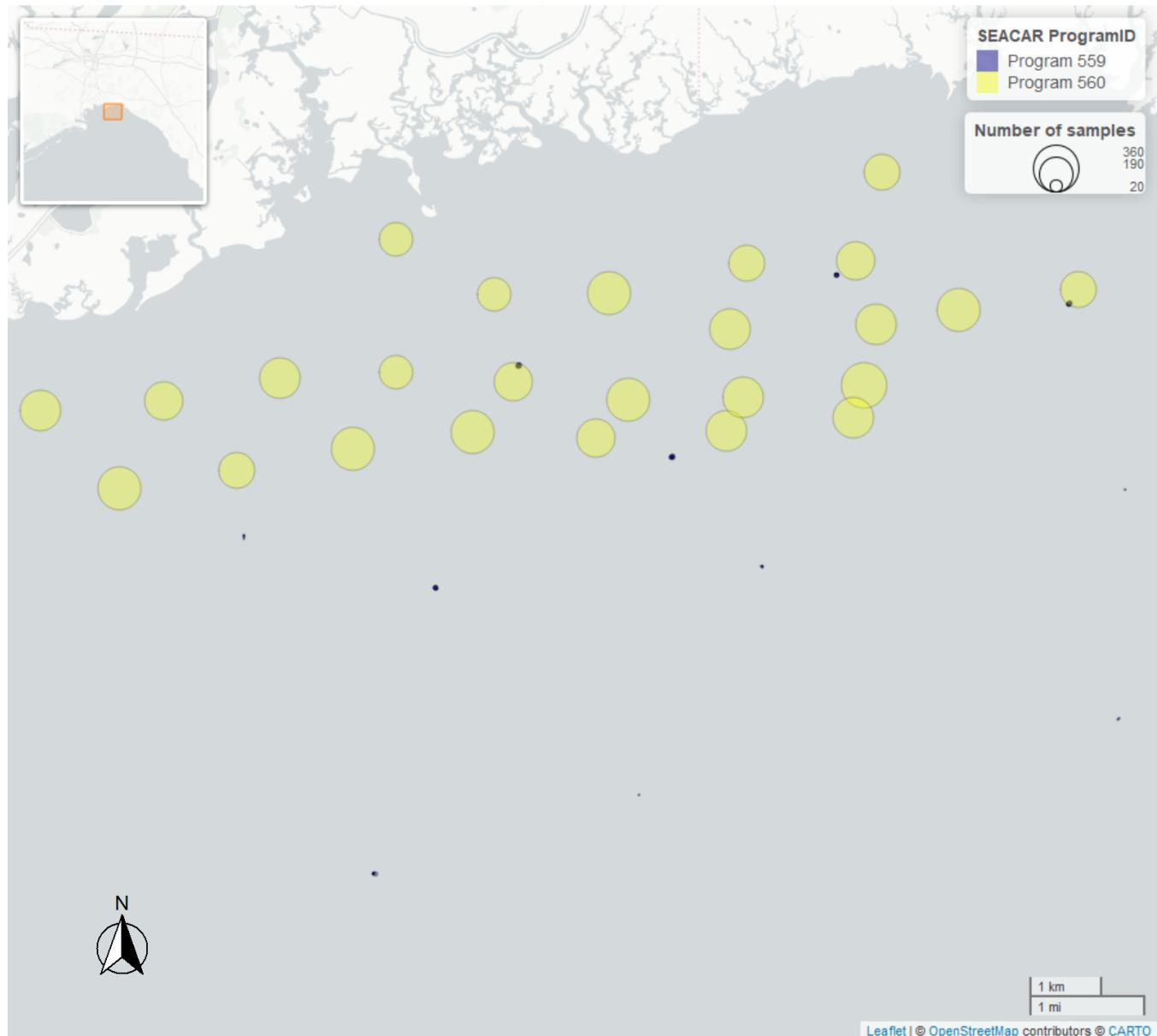


Table 10: Northern Big Bend Seagrass Monitoring - *Program 559*¹²

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
131	2012	2018	Modified Braun Blanquet	54

Table 11: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*¹¹

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
5879	2006	2024	Modified Braun Blanquet	25
953	2022	2024	Percent Cover	25

Median Percent Cover - Species Trend Table

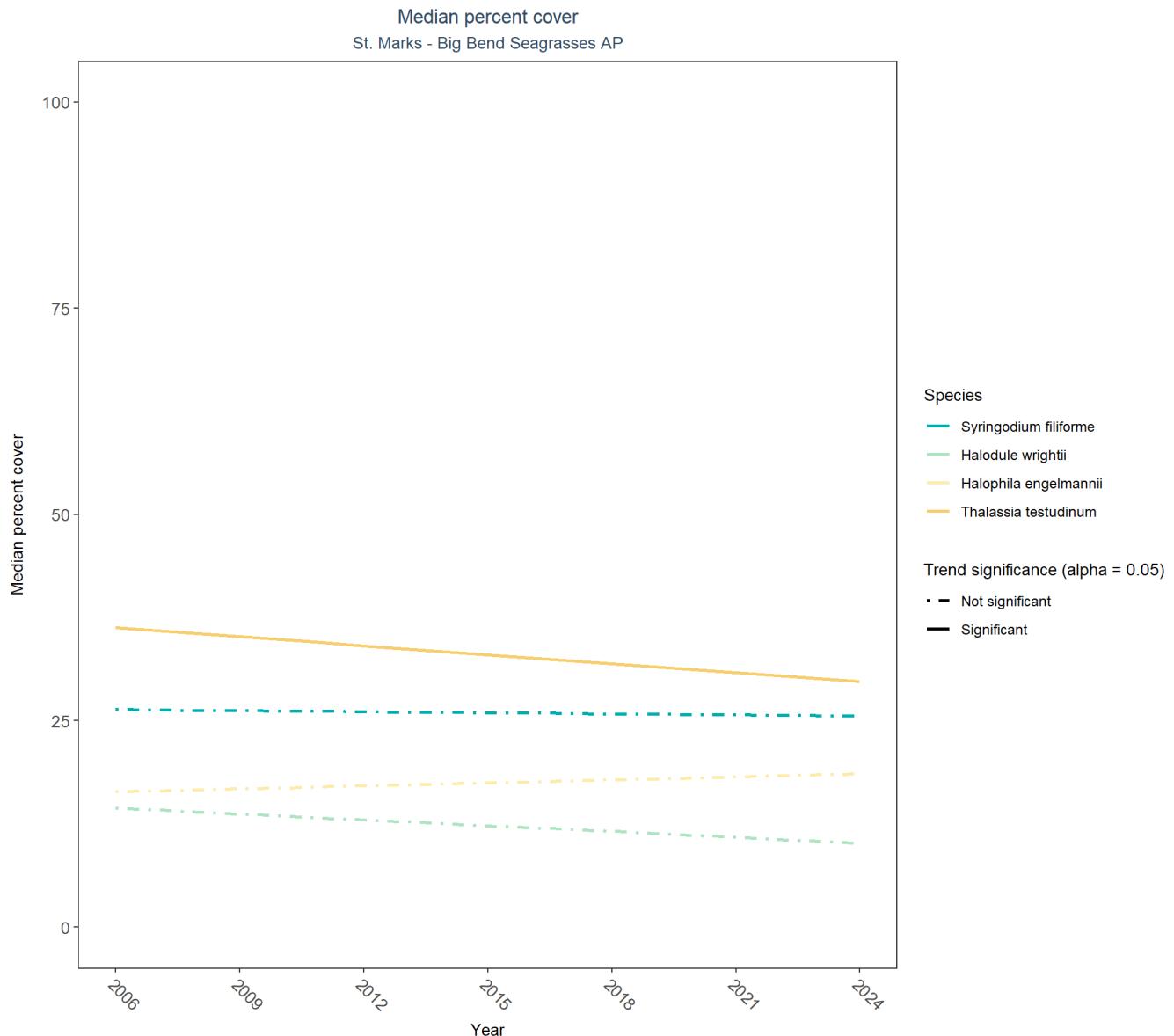
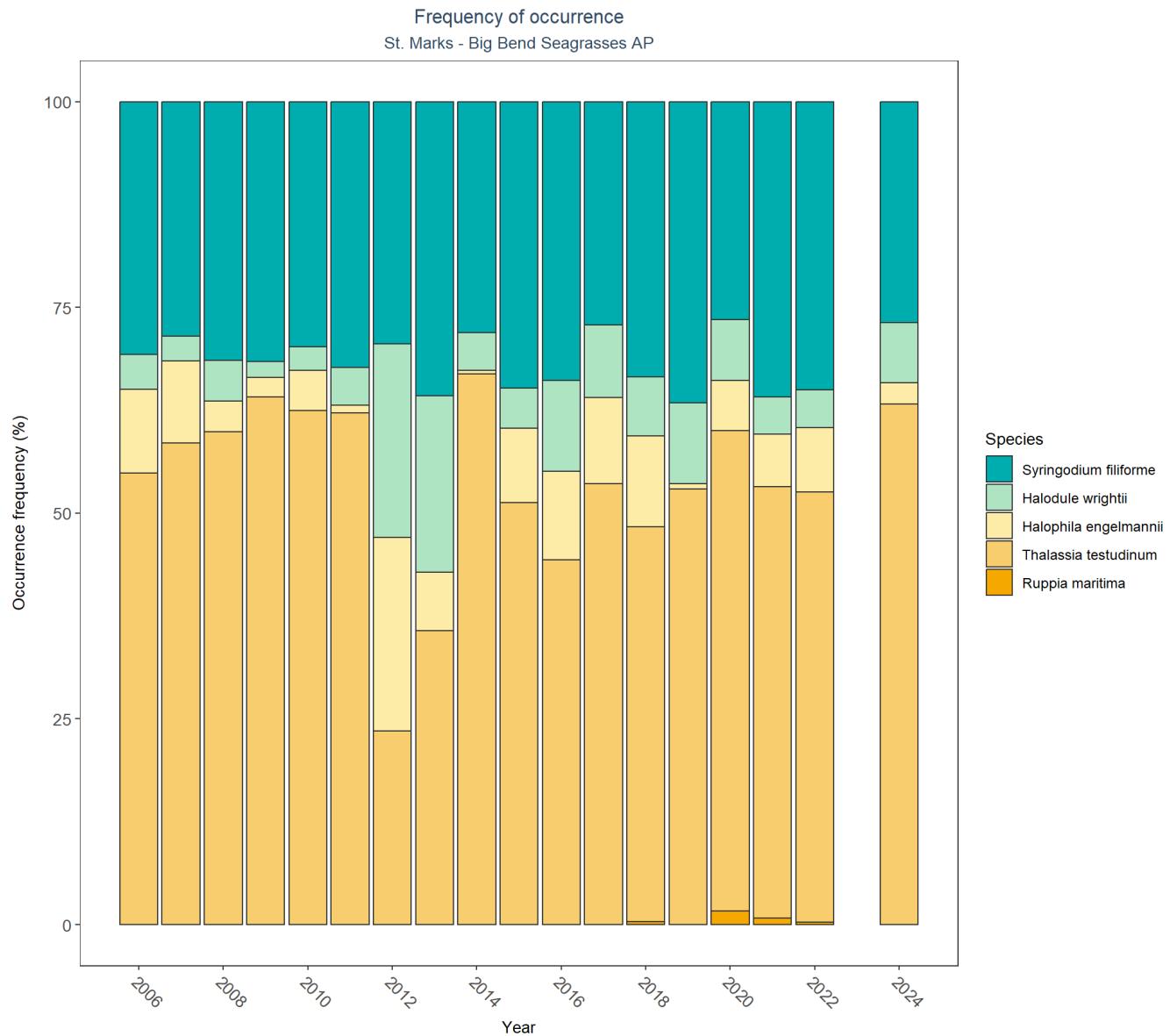


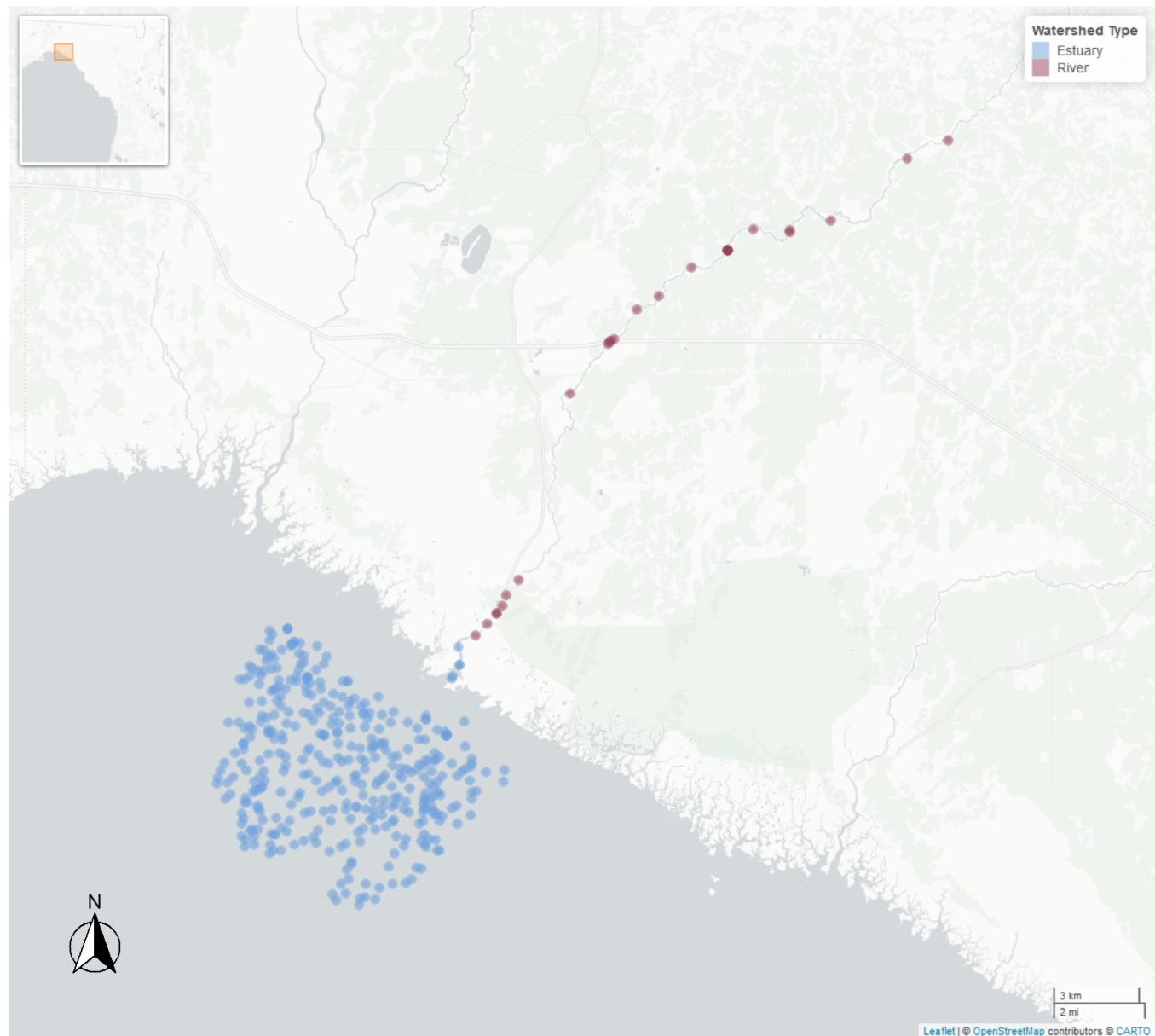
Table 12: Percent Cover Trend Analysis for St. Marks

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	No significant trend	2006 - 2024	22.5636	-0.1903	0.3803
Halodule wrightii	No significant trend	2006 - 2024	15.8141	-0.2347	0.2613
Halophila engelmannii	No significant trend	2006 - 2024	15.6710	0.1209	0.6904
No grass in quadrat	Insufficient data to calculate trend	-	-	-	-
Ruppia maritima	Insufficient data to calculate trend	-	-	-	-
Syringodium filiforme	No significant trend	2006 - 2024	26.6180	-0.0426	0.7872
Thalassia testudinum	Significantly decreasing trend	2006 - 2024	38.4349	-0.3606	0.0222

Frequency of Occurrence Barplots



Econfina



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 13: Seasonal Kendall-Tau Results for Econfina

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2011 - 2019	6	30	FALSE	-	-	-	-
River	Chlorophyll a, Corrected for Pheophytin	1999 - 2023	23	293	TRUE	-0.01	0.90	0.0000	↓
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2004 - 2019	6	29	FALSE	-	-	-	-
River	Chlorophyll a, Uncorrected for Pheophytin	1990 - 2023	17	166	TRUE	0.01	0.37	0.0003	↑
Estuary	Colored Dissolved Organic Matter	2018 - 2019	2	3	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2020 - 2023	4	28	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1991 - 2019	17	1217	TRUE	-0.03	9.67	0.2920	0
River	Dissolved Oxygen	1989 - 2023	32	583	TRUE	0.01	5.16	0.0095	↑
Estuary	Dissolved Oxygen Saturation	2011 - 2019	6	49	FALSE	-	-	-	-
River	Dissolved Oxygen Saturation	1999 - 2023	11	84	TRUE	-0.16	68.18	0.7415	0
Estuary	Salinity	1991 - 2019	17	1218	TRUE	-0.44	38.60	0.0002	↓
River	Salinity	1999 - 2016	14	116	TRUE	0.00	0.10	0.2441	0
Estuary	Secchi Depth	1991 - 2019	17	1195	TRUE	-0.04	2.48	0.0286	↓
River	Secchi Depth	1992 - 2023	27	403	TRUE	-0.01	0.67	0.0003	↓
Estuary	Total Nitrogen	2004 - 2019	8	42	FALSE	-	-	-	-
River	Total Nitrogen	1990 - 2023	26	363	TRUE	0.00	0.78	0.3860	0
Estuary	Total Phosphorus	2004 - 2019	8	38	FALSE	-	-	-	-
River	Total Phosphorus	1998 - 2023	24	295	TRUE	0.00	0.08	0.9202	0
Estuary	Total Suspended Solids	2011 - 2019	6	33	FALSE	-	-	-	-
River	Total Suspended Solids	1990 - 2023	31	367	TRUE	0.00	4.00	0.0040	↓
Estuary	Turbidity	2011 - 2019	6	32	FALSE	-	-	-	-
River	Turbidity	1990 - 2023	31	472	TRUE	0.01	1.99	0.0317	↑
Estuary	Water Temperature	1991 - 2019	17	1219	TRUE	0.06	26.68	0.2680	0
River	Water Temperature	1989 - 2023	32	579	TRUE	0.01	19.76	0.2357	0
Estuary	pH	1991 - 2019	17	1215	TRUE	0.00	8.37	0.3301	0
River	pH	1989 - 2023	32	573	TRUE	0.00	7.14	0.3557	0

Table containing overview of Programs contributing data for Econfina

Table 14: Overview of Program Data for Econfina

ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	103	1	-
Ammonium, Filtered (NH4)	115	1	-
Ammonium, Filtered (NH4)	5002	33	458
Chlorophyll a, Corrected for Pheophytin	5002	31	293
Chlorophyll a, Uncorrected for Pheophytin	103	5	-
Chlorophyll a, Uncorrected for Pheophytin	115	2	-
Chlorophyll a, Uncorrected for Pheophytin	118	1	-
Chlorophyll a, Uncorrected for Pheophytin	5002	22	166
Colored Dissolved Organic Matter	5002	3	28
Dissolved Oxygen	69	1150	-
Dissolved Oxygen	95	3	-
Dissolved Oxygen	103	2	-
Dissolved Oxygen	115	13	-
Dissolved Oxygen	118	1	-
Dissolved Oxygen	5002	48	652
Dissolved Oxygen Saturation	95	1	-
Dissolved Oxygen Saturation	5002	48	84
NO2+3, Filtered	5002	33	454
Nitrate (NO3)	5002	-	10
Nitrite (NO2)	5002	-	10
Phosphate, Filtered (PO4)	103	1	-
Phosphate, Filtered (PO4)	115	1	-
Phosphate, Filtered (PO4)	5002	13	298
Salinity	69	1150	-
Salinity	95	4	-
Salinity	103	2	-
Salinity	115	13	-
Salinity	5002	49	116
Secchi Depth	69	1150	-
Secchi Depth	115	6	-
Secchi Depth	5002	39	469
Specific Conductivity	69	1150	-
Specific Conductivity	5002	49	968
Total Kjeldahl Nitrogen	5002	33	469
Total Nitrogen	103	9	-
Total Nitrogen	115	1	-
Total Nitrogen	5002	33	363

Total Phosphorus	103	5	-
Total Phosphorus	115	1	-
Total Phosphorus	5002	33	295
Total Suspended Solids	5002	33	367
Turbidity	103	1	-
Turbidity	5002	33	476
Water Temperature	69	1150	-
Water Temperature	95	4	-
Water Temperature	103	3	-
Water Temperature	115	13	-
Water Temperature	5002	49	648
pH	69	1150	-
pH	95	1	-
pH	103	2	-
pH	115	13	-
pH	5002	49	643

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

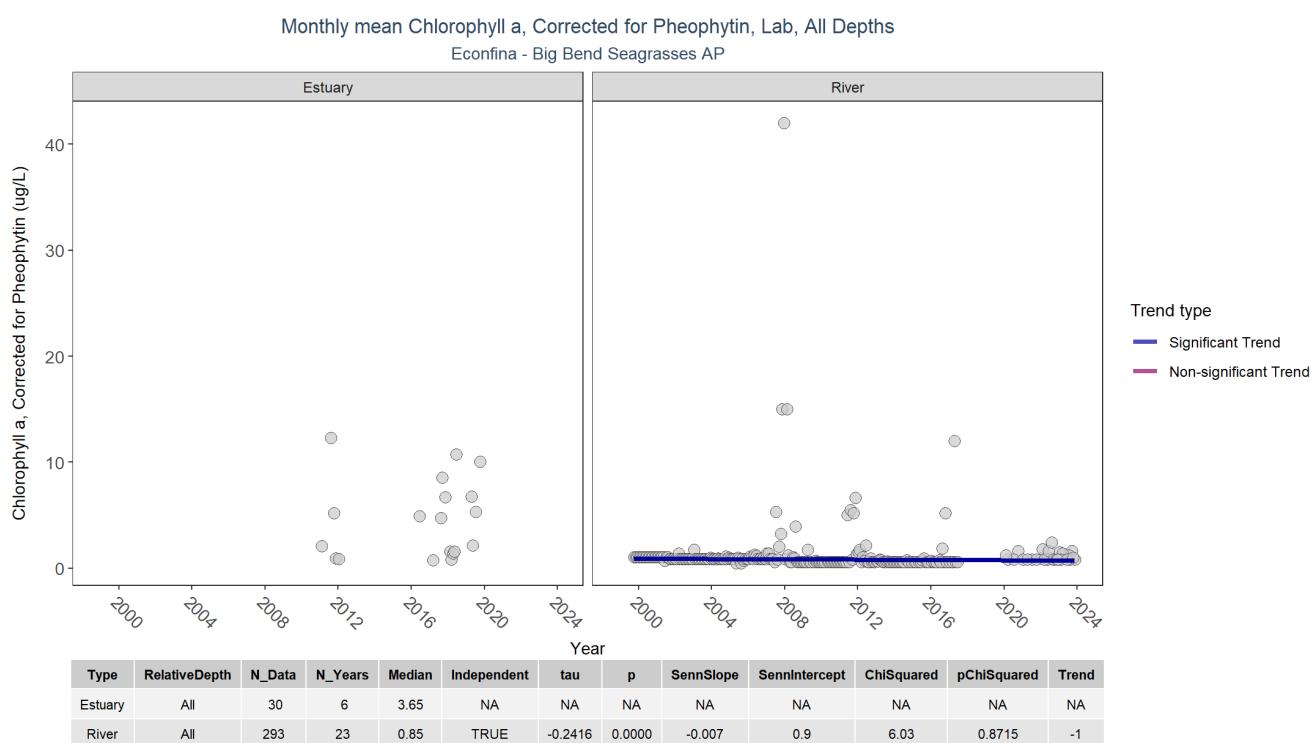
103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

115 - Environmental Monitoring Assessment Program -⁷

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

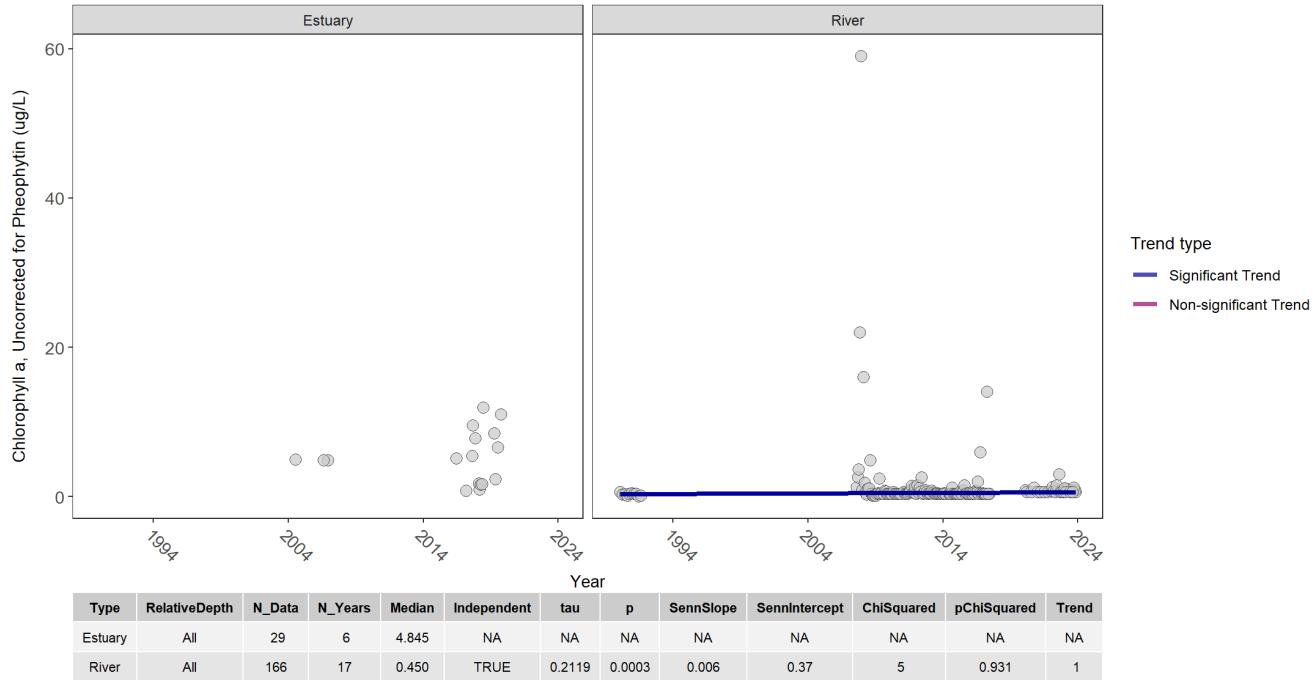
5002 - Florida STORET / WIN -²

Chlorophyll a, Corrected for Pheophytin



Chlorophyll a, Uncorrected for Pheophytin

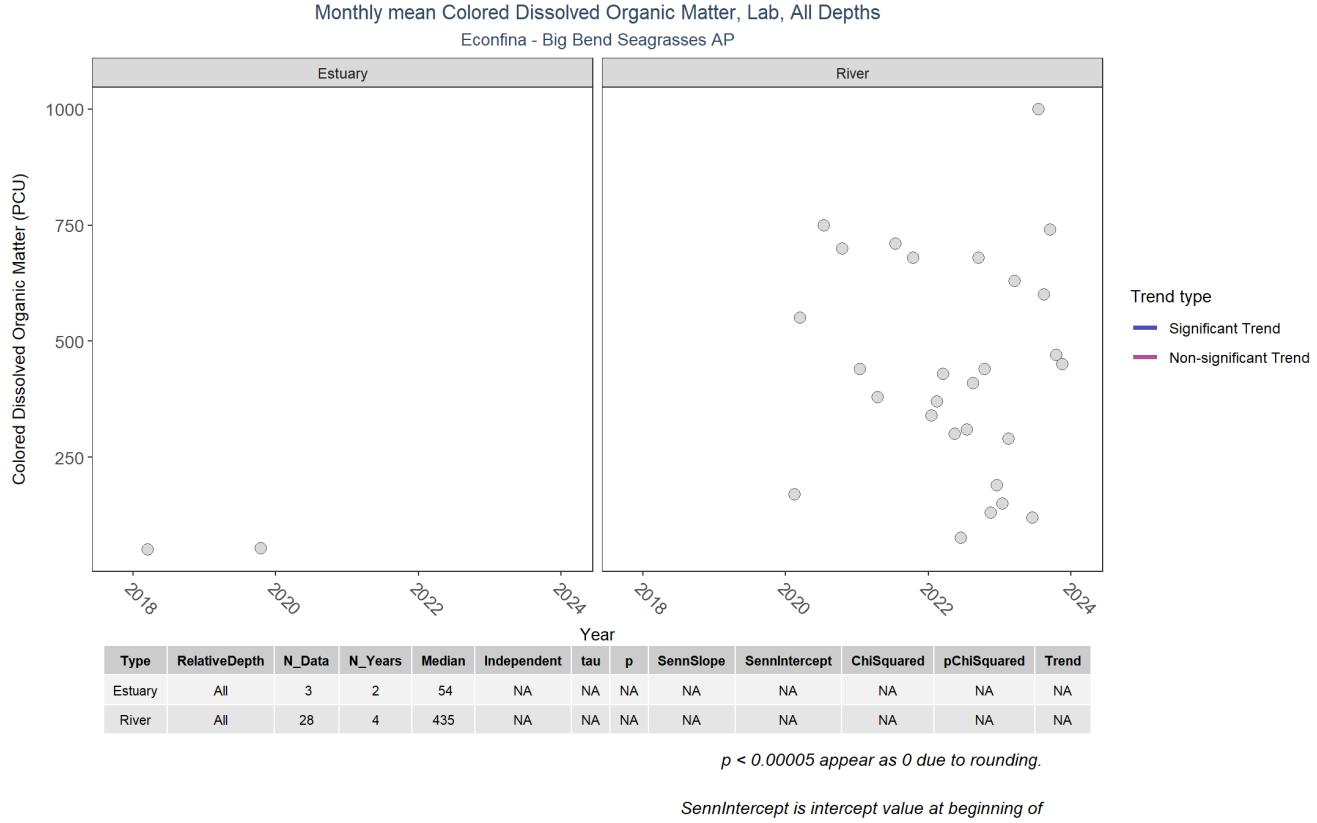
Monthly mean Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths
Econfina - Big Bend Seagrasses AP



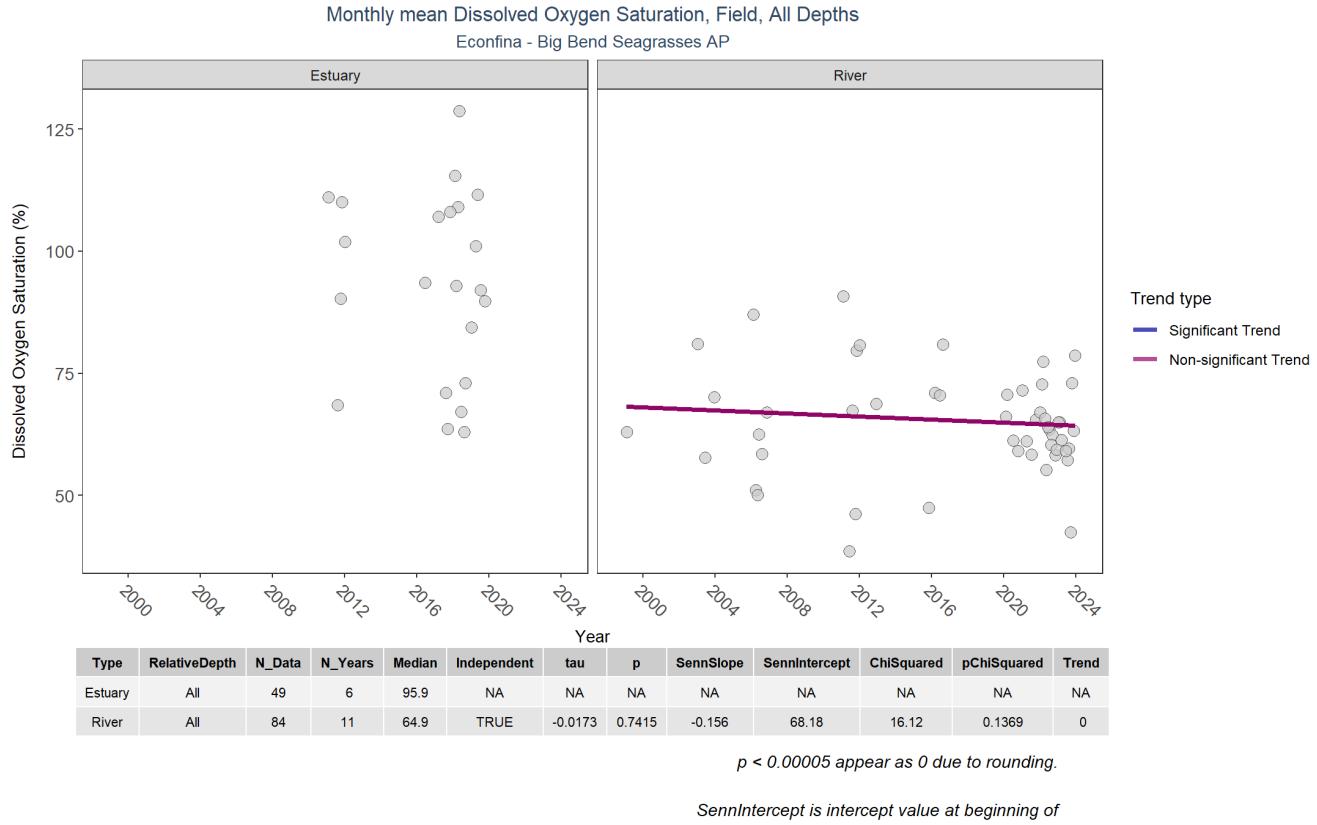
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

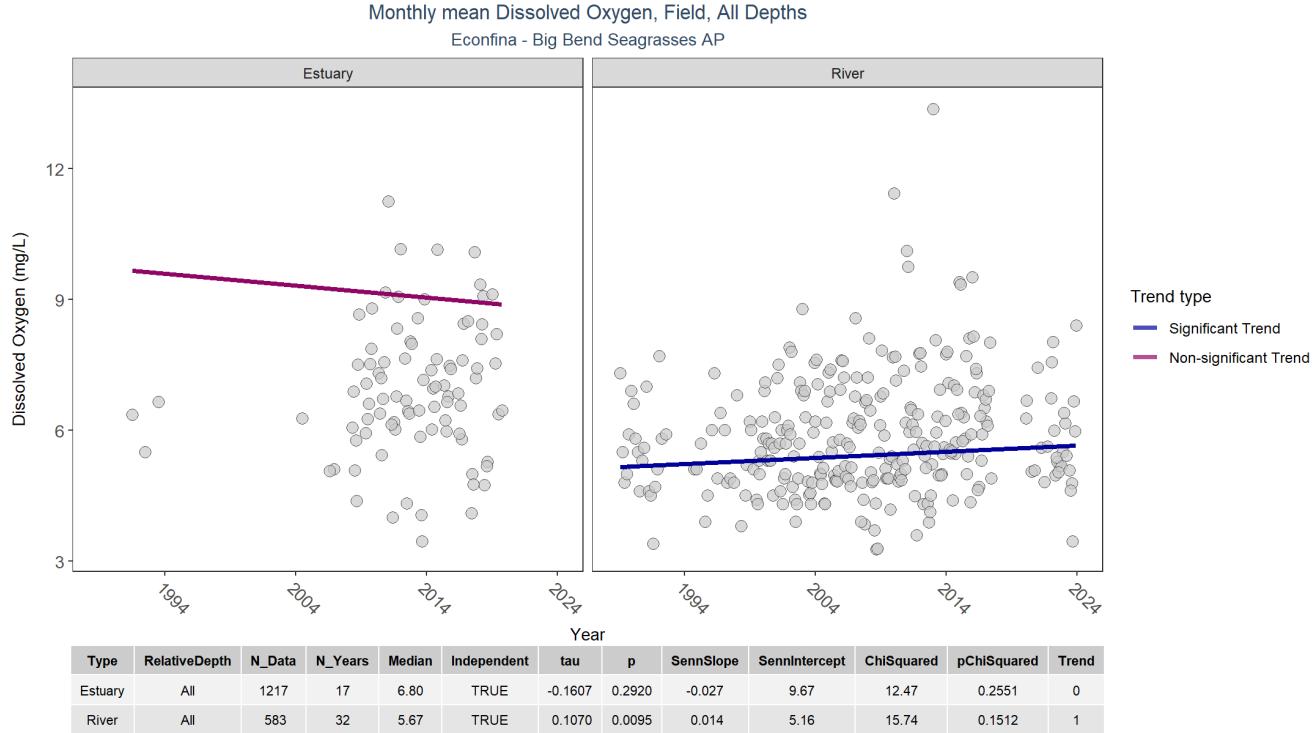
Colored Dissolved Organic Matter



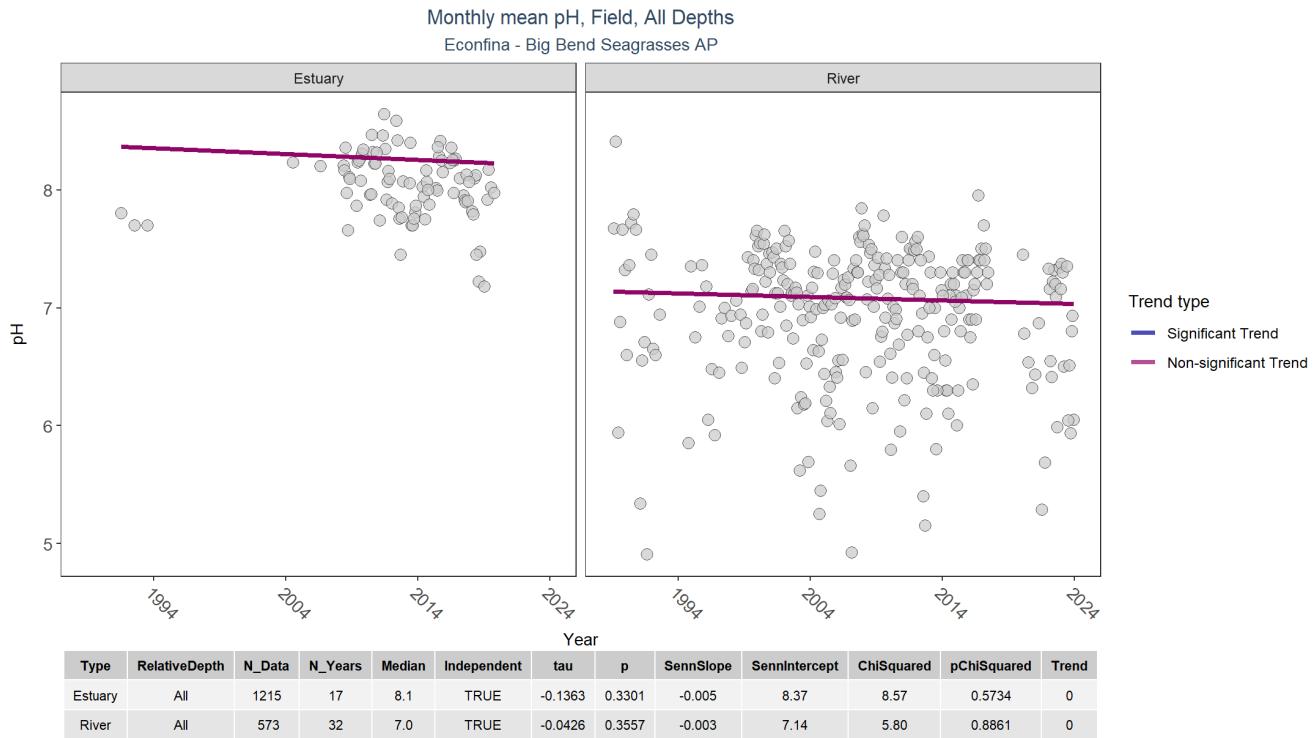
Dissolved Oxygen Saturation



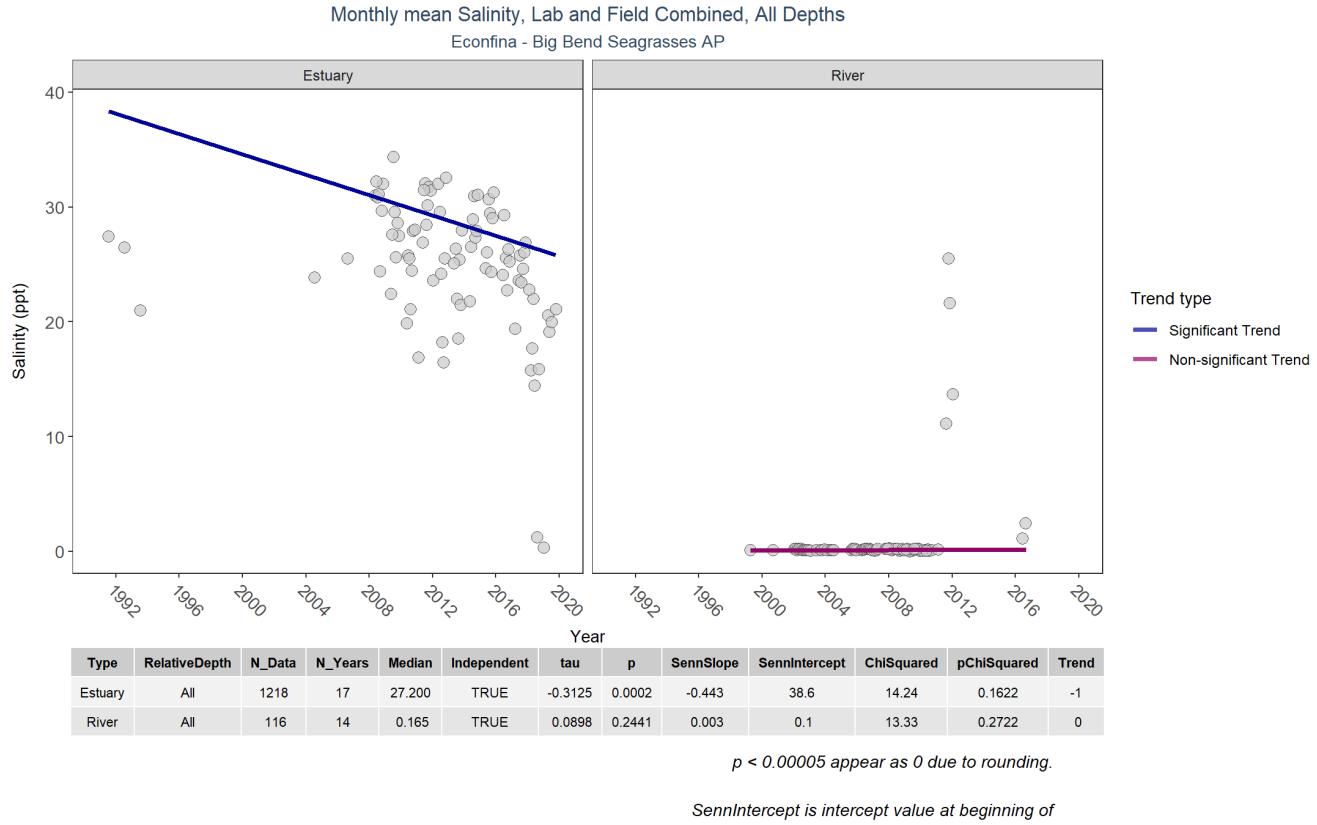
Dissolved Oxygen



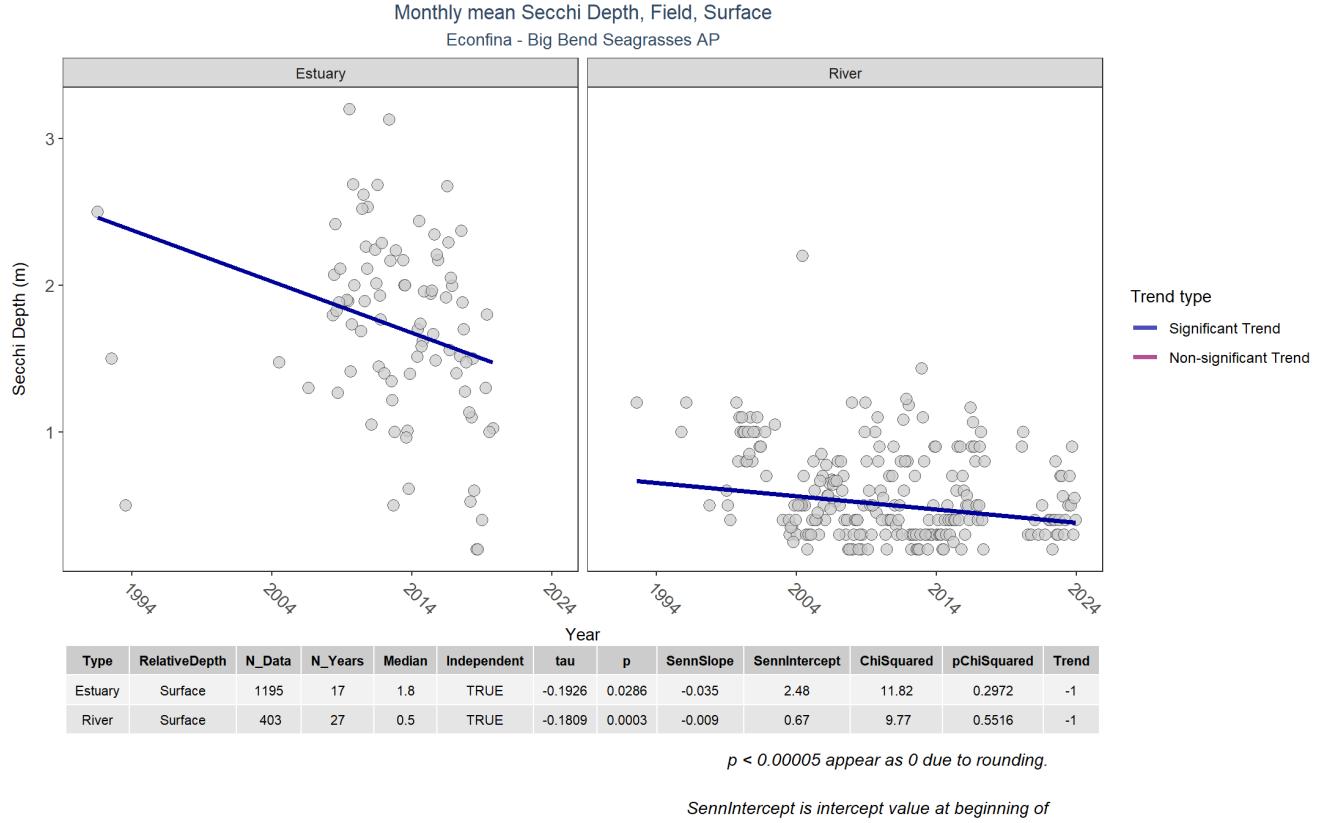
pH



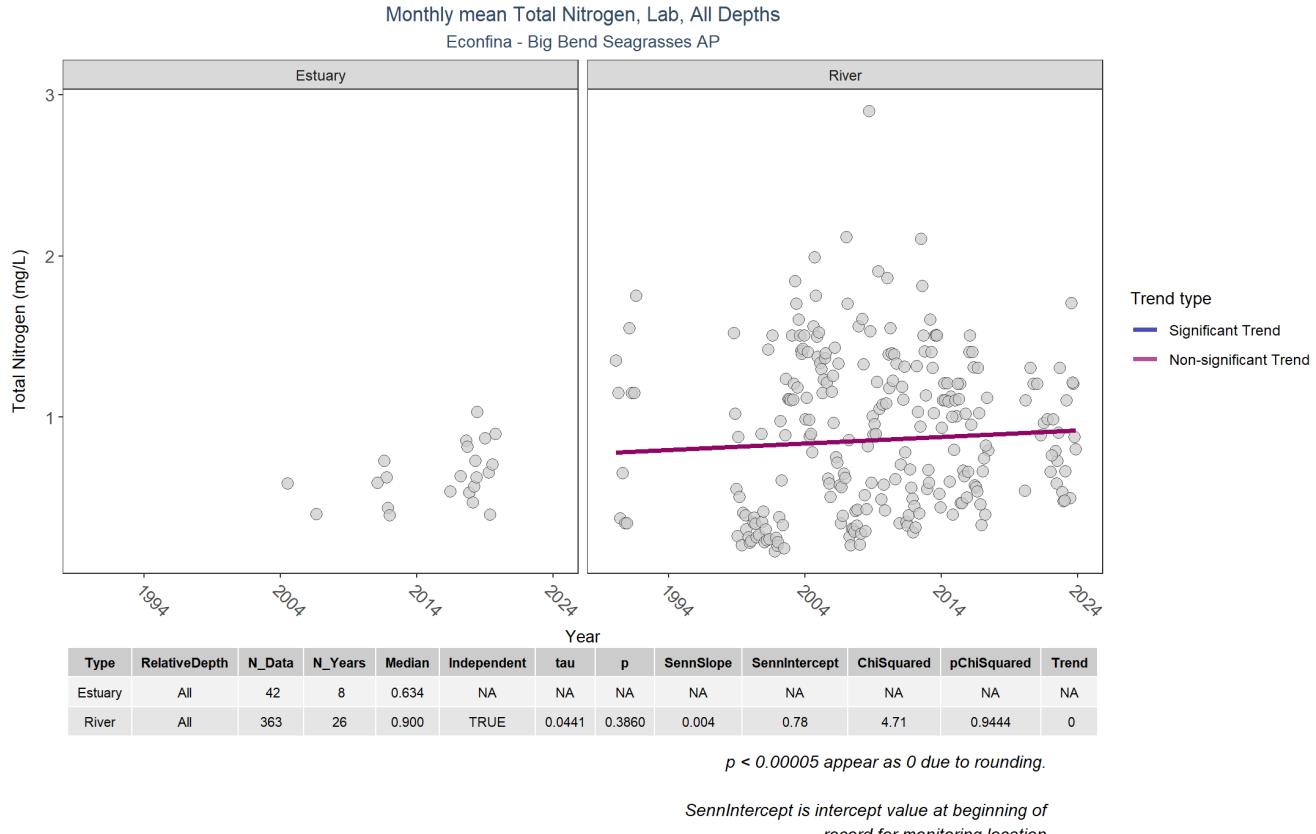
Salinity



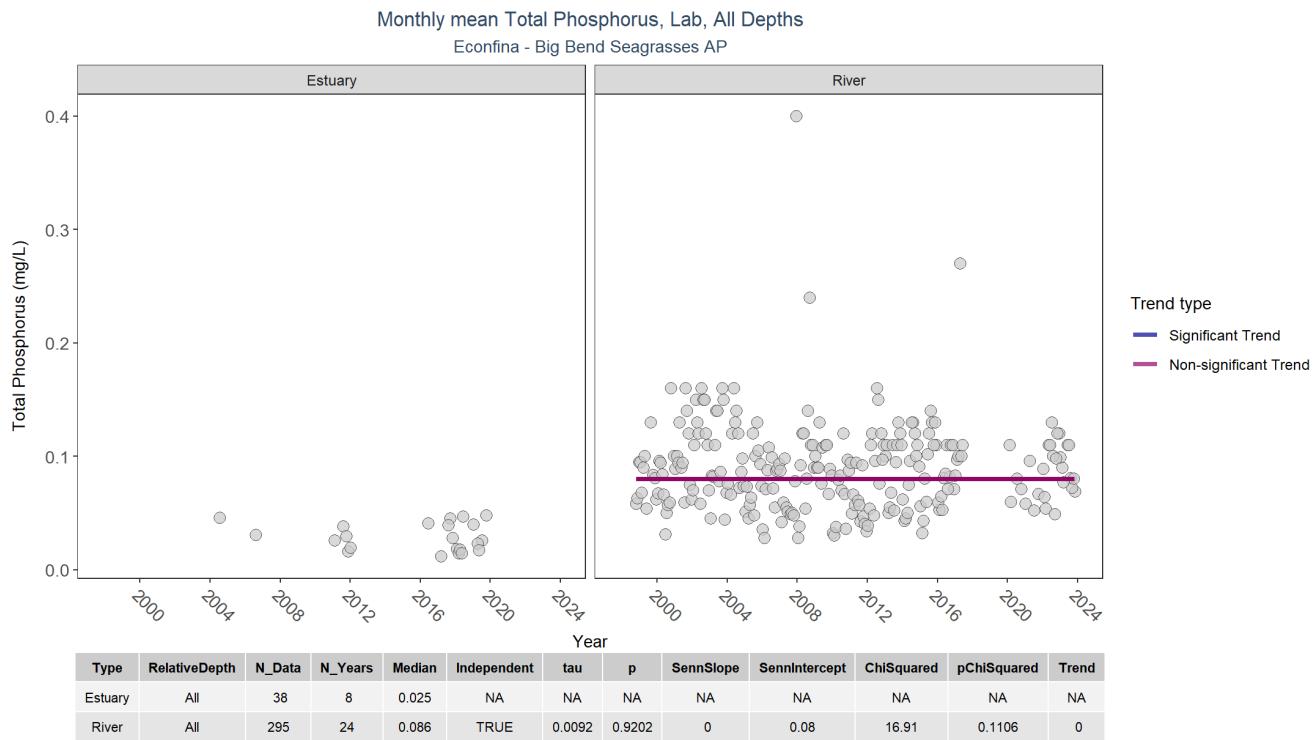
Secchi Depth



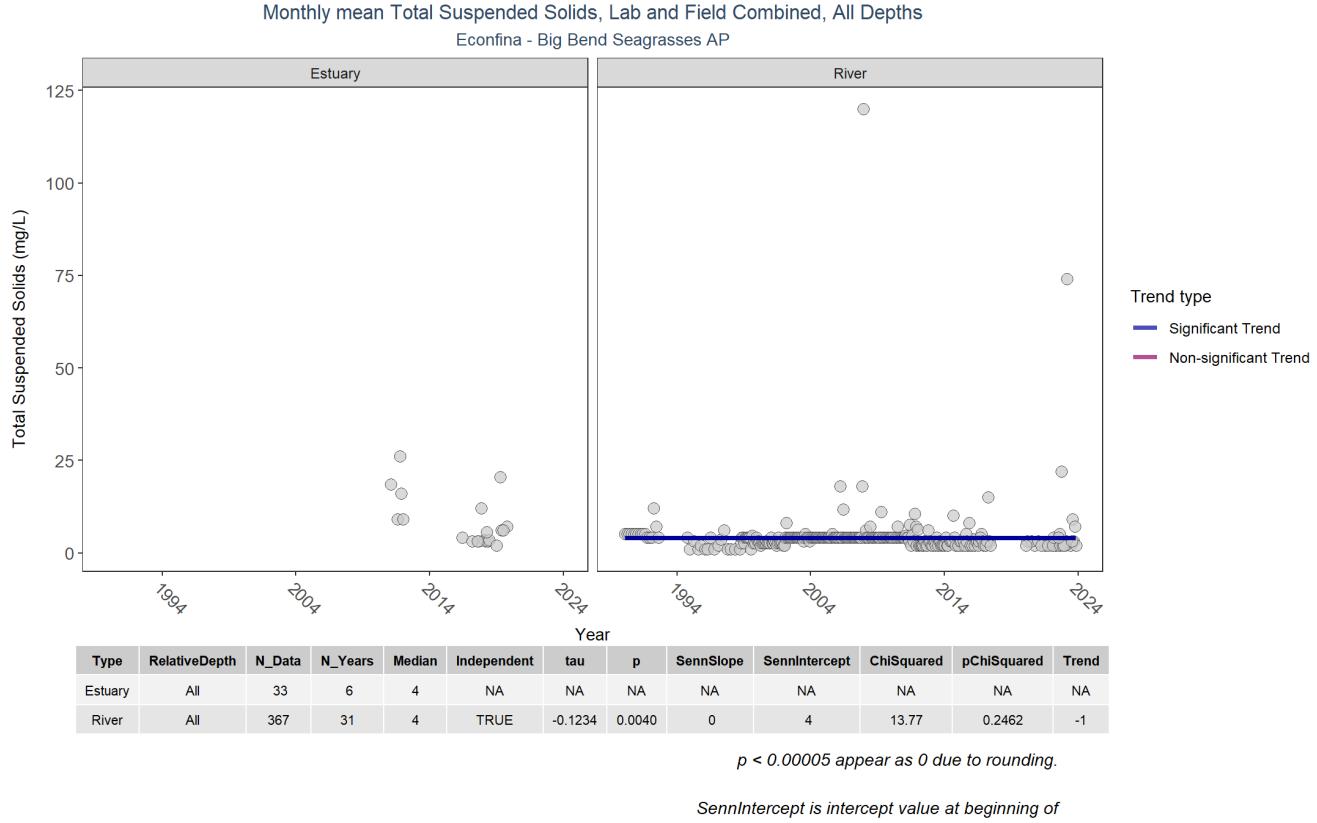
Total Nitrogen



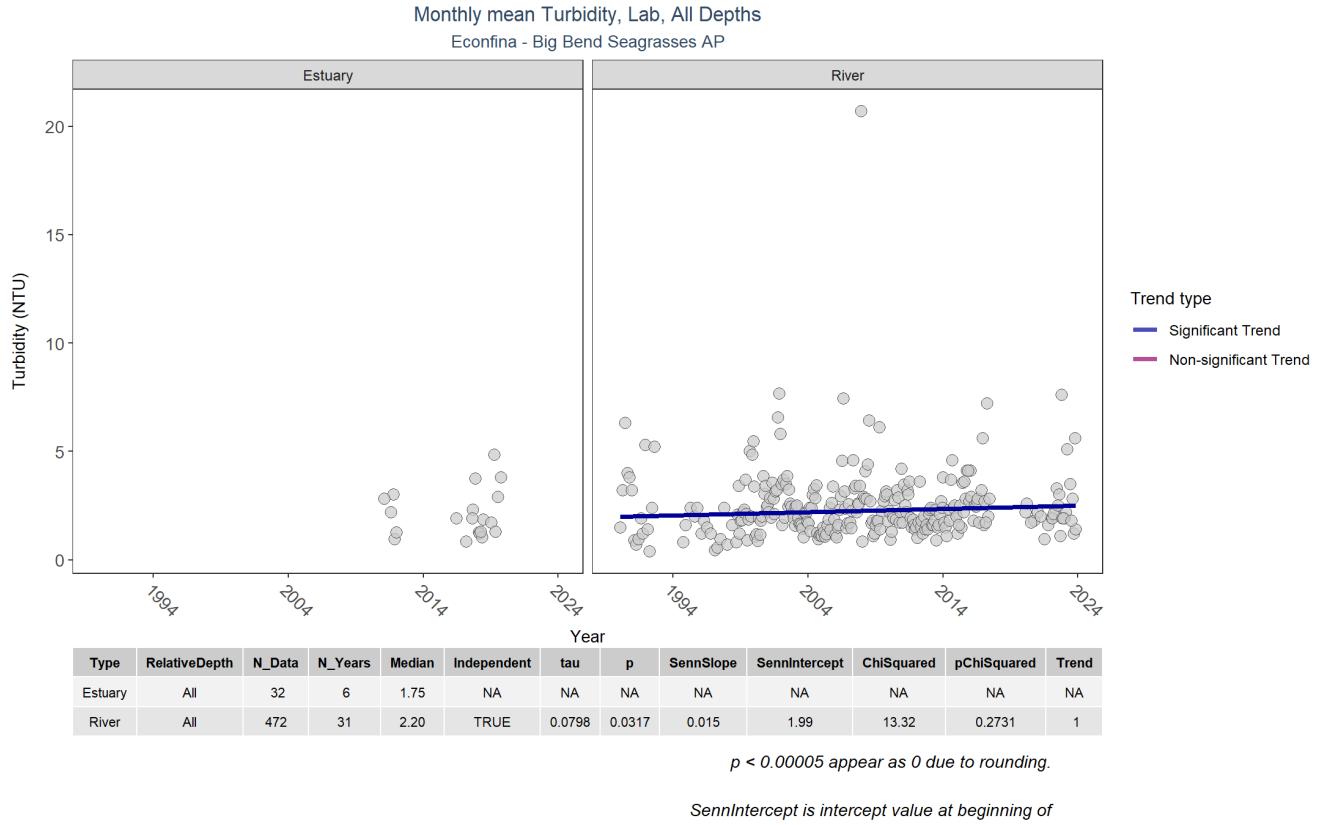
Total Phosphorus



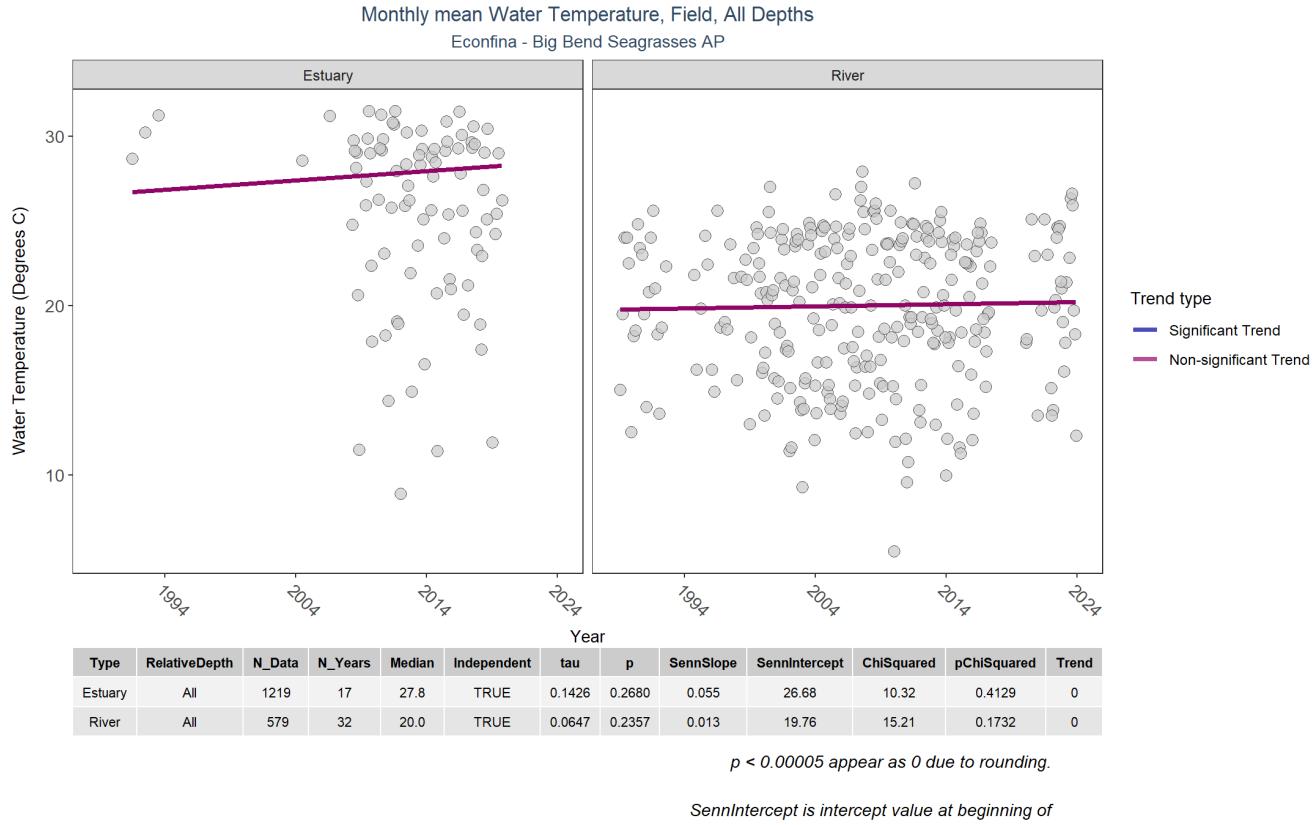
Total Suspended Solids



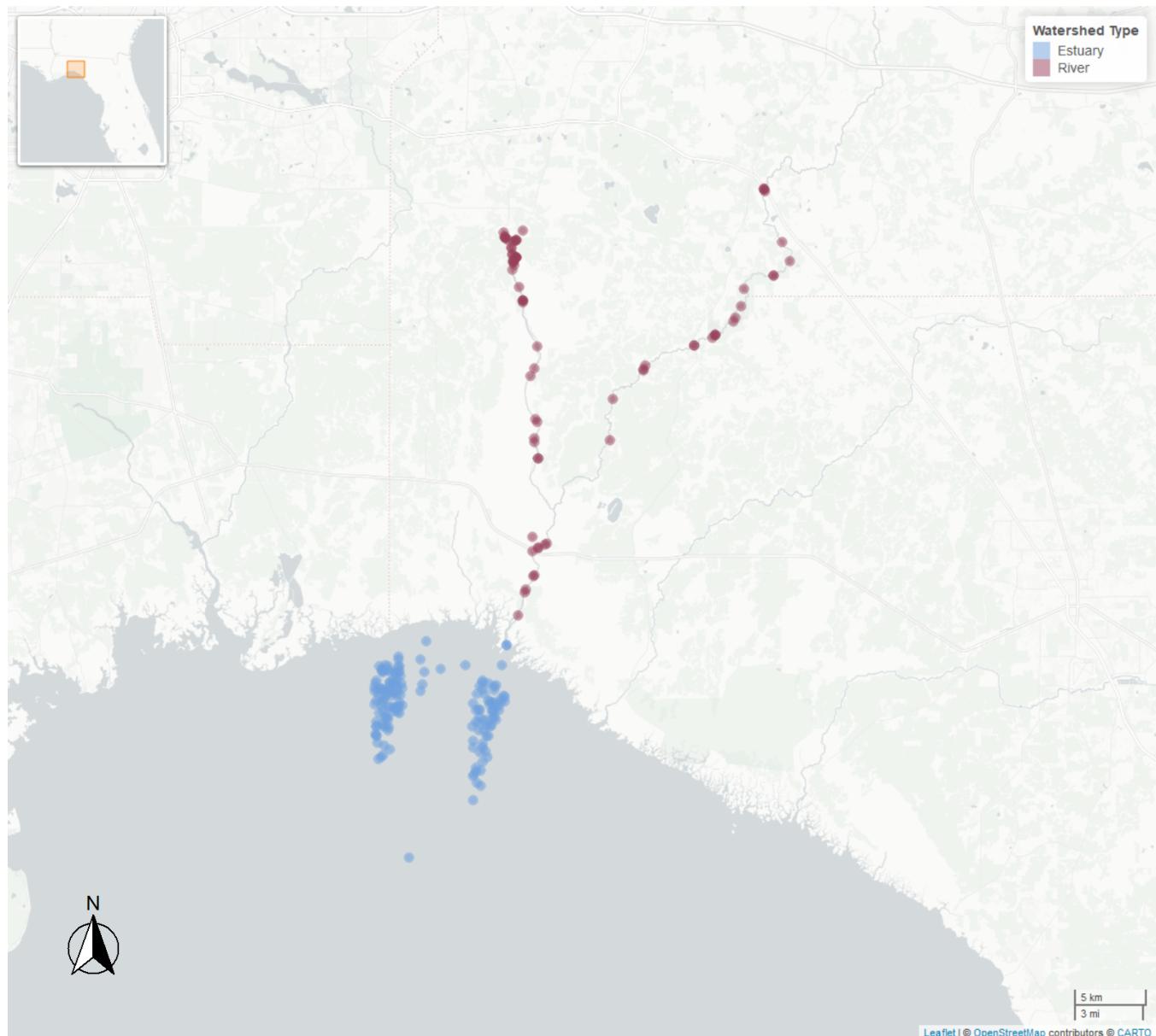
Turbidity



Water Temperature



Aucilla



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 15: Seasonal Kendall-Tau Results for Aucilla

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2010 - 2021	6	41	FALSE	-	-	-	-
River	Chlorophyll a, Corrected for Pheophytin	1999 - 2024	26	392	TRUE	0.00	0.86	0.0111	↓
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2010 - 2021	6	55	FALSE	-	-	-	-
River	Chlorophyll a, Uncorrected for Pheophytin	1993 - 2024	27	319	TRUE	-0.01	1.16	0.0000	↓
Estuary	Colored Dissolved Organic Matter	2020 - 2020	1	1	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2001 - 2024	13	126	TRUE	-0.26	58.81	0.6396	0
Estuary	Dissolved Oxygen	2008 - 2022	15	615	TRUE	-0.05	7.11	0.1288	0
River	Dissolved Oxygen	1994 - 2024	31	1054	TRUE	-0.06	6.71	0.0000	↓
Estuary	Dissolved Oxygen Saturation	2018 - 2022	5	45	FALSE	-	-	-	-
River	Dissolved Oxygen Saturation	2002 - 2024	15	273	TRUE	-0.23	68.21	0.3768	0
Estuary	Salinity	2006 - 2024	18	781	TRUE	-0.68	33.33	0.0000	↓
River	Salinity	1995 - 2024	24	363	TRUE	0.00	0.10	0.0912	0
Estuary	Secchi Depth	2008 - 2022	15	552	TRUE	-0.08	2.34	0.0297	↓
River	Secchi Depth	1993 - 2023	31	684	TRUE	-0.01	1.33	0.0457	↓
Estuary	Total Nitrogen	2010 - 2021	6	41	FALSE	-	-	-	-
River	Total Nitrogen	1993 - 2024	30	709	TRUE	0.01	0.21	0.0000	↑
Estuary	Total Phosphorus	2010 - 2021	6	49	FALSE	-	-	-	-
River	Total Phosphorus	1993 - 2024	30	660	TRUE	0.00	0.02	0.0000	↑
Estuary	Total Suspended Solids	2010 - 2021	6	47	FALSE	-	-	-	-
River	Total Suspended Solids	1994 - 2024	31	531	TRUE	0.00	3.83	0.0065	↓
Estuary	Turbidity	2010 - 2021	6	42	FALSE	-	-	-	-
River	Turbidity	1994 - 2024	31	859	TRUE	0.00	1.15	0.7452	0
Estuary	Water Temperature	2008 - 2022	15	602	TRUE	-0.04	25.92	0.5690	0
River	Water Temperature	1994 - 2024	31	1053	TRUE	0.03	20.46	0.0380	↑
Estuary	pH	2008 - 2022	15	600	TRUE	-0.03	8.22	0.0011	↓
River	pH	1994 - 2024	31	1044	TRUE	0.00	7.22	0.5768	0

Table containing overview of Programs contributing data for Aucilla

Table 16: Overview of Program Data for Aucilla

ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	477	-	51
Ammonium, Filtered (NH4)	5002	42	799
Chlorophyll a, Corrected for Pheophytin	477	-	48
Chlorophyll a, Corrected for Pheophytin	5002	41	344
Chlorophyll a, Uncorrected for Pheophytin	103	14	-
Chlorophyll a, Uncorrected for Pheophytin	477	-	48
Chlorophyll a, Uncorrected for Pheophytin	514	-	73
Chlorophyll a, Uncorrected for Pheophytin	5002	41	198
Colored Dissolved Organic Matter	103	1	-
Colored Dissolved Organic Matter	477	-	51
Colored Dissolved Organic Matter	514	-	9
Colored Dissolved Organic Matter	5002	1	66
Dissolved Oxygen	69	521	-
Dissolved Oxygen	103	13	-
Dissolved Oxygen	118	16	-
Dissolved Oxygen	477	-	49
Dissolved Oxygen	560	176	-
Dissolved Oxygen	5002	65	1092
Dissolved Oxygen Saturation	95	1	-
Dissolved Oxygen Saturation	477	-	49
Dissolved Oxygen Saturation	5002	44	224
NO2+3, Filtered	477	-	51
NO2+3, Filtered	5002	41	816
Nitrate (NO3)	5002	-	2
Phosphate, Filtered (PO4)	5002	-	573
Salinity	69	522	-
Salinity	95	1	-
Salinity	118	19	-
Salinity	477	-	47
Salinity	560	177	-
Salinity	5002	62	316
Secchi Depth	69	519	-
Secchi Depth	103	7	-
Secchi Depth	118	1	-
Secchi Depth	477	-	51
Secchi Depth	514	-	21
Secchi Depth	560	12	-

Secchi Depth	5002	26	701
Specific Conductivity	69	521	-
Specific Conductivity	103	13	-
Specific Conductivity	477	-	97
Specific Conductivity	5002	47	1558
Total Kjeldahl Nitrogen	477	-	51
Total Kjeldahl Nitrogen	5002	42	838
Total Nitrogen	514	-	76
Total Nitrogen	5002	41	633
Total Phosphorus	103	7	-
Total Phosphorus	477	-	51
Total Phosphorus	514	-	76
Total Phosphorus	5002	42	533
Total Suspended Solids	103	7	-
Total Suspended Solids	5002	40	531
Turbidity	103	7	-
Turbidity	477	-	86
Turbidity	5002	42	849
Water Temperature	69	522	-
Water Temperature	95	2	-
Water Temperature	103	13	-
Water Temperature	118	7	-
Water Temperature	477	-	51
Water Temperature	560	176	-
Water Temperature	5002	65	1089
pH	69	521	-
pH	95	1	-
pH	103	13	-
pH	118	8	-
pH	477	-	51
pH	560	151	-
pH	5002	65	1126

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

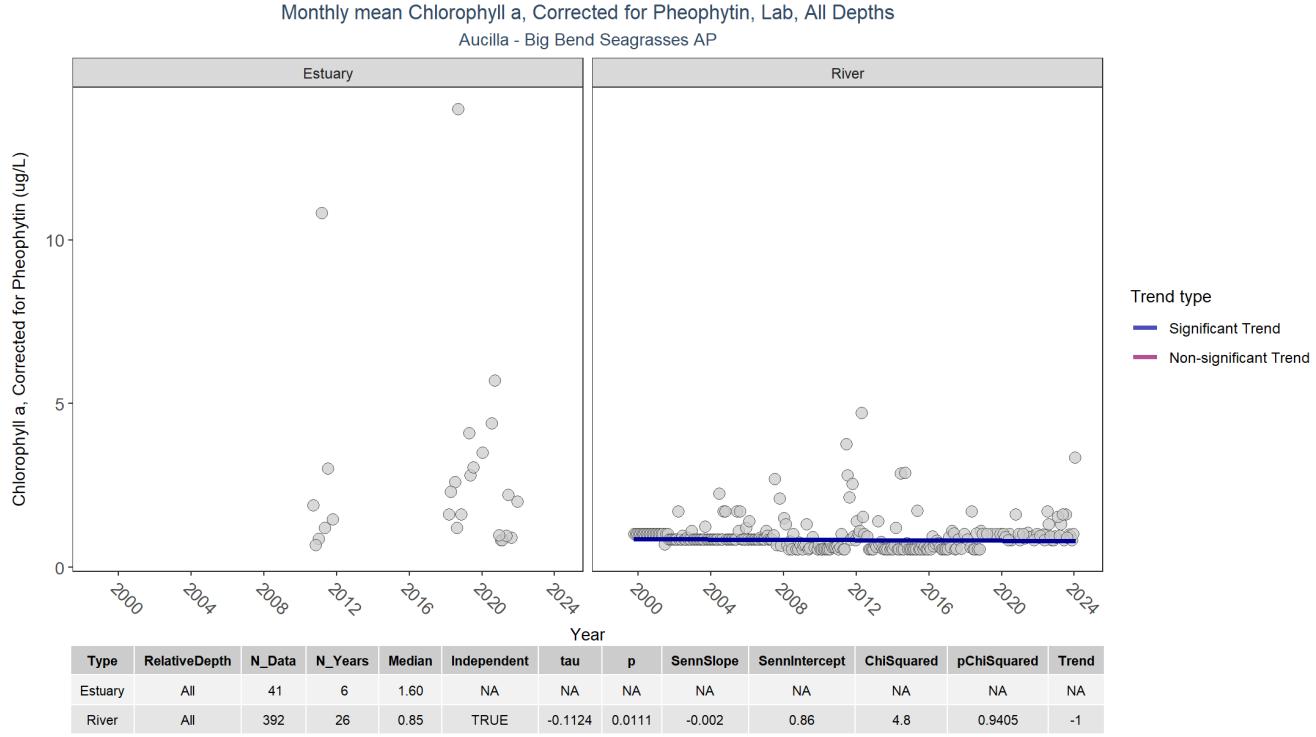
477 - Suwannee River Water Management District Water Resource Monitoring Program -¹⁰

514 - Florida LAKEWATCH Program -⁸

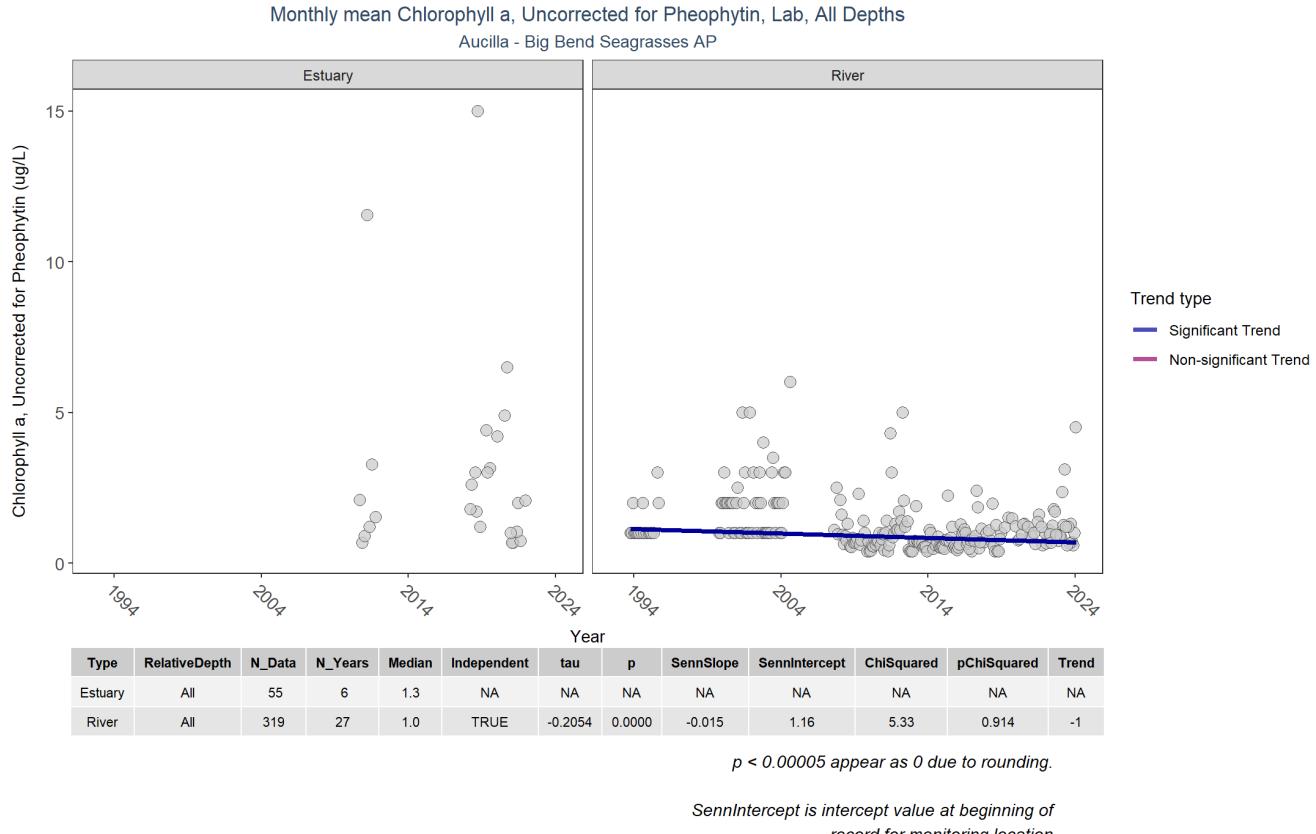
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring -¹¹

5002 - Florida STORET / WIN -²

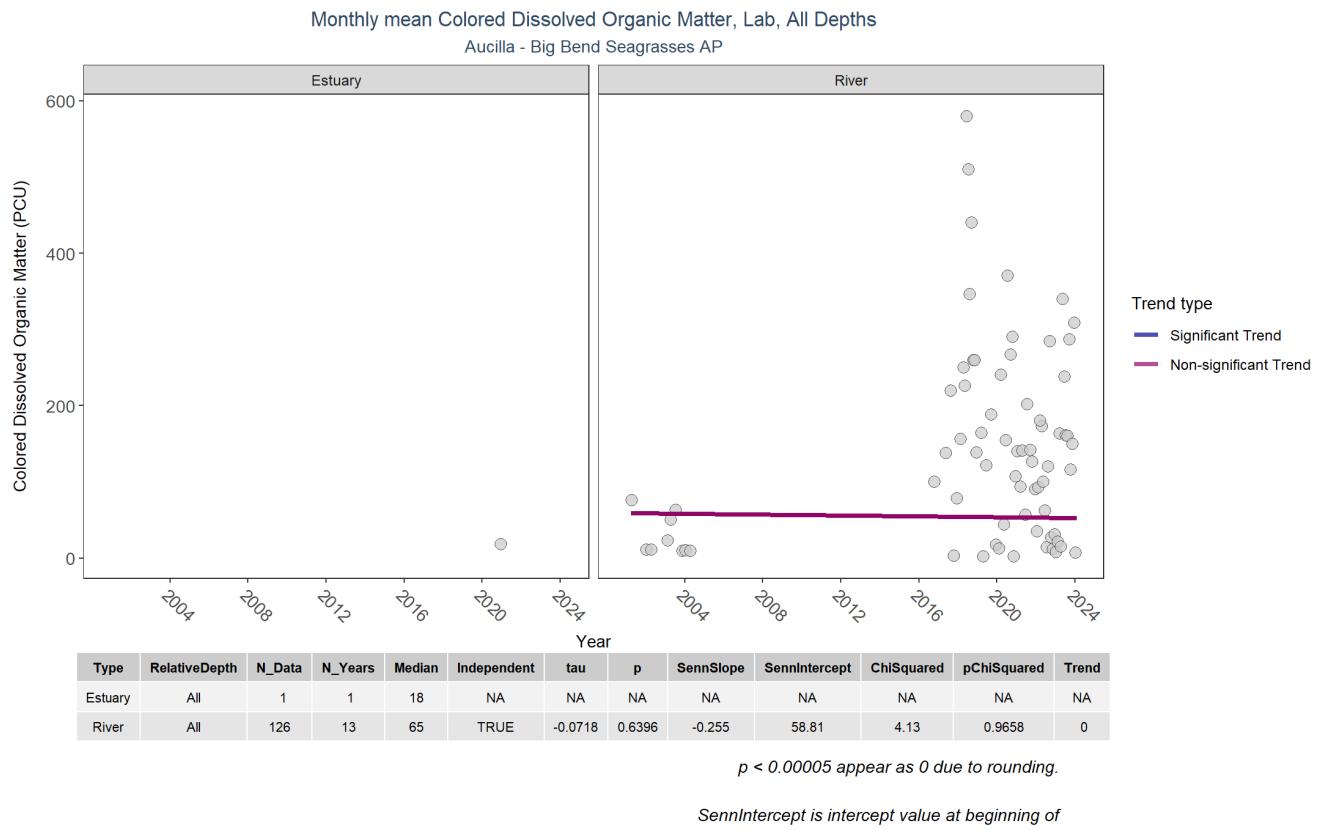
Chlorophyll a, Corrected for Pheophytin



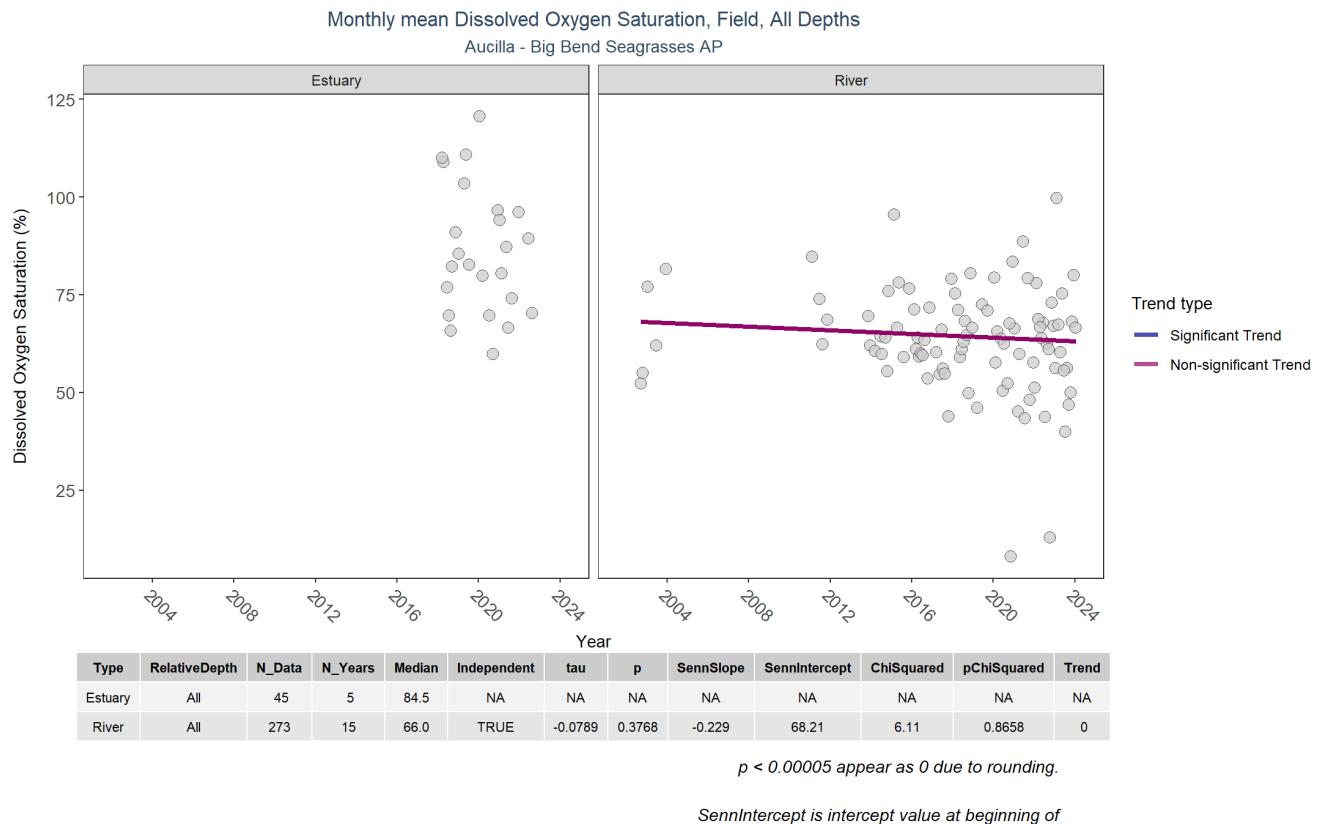
Chlorophyll a, Uncorrected for Pheophytin



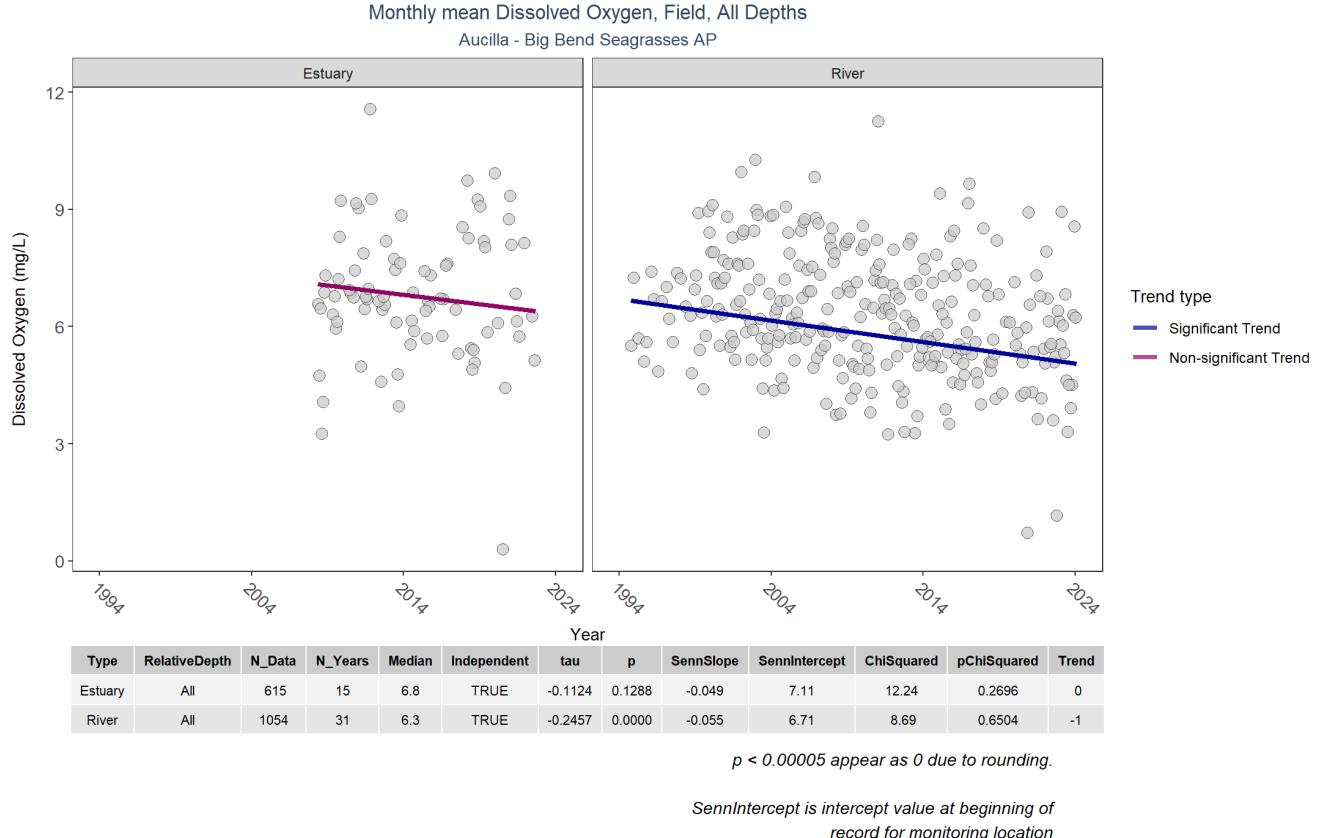
Colored Dissolved Organic Matter



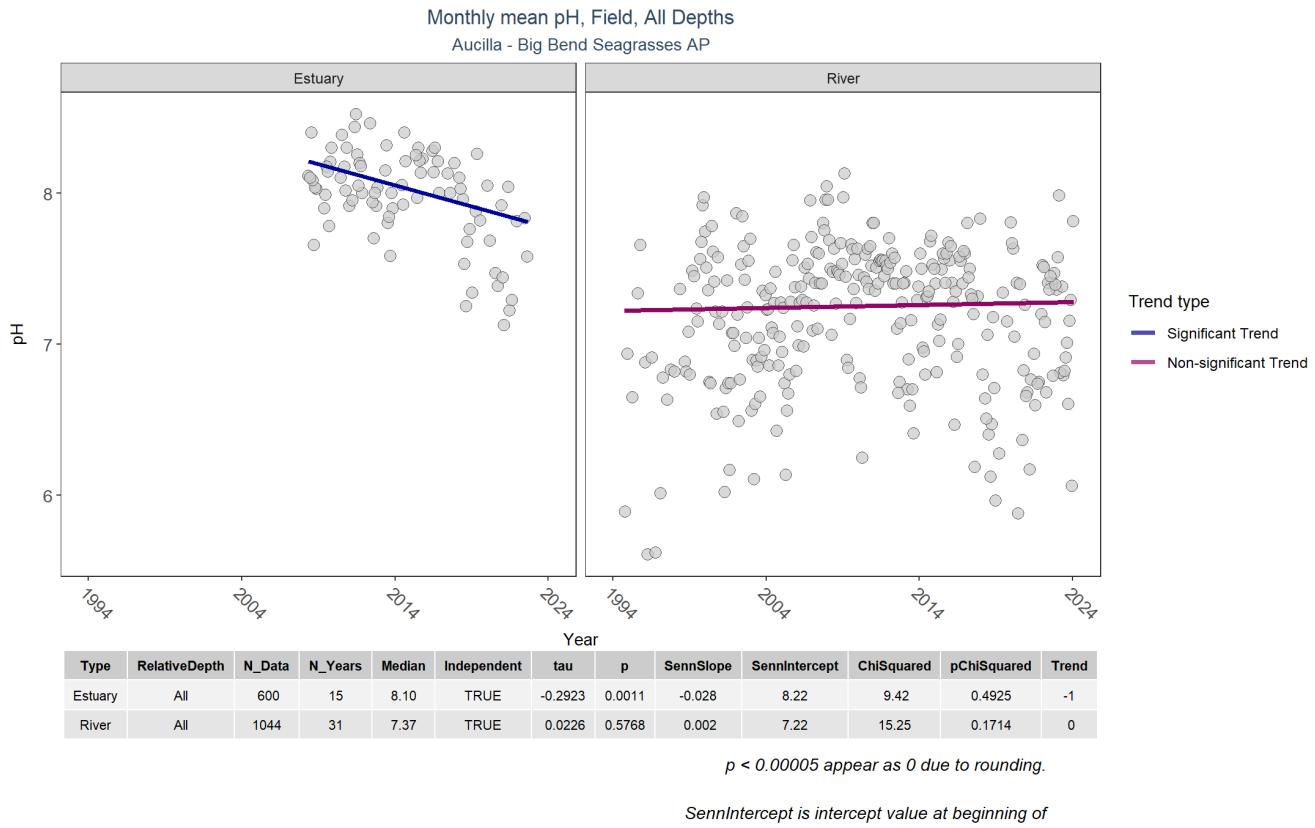
Dissolved Oxygen Saturation



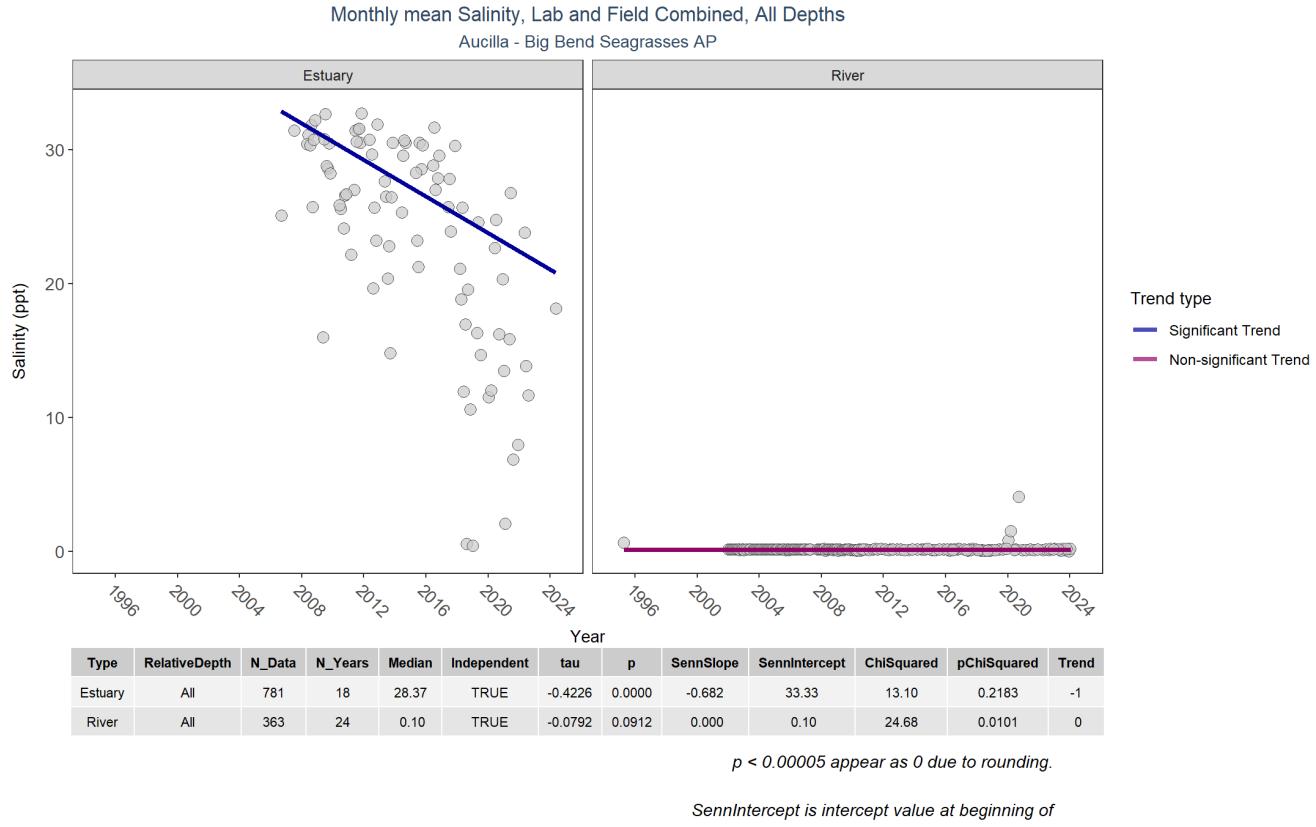
Dissolved Oxygen



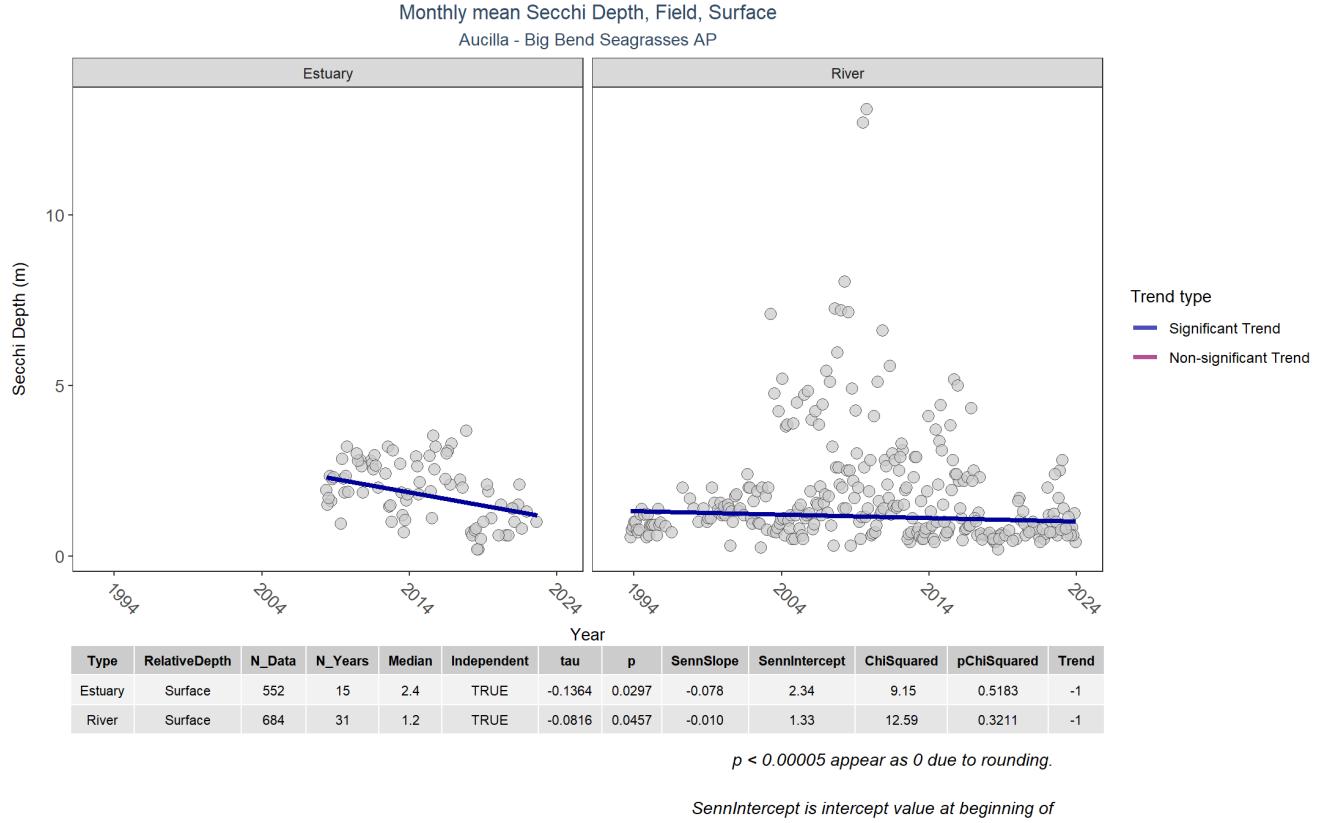
pH



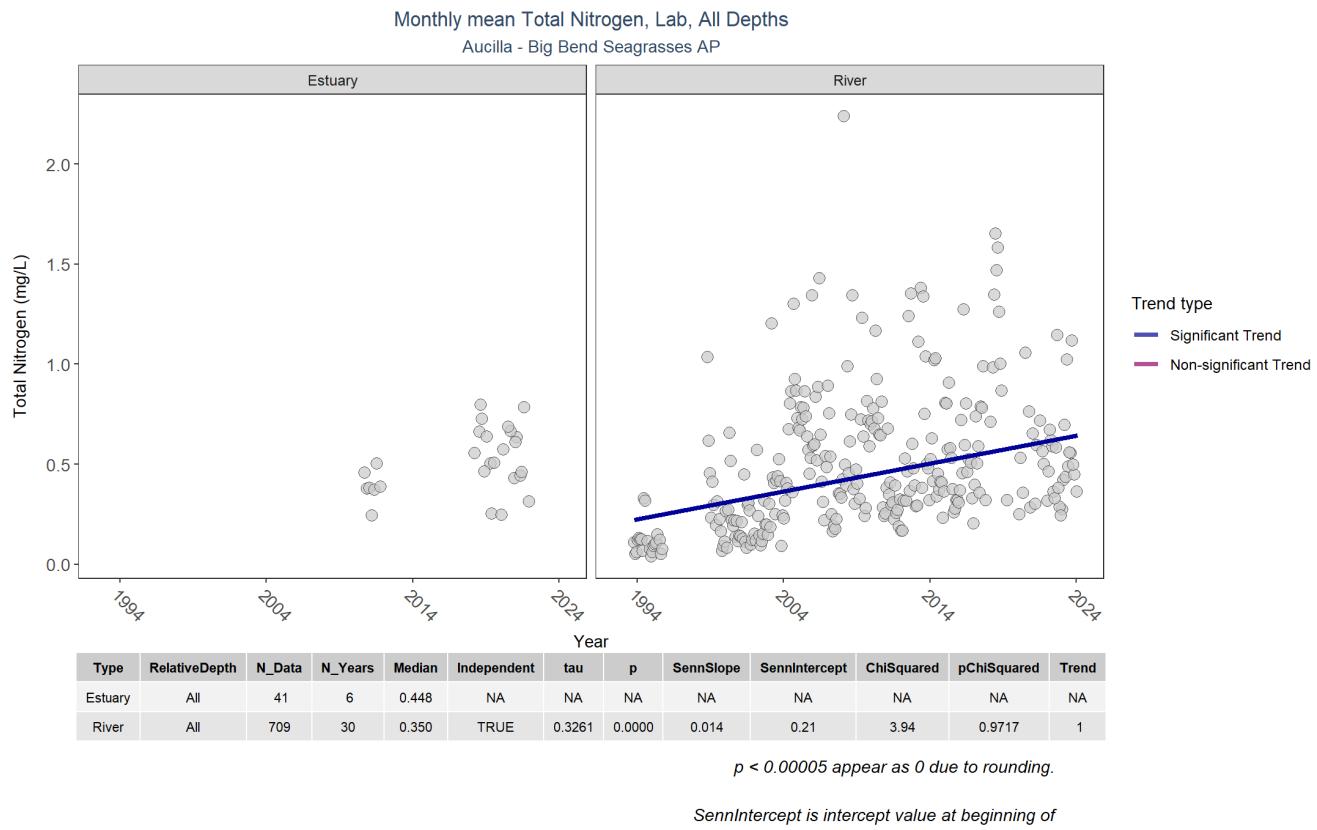
Salinity



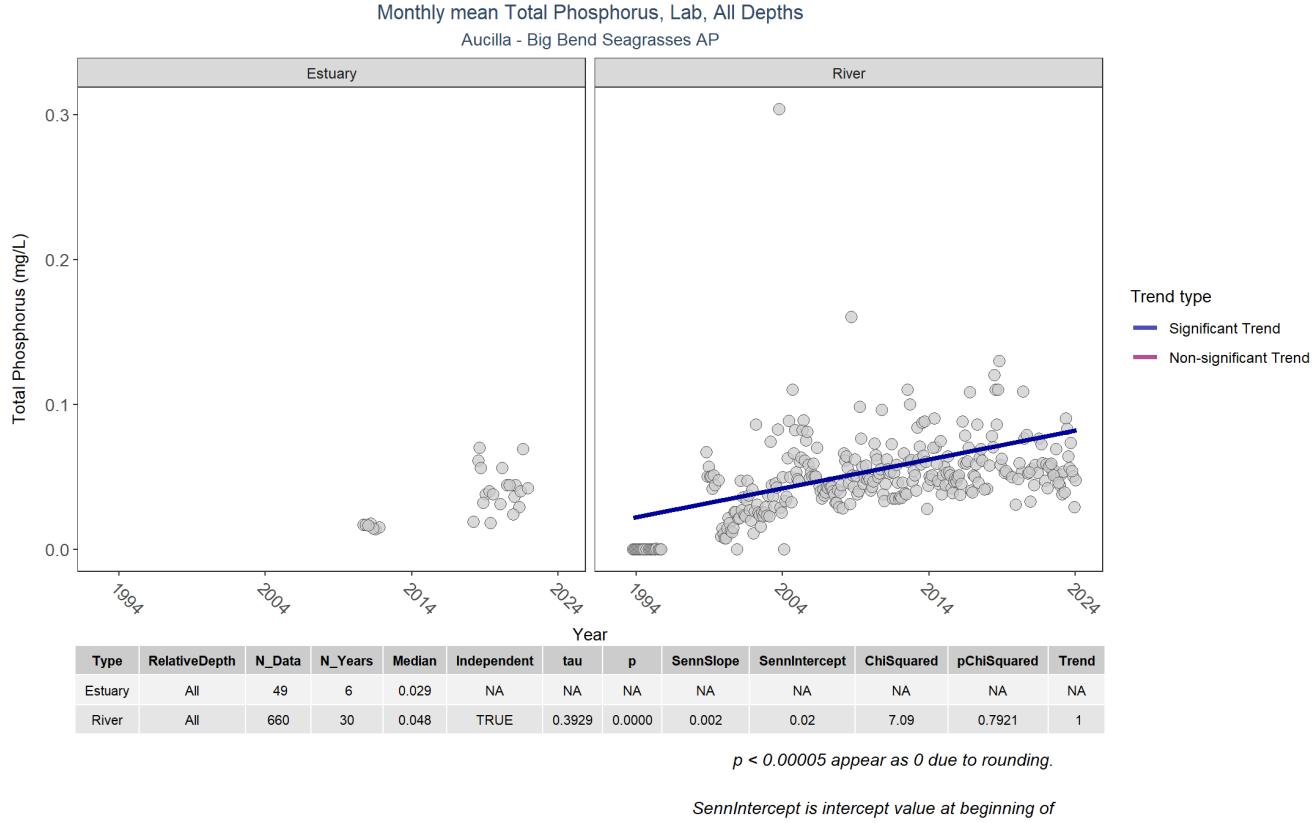
Secchi Depth



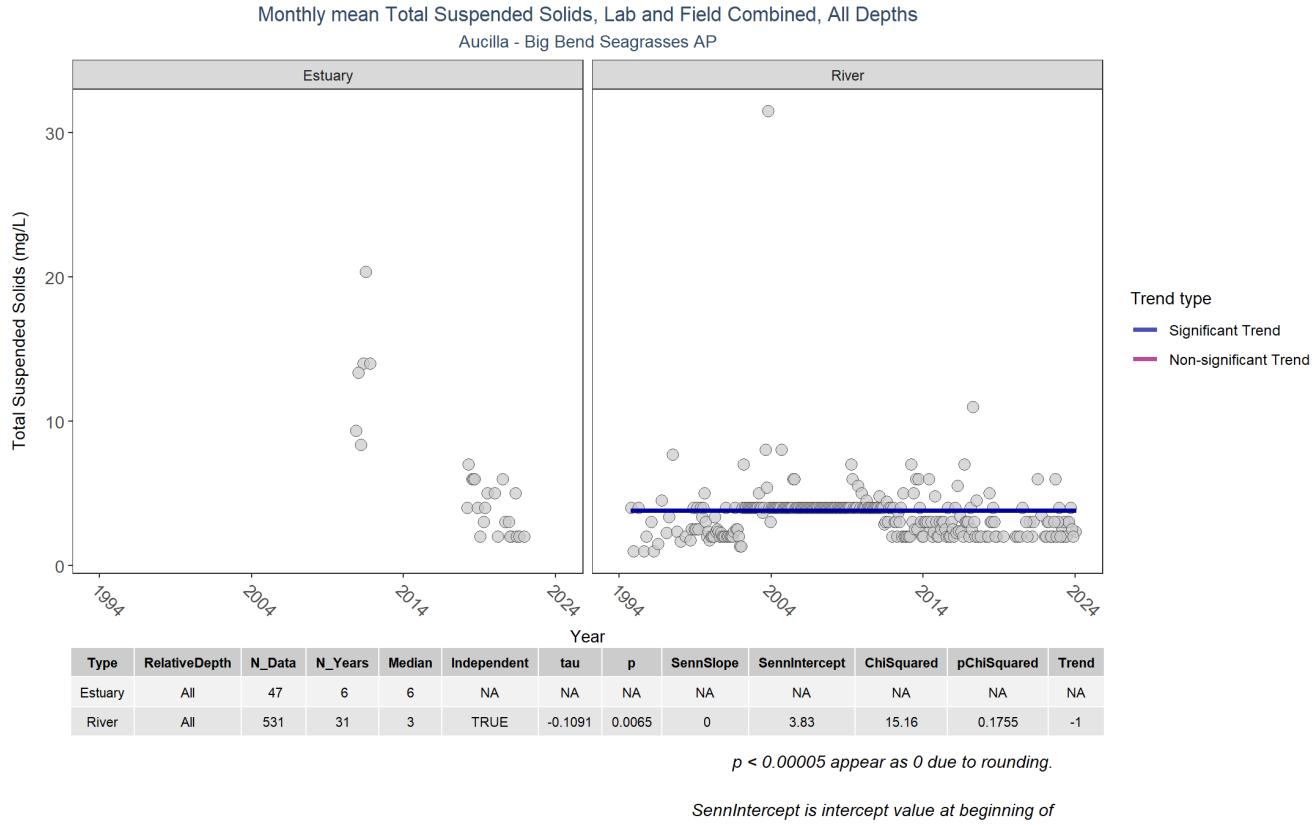
Total Nitrogen



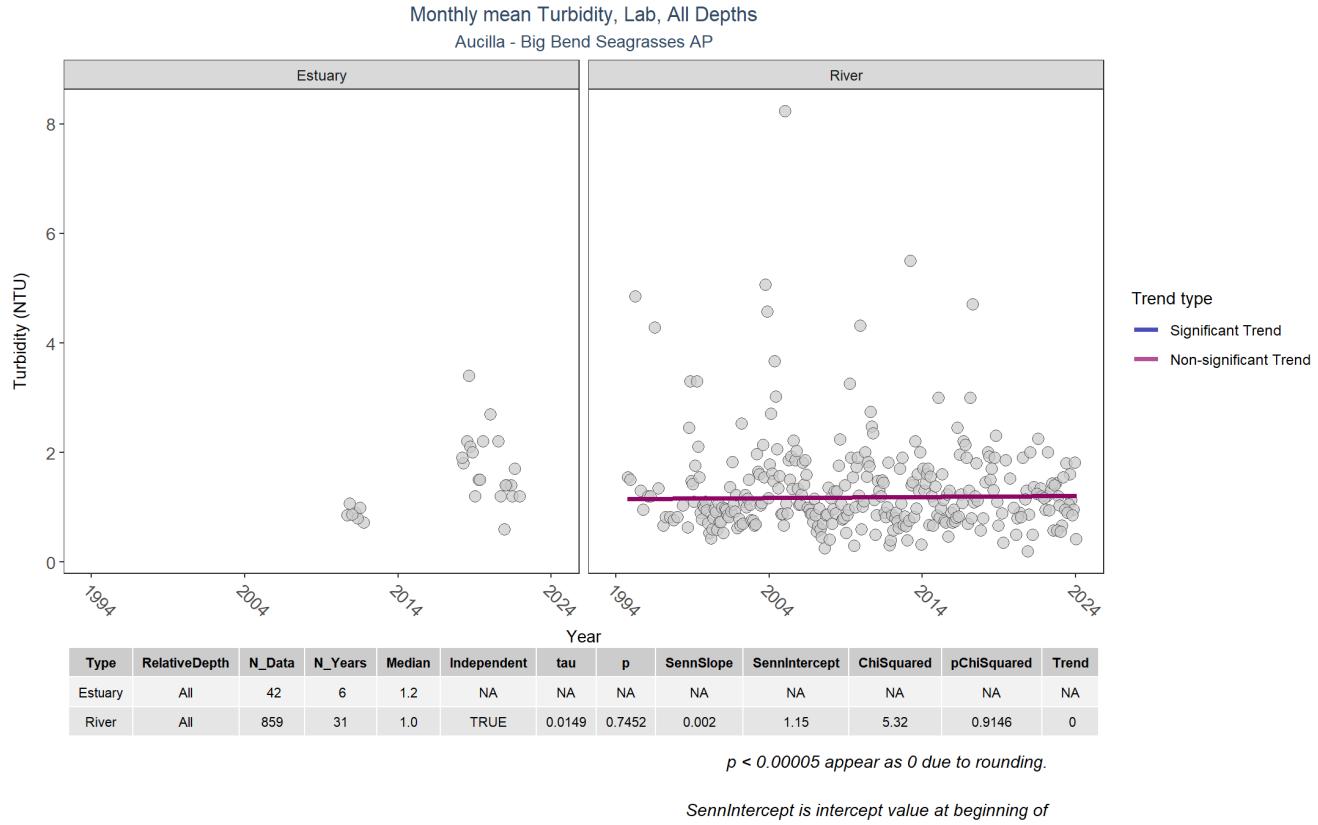
Total Phosphorus



Total Suspended Solids



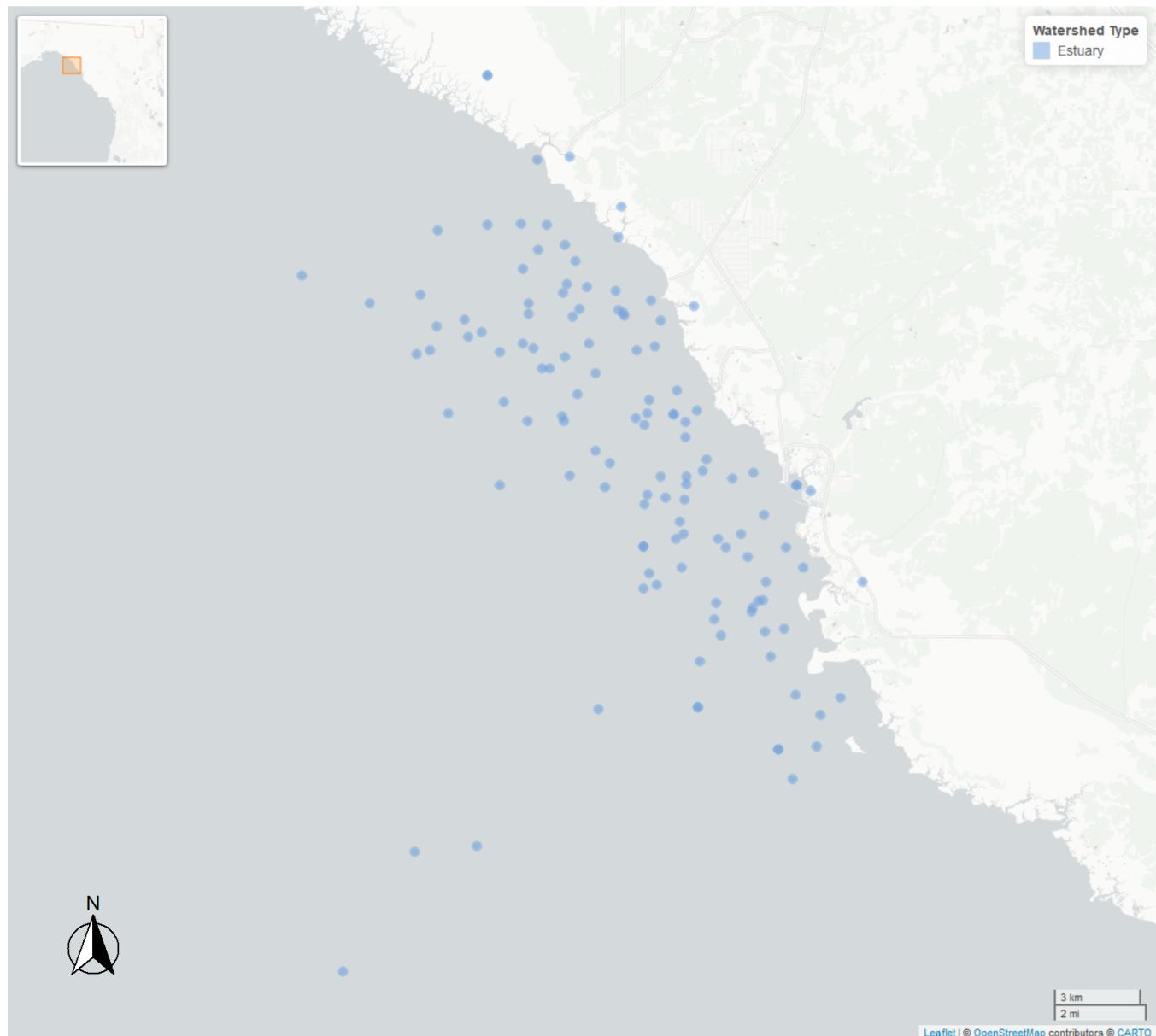
Turbidity



Water Temperature



Keaton Beach



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 17: Seasonal Kendall-Tau Results for Keaton Beach

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2010 - 2024	9	129	FALSE	-	-	-	-
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2010 - 2024	9	153	FALSE	-	-	-	-
Estuary	Colored Dissolved Organic Matter	2022 - 2022	1	1	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1996 - 2024	16	394	TRUE	0.01	5.58	0.6160	0
Estuary	Dissolved Oxygen Saturation	2003 - 2022	2	4	FALSE	-	-	-	-
Estuary	Salinity	1996 - 2024	16	578	TRUE	-0.31	34.95	0.0031	↓
Estuary	Secchi Depth	2002 - 2022	5	241	FALSE	-	-	-	-
Estuary	Total Nitrogen	2010 - 2024	9	132	FALSE	-	-	-	-
Estuary	Total Phosphorus	2010 - 2024	9	144	FALSE	-	-	-	-
Estuary	Total Suspended Solids	2010 - 2022	2	3	FALSE	-	-	-	-
Estuary	Turbidity	2010 - 2024	7	58	FALSE	-	-	-	-
Estuary	Water Temperature	1996 - 2024	18	405	TRUE	-0.05	24.76	0.1633	0
Estuary	pH	1999 - 2024	14	395	TRUE	-0.01	8.25	0.3043	0

Table containing overview of Programs contributing data for Keaton Beach

Table 18: Overview of Program Data for Keaton Beach

ParameterName	ProgramID	n-data-Estuary	n-data-River
Ammonium, Filtered (NH4)	5002	3	-
Chlorophyll a, Corrected for Pheophytin	5002	137	-
Chlorophyll a, Uncorrected for Pheophytin	103	24	-
Chlorophyll a, Uncorrected for Pheophytin	5002	137	-
Colored Dissolved Organic Matter	5002	1	-
Dissolved Oxygen	69	236	-
Dissolved Oxygen	95	11	-
Dissolved Oxygen	103	12	-
Dissolved Oxygen	560	200	-
Dissolved Oxygen	5002	135	-
Dissolved Oxygen Saturation	5002	4	-
NO2+3, Filtered	5002	135	-
Salinity	69	236	-
Salinity	95	18	-
Salinity	560	200	-
Salinity	5002	124	-
Secchi Depth	69	236	-
Secchi Depth	560	50	-
Secchi Depth	5002	5	-
Specific Conductivity	69	236	-
Specific Conductivity	5002	21	-
Total Kjeldahl Nitrogen	5002	140	-
Total Nitrogen	5002	140	-
Total Phosphorus	103	12	-
Total Phosphorus	5002	140	-
Total Suspended Solids	5002	3	-
Turbidity	103	12	-
Turbidity	5002	59	-
Water Temperature	69	236	-
Water Temperature	95	16	-
Water Temperature	103	12	-
Water Temperature	560	200	-
Water Temperature	5002	141	-
pH	69	236	-
pH	95	6	-
pH	103	12	-
pH	560	200	-
pH	5002	141	-

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

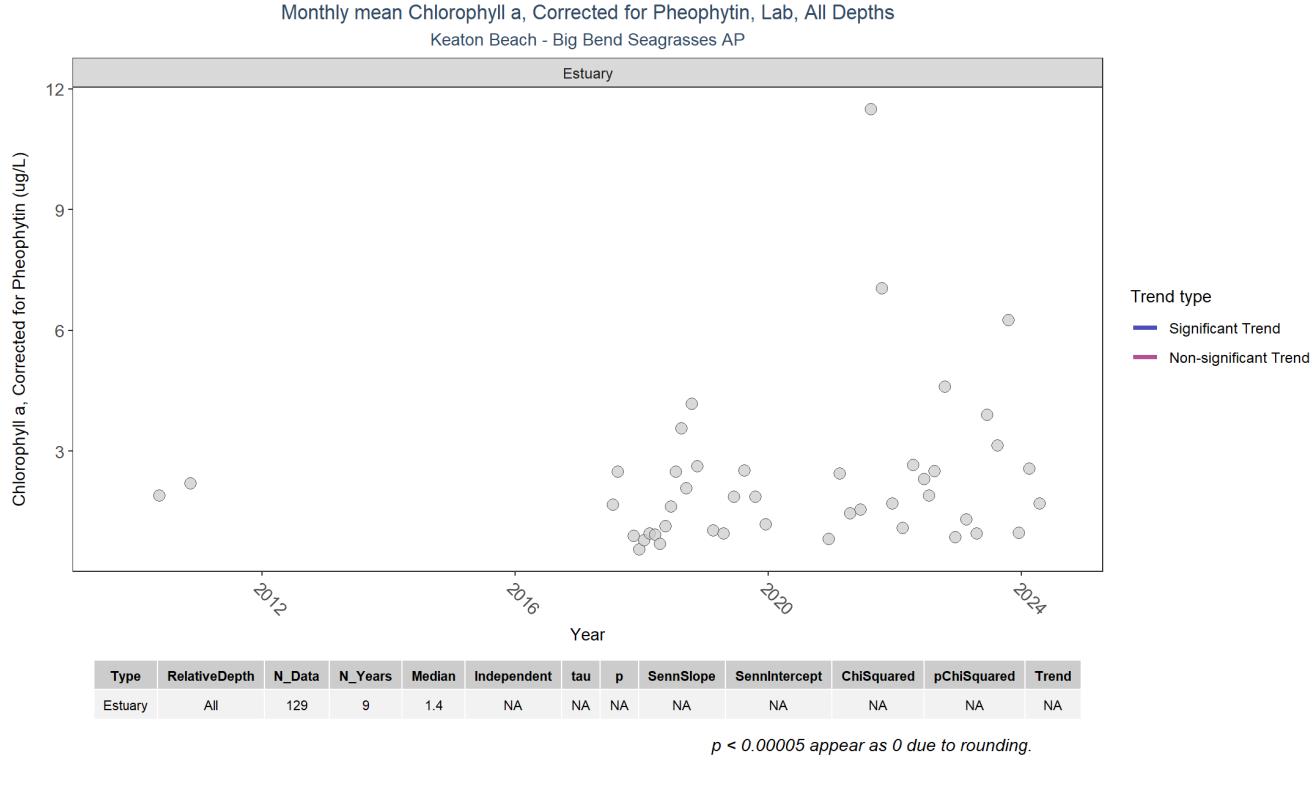
95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

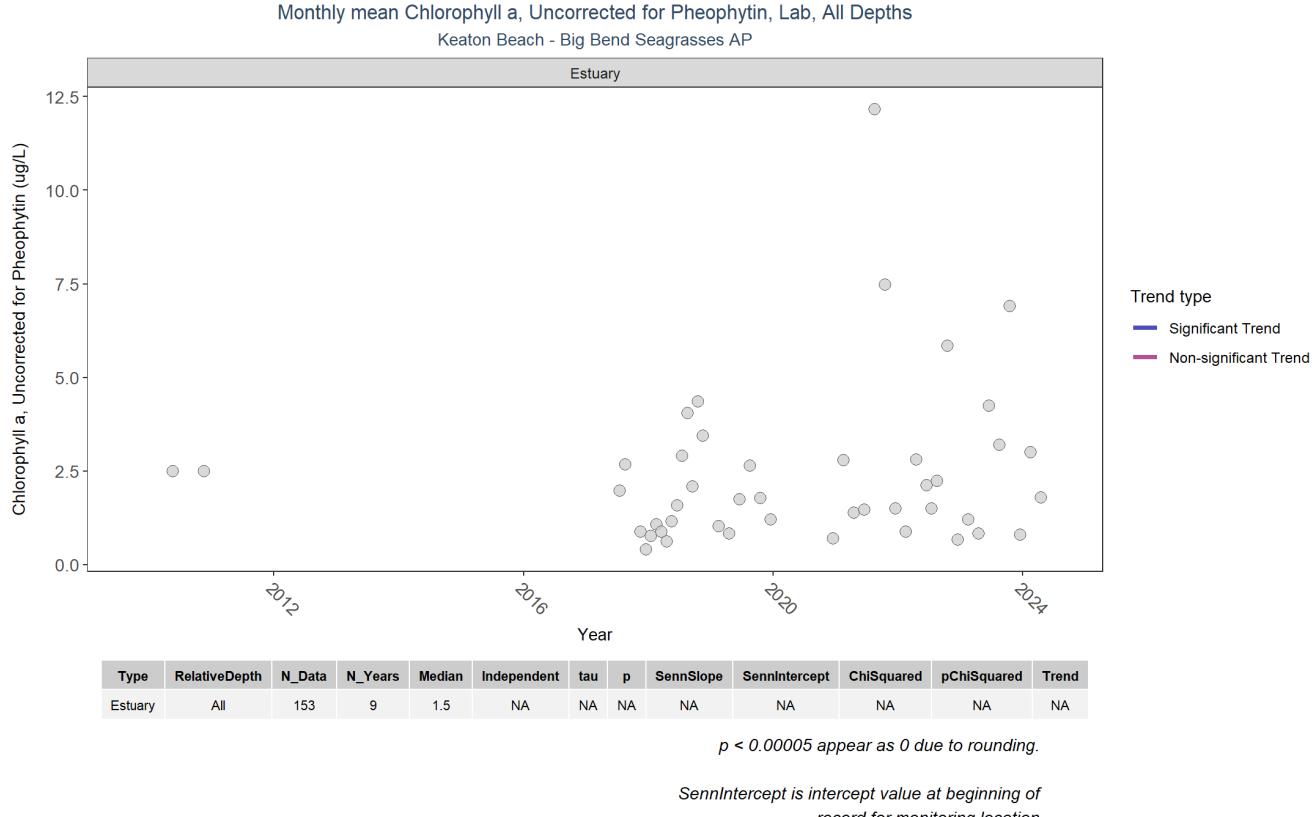
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring -¹¹

5002 - Florida STORET / WIN -²

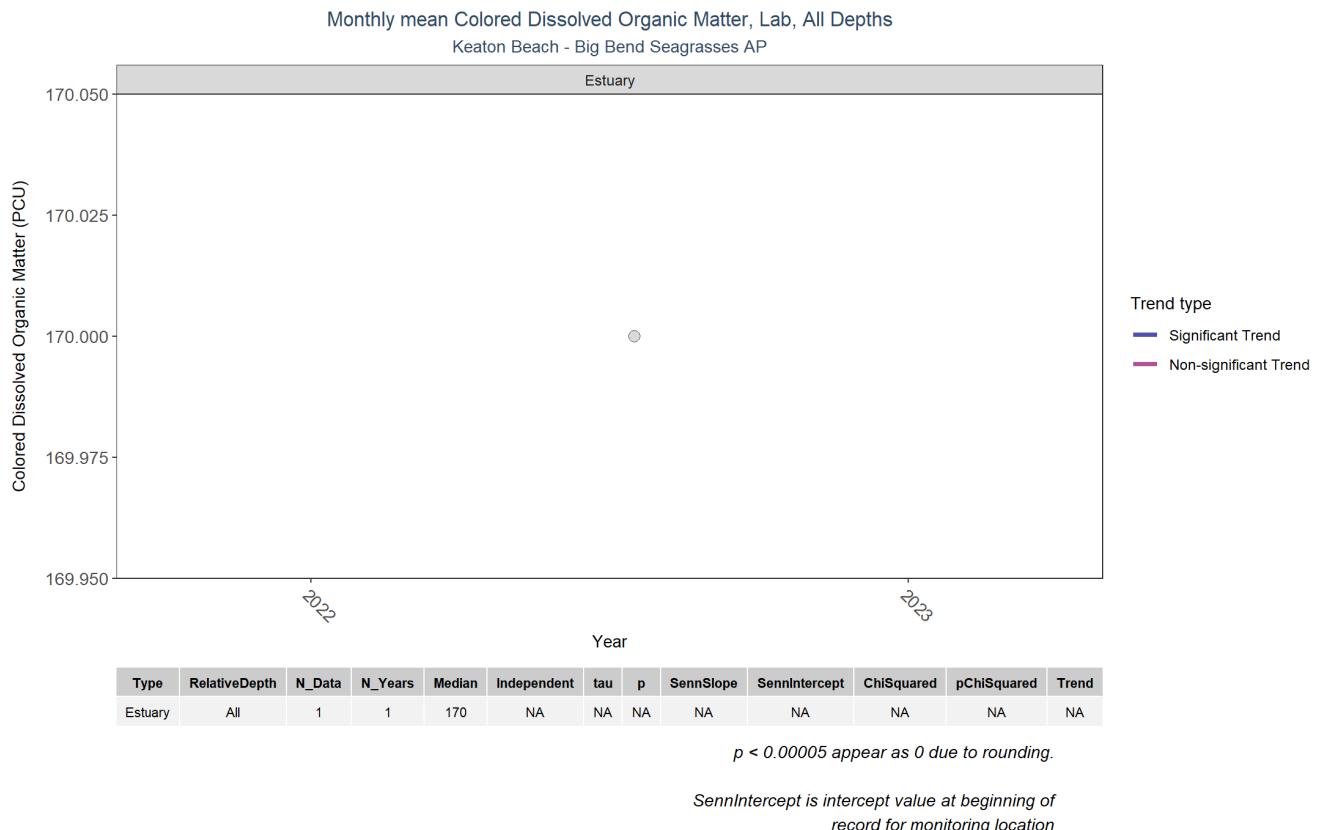
Chlorophyll a, Corrected for Pheophytin



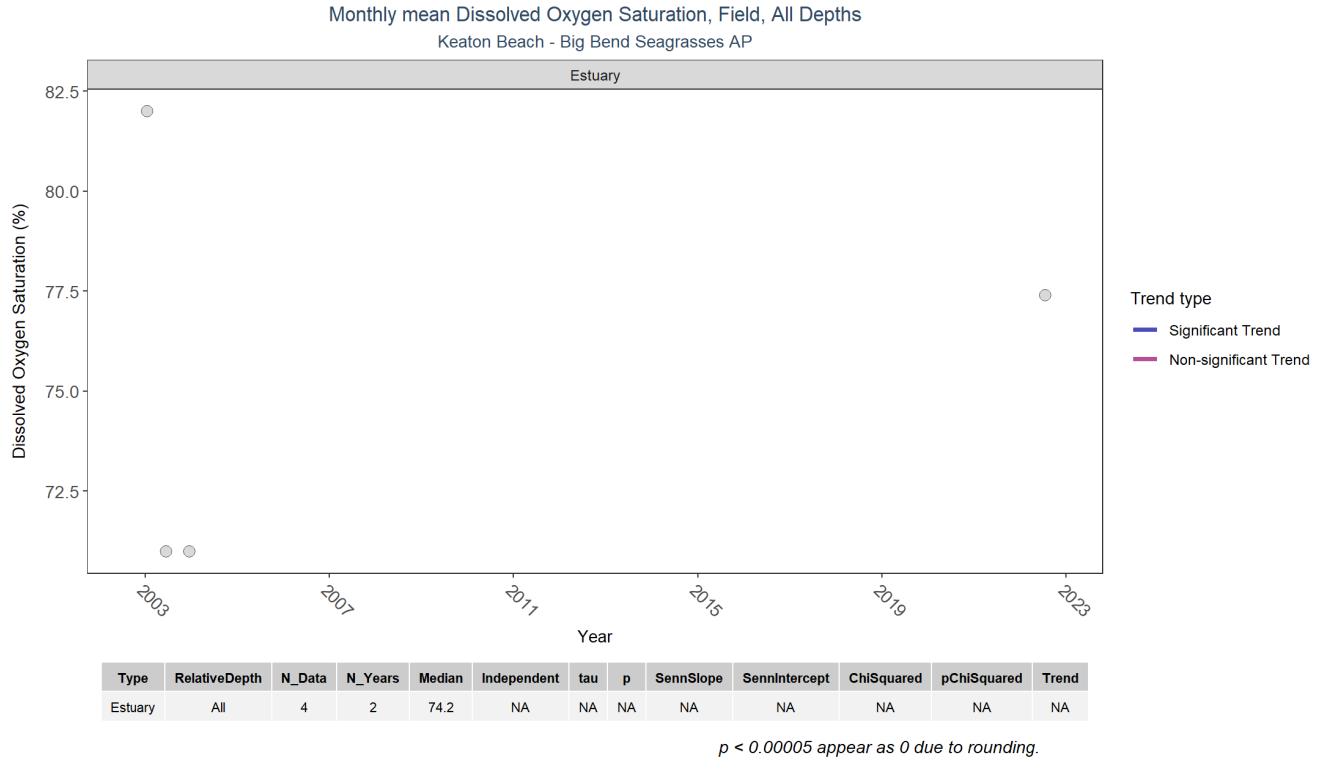
Chlorophyll a, Uncorrected for Pheophytin



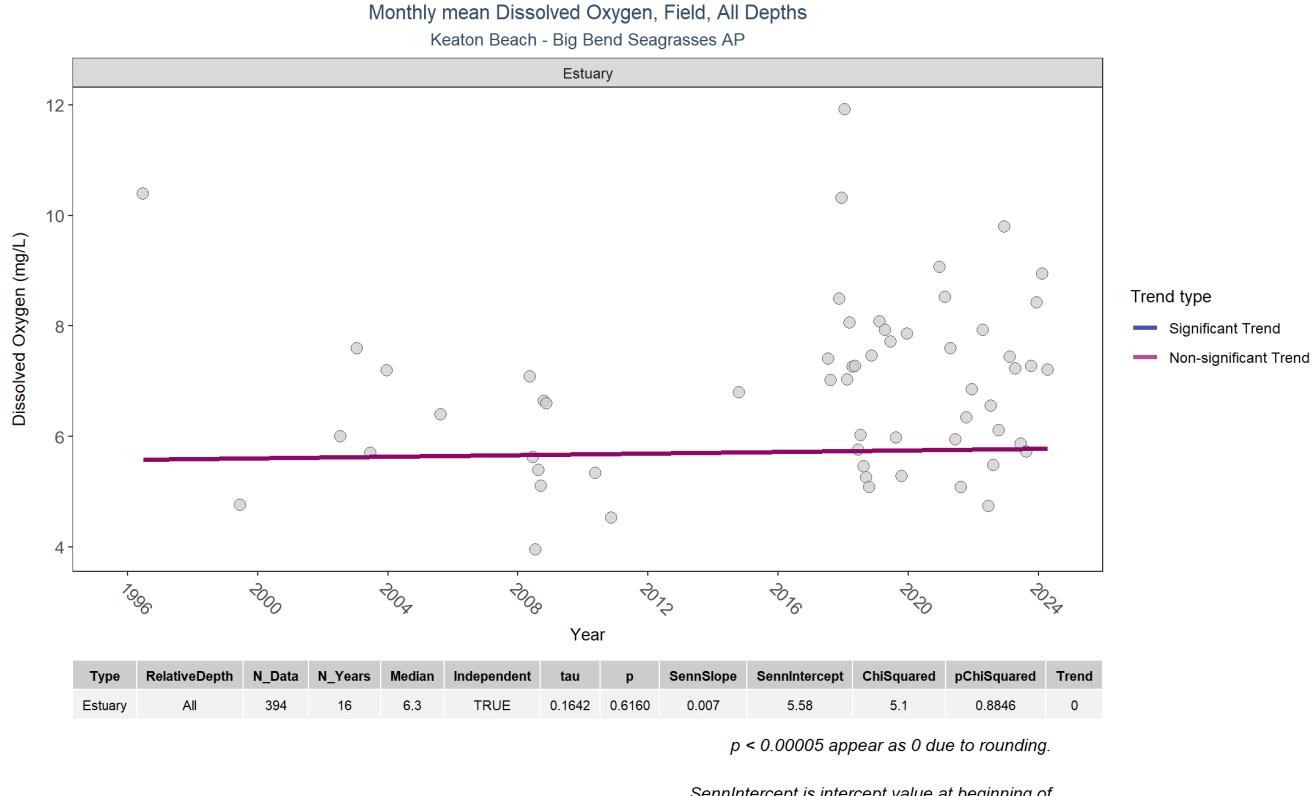
Colored Dissolved Organic Matter



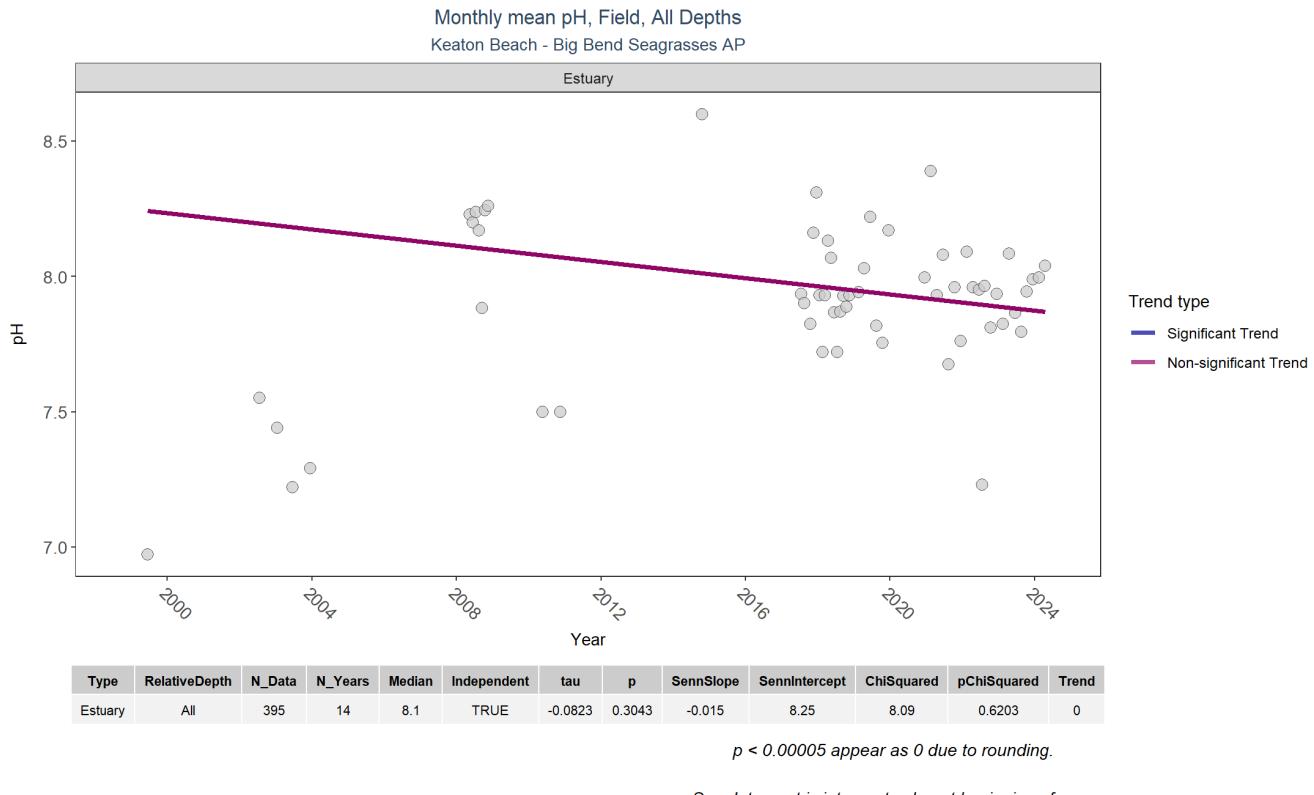
Dissolved Oxygen Saturation



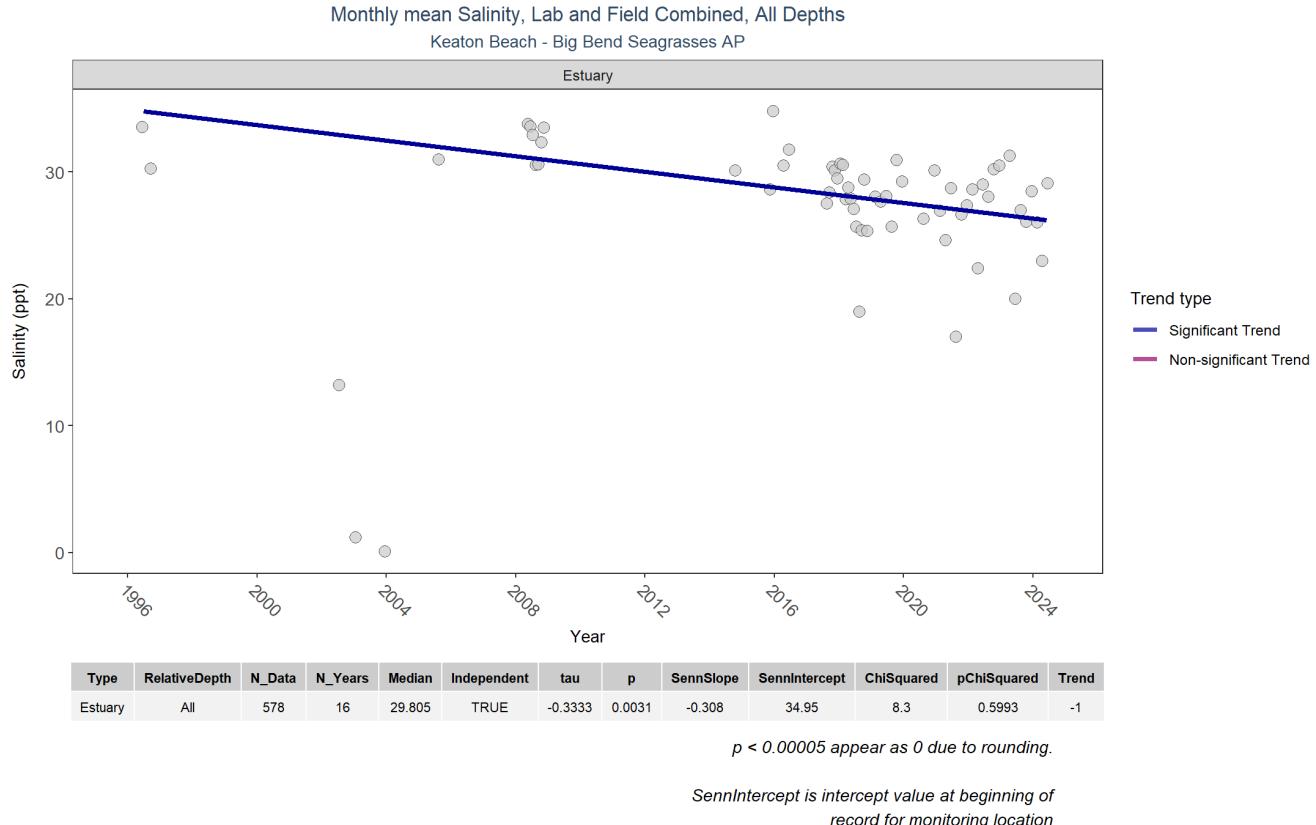
Dissolved Oxygen



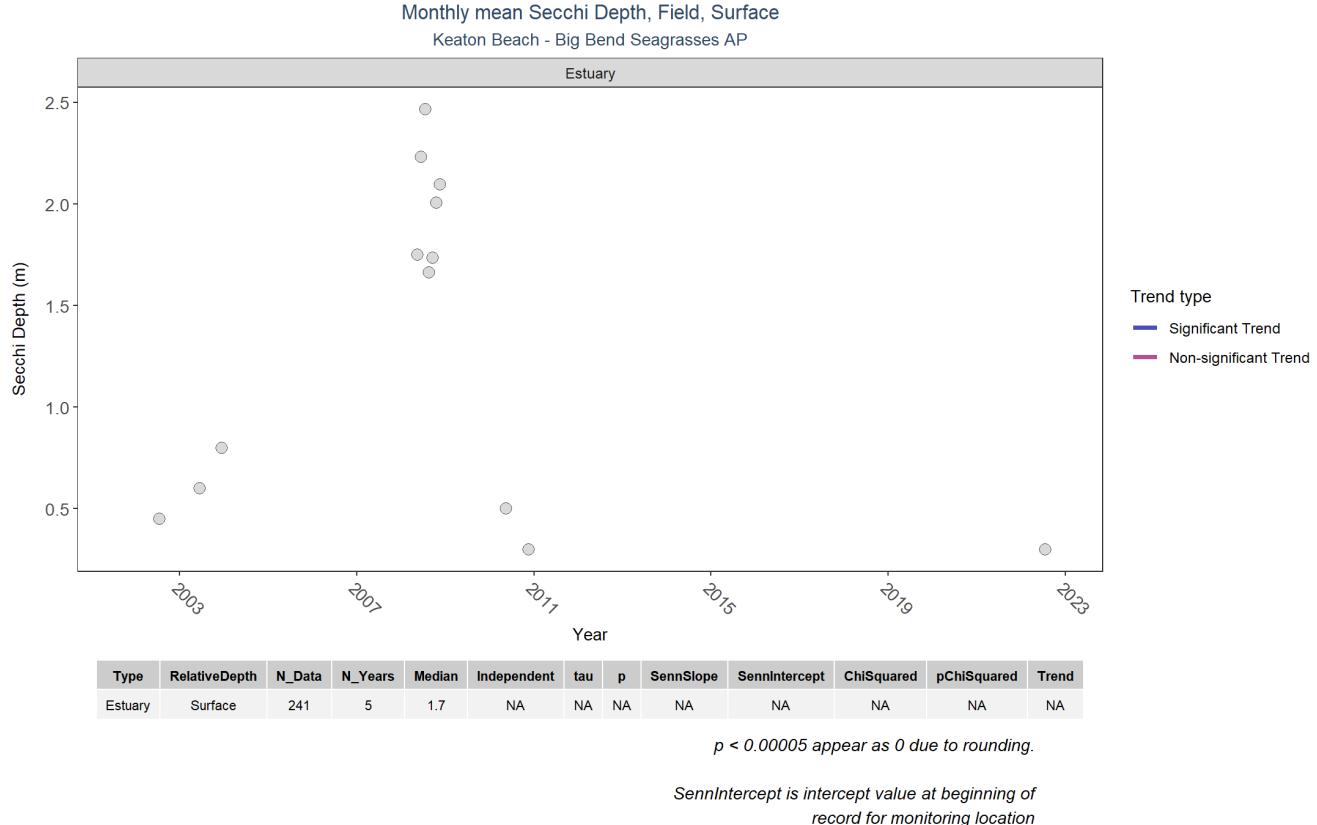
pH



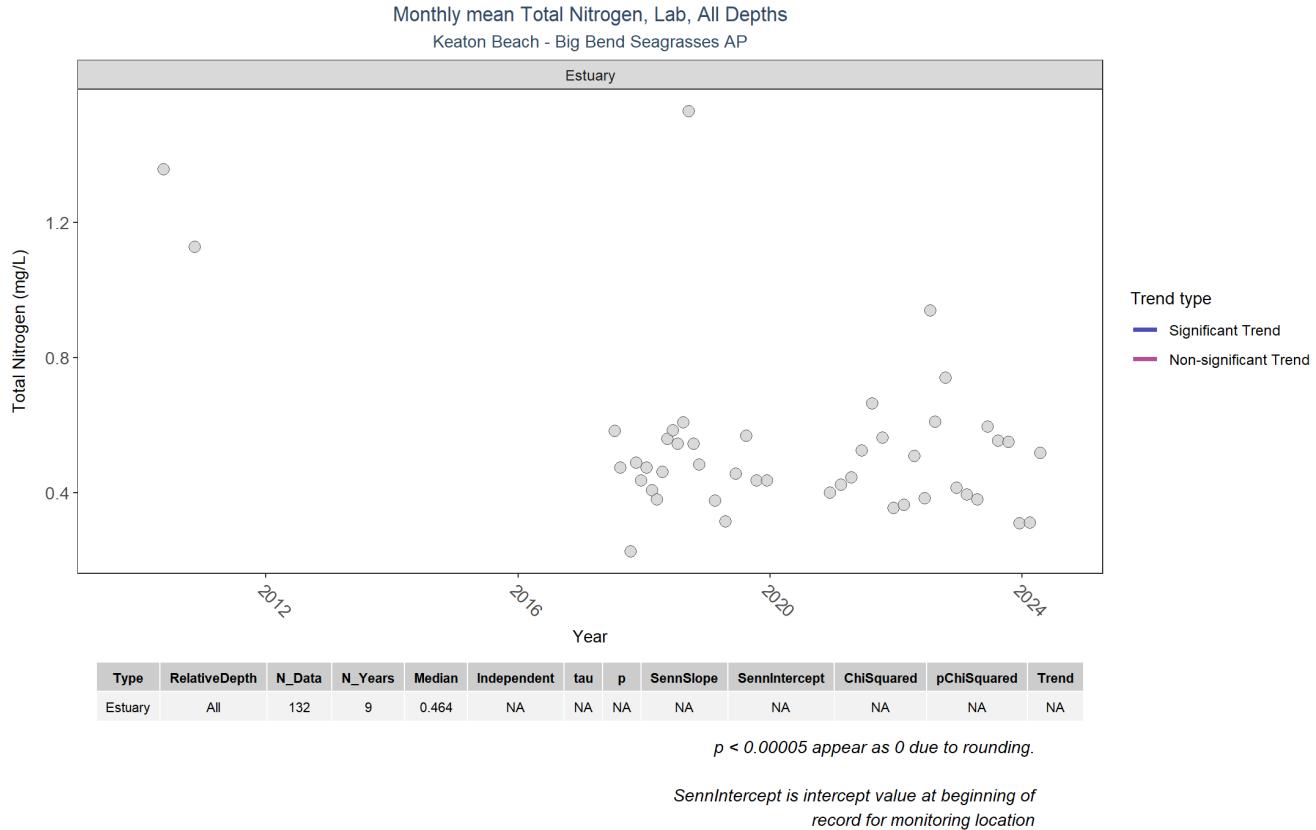
Salinity



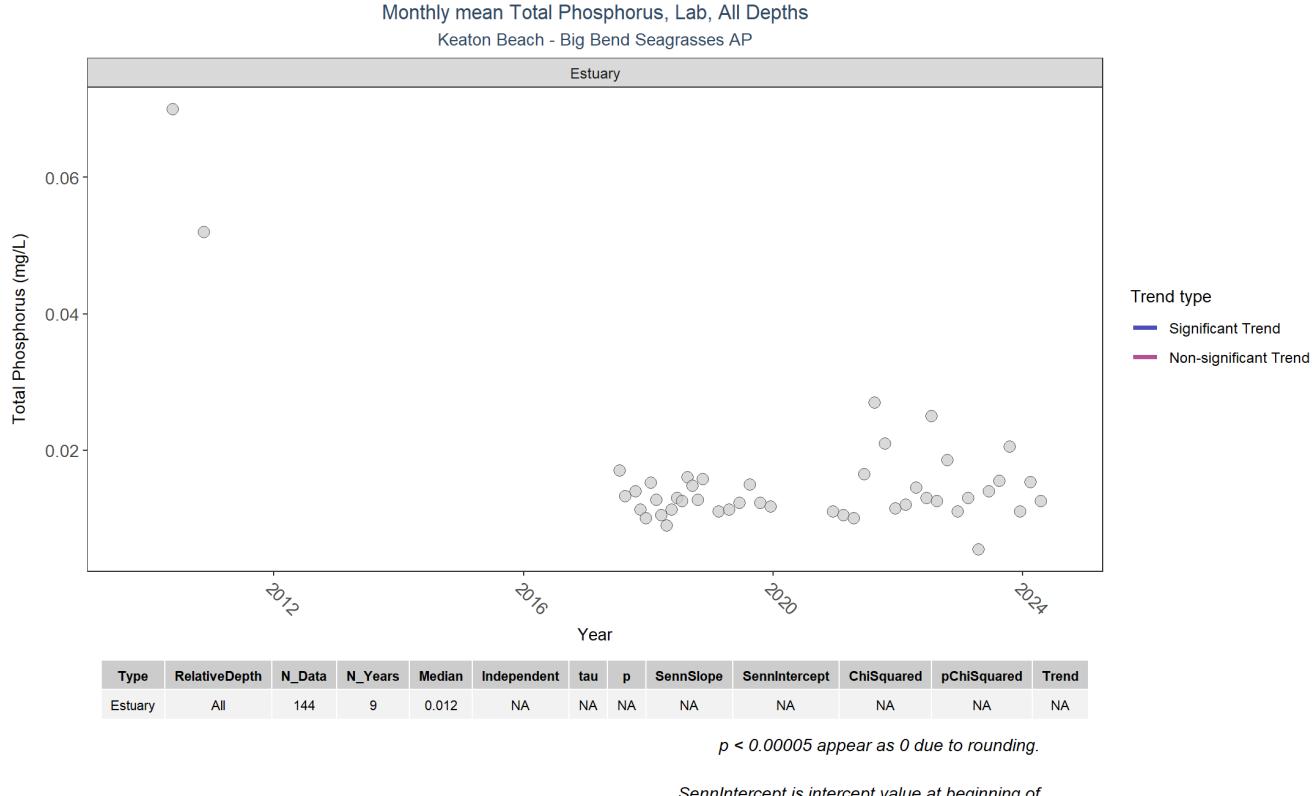
Secchi Depth



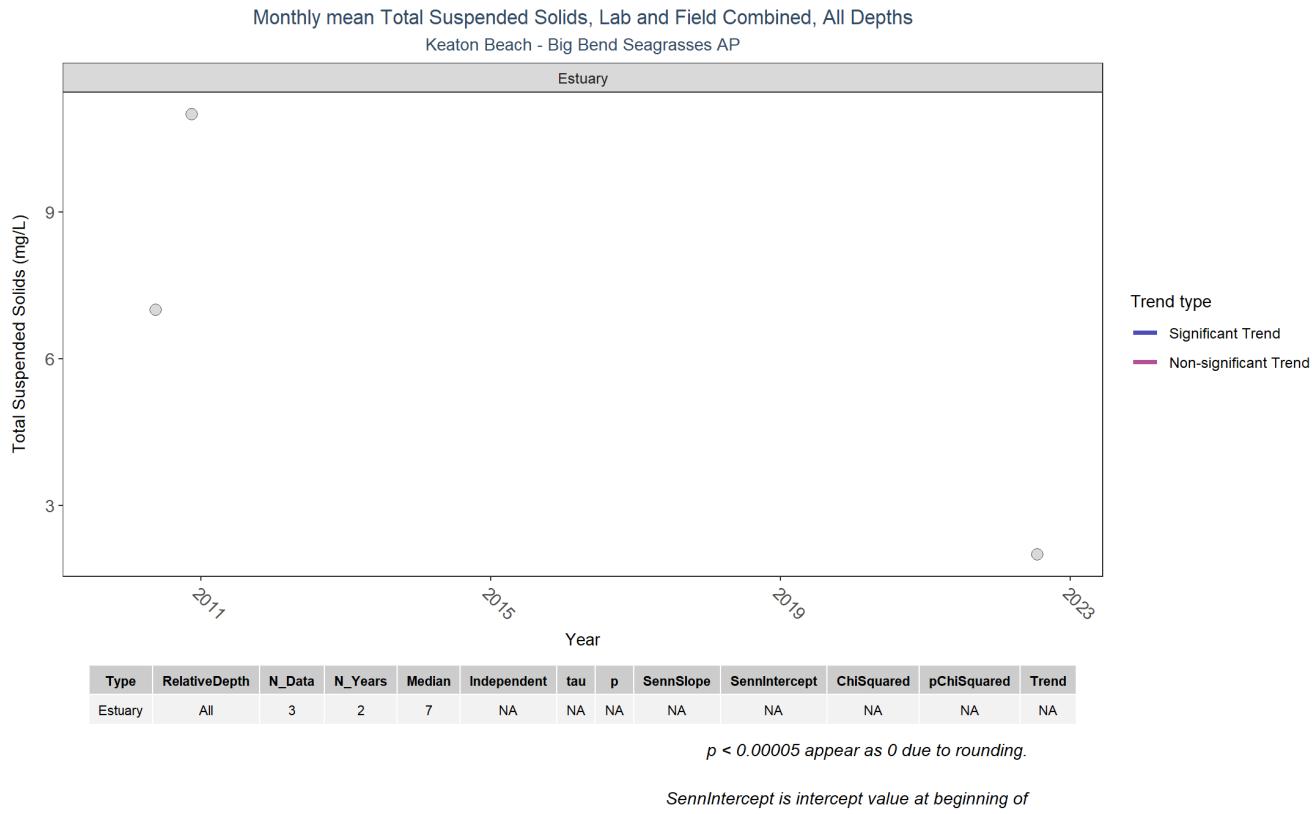
Total Nitrogen



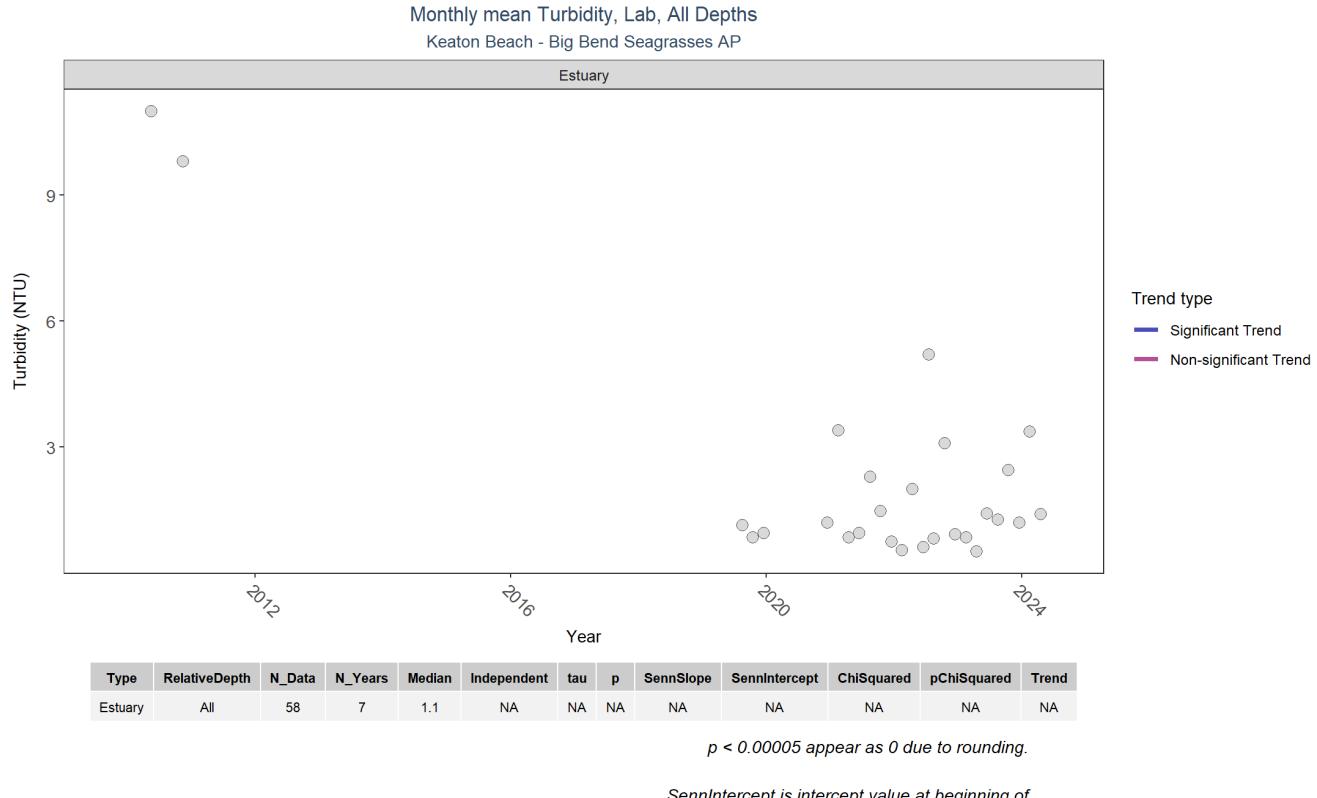
Total Phosphorus



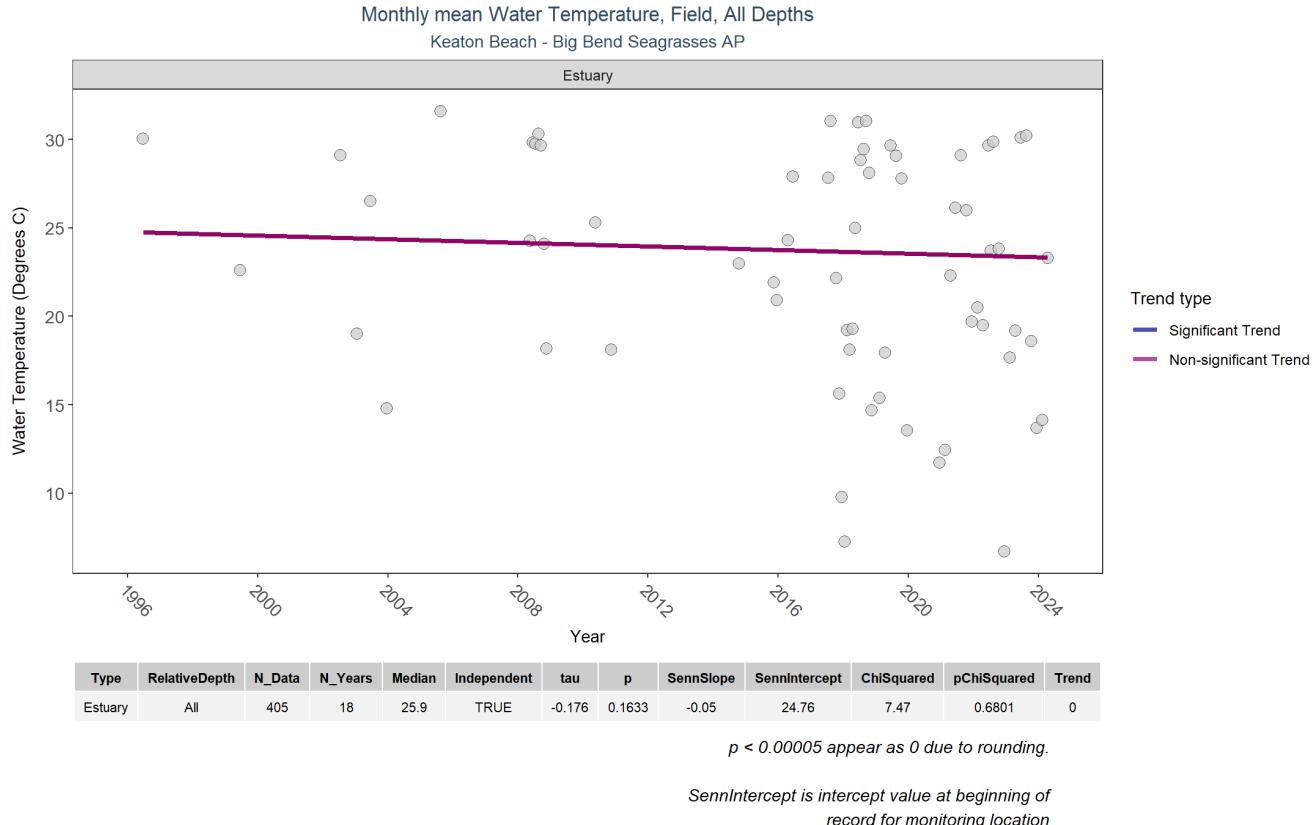
Total Suspended Solids



Turbidity



Water Temperature



Submerged Aquatic Vegetation

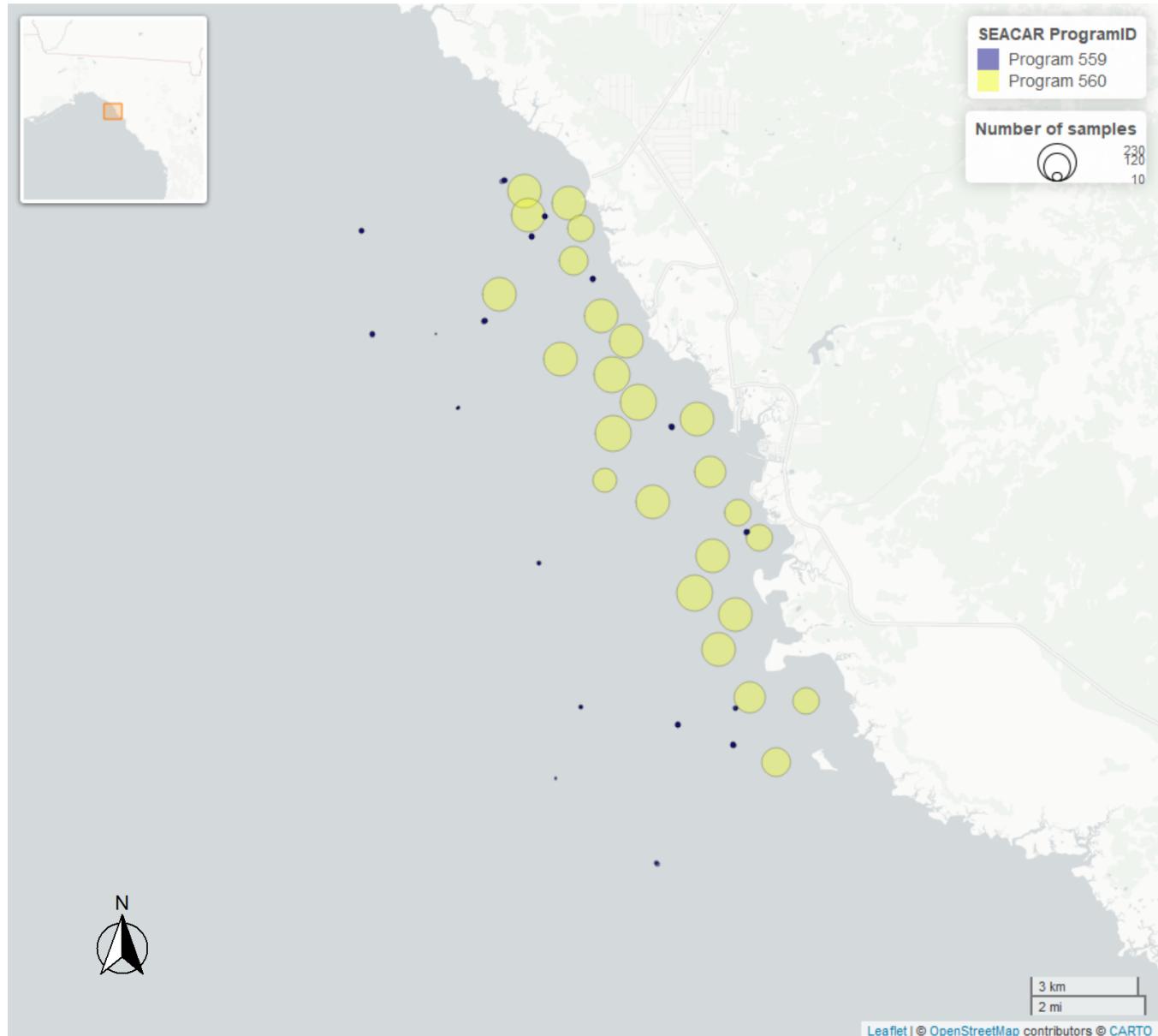


Table 19: Northern Big Bend Seagrass Monitoring - *Program 559*¹²

<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 20: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*¹¹

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
3067	2017	2024	Modified Braun Blanquet	25
1405	2022	2024	Percent Cover	25

Median Percent Cover - Species Trend Table

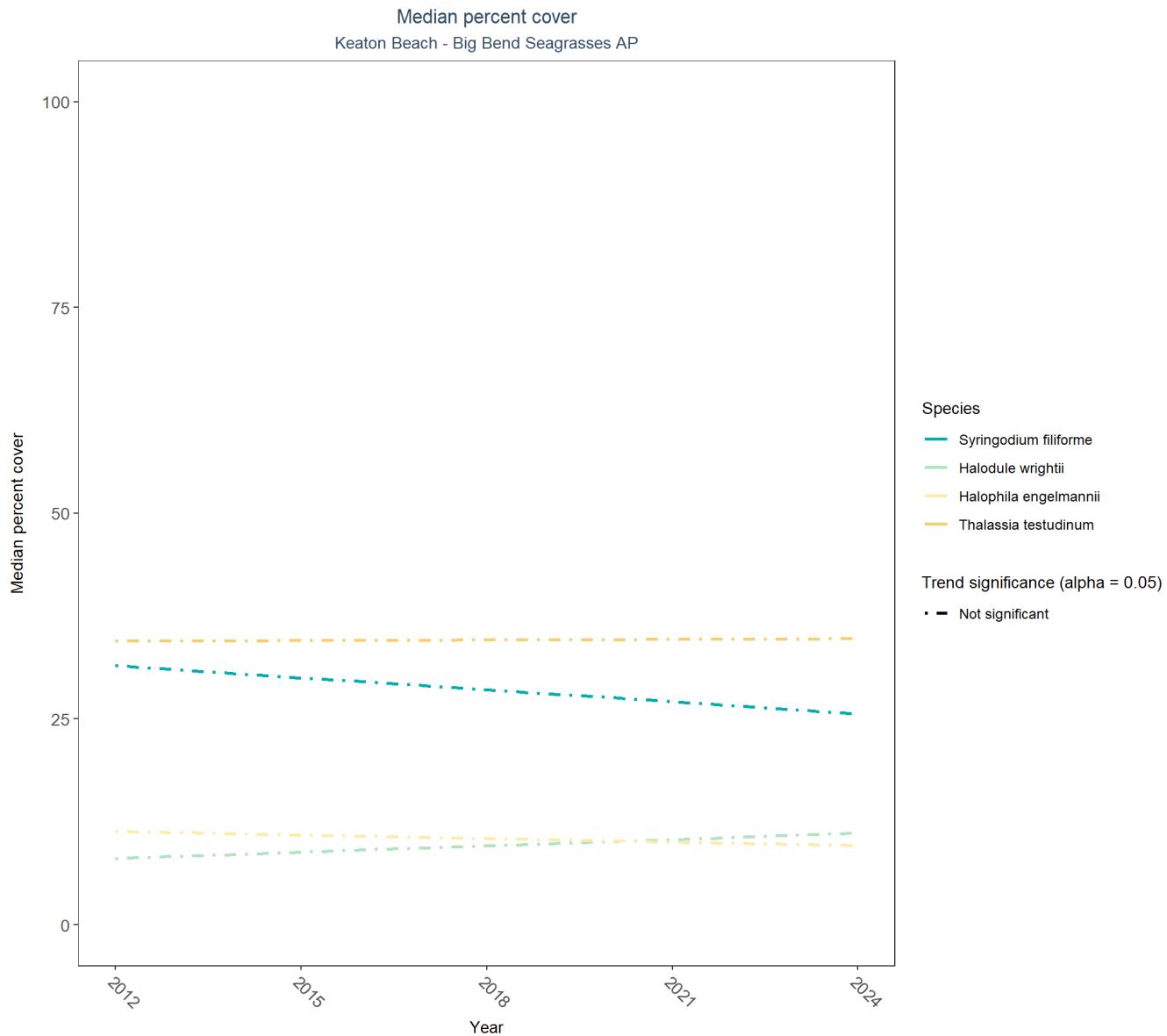
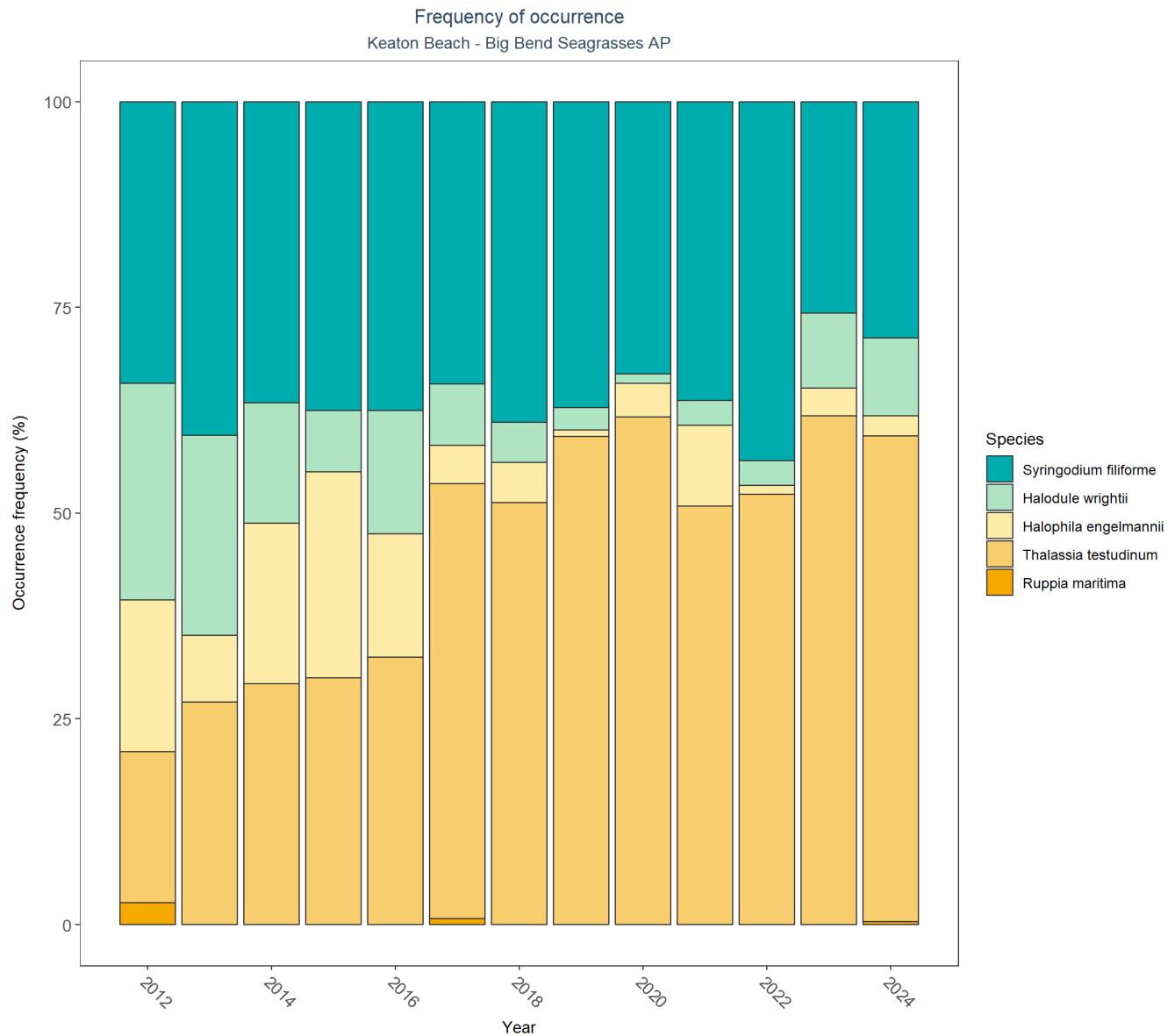


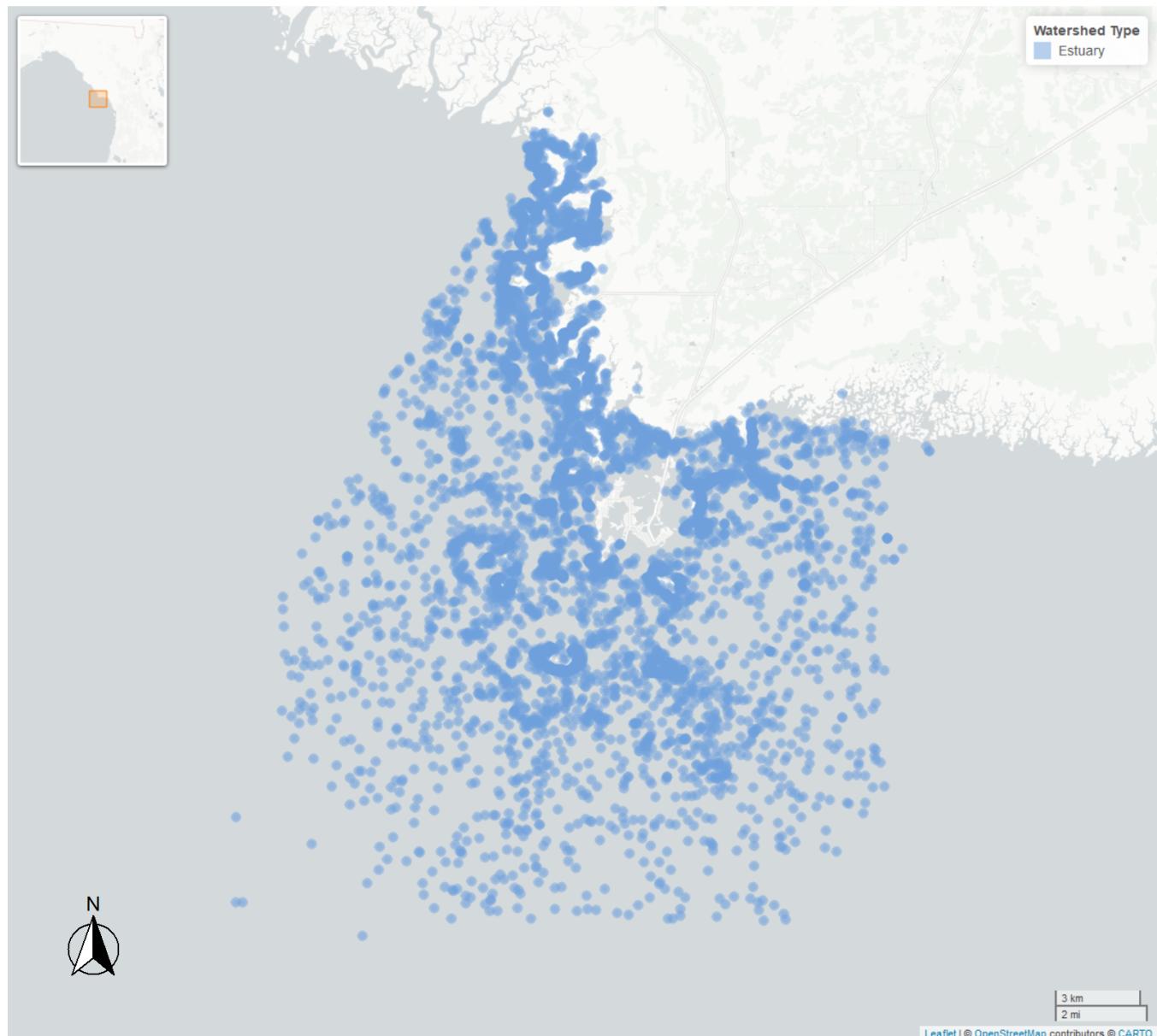
Table 21: Percent Cover Trend Analysis for Keaton Beach

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	Significantly increasing trend	2012 - 2024	-4.6803	1.6565	0.0056
Halodule wrightii	No significant trend	2012 - 2024	4.9694	0.2568	0.3072
Halophila engelmannii	No significant trend	2012 - 2024	13.1211	-0.1463	0.6842
Ruppia maritima	Insufficient data to calculate trend	-	-	-	-
Syringodium filiforme	No significant trend	2012 - 2024	37.3055	-0.4861	0.3933
Thalassia testudinum	No significant trend	2012 - 2024	34.1714	0.0253	0.9479

Frequency of Occurrence Barplots



Cedar Key



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 22: Seasonal Kendall-Tau Results for Cedar Key

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	1997 - 2023	18	446	TRUE	0.00	13.71	1.0000	0
Estuary	Chlorophyll a, Uncorrected for Pheophytin	1997 - 2023	20	493	TRUE	0.22	9.38	0.0045	↑
Estuary	Colored Dissolved Organic Matter	2017 - 2023	7	137	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1985 - 2022	29	49645	TRUE	-0.02	7.23	0.0074	↓
Estuary	Dissolved Oxygen Saturation	2013 - 2016	2	8	FALSE	-	-	-	-
Estuary	Salinity	1967 - 2024	34	52433	TRUE	0.02	23.48	0.3130	0
Estuary	Secchi Depth	1994 - 2023	30	17863	TRUE	-0.01	1.03	0.0100	↓
Estuary	Total Nitrogen	2000 - 2023	17	536	TRUE	-0.02	0.90	0.0002	↓
Estuary	Total Phosphorus	2000 - 2023	15	512	TRUE	0.00	0.04	0.1350	0
Estuary	Total Suspended Solids	1995 - 2013	4	48	FALSE	-	-	-	-
Estuary	Turbidity	1995 - 2022	24	13310	TRUE	0.04	7.94	0.2974	0
Estuary	Water Temperature	1967 - 2022	31	52026	TRUE	0.03	22.53	0.0075	↑
Estuary	pH	1994 - 2022	28	34175	TRUE	-0.01	8.09	0.0000	↓

Table containing overview of Programs contributing data for Cedar Key

Table 23: Overview of Program Data for Cedar Key

ParameterName	ProgramID	n-data-Estuary	n-data-River
Ammonium, Filtered (NH4)	103	2	-
Ammonium, Filtered (NH4)	115	2	-
Ammonium, Filtered (NH4)	5002	179	-
Chlorophyll a, Corrected for Pheophytin	514	96	-
Chlorophyll a, Corrected for Pheophytin	540	104	-
Chlorophyll a, Corrected for Pheophytin	5002	255	-
Chlorophyll a, Uncorrected for Pheophytin	103	56	-
Chlorophyll a, Uncorrected for Pheophytin	115	2	-
Chlorophyll a, Uncorrected for Pheophytin	118	4	-
Chlorophyll a, Uncorrected for Pheophytin	514	142	-
Chlorophyll a, Uncorrected for Pheophytin	540	104	-
Chlorophyll a, Uncorrected for Pheophytin	5002	194	-
Colored Dissolved Organic Matter	103	6	-
Colored Dissolved Organic Matter	514	73	-
Colored Dissolved Organic Matter	540	71	-
Dissolved Oxygen	69	17567	-
Dissolved Oxygen	95	394	-
Dissolved Oxygen	103	6	-
Dissolved Oxygen	115	5	-
Dissolved Oxygen	118	2	-
Dissolved Oxygen	540	72	-
Dissolved Oxygen	560	435	-
Dissolved Oxygen	5002	31599	-
Dissolved Oxygen Saturation	95	1	-
Dissolved Oxygen Saturation	5002	7	-
NO2+3, Filtered	115	2	-
NO2+3, Filtered	540	106	-
NO2+3, Filtered	5002	341	-
Nitrate (NO3)	5002	1	-
Phosphate, Filtered (PO4)	103	2	-
Phosphate, Filtered (PO4)	115	2	-
Phosphate, Filtered (PO4)	5002	176	-
Salinity	69	17610	-
Salinity	95	442	-
Salinity	115	5	-
Salinity	540	88	-
Salinity	560	435	-
Salinity	5002	33853	-
Secchi Depth	69	17626	-
Secchi Depth	115	2	-
Secchi Depth	514	214	-
Secchi Depth	560	50	-
Secchi Depth	5002	21	-
Specific Conductivity	69	17496	-
Specific Conductivity	95	5	-
Specific Conductivity	514	73	-
Specific Conductivity	5002	364	-
Total Kjeldahl Nitrogen	540	106	-
Total Kjeldahl Nitrogen	5002	346	-
Total Nitrogen	103	17	-

Total Nitrogen	115	2	-
Total Nitrogen	118	1	-
Total Nitrogen	514	214	-
Total Nitrogen	540	106	-
Total Nitrogen	5002	207	-
Total Phosphorus	103	38	-
Total Phosphorus	115	2	-
Total Phosphorus	118	1	-
Total Phosphorus	514	212	-
Total Phosphorus	540	105	-
Total Phosphorus	5002	165	-
Total Suspended Solids	5002	48	-
Turbidity	103	10	-
Turbidity	540	35	-
Turbidity	5002	13278	-
Water Temperature	69	17626	-
Water Temperature	95	422	-
Water Temperature	103	6	-
Water Temperature	115	5	-
Water Temperature	540	88	-
Water Temperature	560	436	-
Water Temperature	5002	33879	-
pH	69	17543	-
pH	95	202	-
pH	103	4	-
pH	115	5	-
pH	540	56	-
pH	560	392	-
pH	5002	16365	-

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

115 - Environmental Monitoring Assessment Program -⁷

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

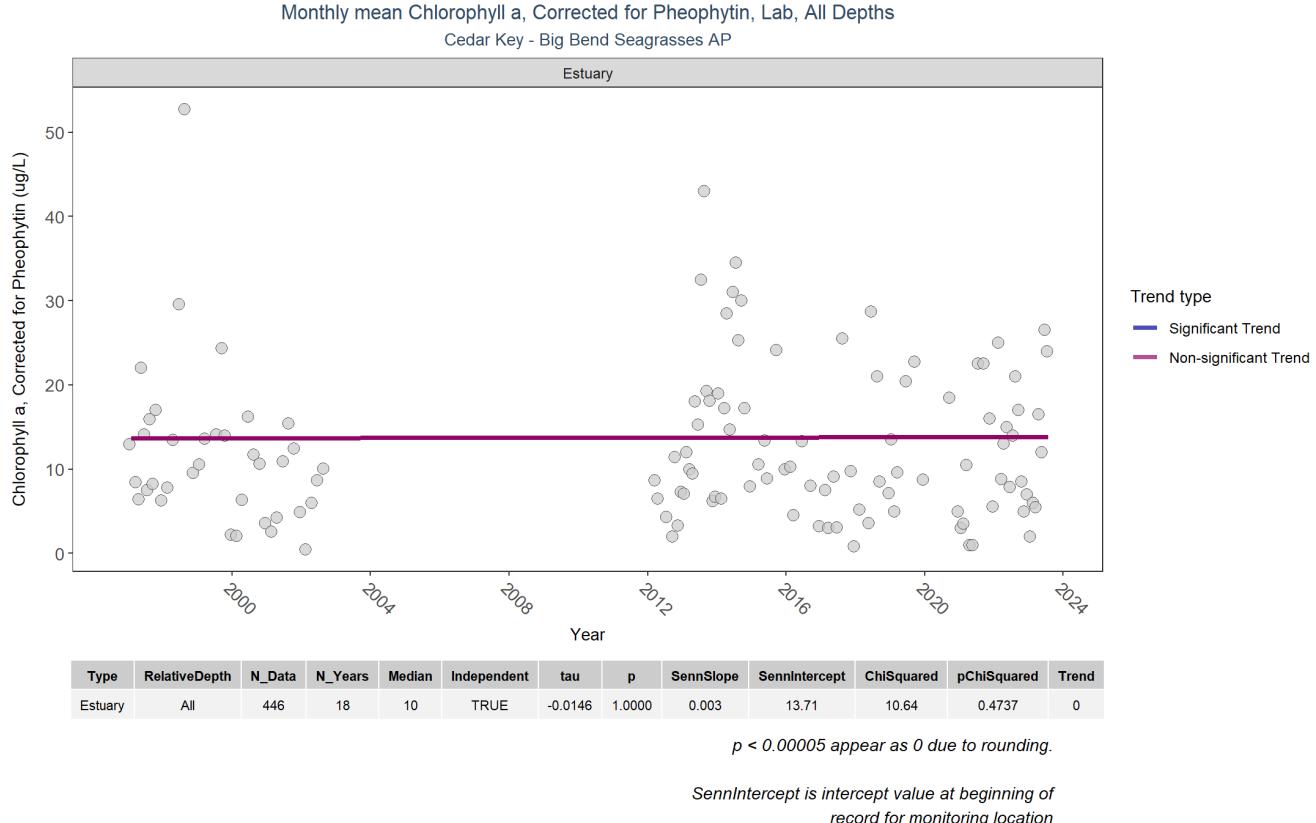
514 - Florida LAKEWATCH Program -⁸

540 - Shellfish Harvest Area Classification Program -¹³

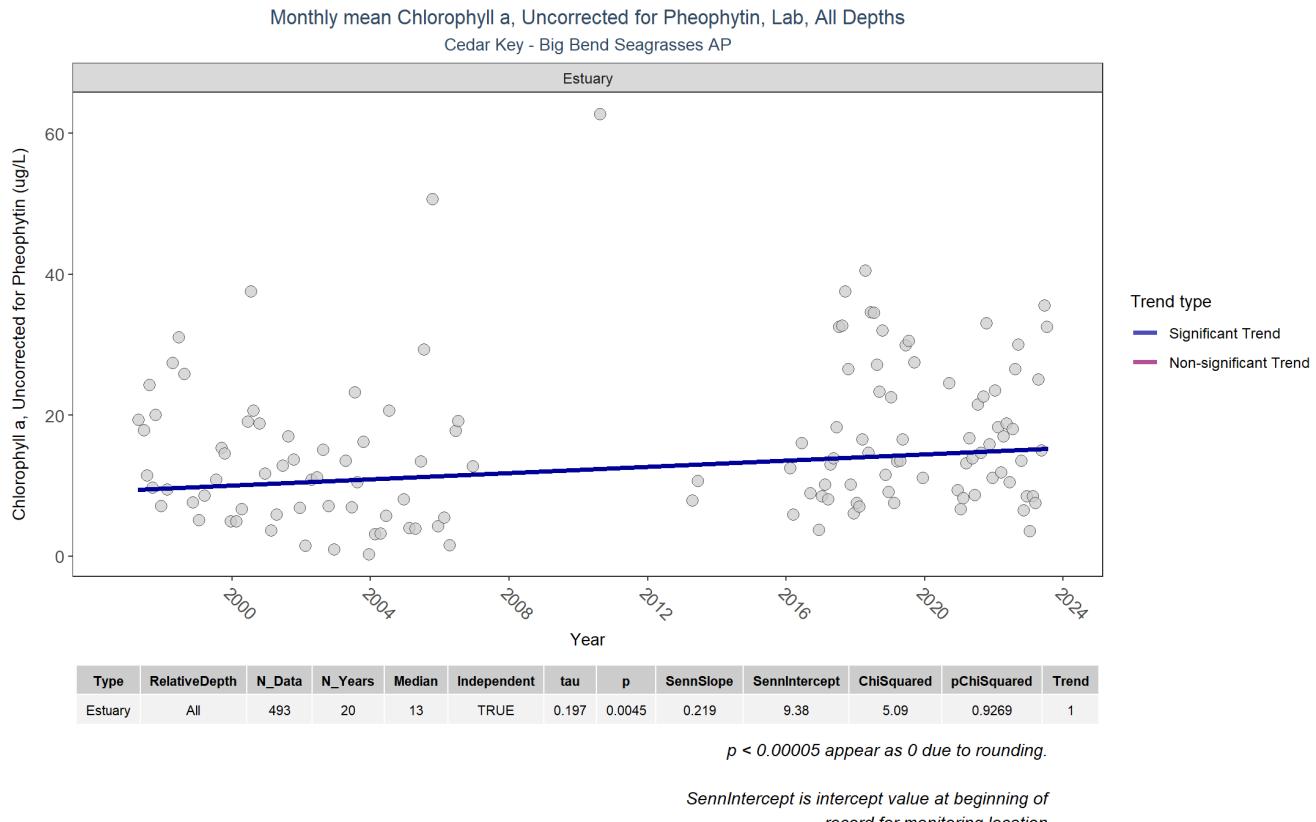
560 - Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring -¹¹

5002 - Florida STORET / WIN -²

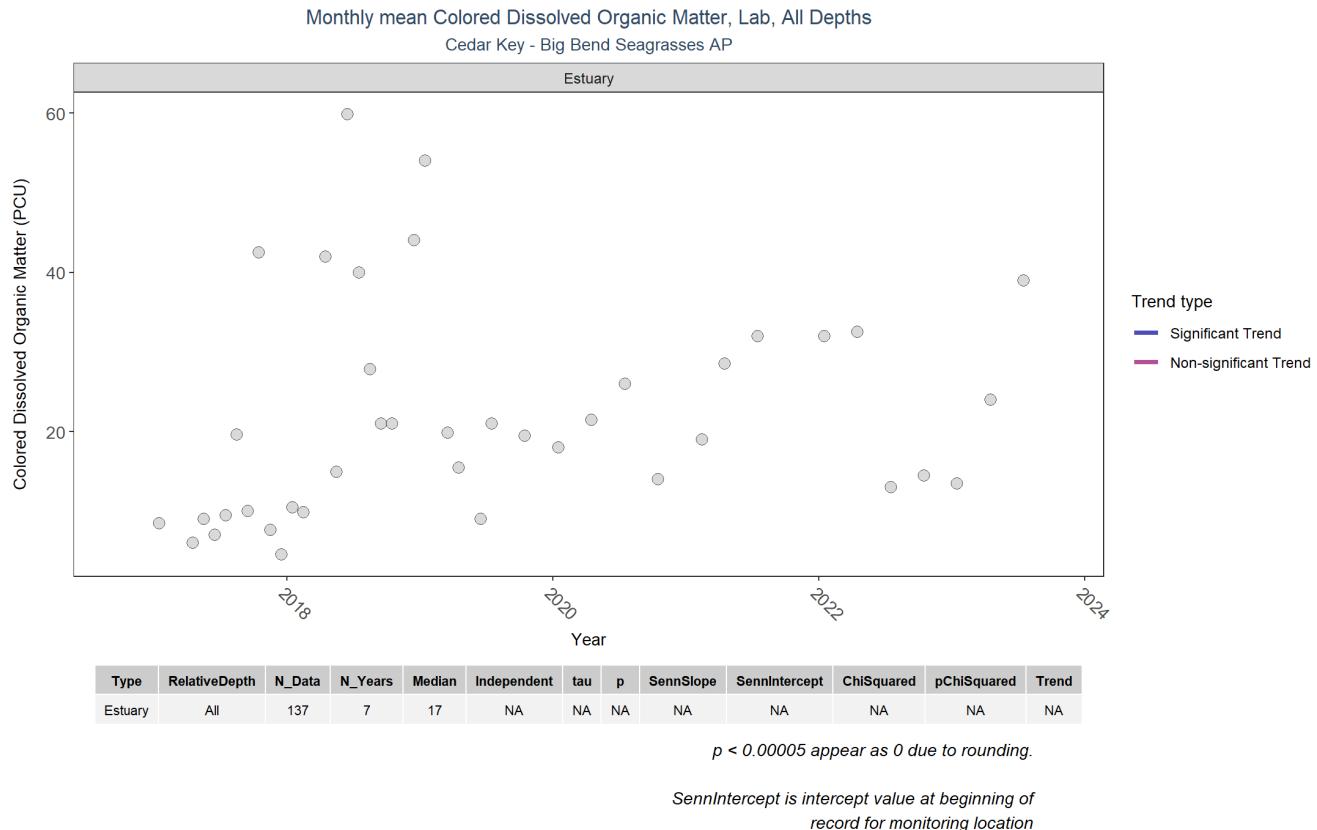
Chlorophyll a, Corrected for Pheophytin



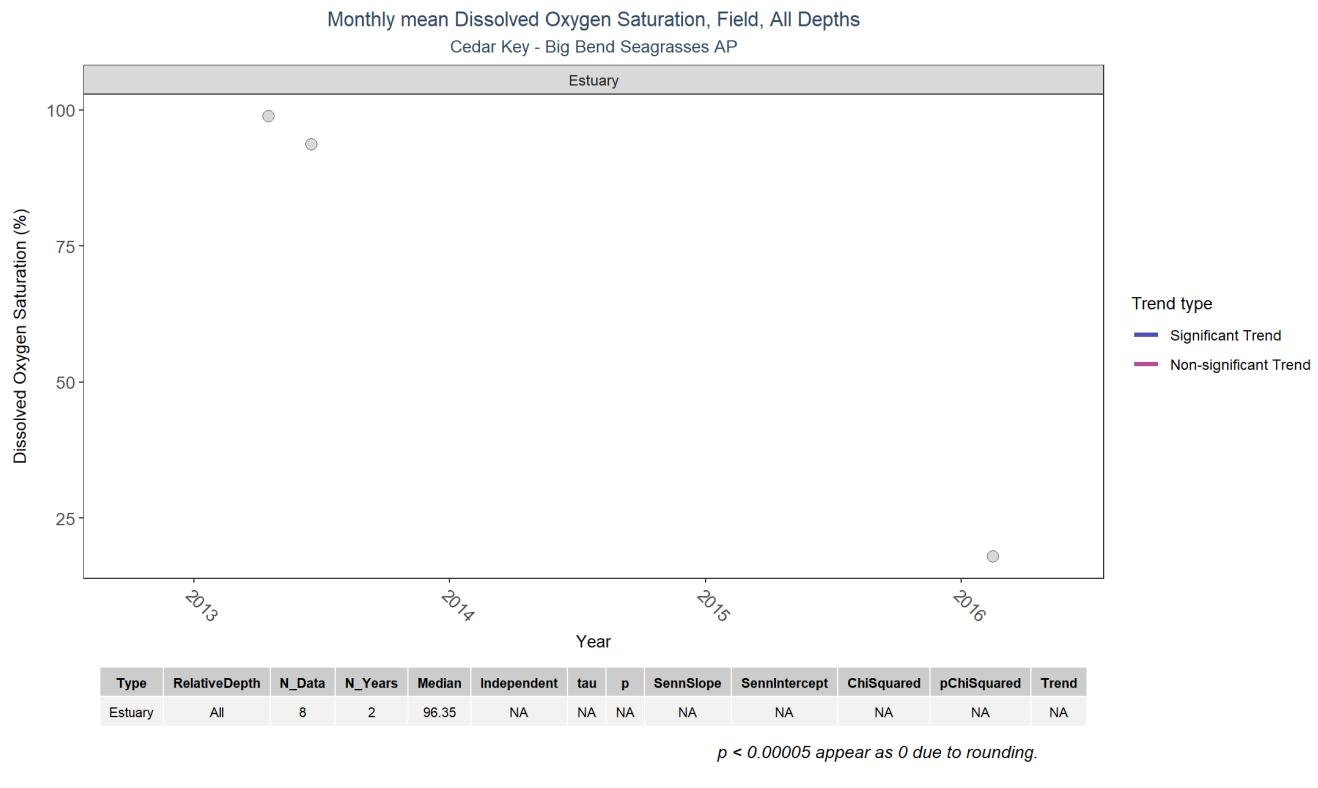
Chlorophyll a, Uncorrected for Pheophytin



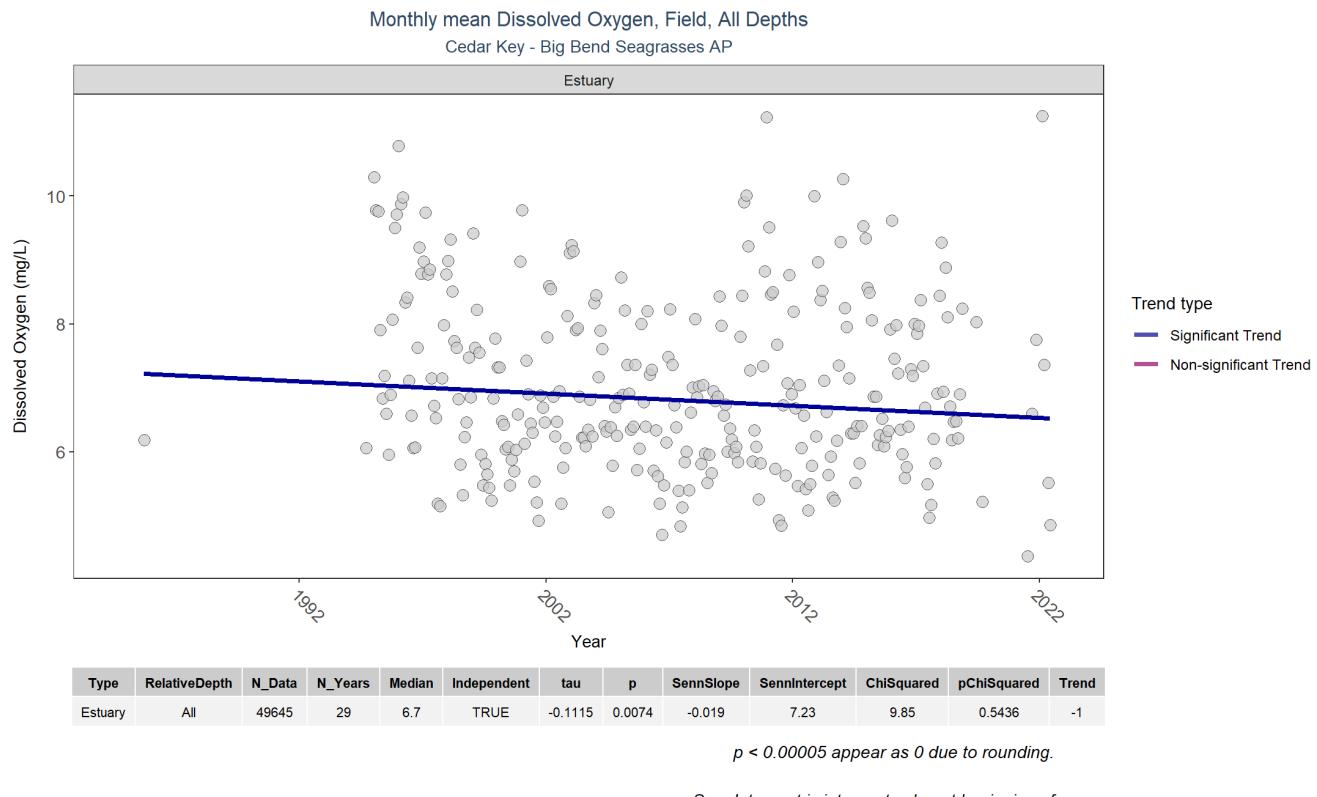
Colored Dissolved Organic Matter



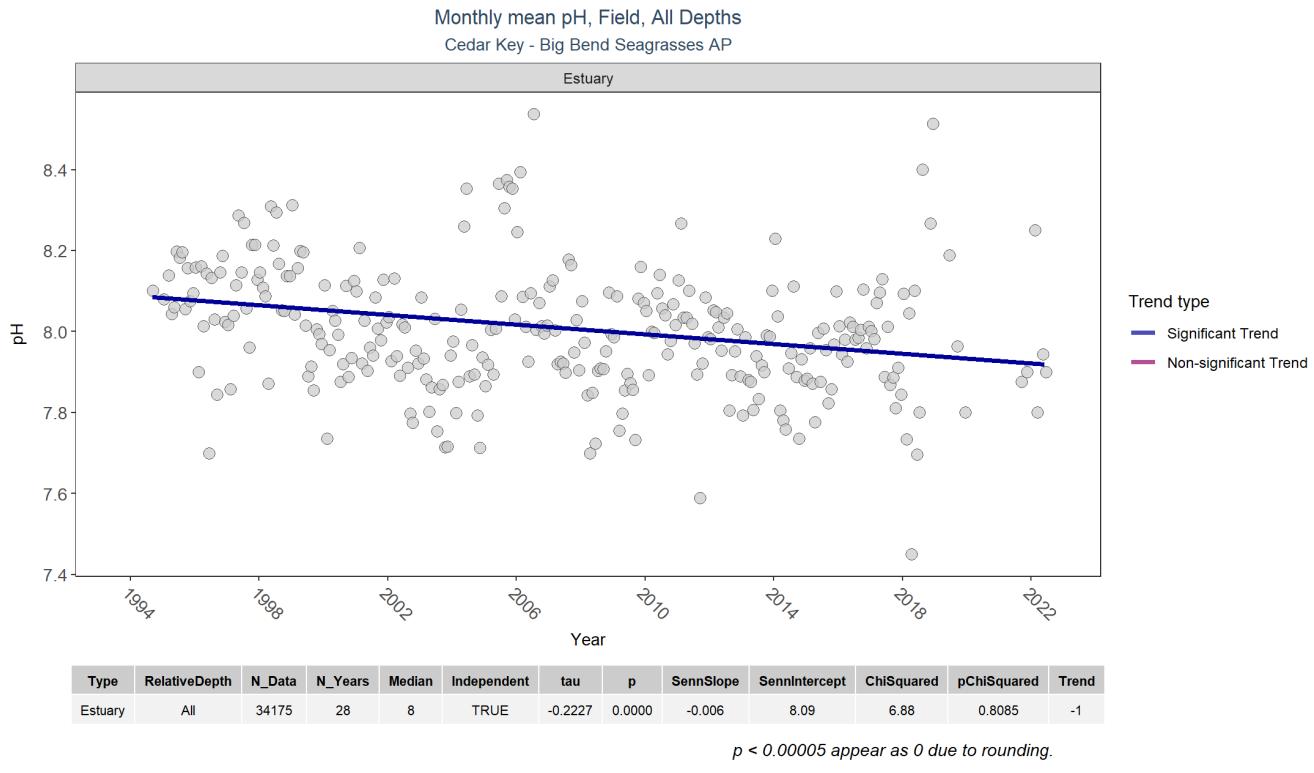
Dissolved Oxygen Saturation



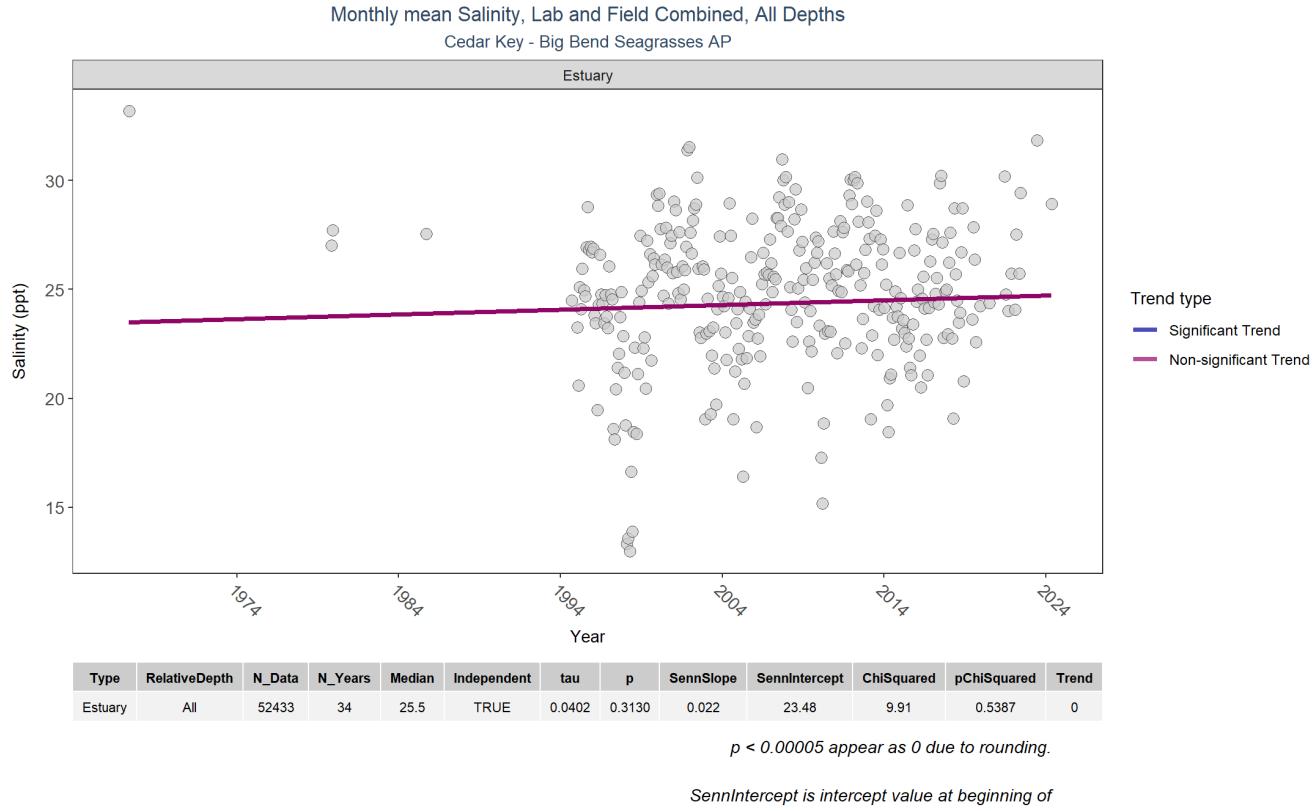
Dissolved Oxygen



pH

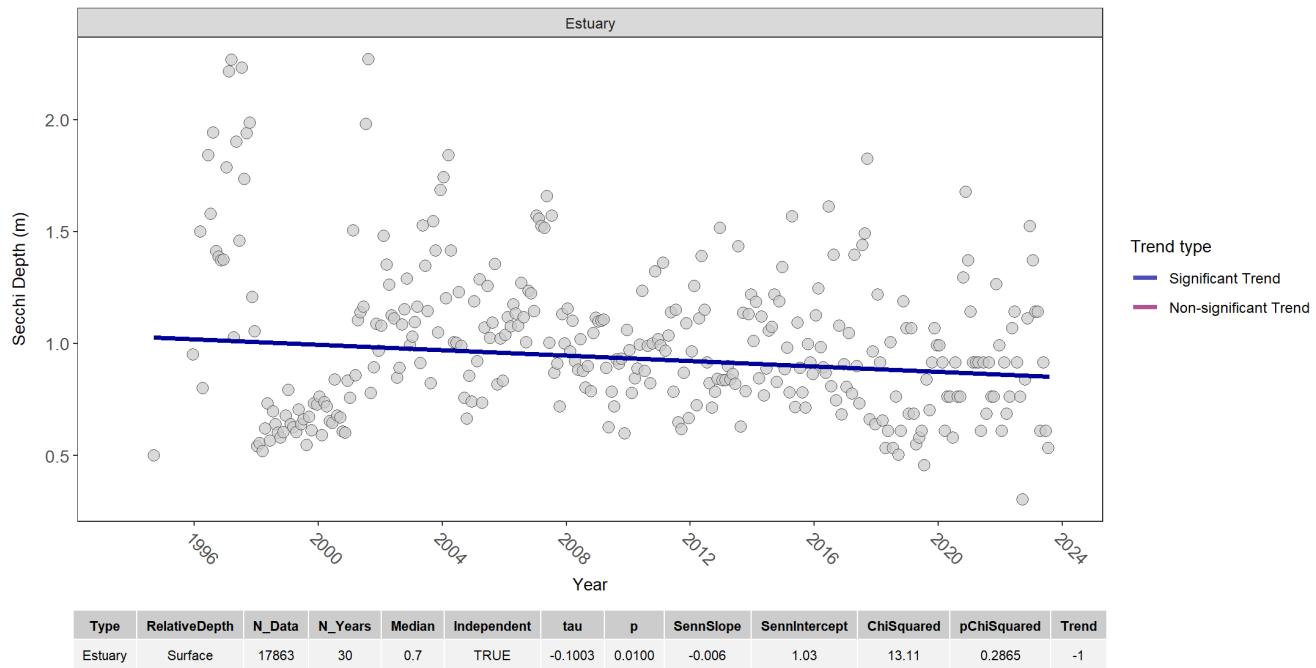


Salinity

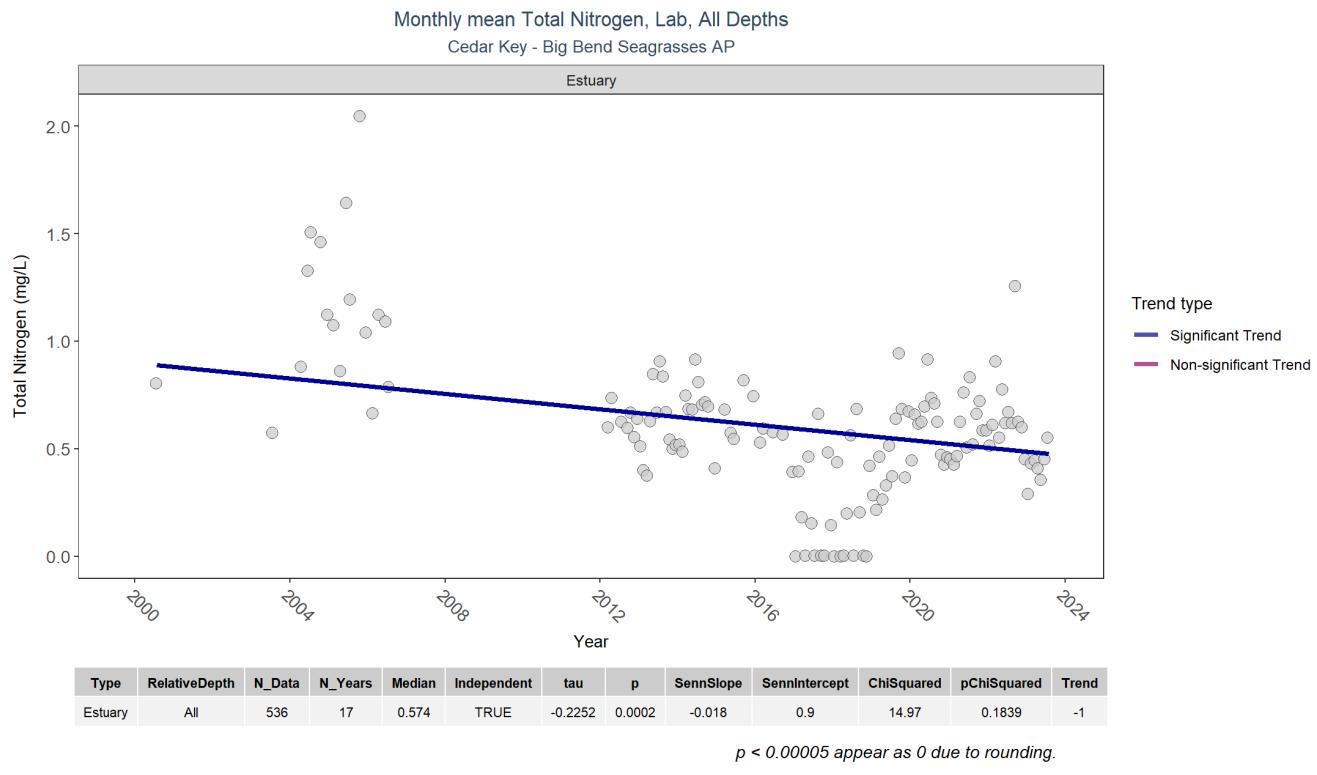


Secchi Depth

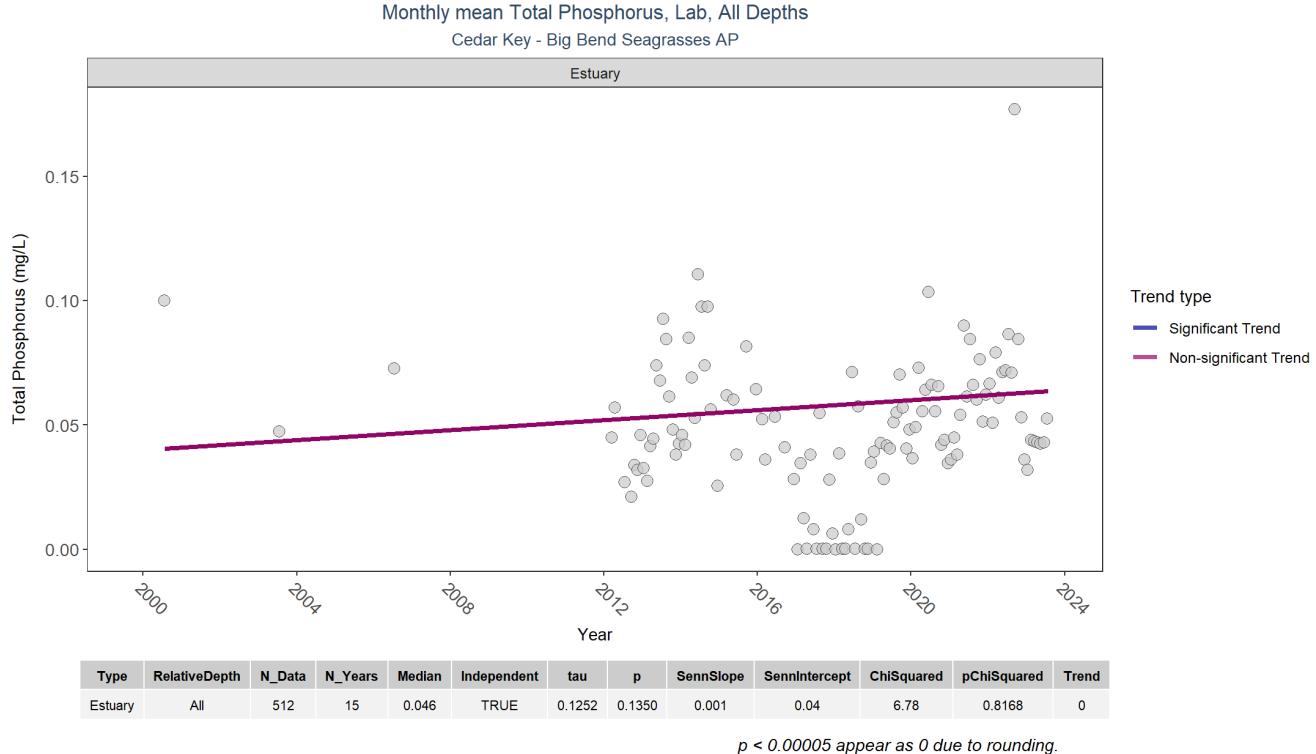
Monthly mean Secchi Depth, Field, Surface
Cedar Key - Big Bend Seagrasses AP



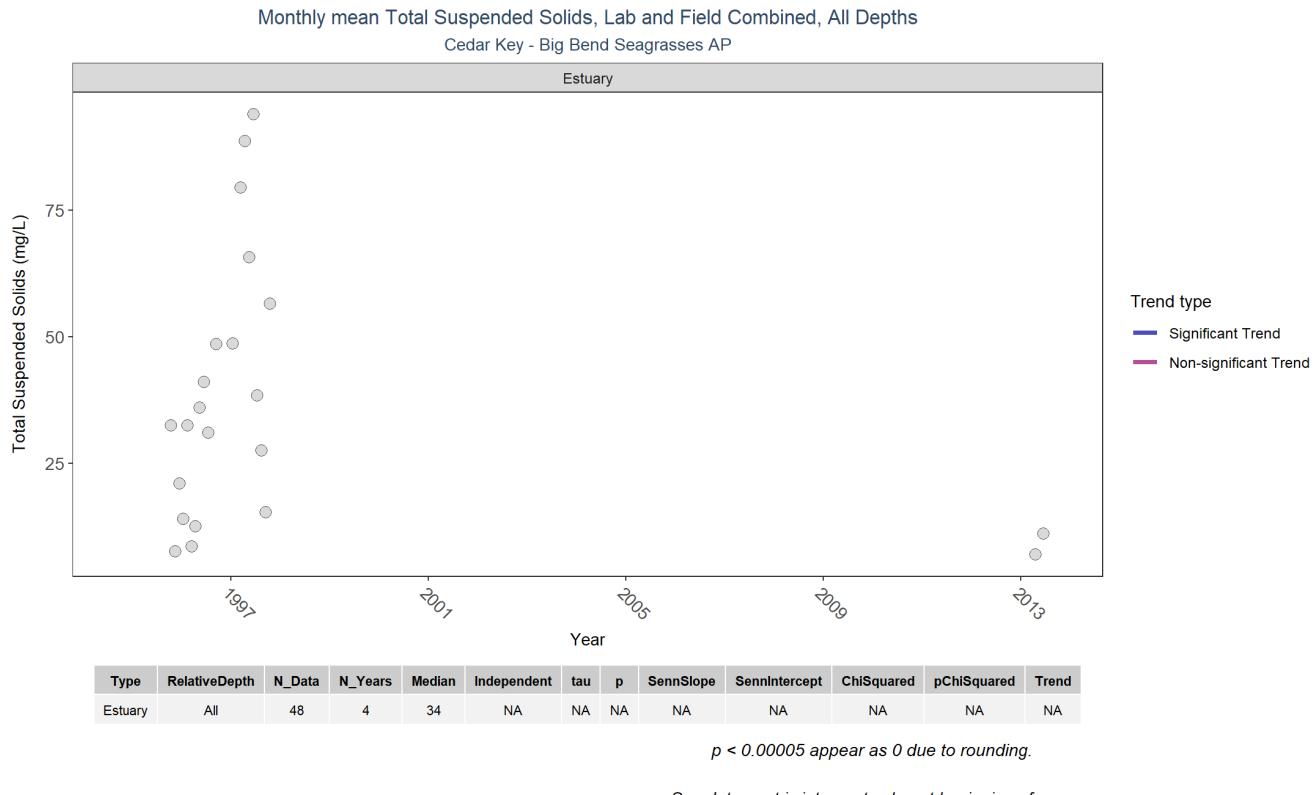
Total Nitrogen



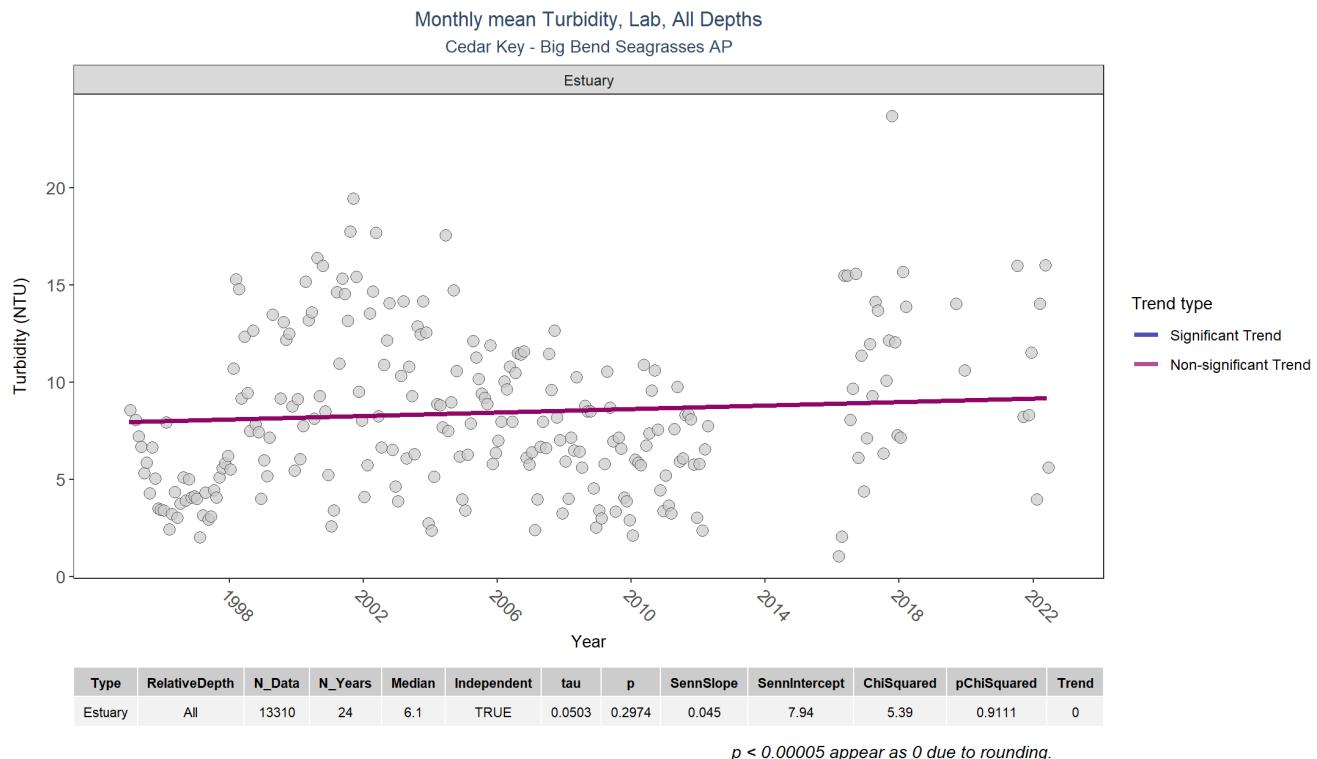
Total Phosphorus



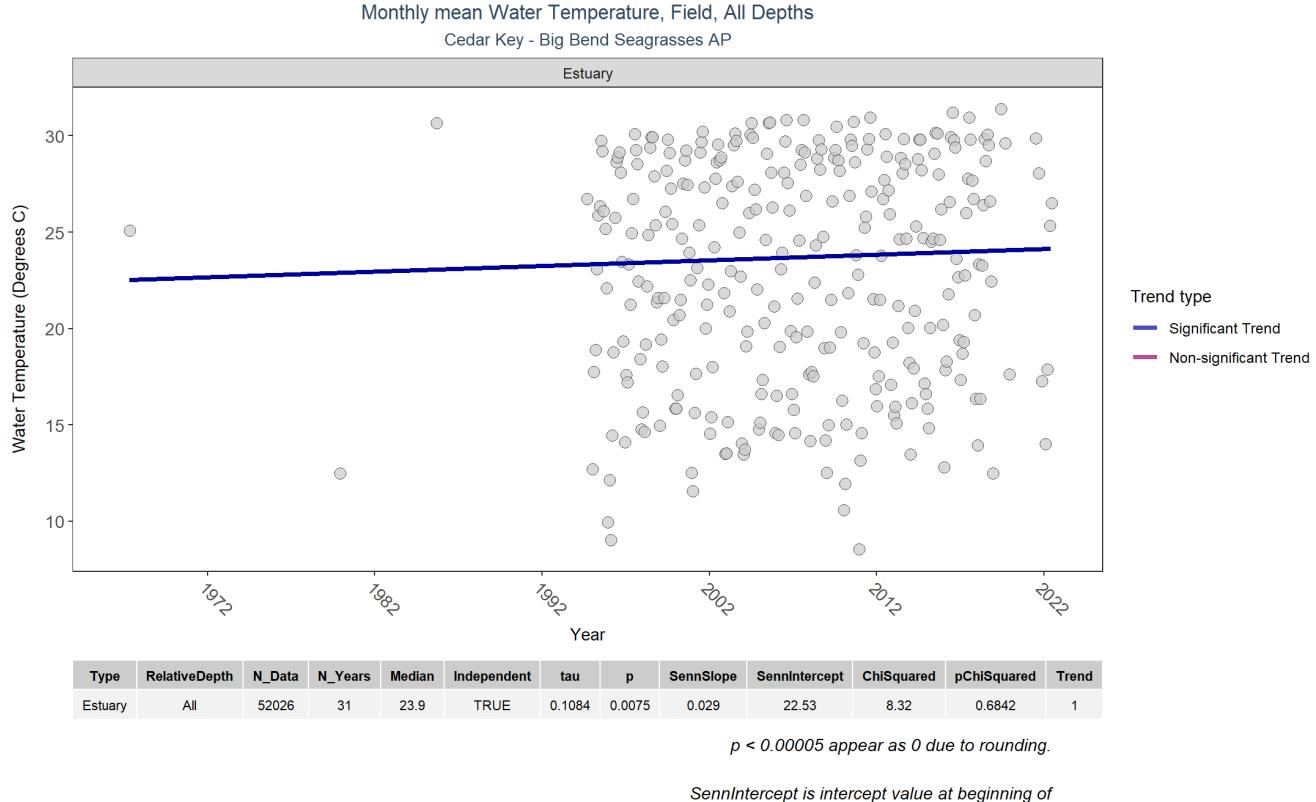
Total Suspended Solids



Turbidity



Water Temperature



Submerged Aquatic Vegetation

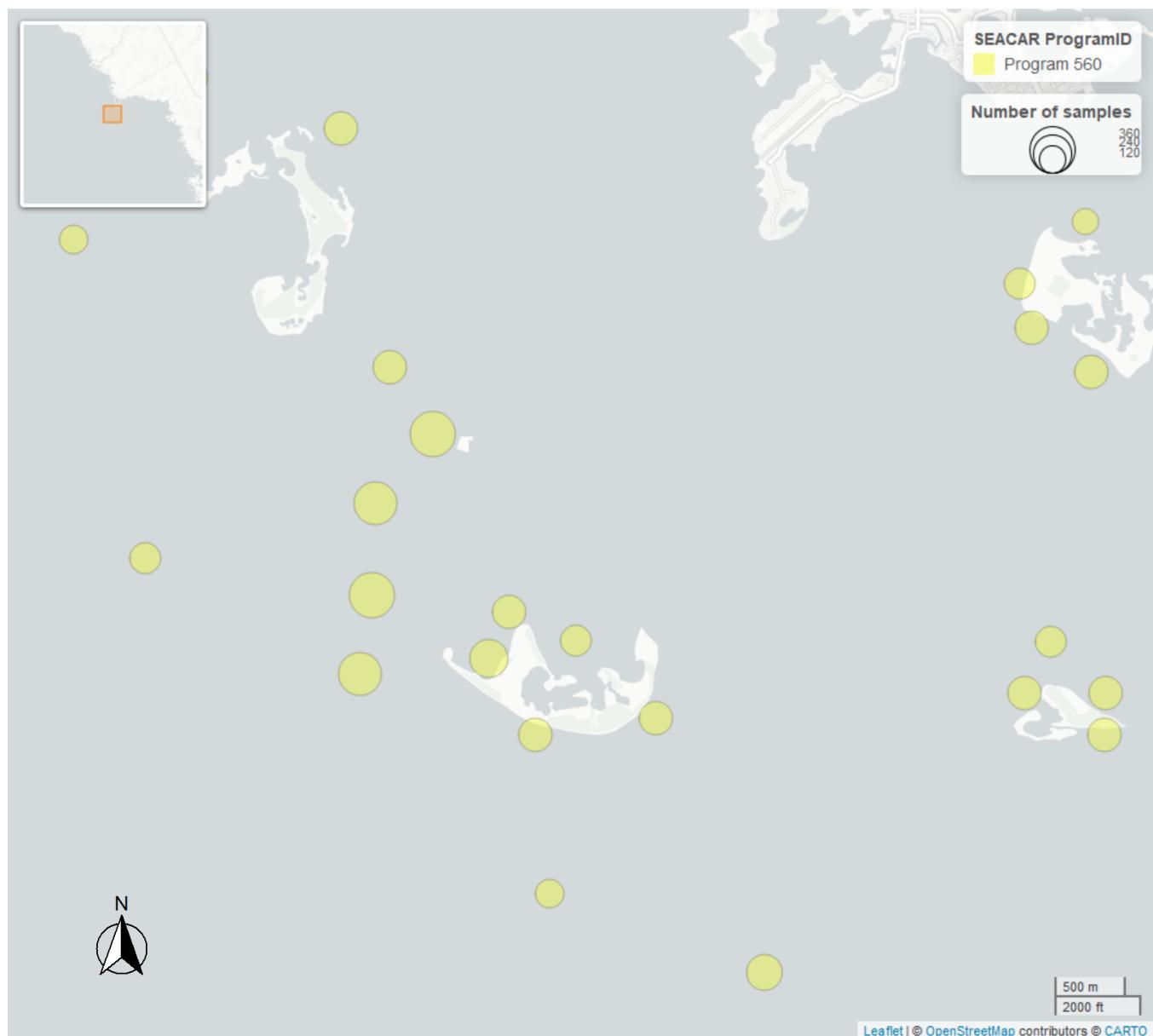


Table 24: Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring - *Program 560*¹¹

<i>N_Data</i>	<i>YearMin</i>	<i>YearMax</i>	<i>Collection Method</i>	<i>Sample Locations</i>
4539	2006	2024	Modified Braun Blanquet	25
875	2022	2024	Percent Cover	25

Median Percent Cover - Species Trend Table

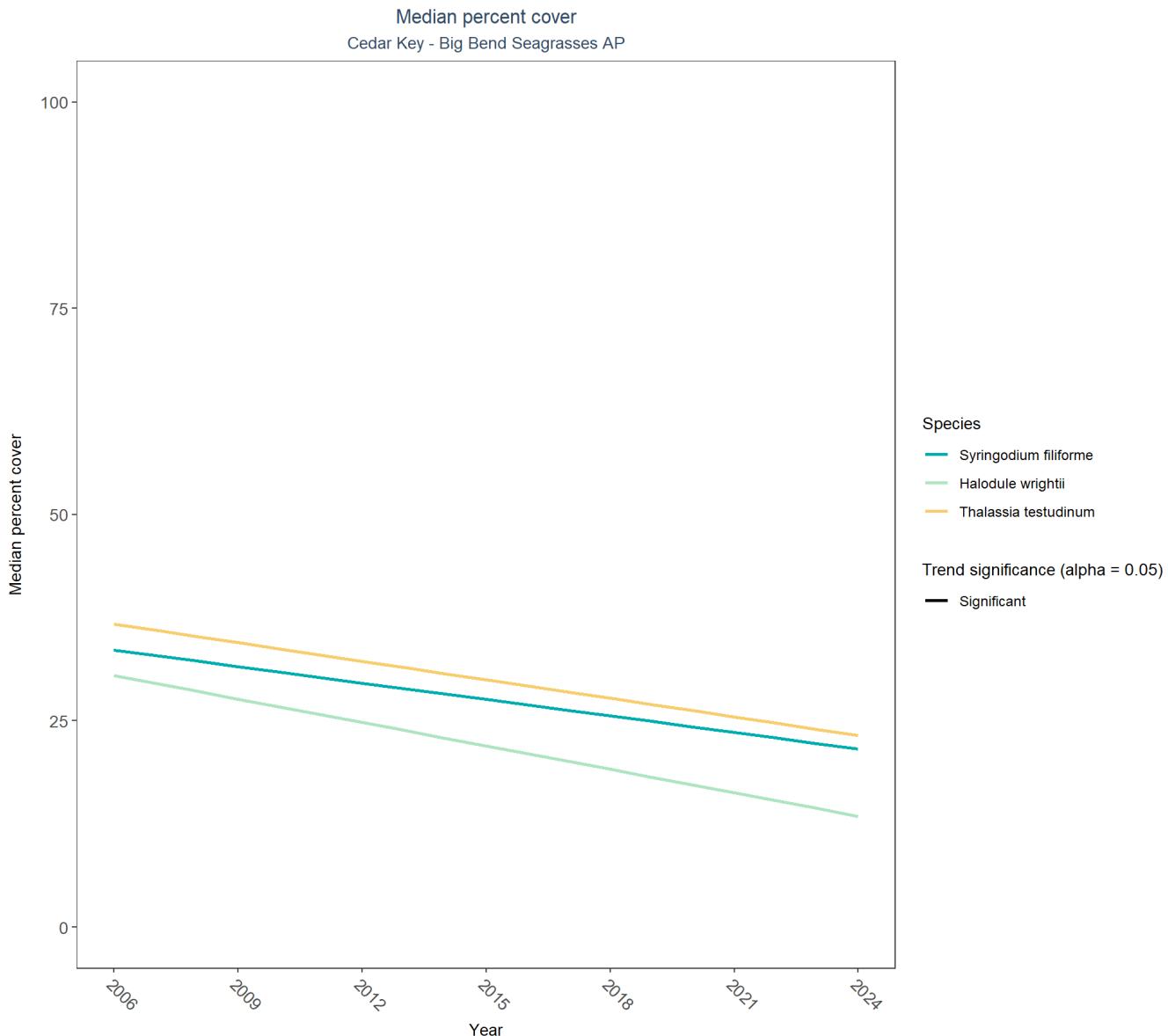
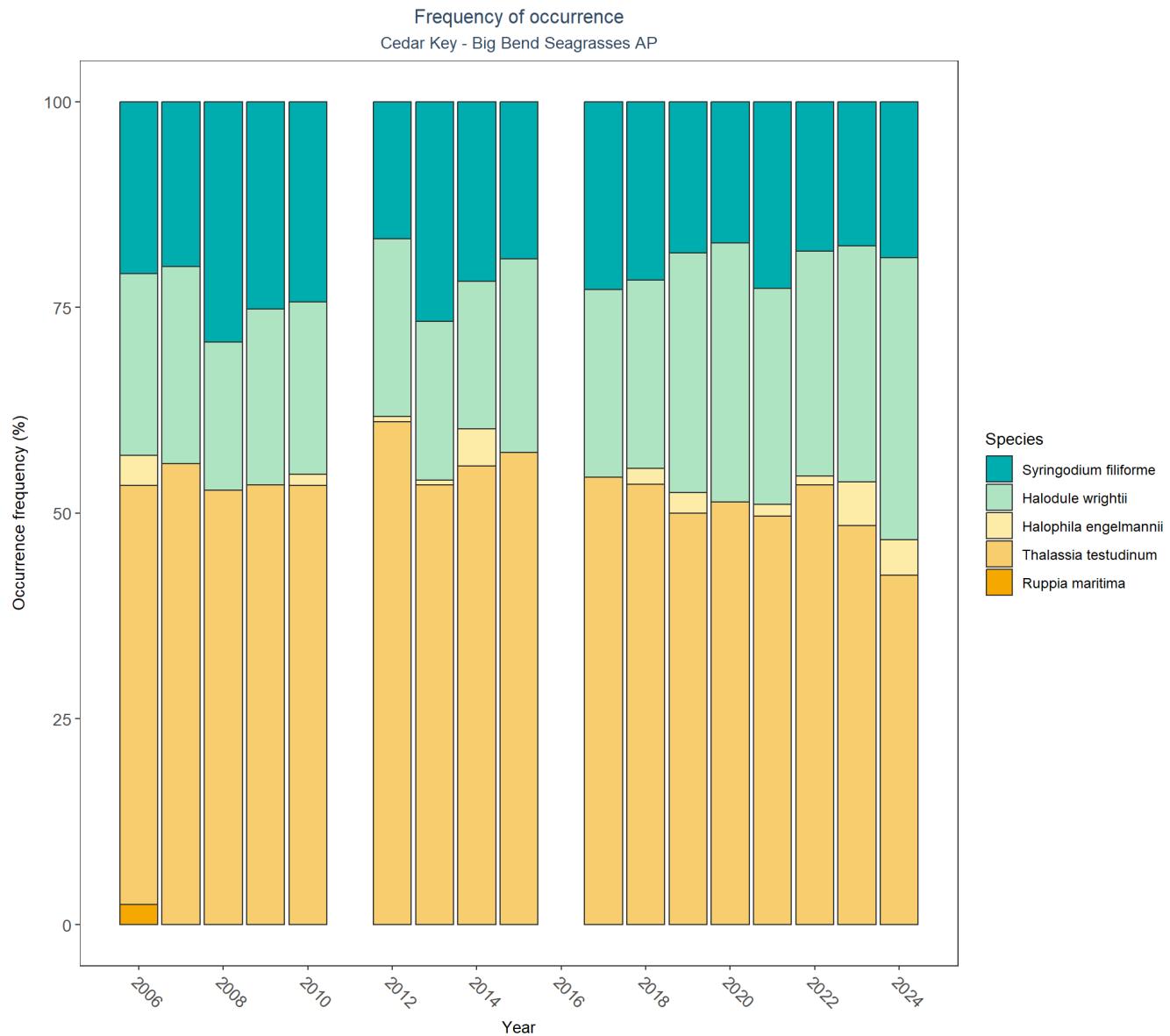


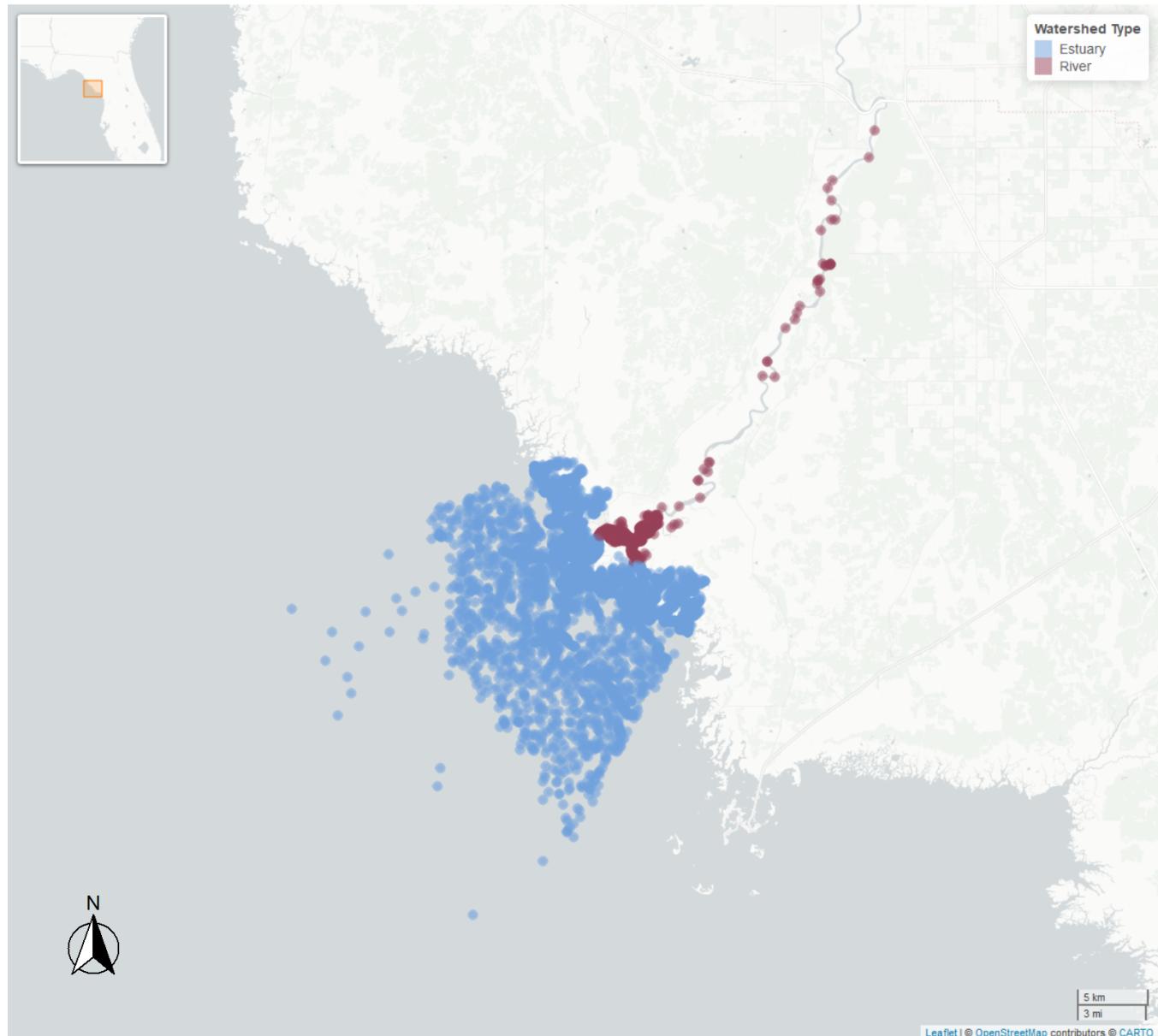
Table 25: Percent Cover Trend Analysis for Cedar Key

Species	Trend Significance (0.05)	Period of Record	LME_Intercept	LME_Slope	p
Drift algae	Significantly increasing trend	2006 - 2024	-12.0977	2.0225	0.0011
Halodule wrightii	Significantly decreasing trend	2006 - 2024	36.1611	-0.9468	0.0000
Halophila engelmannii	Model did not fit the available data	2006 - 2024	-	-	-
No grass in quadrat	Model did not fit the available data	2007 - 2024	-	-	-
Ruppia maritima	Insufficient data to calculate trend	-	-	-	-
Syringodium filiforme	Significantly decreasing trend	2006 - 2024	37.5765	-0.6657	0.0092
Thalassia testudinum	Significantly decreasing trend	2006 - 2024	41.2361	-0.7503	0.0000

Frequency of Occurrence Barplots



Suwannee



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 26: Seasonal Kendall-Tau Results for Suwannee

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	1995 - 2024	19	717	TRUE	0.12	1.54	0.0000	↑
River	Chlorophyll a, Corrected for Pheophytin	1999 - 2023	20	156	TRUE	0.01	0.92	0.1192	0
Estuary	Chlorophyll a, Uncorrected for Pheophytin	1990 - 2024	28	1048	TRUE	0.14	0.92	0.0000	↑
River	Chlorophyll a, Uncorrected for Pheophytin	1990 - 2023	28	325	TRUE	0.00	1.05	0.3374	0
Estuary	Colored Dissolved Organic Matter	2016 - 2023	8	101	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2002 - 2023	8	121	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1990 - 2024	33	36622	TRUE	0.00	6.57	0.4895	0
River	Dissolved Oxygen	1989 - 2023	35	3860	TRUE	-0.04	6.68	0.0000	↓
Estuary	Dissolved Oxygen Saturation	2013 - 2023	11	128	TRUE	2.20	66.98	0.1518	0
River	Dissolved Oxygen Saturation	2013 - 2023	11	142	TRUE	-1.00	47.53	0.0968	0
Estuary	Salinity	1967 - 2024	35	38042	TRUE	0.05	15.57	0.1927	0
River	Salinity	1990 - 2023	31	3519	TRUE	0.00	0.20	0.0051	↓
Estuary	Secchi Depth	1991 - 2023	31	15808	TRUE	-0.01	1.10	0.0097	↓
River	Secchi Depth	1993 - 2023	25	3094	TRUE	0.00	1.06	0.9024	0
Estuary	Total Nitrogen	1990 - 2024	19	448	TRUE	-0.01	1.29	0.0021	↓
River	Total Nitrogen	1990 - 2023	25	309	TRUE	0.02	1.10	0.0000	↑
Estuary	Total Phosphorus	2004 - 2024	16	337	TRUE	0.00	0.12	0.0009	↓
River	Total Phosphorus	2001 - 2023	23	311	TRUE	0.00	0.10	0.0129	↑
Estuary	Total Suspended Solids	1990 - 2001	9	381	FALSE	-	-	-	-
River	Total Suspended Solids	1990 - 2023	31	250	TRUE	-0.02	4.00	0.0017	↓
Estuary	Turbidity	1990 - 2024	33	10114	TRUE	0.02	2.98	0.0477	↑
River	Turbidity	1990 - 2023	34	707	TRUE	-0.02	1.78	0.0024	↓
Estuary	Water Temperature	1967 - 2024	35	38385	TRUE	0.02	22.63	0.0715	0
River	Water Temperature	1989 - 2023	35	3904	TRUE	0.01	22.49	0.2965	0
Estuary	pH	1990 - 2024	33	27151	TRUE	0.00	7.87	0.8796	0
River	pH	1989 - 2023	35	3689	TRUE	0.00	7.75	0.1139	0

Table containing overview of Programs contributing data for Suwannee

Table 27: Overview of Program Data for Suwannee

ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	103	1	-
Ammonium, Filtered (NH4)	115	1	-
Ammonium, Filtered (NH4)	477	102	100
Ammonium, Filtered (NH4)	5002	1021	442
Chlorophyll a, Corrected for Pheophytin	103	6	2
Chlorophyll a, Corrected for Pheophytin	477	84	41
Chlorophyll a, Corrected for Pheophytin	5002	633	113
Chlorophyll a, Uncorrected for Pheophytin	103	28	-
Chlorophyll a, Uncorrected for Pheophytin	115	1	-
Chlorophyll a, Uncorrected for Pheophytin	118	-	1
Chlorophyll a, Uncorrected for Pheophytin	477	98	48
Chlorophyll a, Uncorrected for Pheophytin	514	-	57
Chlorophyll a, Uncorrected for Pheophytin	5002	927	219
Colored Dissolved Organic Matter	103	6	2
Colored Dissolved Organic Matter	477	101	101
Colored Dissolved Organic Matter	514	-	12
Colored Dissolved Organic Matter	5002	-	8
Dissolved Oxygen	69	15431	2868
Dissolved Oxygen	95	241	-
Dissolved Oxygen	103	21	2
Dissolved Oxygen	115	7	2
Dissolved Oxygen	118	6	-
Dissolved Oxygen	477	102	100
Dissolved Oxygen	5002	20814	891
Dissolved Oxygen Saturation	477	102	100
Dissolved Oxygen Saturation	5002	26	42
NO2+3, Filtered	477	102	100
NO2+3, Filtered	5002	1200	497
Nitrate (NO3)	5002	37	20
Nitrite (NO2)	5002	37	20
Phosphate, Filtered (PO4)	103	1	-
Phosphate, Filtered (PO4)	115	1	-
Phosphate, Filtered (PO4)	5002	950	363
Salinity	69	15509	2874
Salinity	95	259	-
Salinity	103	2	-
Salinity	115	7	2

Salinity	118	5	-
Salinity	477	94	68
Salinity	5002	22166	575
Secchi Depth	69	15519	2874
Secchi Depth	103	6	2
Secchi Depth	115	3	1
Secchi Depth	118	1	-
Secchi Depth	477	102	100
Secchi Depth	514	-	54
Secchi Depth	5002	178	66
Specific Conductivity	69	11573	81
Specific Conductivity	95	9	-
Specific Conductivity	103	12	4
Specific Conductivity	477	196	195
Specific Conductivity	5002	1897	853
Total Kjeldahl Nitrogen	477	102	100
Total Kjeldahl Nitrogen	5002	1166	504
Total Nitrogen	103	7	-
Total Nitrogen	115	1	-
Total Nitrogen	477	2	1
Total Nitrogen	514	-	60
Total Nitrogen	5002	443	248
Total Phosphorus	103	22	2
Total Phosphorus	115	1	-
Total Phosphorus	477	102	100
Total Phosphorus	514	-	60
Total Phosphorus	5002	218	149
Total Suspended Solids	477	-	28
Total Suspended Solids	5002	381	222
Turbidity	103	25	4
Turbidity	477	172	174
Turbidity	5002	10035	618
Water Temperature	69	15515	2874
Water Temperature	95	268	-
Water Temperature	103	20	2
Water Temperature	115	7	2
Water Temperature	118	5	-
Water Temperature	477	102	101
Water Temperature	5002	22473	928
pH	69	15385	2861
pH	95	164	-
pH	103	19	2
pH	115	7	2
pH	118	2	-
pH	477	102	100
pH	5002	11502	741

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

115 - Environmental Monitoring Assessment Program -⁷

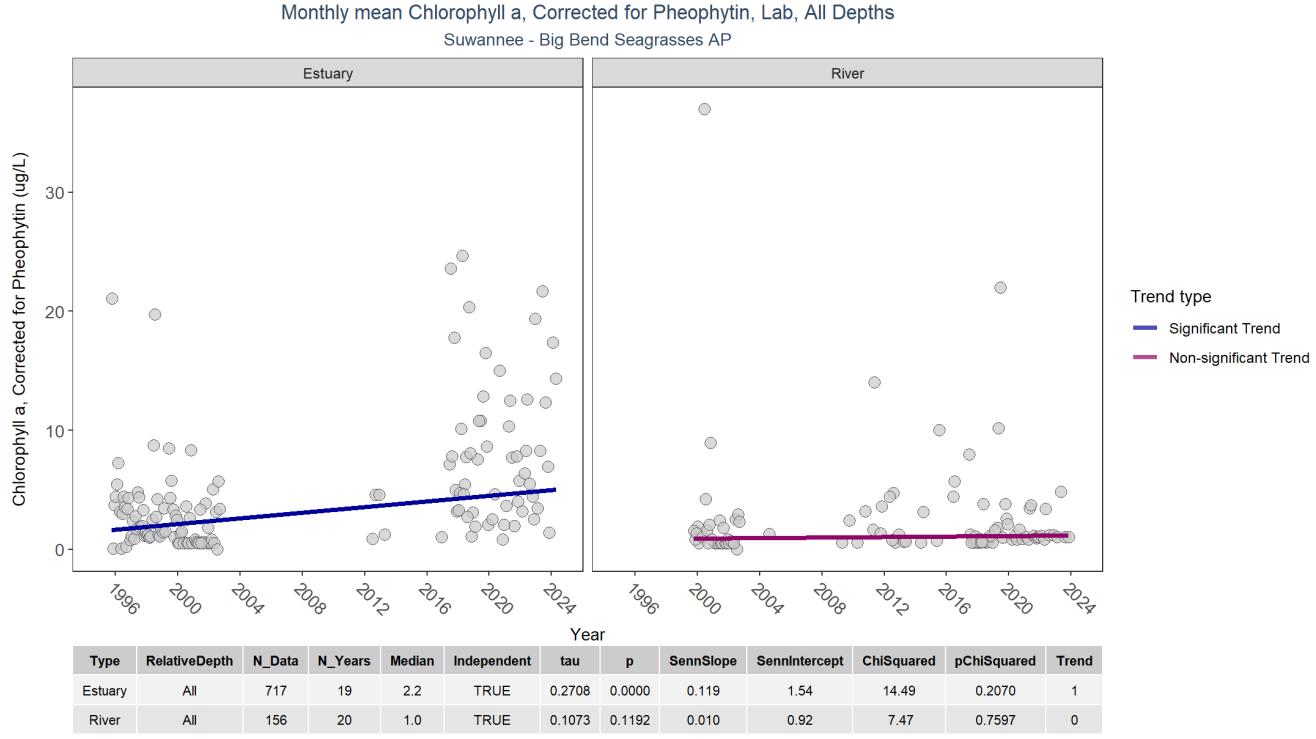
118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

477 - Suwannee River Water Management District Water Resource Monitoring Program -¹⁰

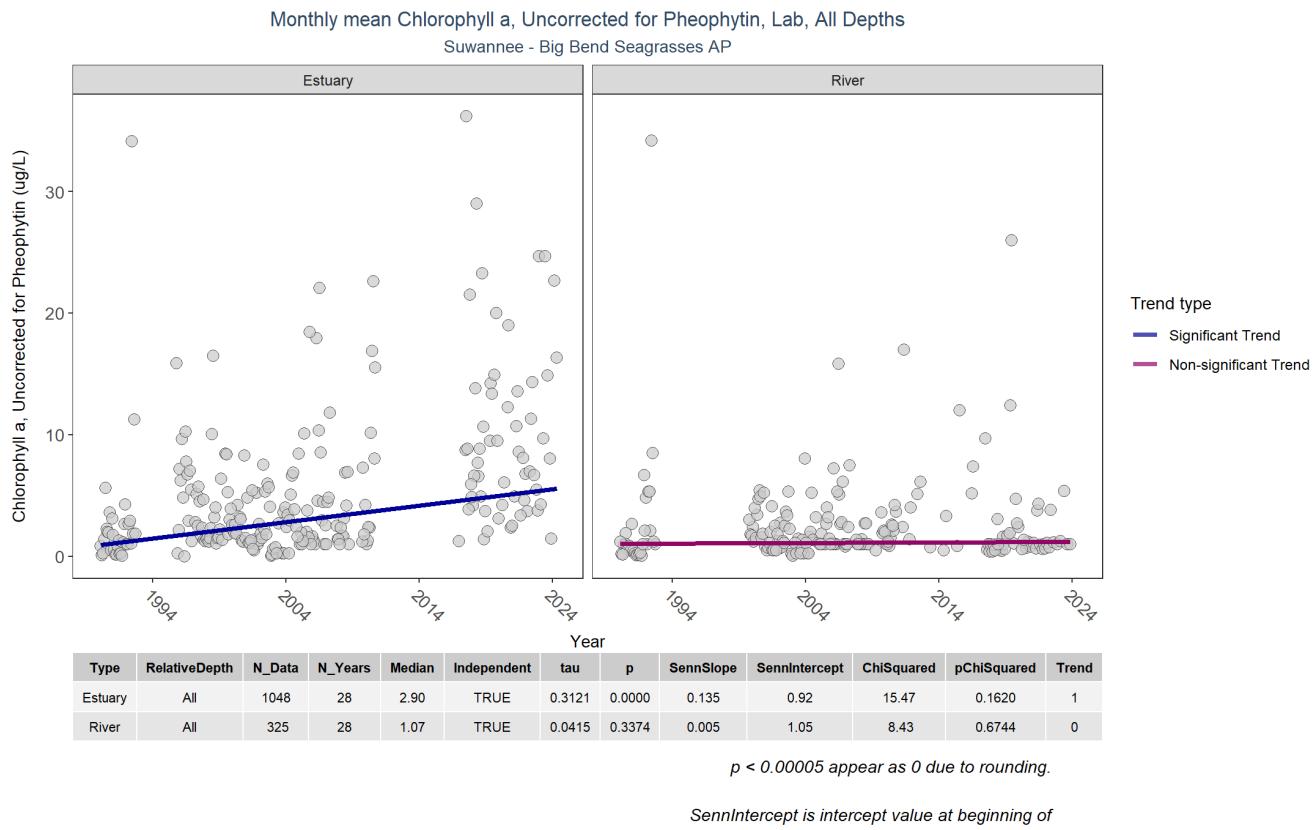
514 - Florida LAKEWATCH Program -⁸

5002 - Florida STORET / WIN -²

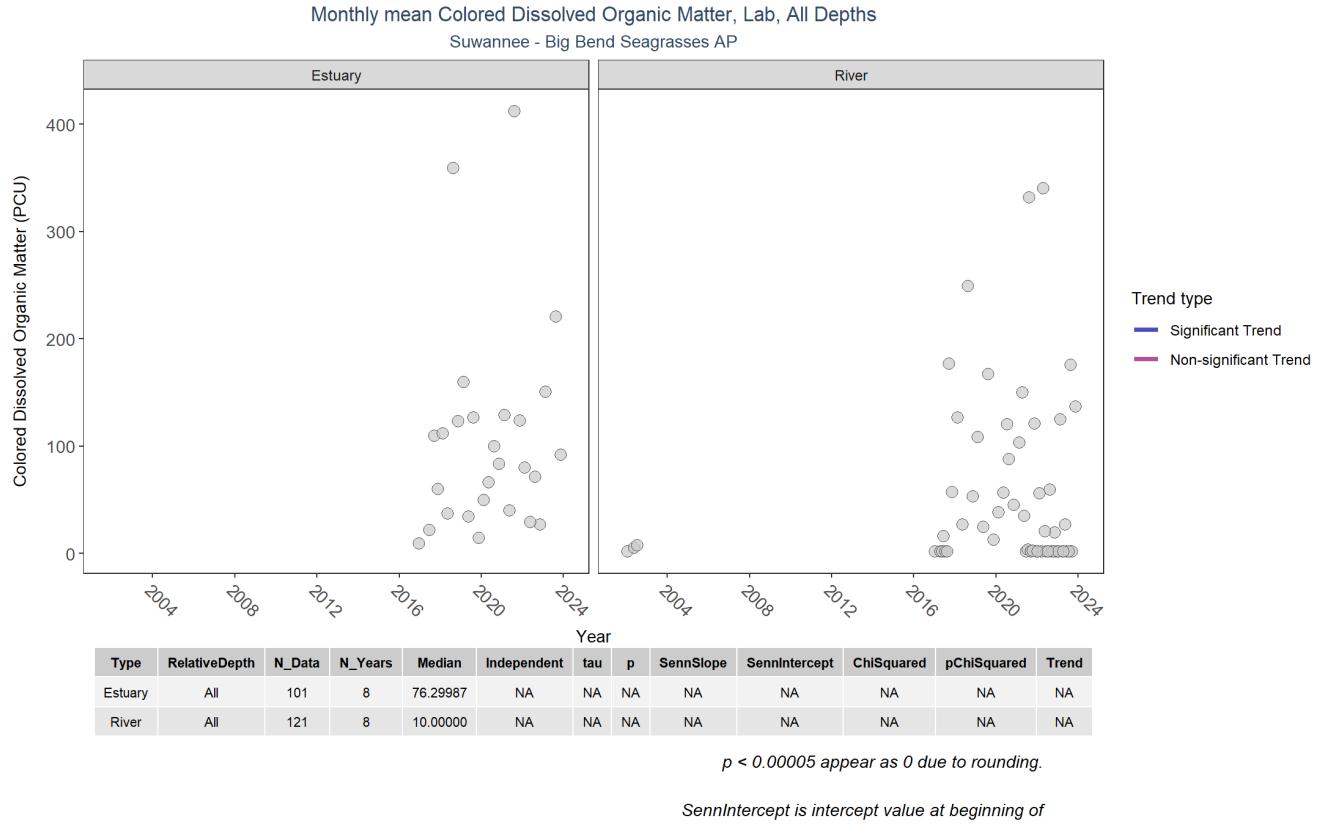
Chlorophyll a, Corrected for Pheophytin



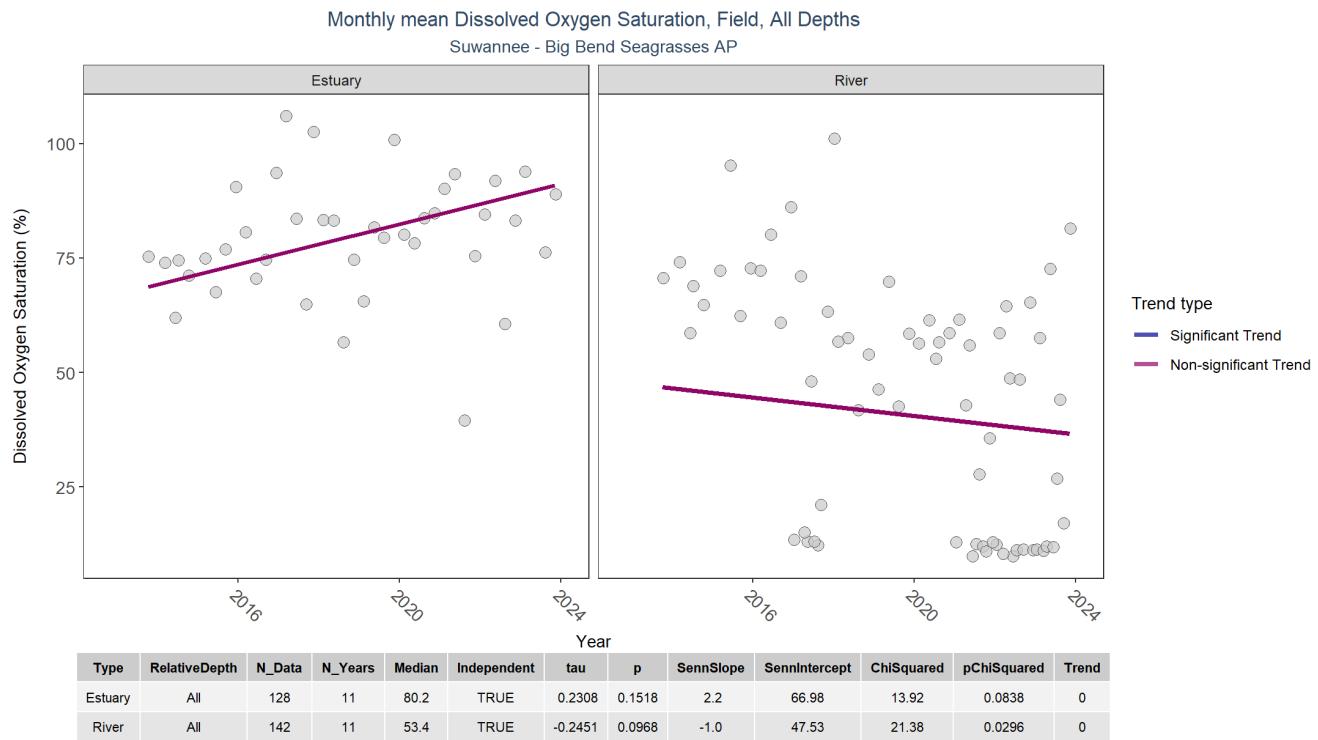
Chlorophyll a, Uncorrected for Pheophytin



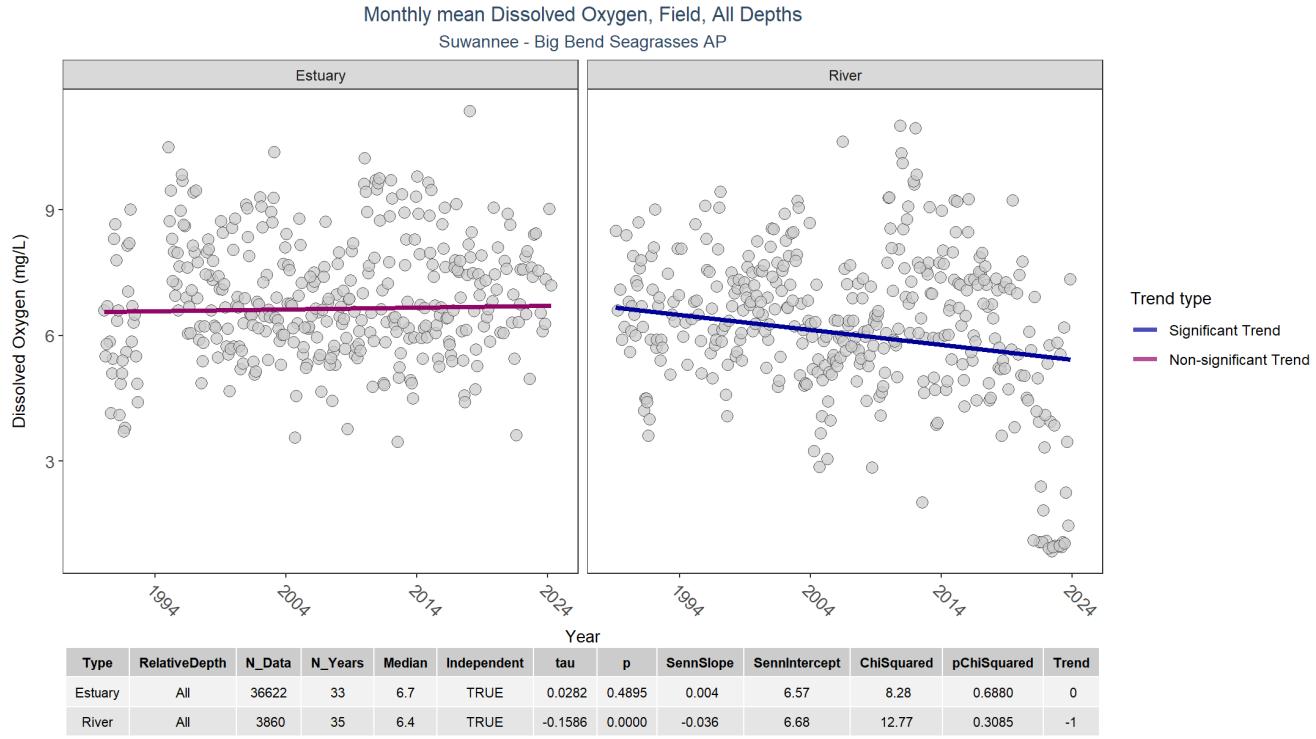
Colored Dissolved Organic Matter



Dissolved Oxygen Saturation



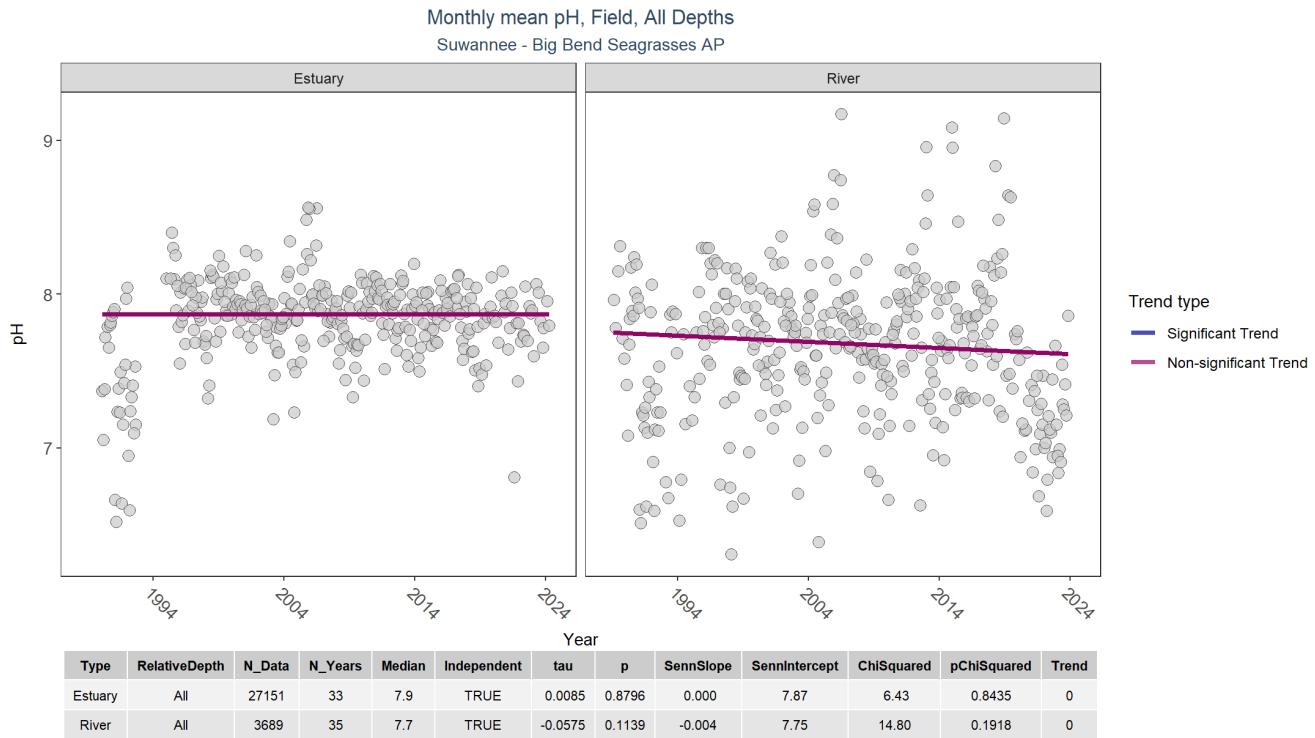
Dissolved Oxygen



p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

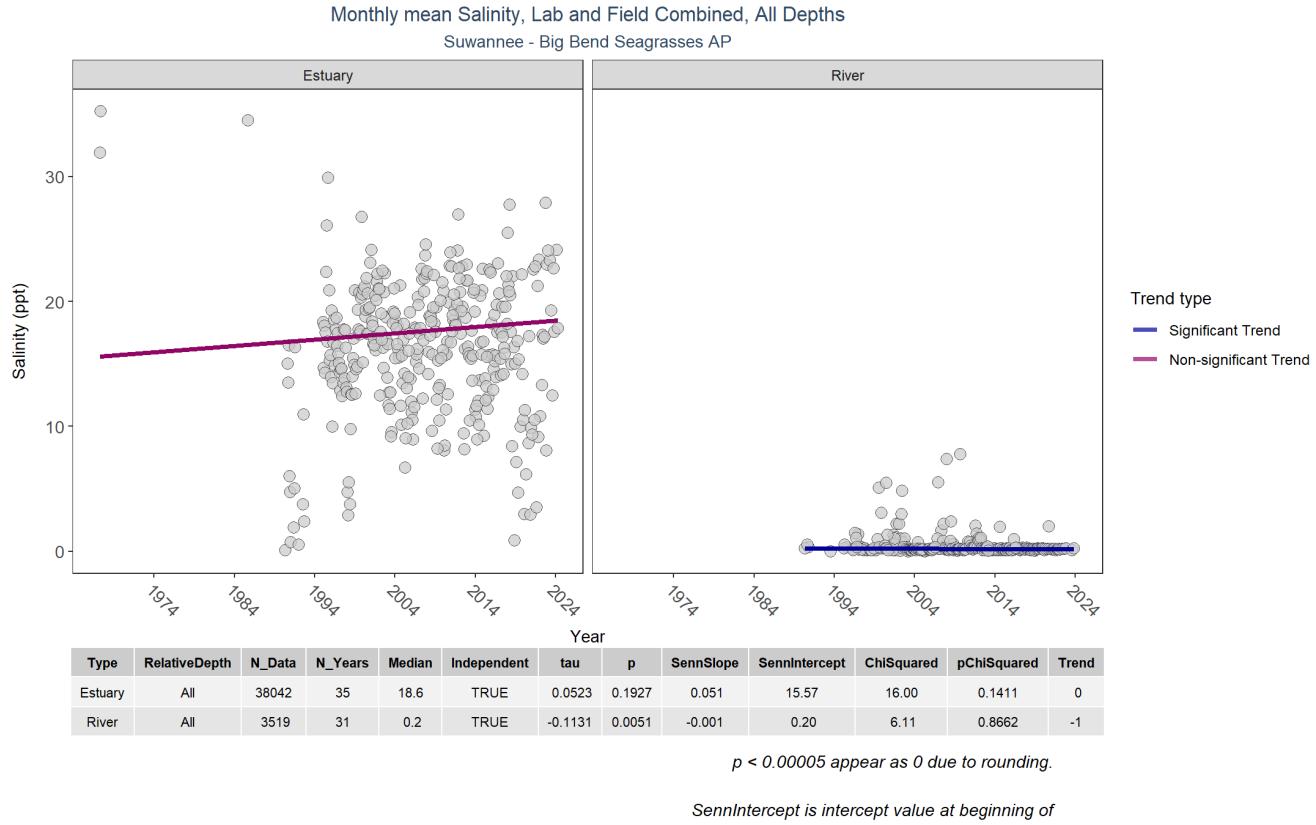
pH



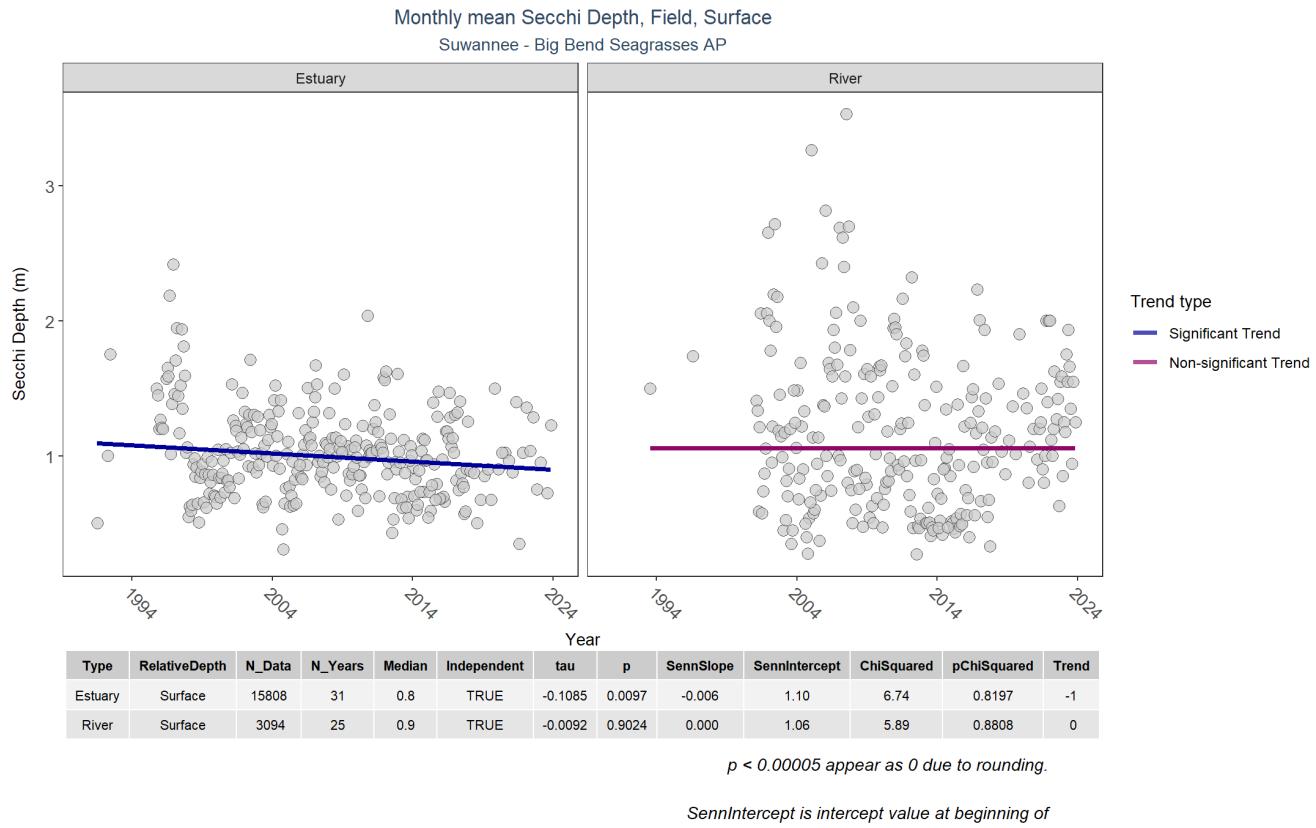
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

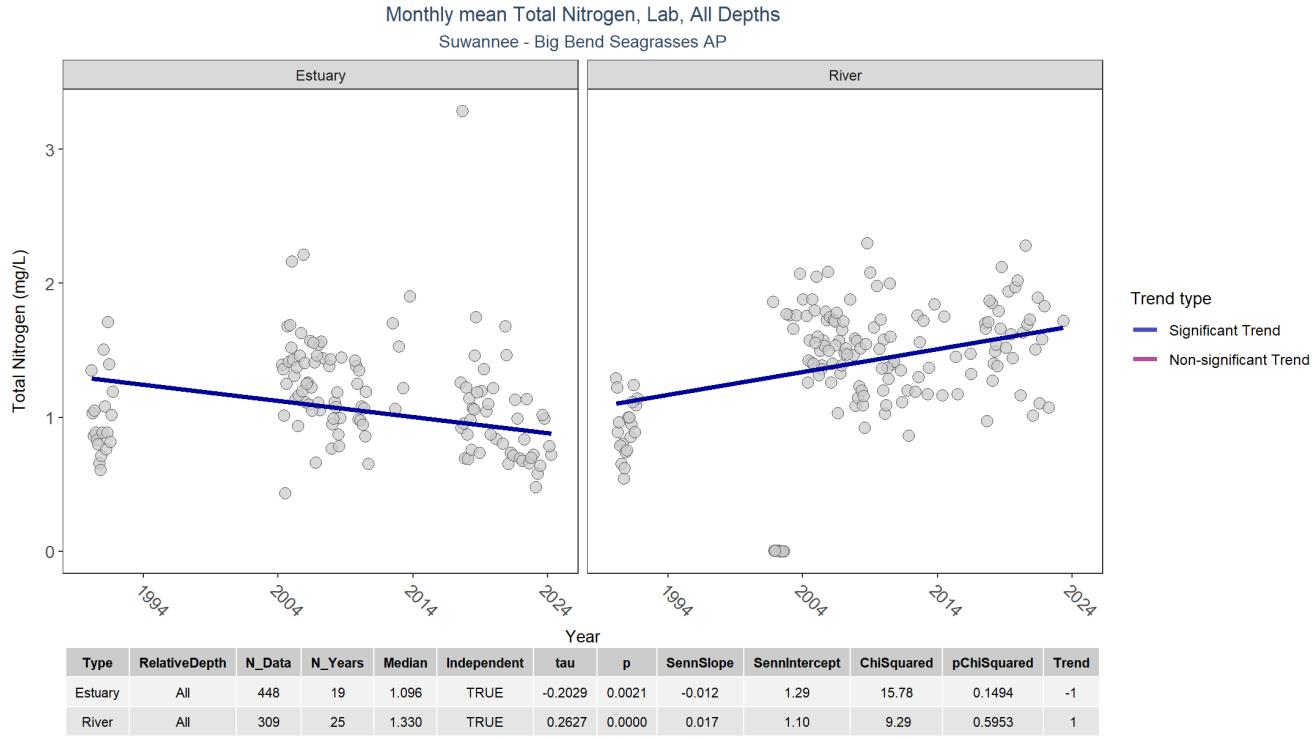
Salinity



Secchi Depth



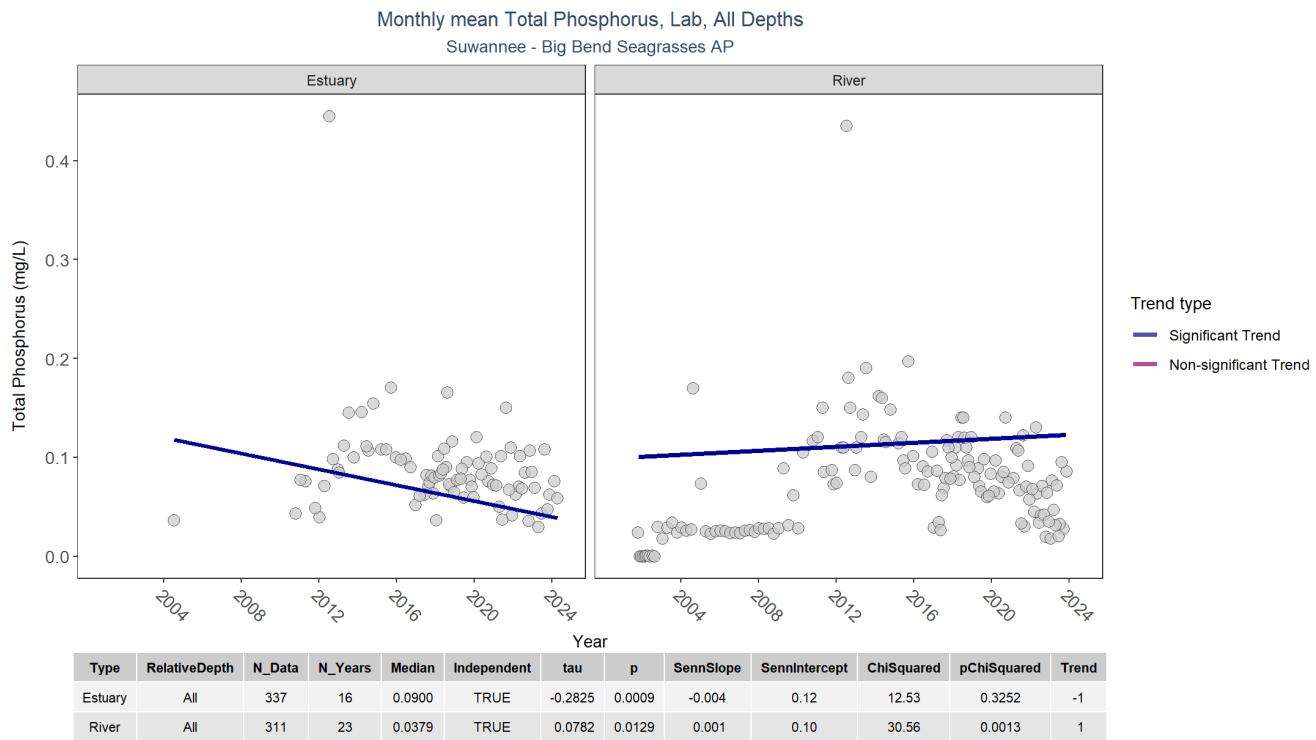
Total Nitrogen



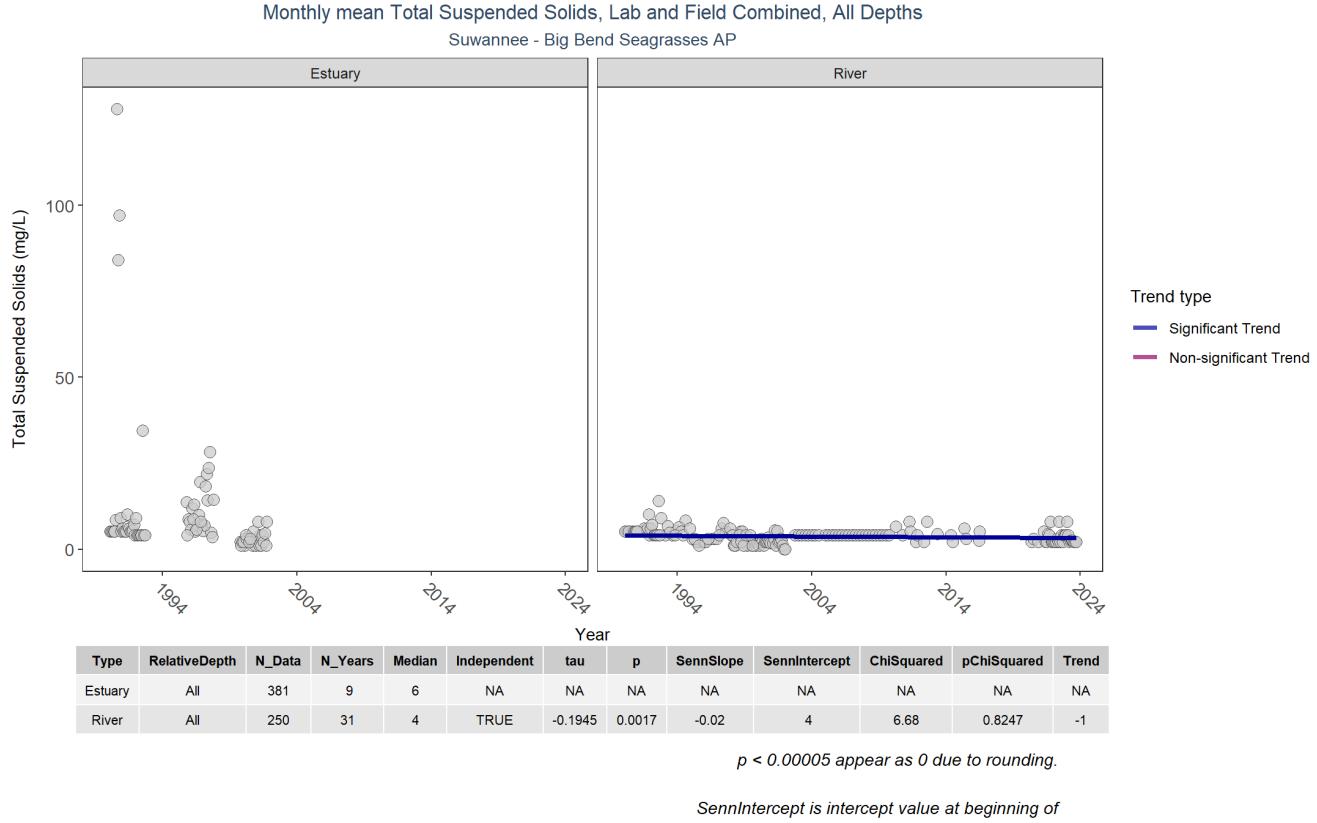
p < 0.00005 appear as 0 due to rounding.

SennIntercept is intercept value at beginning of record for monitoring location

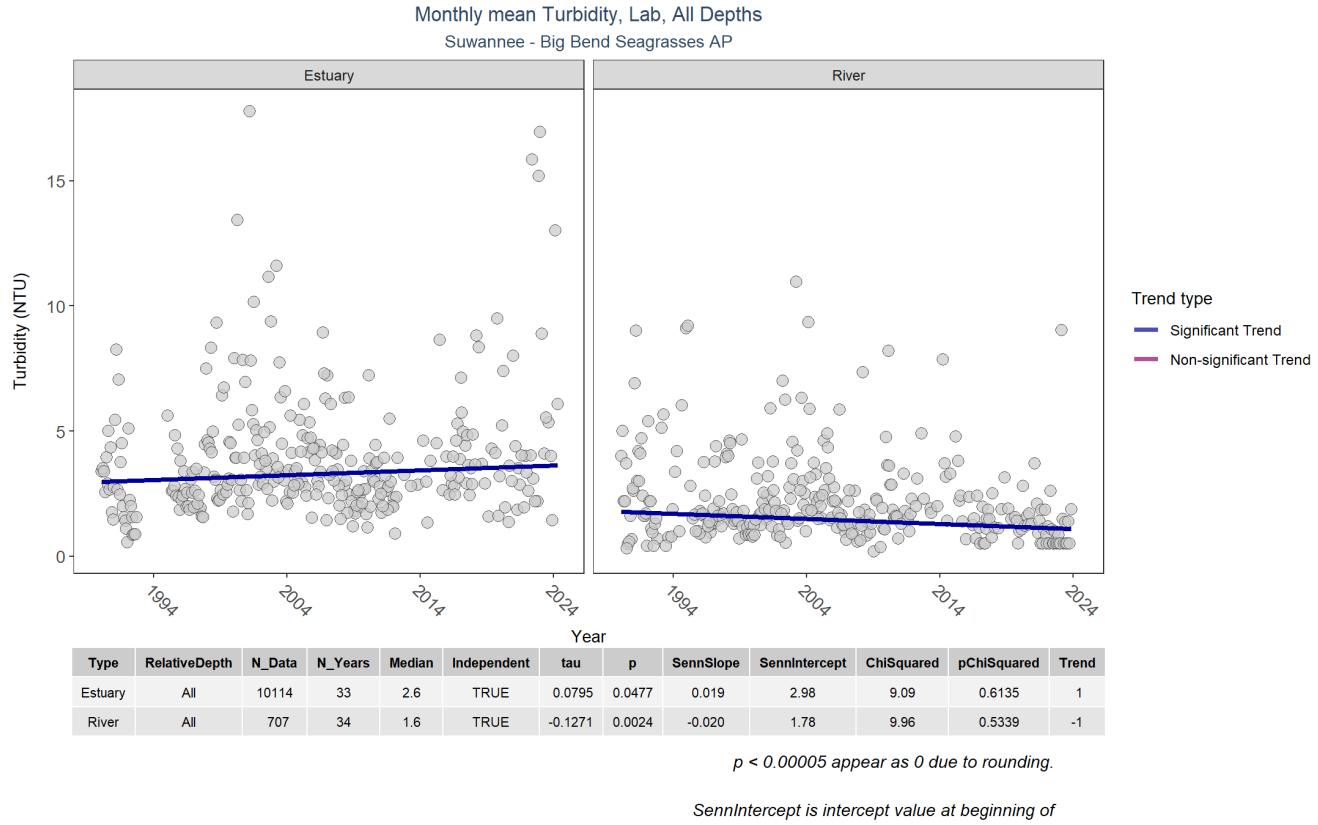
Total Phosphorus



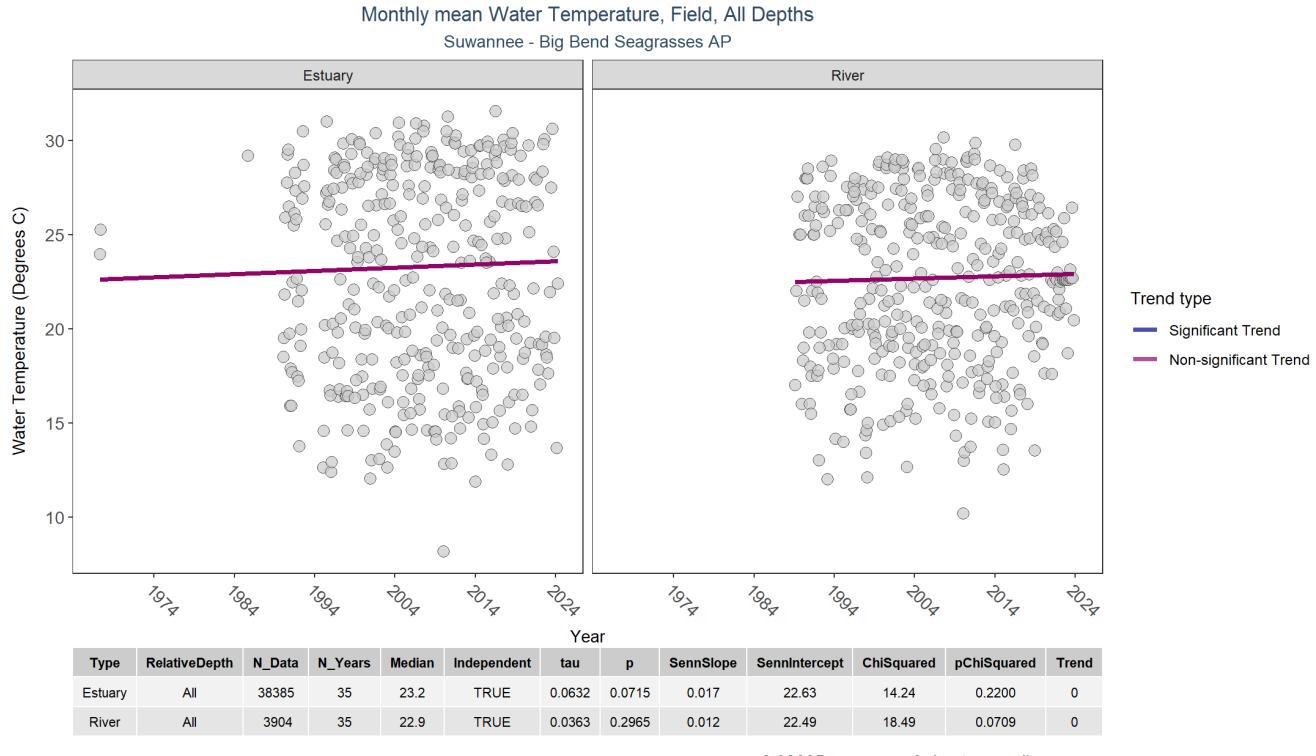
Total Suspended Solids



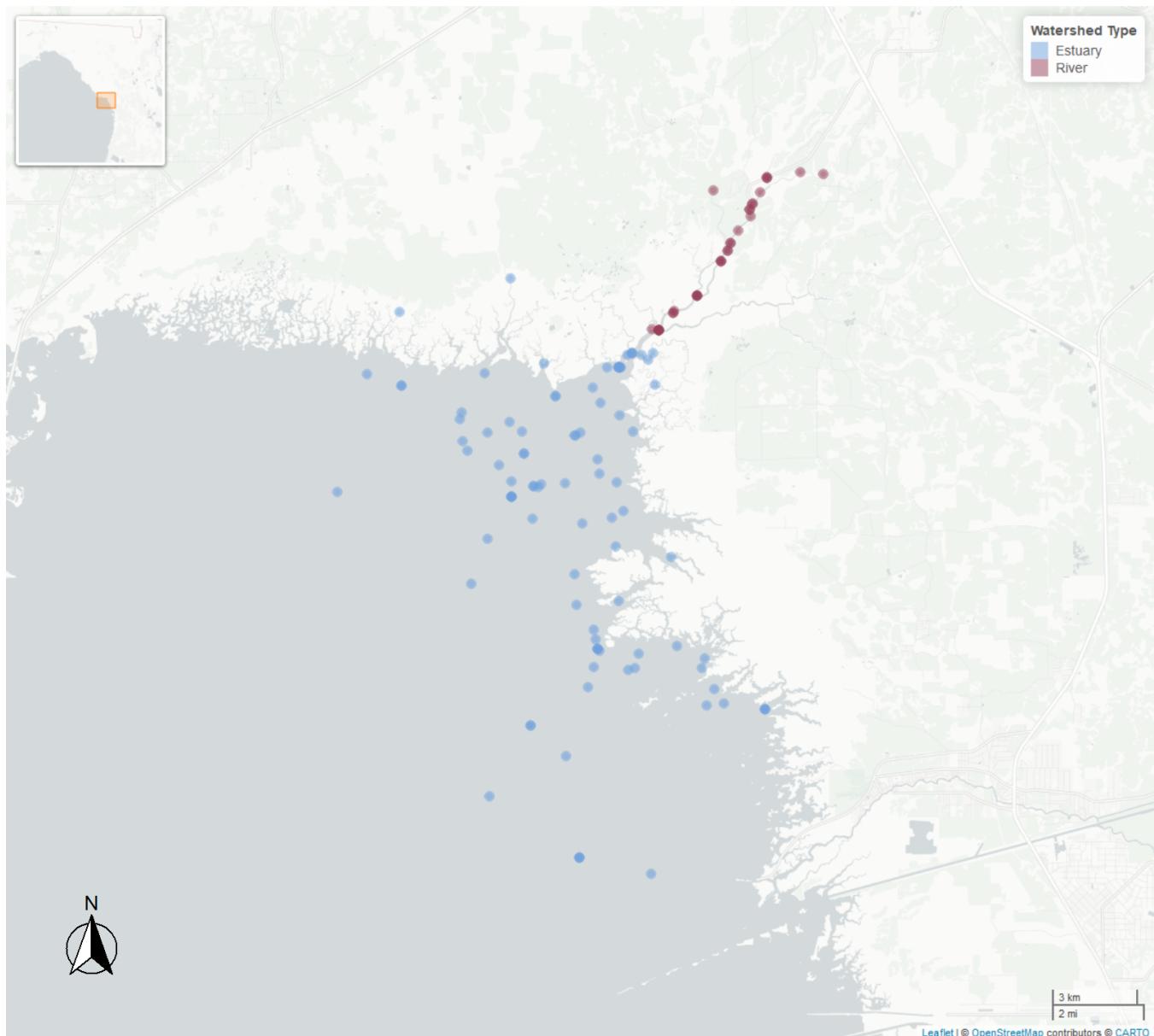
Turbidity



Water Temperature



Waccasassa



Plots will be produced below for all parameters. A Seasonal Kendall-Tau trendline will be plotted only for parameters where *SufficientData* is **TRUE**.

Trend arrows denote trends where the p value is less than 0.05 and the slope is less than 10% of the median parameter value.

Table 28: Seasonal Kendall-Tau Results for Waccasassa

Type	ParameterName	Period-of-Record	N-Years	N-Data	SufficientData	SennSlope	SennIntercept	p	Trend
Estuary	Chlorophyll a, Corrected for Pheophytin	2011 - 2024	14	315	TRUE	-0.06	5.88	0.4198	0
River	Chlorophyll a, Corrected for Pheophytin	1999 - 2024	26	363	TRUE	0.01	1.04	0.0372	↑
Estuary	Chlorophyll a, Uncorrected for Pheophytin	2016 - 2024	9	262	FALSE	-	-	-	-
River	Chlorophyll a, Uncorrected for Pheophytin	2007 - 2024	18	240	TRUE	0.00	1.56	0.5937	0
Estuary	Colored Dissolved Organic Matter	2017 - 2024	7	67	FALSE	-	-	-	-
River	Colored Dissolved Organic Matter	2017 - 2023	7	38	FALSE	-	-	-	-
Estuary	Dissolved Oxygen	1992 - 2024	32	10948	TRUE	0.00	6.88	0.8401	0
River	Dissolved Oxygen	1992 - 2024	31	1286	TRUE	-0.01	6.42	0.4273	0
Estuary	Dissolved Oxygen Saturation	2011 - 2024	5	66	FALSE	-	-	-	-
River	Dissolved Oxygen Saturation	2001 - 2023	8	162	FALSE	-	-	-	-
Estuary	Salinity	1992 - 2024	32	11555	TRUE	0.10	20.33	0.0054	↑
River	Salinity	1992 - 2024	31	850	TRUE	0.05	5.90	0.2056	0
Estuary	Secchi Depth	1992 - 2024	8	112	FALSE	-	-	-	-
River	Secchi Depth	1992 - 2023	22	449	TRUE	0.00	1.02	0.5867	0
Estuary	Total Nitrogen	2011 - 2024	14	309	TRUE	-0.02	0.84	0.0000	↓
River	Total Nitrogen	1998 - 2024	27	351	TRUE	0.01	0.52	0.0000	↑
Estuary	Total Phosphorus	2011 - 2024	14	327	TRUE	0.00	0.06	0.0003	↓
River	Total Phosphorus	1998 - 2024	27	375	TRUE	0.00	0.07	0.0000	↓
Estuary	Total Suspended Solids	2011 - 2011	1	18	FALSE	-	-	-	-
River	Total Suspended Solids	1998 - 2023	26	307	TRUE	-0.06	4.71	0.0000	↓
Estuary	Turbidity	1995 - 2024	27	4593	TRUE	0.07	5.18	0.0346	↑
River	Turbidity	1995 - 2024	30	597	TRUE	-0.03	2.63	0.0054	↓
Estuary	Water Temperature	1992 - 2024	32	11611	TRUE	0.04	22.16	0.0003	↑
River	Water Temperature	1992 - 2024	31	1327	TRUE	-0.01	22.34	0.3160	0
Estuary	pH	1992 - 2024	32	6108	TRUE	0.00	8.02	0.0005	↓
River	pH	1992 - 2024	31	922	TRUE	-0.01	7.79	0.0000	↓

Table containing overview of Programs contributing data for Waccasassa

Table 29: Overview of Program Data for Waccasassa

ParameterName	ProgramID	n-data-Estuay	n-data-River
Ammonium, Filtered (NH4)	477	-	1
Ammonium, Filtered (NH4)	5002	18	301
Chlorophyll a, Corrected for Pheophytin	540	29	7
Chlorophyll a, Corrected for Pheophytin	5002	280	357
Chlorophyll a, Corrected for Pheophytin	5008	16	-
Chlorophyll a, Uncorrected for Pheophytin	103	34	12
Chlorophyll a, Uncorrected for Pheophytin	540	29	7
Chlorophyll a, Uncorrected for Pheophytin	5002	192	222
Chlorophyll a, Uncorrected for Pheophytin	5008	17	-
Colored Dissolved Organic Matter	477	-	1
Colored Dissolved Organic Matter	540	30	7
Colored Dissolved Organic Matter	5002	-	30
Colored Dissolved Organic Matter	5008	39	-
Dissolved Oxygen	69	51	-
Dissolved Oxygen	95	159	-
Dissolved Oxygen	103	20	50
Dissolved Oxygen	115	4	2
Dissolved Oxygen	118	4	-
Dissolved Oxygen	477	-	1
Dissolved Oxygen	540	21	5
Dissolved Oxygen	5002	10650	1315
Dissolved Oxygen	5008	39	-
Dissolved Oxygen Saturation	477	-	1
Dissolved Oxygen Saturation	5002	27	161
Dissolved Oxygen Saturation	5008	39	-
NO2+3, Filtered	477	-	1
NO2+3, Filtered	540	30	7
NO2+3, Filtered	5002	273	351
Phosphate, Filtered (PO4)	5002	18	135
Salinity	69	51	-
Salinity	95	160	-
Salinity	115	4	2
Salinity	118	5	-
Salinity	477	-	1
Salinity	540	24	5
Salinity	5002	11270	842
Salinity	5008	41	-

Secchi Depth	69	51	-
Secchi Depth	103	5	25
Secchi Depth	115	2	1
Secchi Depth	118	2	-
Secchi Depth	477	-	1
Secchi Depth	5002	23	507
Secchi Depth	5008	31	-
Specific Conductivity	69	49	-
Specific Conductivity	103	9	49
Specific Conductivity	477	-	2
Specific Conductivity	5002	36	814
Specific Conductivity	5008	39	-
Total Kjeldahl Nitrogen	477	-	1
Total Kjeldahl Nitrogen	540	30	7
Total Kjeldahl Nitrogen	5002	272	362
Total Nitrogen	540	30	7
Total Nitrogen	5002	272	345
Total Nitrogen	5008	17	-
Total Phosphorus	103	17	6
Total Phosphorus	477	-	1
Total Phosphorus	540	30	7
Total Phosphorus	5002	272	362
Total Phosphorus	5008	17	-
Total Suspended Solids	103	-	5
Total Suspended Solids	5002	18	302
Turbidity	103	11	6
Turbidity	477	-	2
Turbidity	5002	4594	596
Water Temperature	69	51	-
Water Temperature	95	160	-
Water Temperature	103	20	50
Water Temperature	115	4	2
Water Temperature	118	3	-
Water Temperature	477	-	1
Water Temperature	540	24	6
Water Temperature	5002	11313	1355
Water Temperature	5008	39	-
pH	69	51	-
pH	95	130	-
pH	103	20	50
pH	115	4	2
pH	118	6	-
pH	477	-	1
pH	540	15	4
pH	5002	5849	952
pH	5008	39	-

Program names:

69 - Fisheries-Independent Monitoring (FIM) Program -⁴

95 - Harmful Algal Bloom Marine Observation Network -⁵

103 - EPA STOrage and RETrieval Data Warehouse (STORET) -⁶

115 - Environmental Monitoring Assessment Program -⁷

118 - National Aquatic Resource Surveys, National Coastal Condition Assessment -⁹

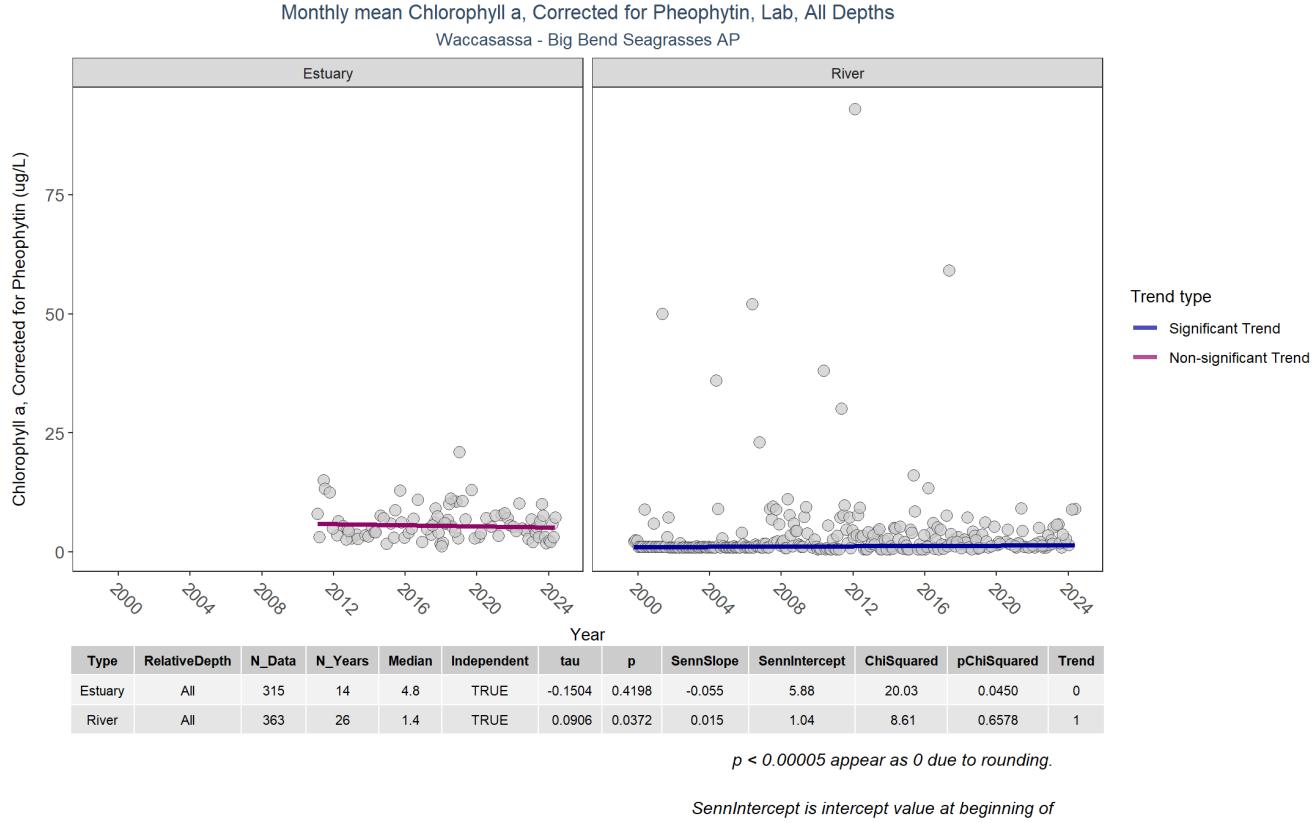
477 - Suwannee River Water Management District Water Resource Monitoring Program -¹⁰

540 - Shellfish Harvest Area Classification Program -¹³

5002 - Florida STORET / WIN -²

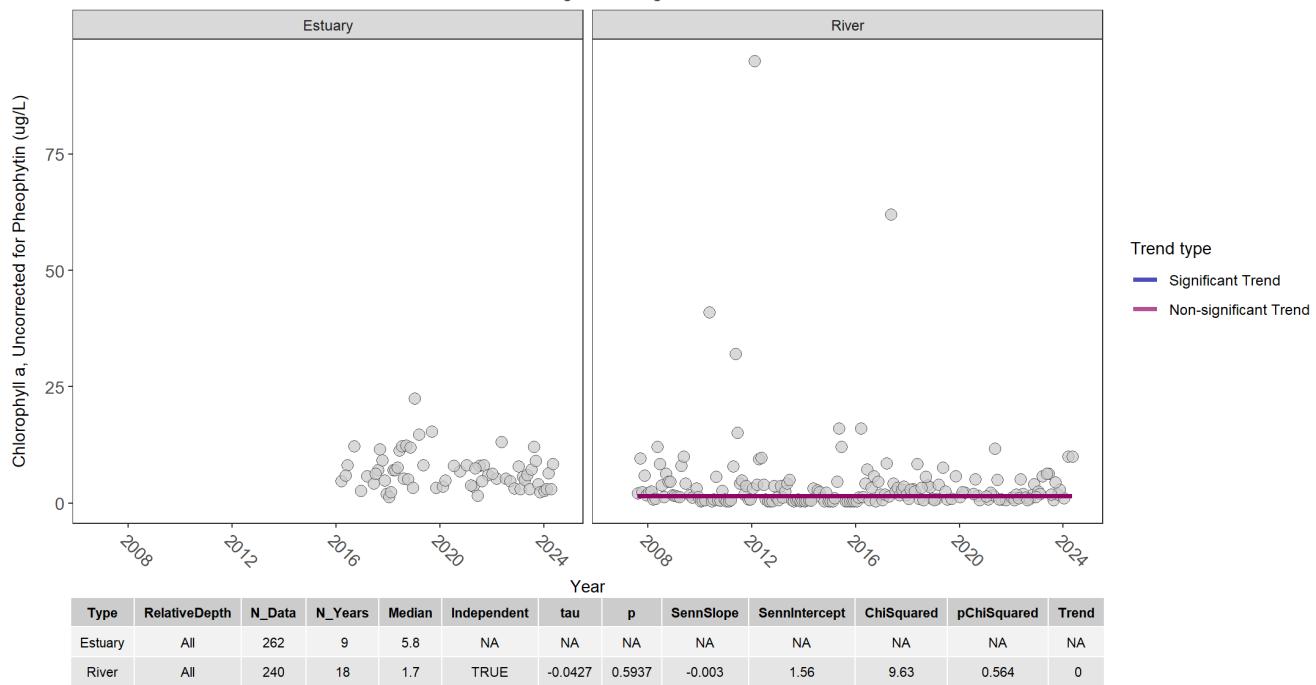
5008 - Project COAST (Coastal Assessment Team) - Springs Coast Ecosystem Region -¹⁴

Chlorophyll a, Corrected for Pheophytin

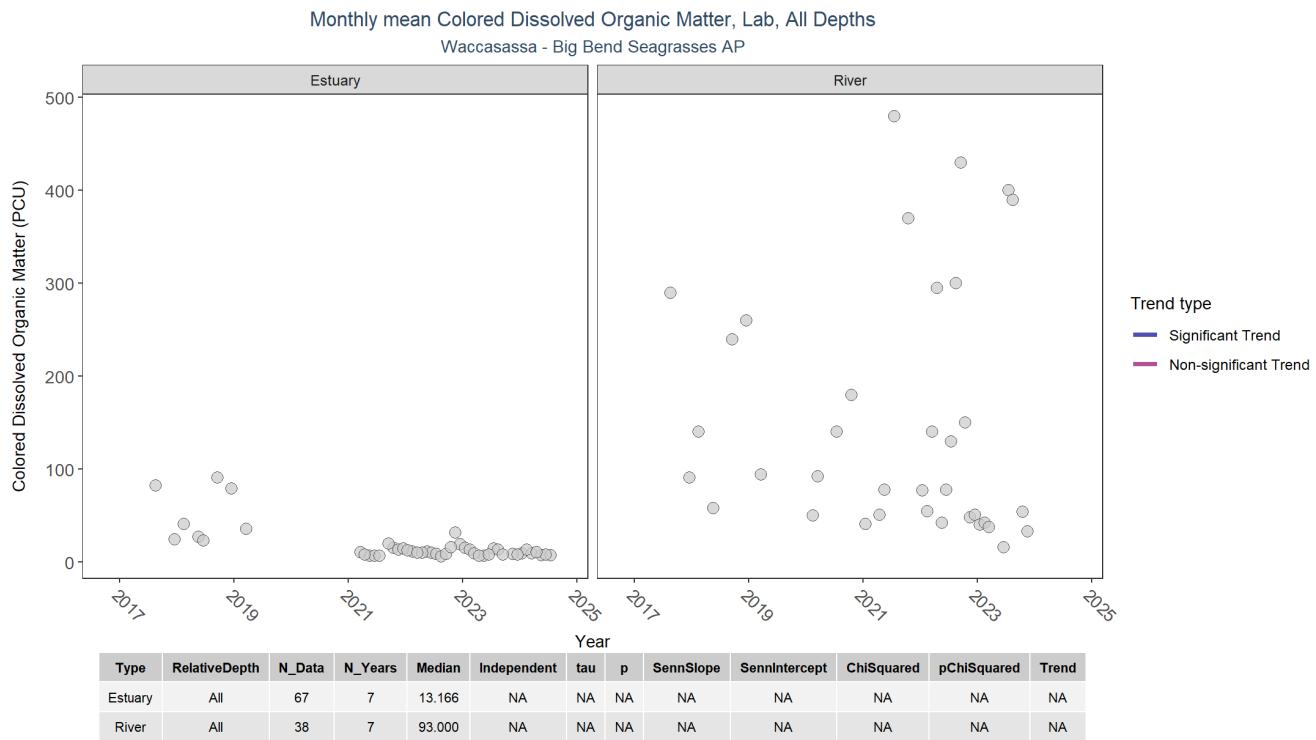


Chlorophyll a, Uncorrected for Pheophytin

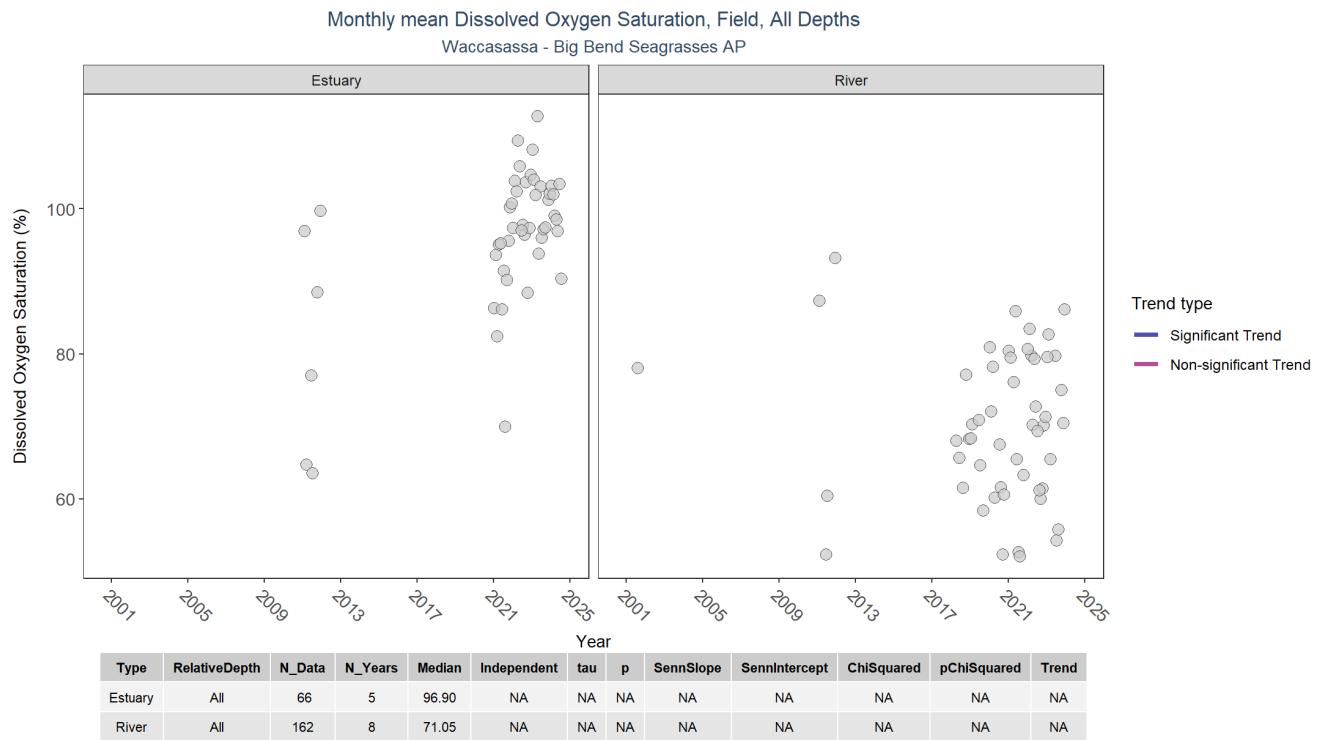
Monthly mean Chlorophyll a, Uncorrected for Pheophytin, Lab, All Depths
Waccasassa - Big Bend Seagrasses AP



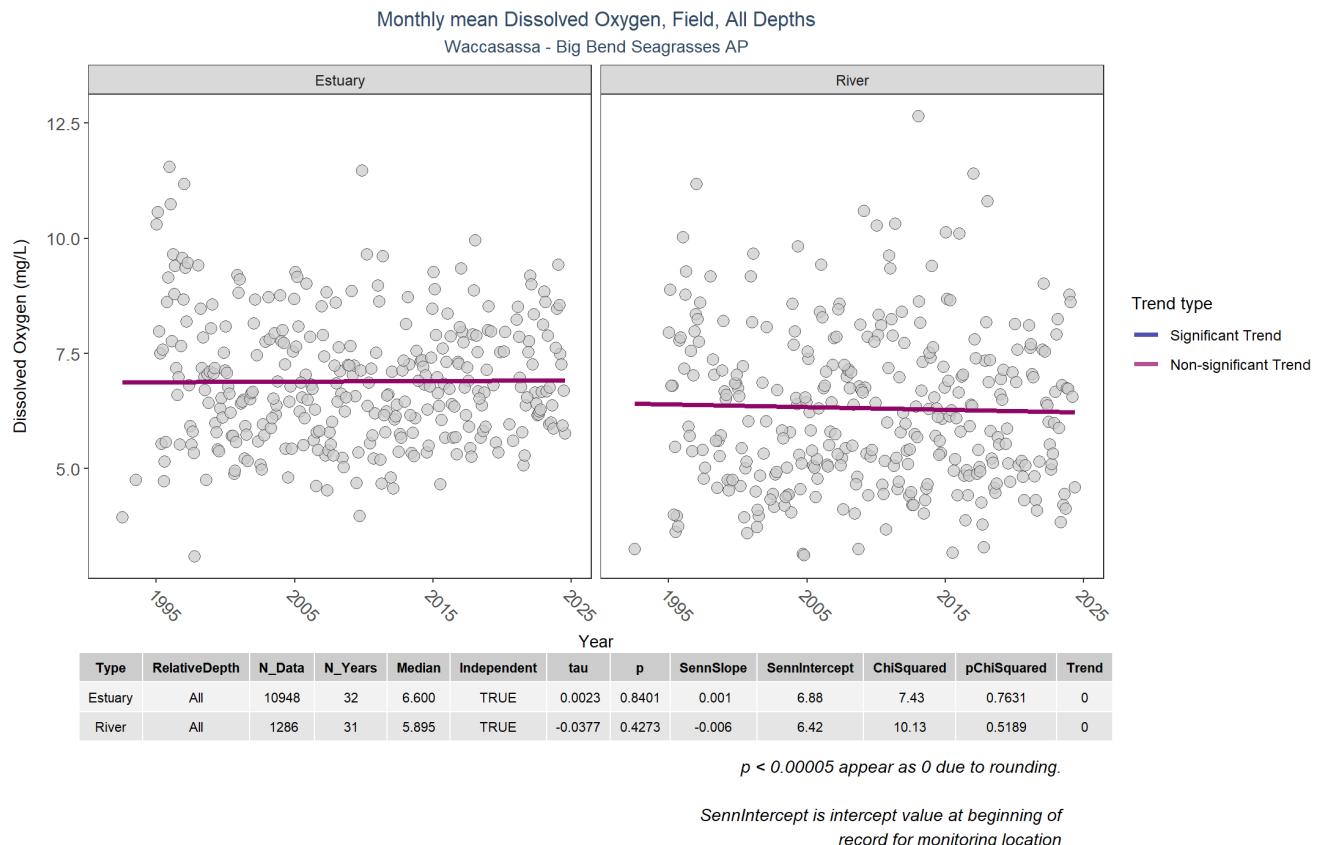
Colored Dissolved Organic Matter



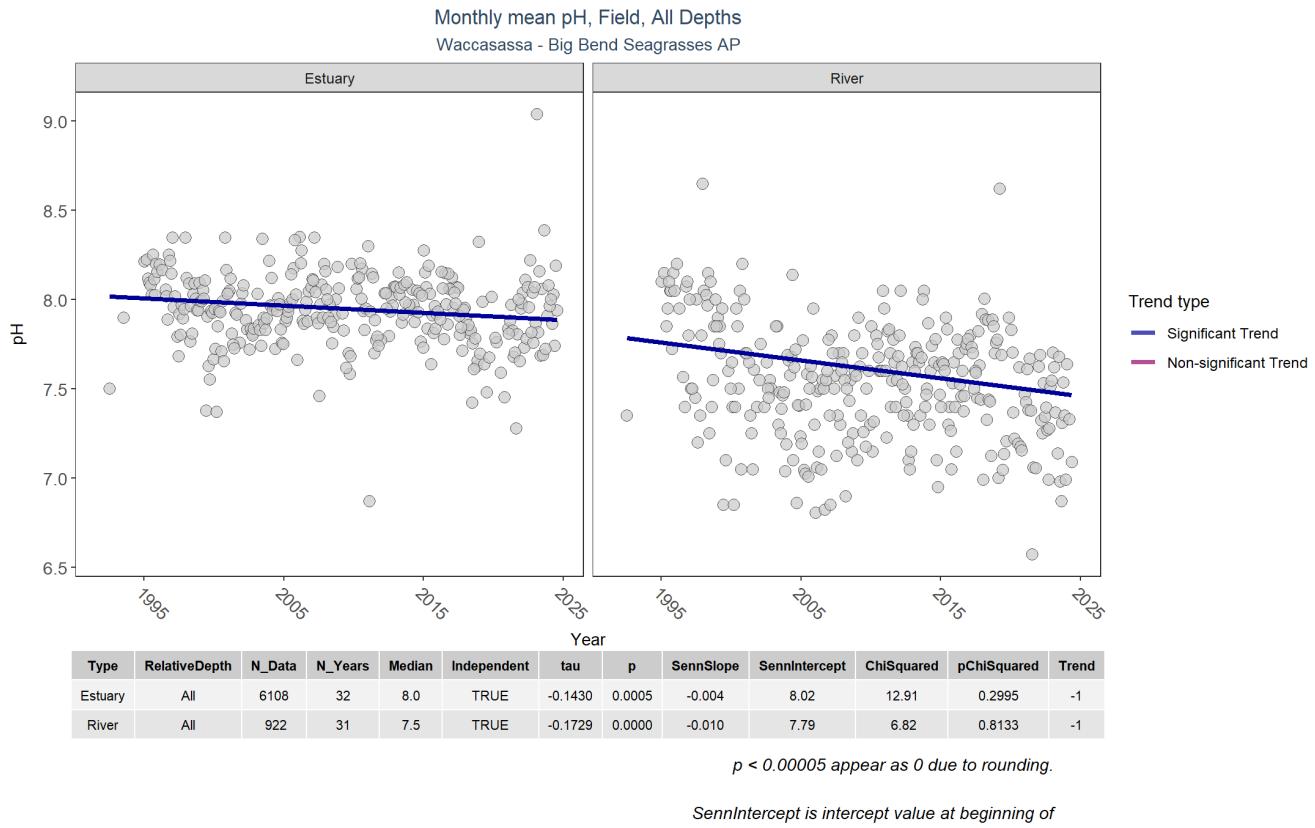
Dissolved Oxygen Saturation



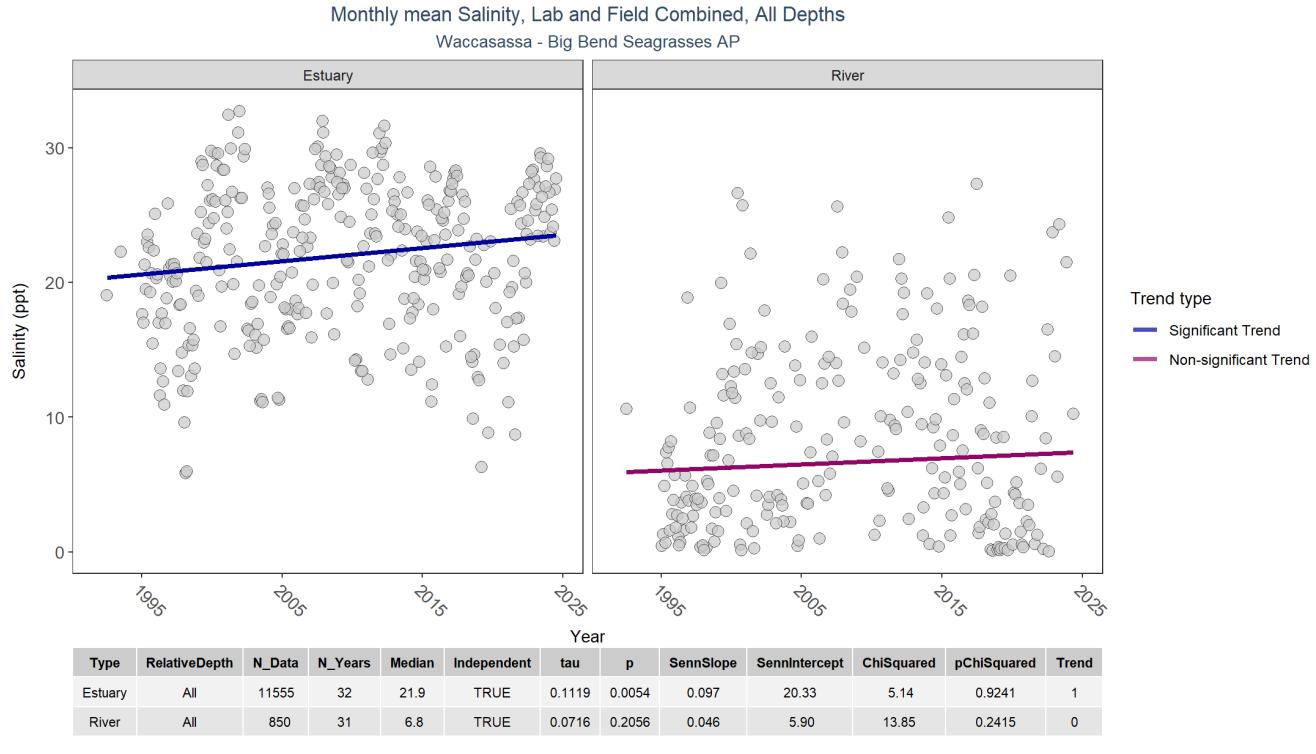
Dissolved Oxygen



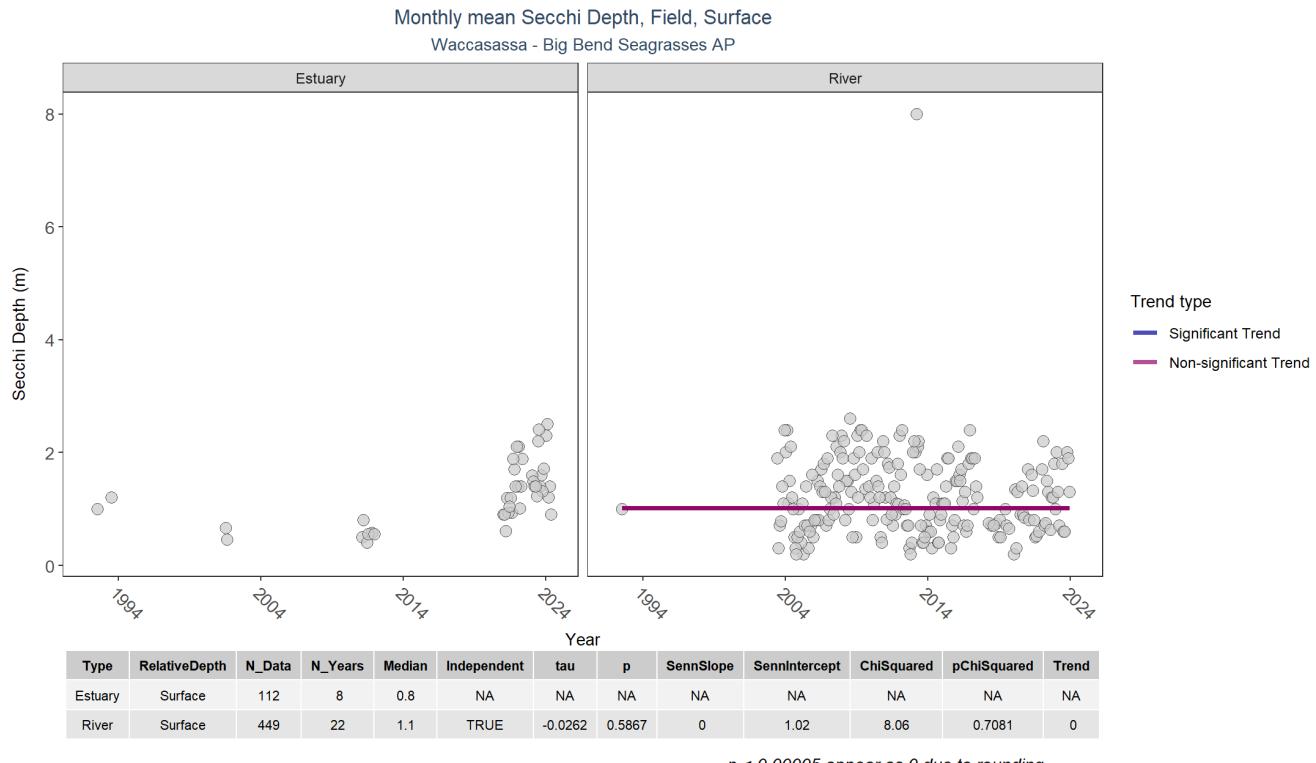
pH



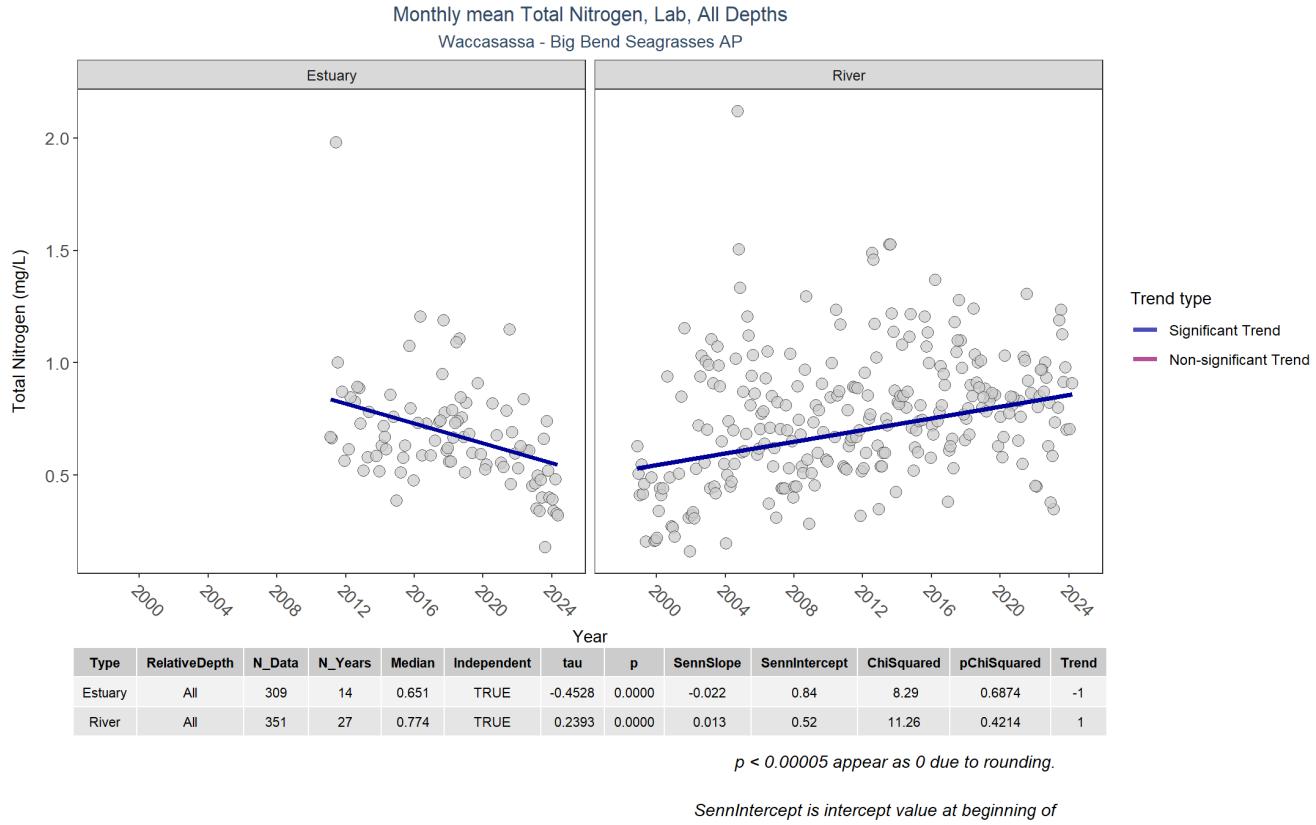
Salinity



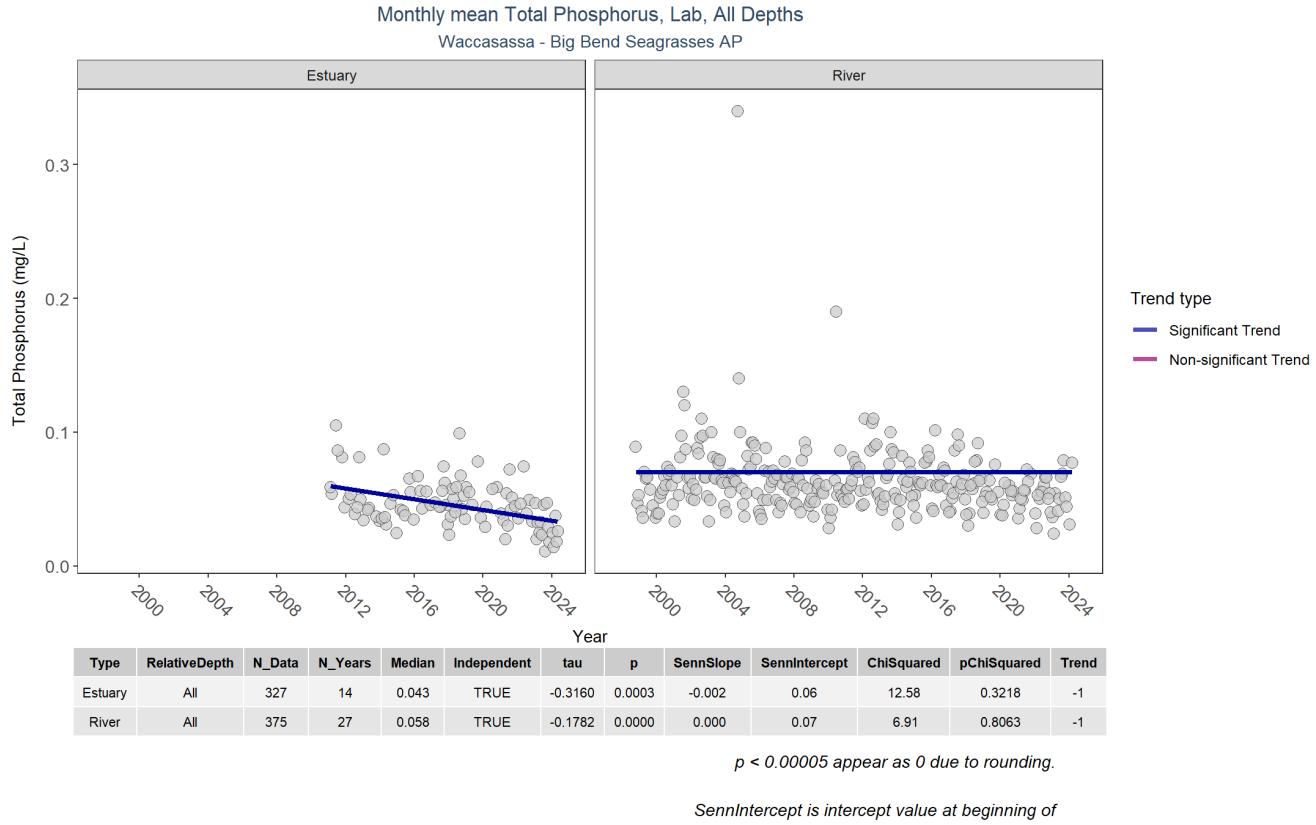
Secchi Depth



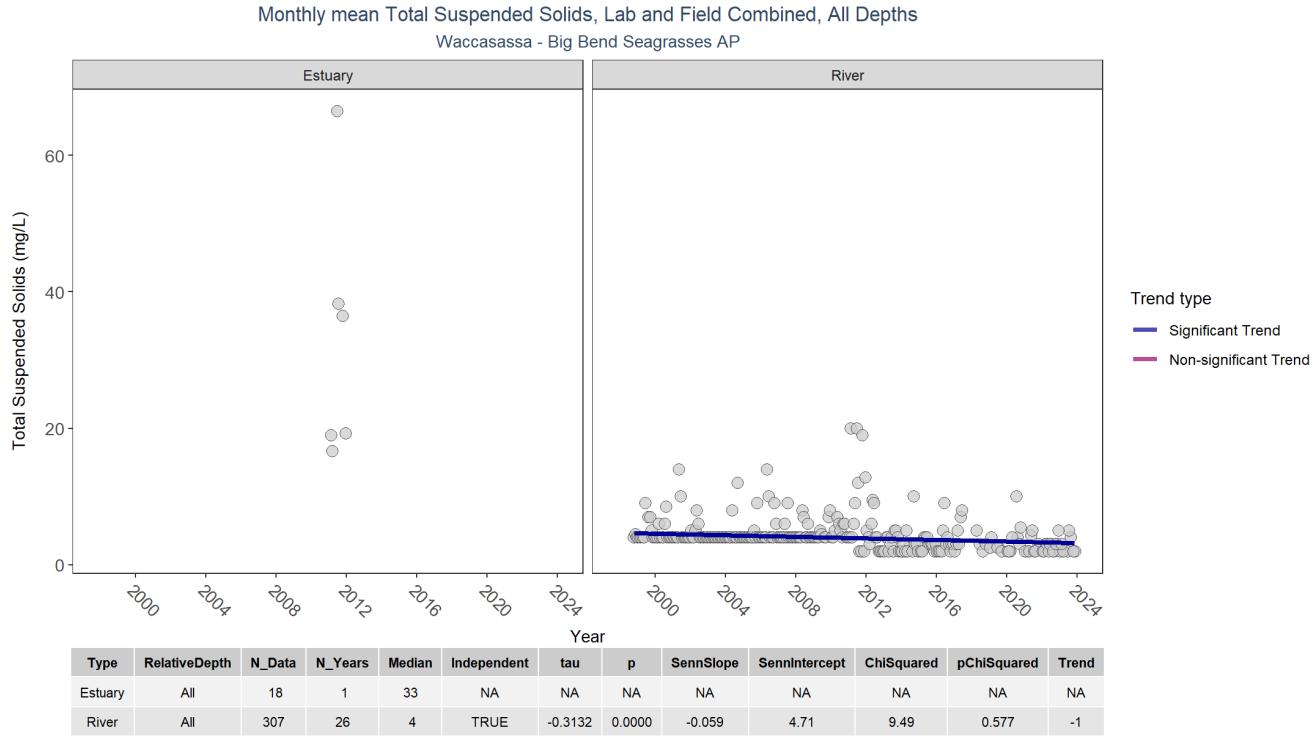
Total Nitrogen



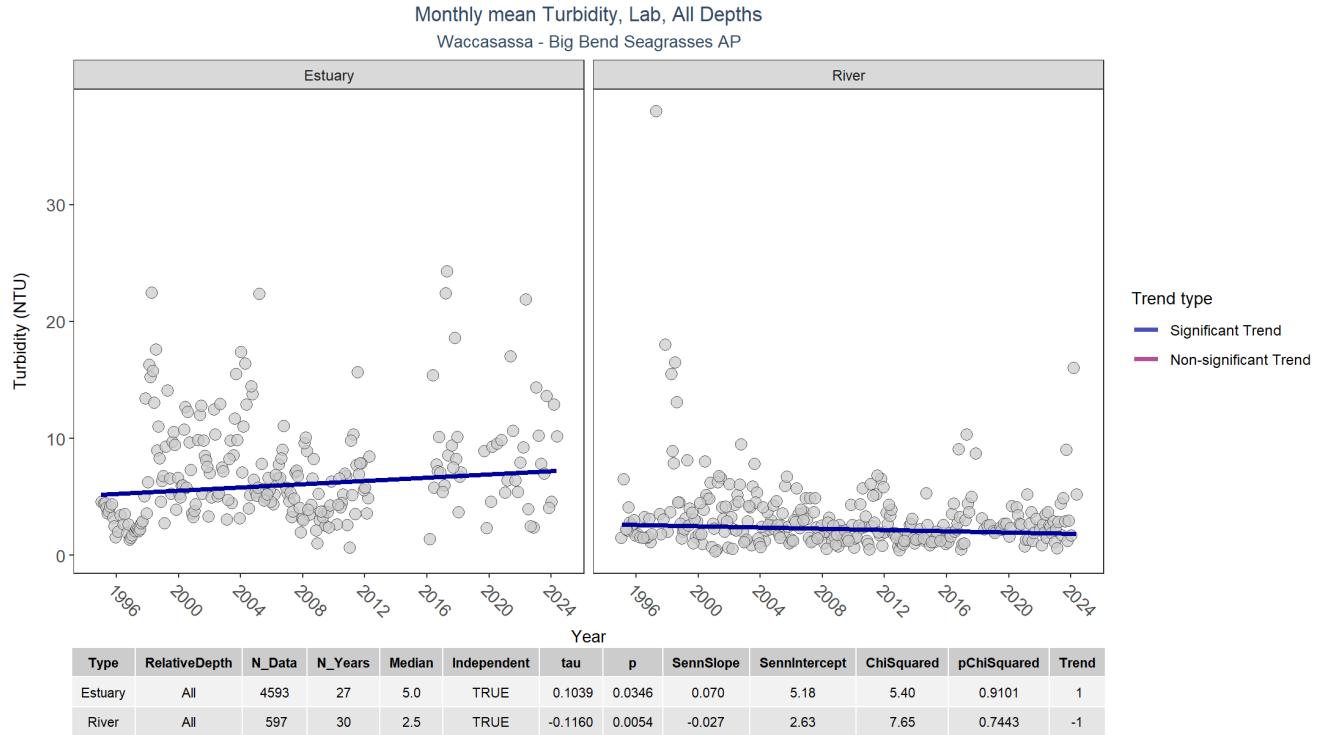
Total Phosphorus



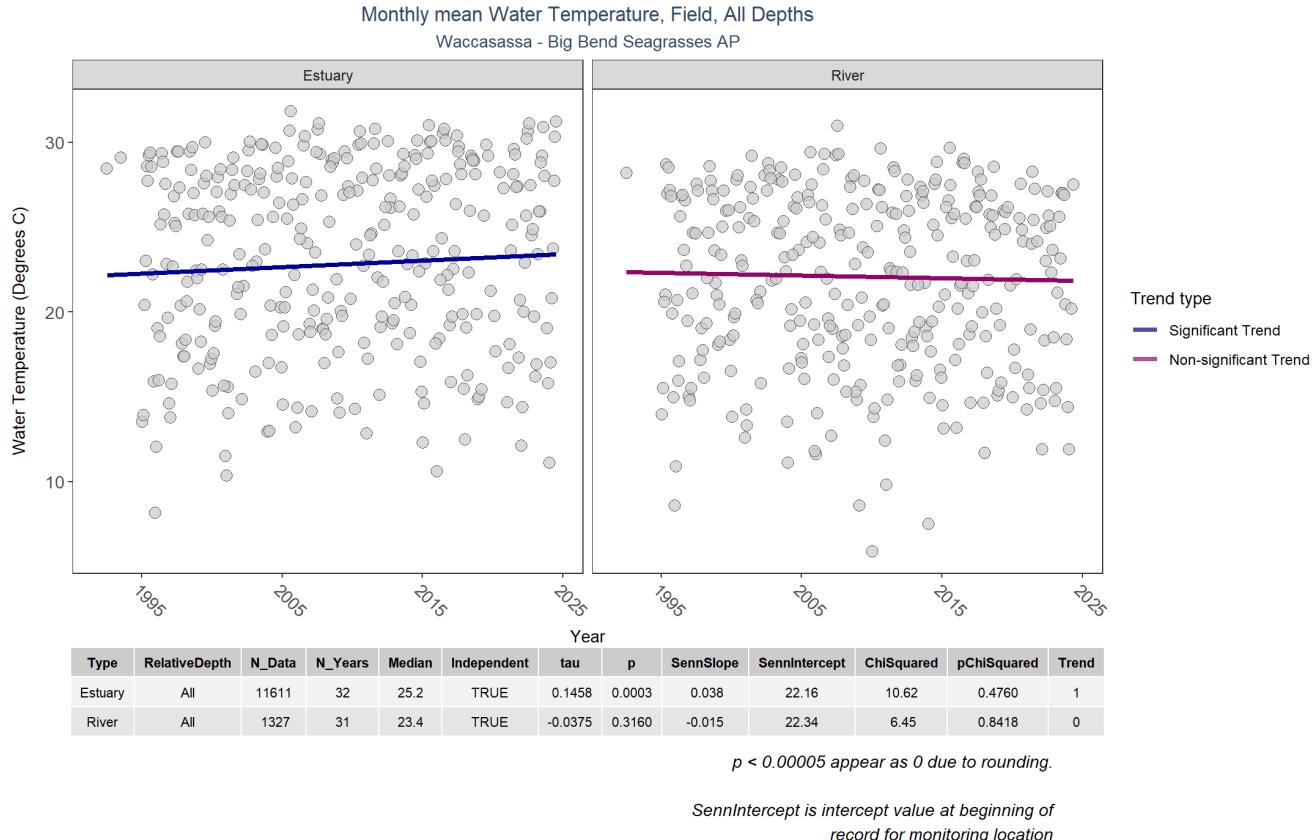
Total Suspended Solids



Turbidity



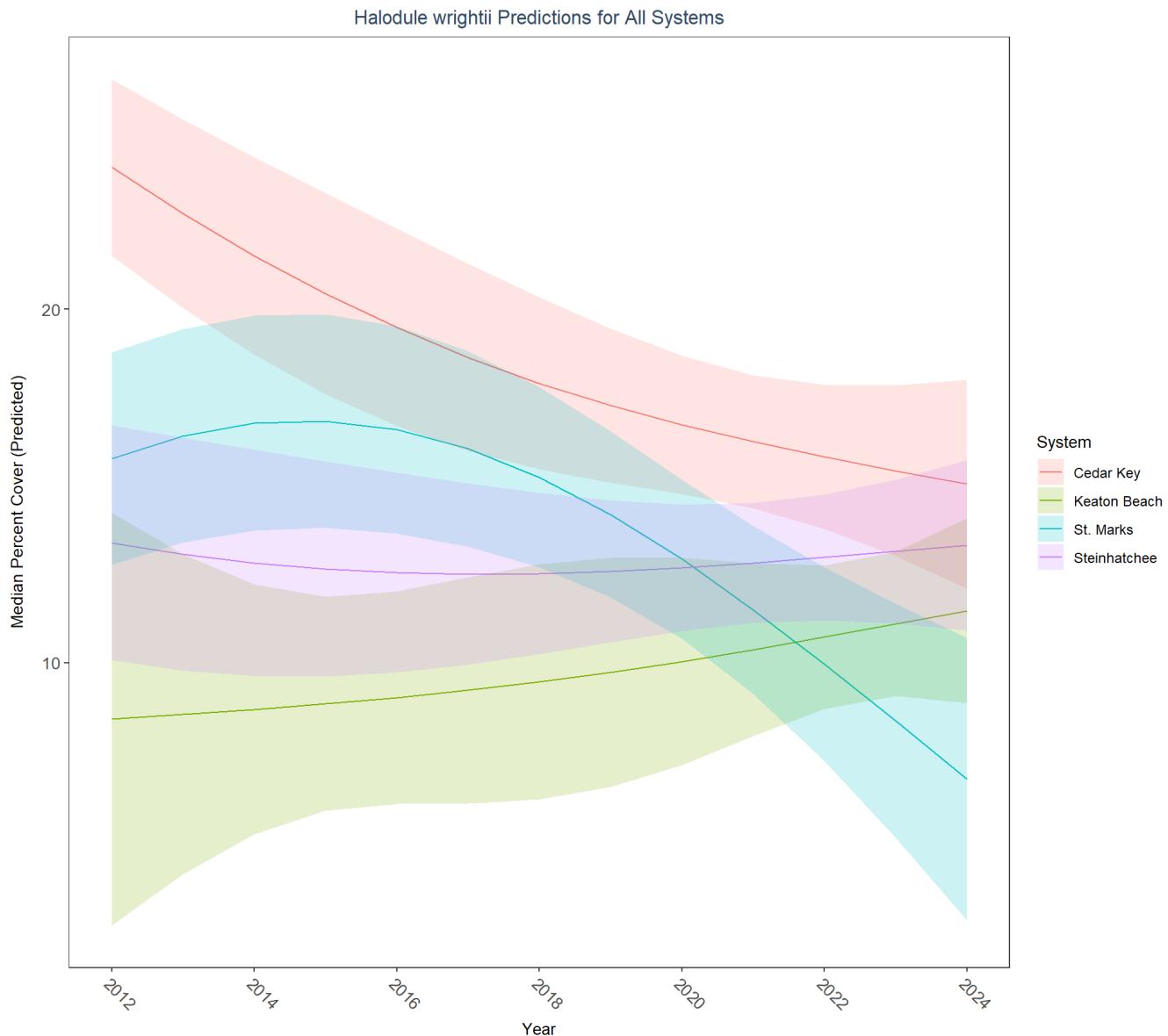
Water Temperature



Submerged Aquatic Vegetation - Generalized Additive Models

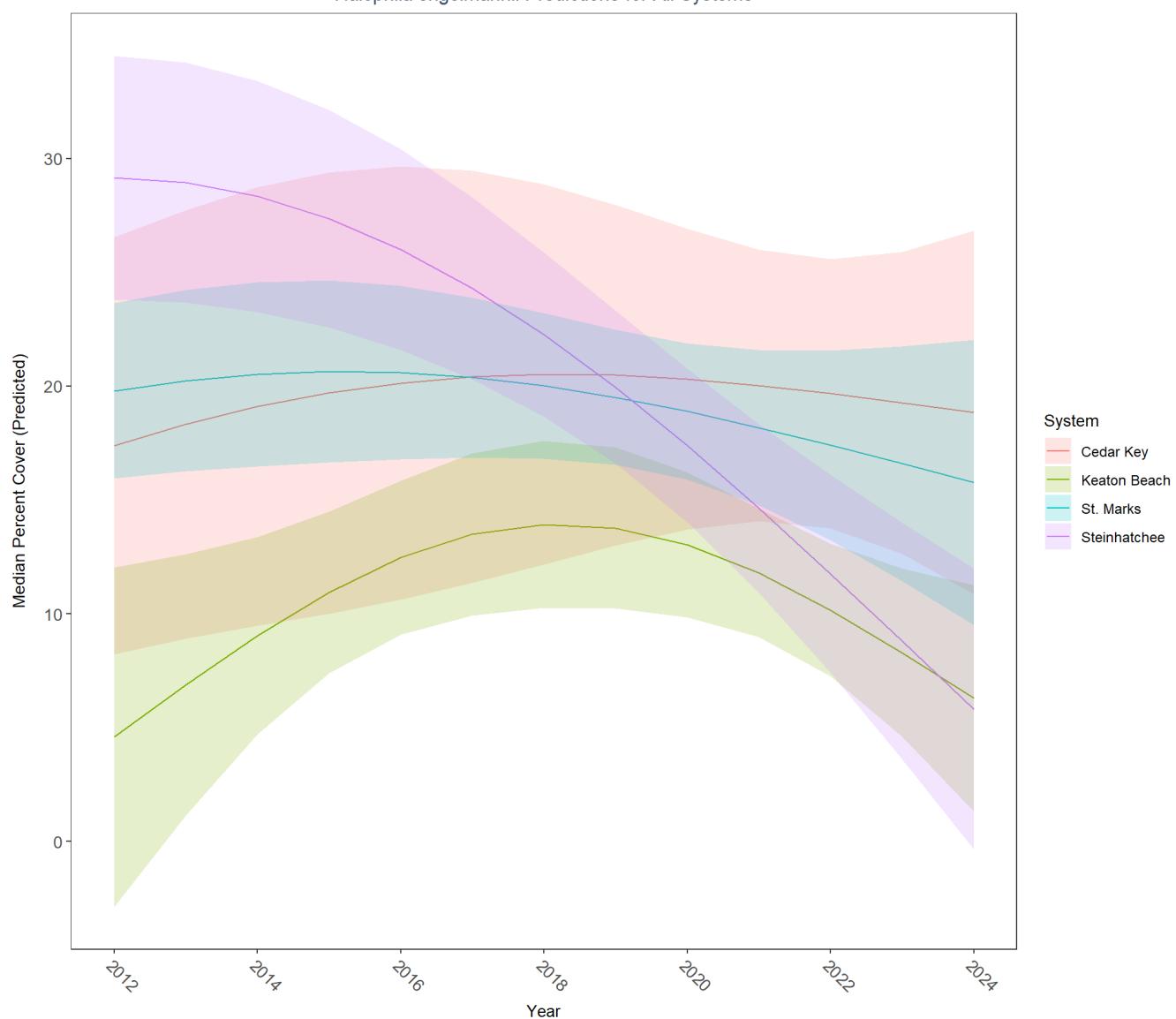
Generalized Additive Model (GAM) estimates are created to visualize the overall trend in Median Percent Cover for each species across the various watersheds in BBSAP. The plots show the predicted values of species presence over time for each system, with separate trends representing each system. The shaded areas around each line represent the 95% confidence intervals for the predictions. These confidence intervals provide insight into the variability of the predictions and suggest that there may be periods or systems where the predicted trends are less certain.

Halodule wrightii

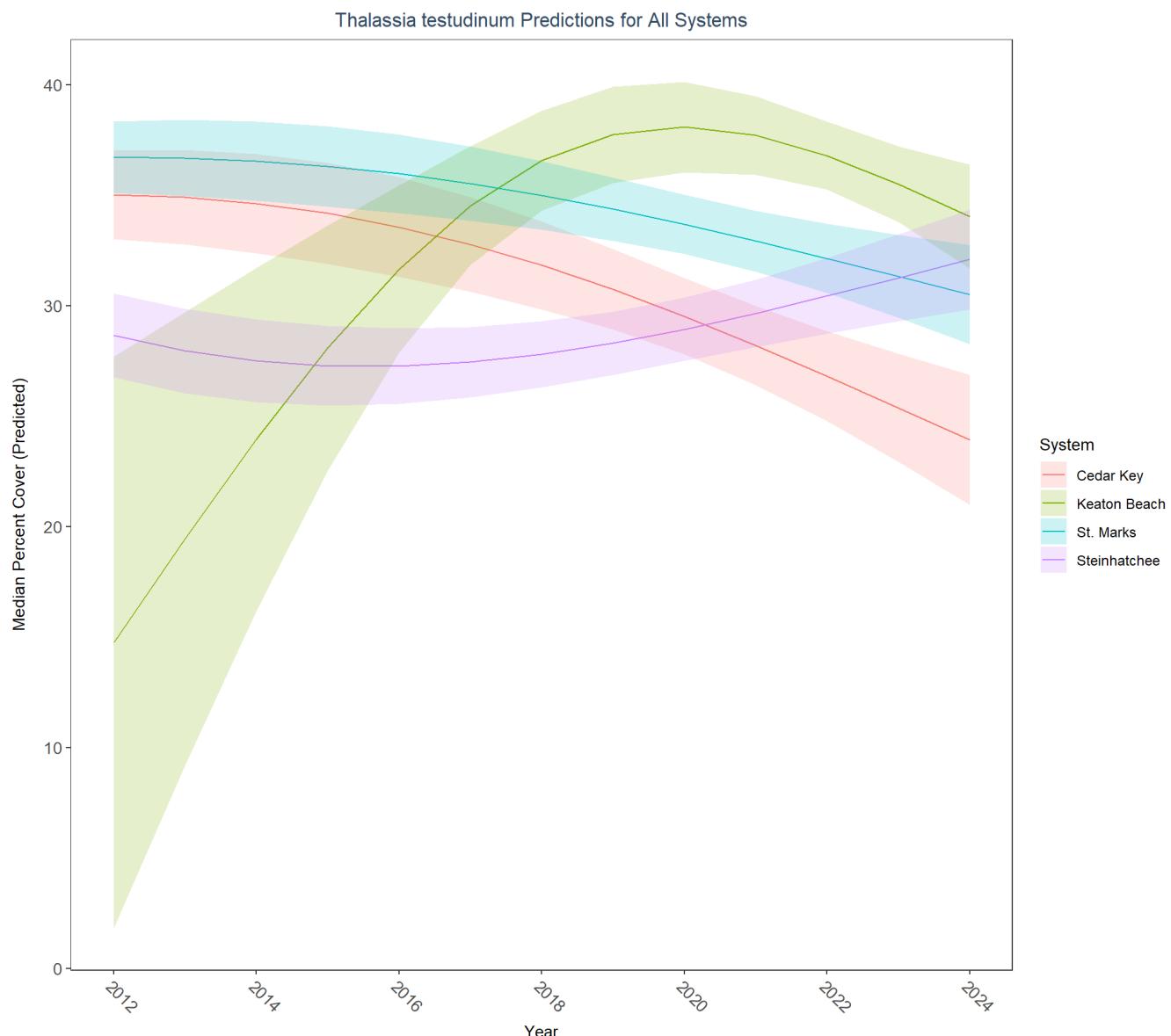


Halophila engelmannii

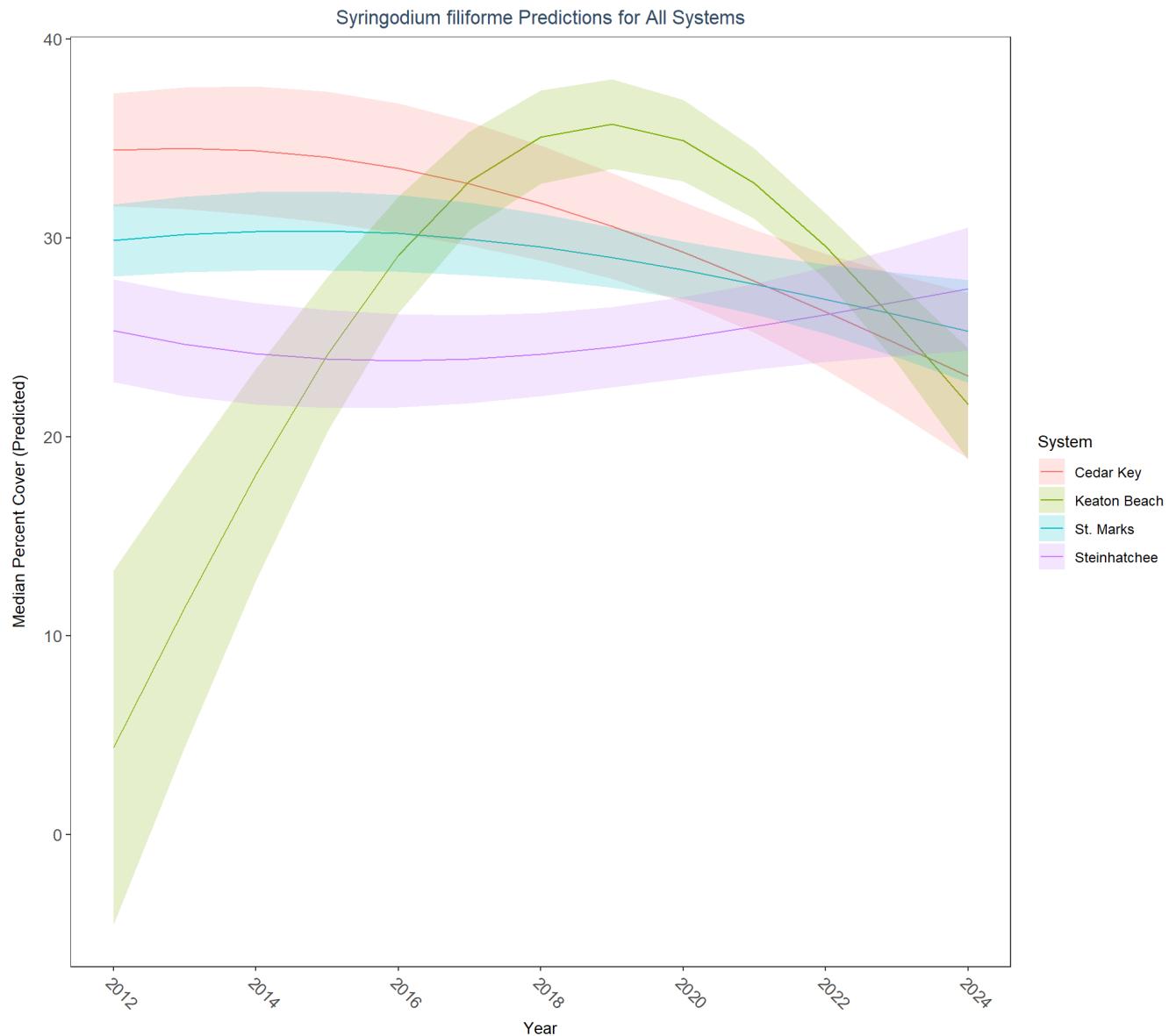
Halophila engelmannii Predictions for All Systems



Thalassia testudinum



Syringodium filiforme



SEACAR Files used in the analysis

The following files were used in the analysis:

- *Combined_WQ_WC_NUT_Ammonia_Un-ionized_NH3-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Chlorophyll_a_corrected_for_pheophytin-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Chlorophyll_a_uncorrected_for_pheophytin-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Colored_dissolved_organic_matter_CDOM-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Dissolved_Oxygen_Saturation-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Light_Exinction_Coefficient-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_NH4_Filtered-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Nitrate_N-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Nitrite_N-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Nitrogen_organic-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_NO2_3_Filtered-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_pH-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_PO4_Filtered-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Salinity-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Secchi_Depth-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Specific_Conductivity-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Total_Kjeldahl_Nitrogen_TKN-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Total_Nitrogen-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Total_Phosphorus-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Total_Suspended_Solids_TSS-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Turbidity-2024-Oct-03.txt*
- *Combined_WQ_WC_NUT_Water_Temperature-2024-Oct-03.txt*

Threshold file used in QA process:

- [Database_Thresholds_20240813.xlsx](#)

References

1. Yarbro, L. A. & Carlson, P. R. Seagrass integrated mapping and monitoring program mapping and monitoring report no. 2. (2016) doi:[10.6095/TXXF-CB11](https://doi.org/10.6095/TXXF-CB11).
2. Florida Department of Environmental Protection (DEP). [Florida STORET / WIN](#). (2024).
3. Gulf States Marine Fisheries Commission. [Southeast Area Monitoring and Assessment Program \(SEAMAP\) - Gulf of Mexico Fall & Summer Shrimp/Groundfish Survey](#). (2016).
4. Florida Fish and Wildlife Conservation Commission (FWC). [Fisheries-Independent Monitoring \(FIM\) Program](#). (2022).
5. Florida Fish and Wildlife Conservation Commission (FWC) & Florida Fish and Wildlife Research Institute (FWRI). [Harmful Algal Bloom Marine Observation Network](#). (2018).
6. U.S. Environmental Protection Agency (EPA). [EPA STOrage and RETrieval Data Warehouse \(STORET\)/WQX](#). (2023).
7. U.S. Environmental Protection Agency (EPA); Office of Research and Development. [Environmental Monitoring Assessment Program](#). (2004).
8. University of Florida (UF); Institute of Food and Agricultural Sciences. [Florida LAKEWATCH Program](#). (2024).
9. U.S. Environmental Protection Agency (EPA); Office of Water *et al.* [National Aquatic Resource Surveys, National Coastal Condition Assessment](#). (2021).
10. Suwannee River Water Management District (SRWMD). [Suwannee River Water Management District Water Resource Monitoring Program](#). (2024).
11. Florida Department of Environmental Protection (DEP); Office of Resilience and Coastal Protection (RCP), Big Bend Seagrasses Aquatic Preserves & University of Florida - Nature Coast Aquatic Preserve. [Big Bend Seagrasses & Nature Coast Aquatic Preserves - Seagrass Monitoring](#). (2024).
12. Florida Fish and Wildlife Conservation Commission (FWC) & Florida Fish and Wildlife Research Institute (FWRI). [Northern Big Bend Seagrass Monitoring](#). (2018).
13. Florida Department of Agriculture and Consumer Services (FDACS); Division of Aquaculture. [Shellfish Harvest Area Classification Program](#). (2022).
14. University of Florida (UF), Florida Department of Environmental Protection (DEP); Office of Resilience and Coastal Protection (RCP) & Big Bend Seagrasses Aquatic Preserves / Nature Coast Aquatic Preserve. [Project COAST \(Coastal Assessment Team\) - Springs Coast Ecosystem Region](#). (2024).