

LAKEWATCH Report for Ponce Inlet-1 in Volusia County
Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link:
<https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link:
<https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
- **Name:** System name that LAKEWATCH uses for the station.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
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- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Ponce Inlet-1
Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.0953
Longitude	-80.9464

Long-Term Data for Estuaries: Definitions

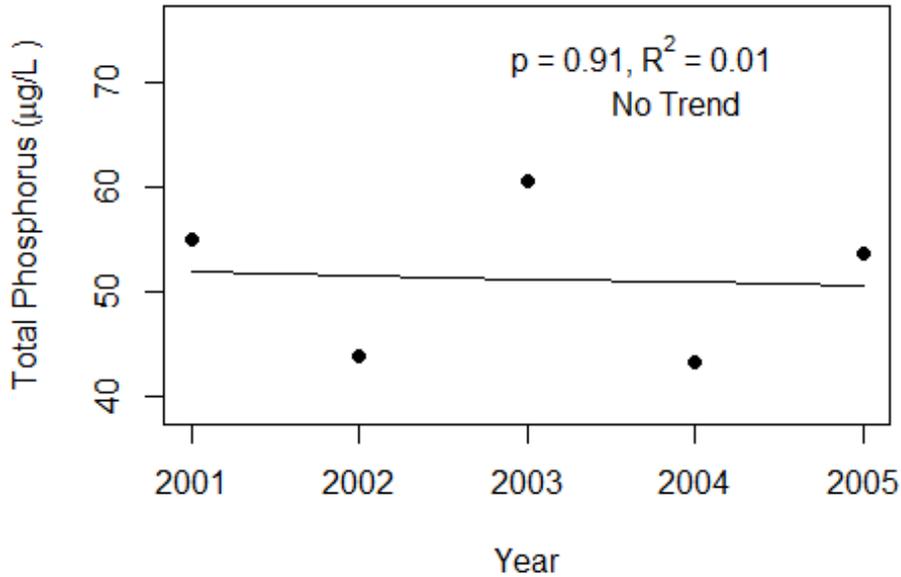
- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	40 - 55	46 (5)
Total Nitrogen ($\mu\text{g/L}$)	306 - 414	352 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	5 - 7	6 (5)
Secchi (ft)	4.0 - 4.8	4.4 (5)
Secchi (m)	1.2 - 1.5	1.3 (5)
Color (Pt-Co Units)	8 - 25	12 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	36244 - 48233	43731 (5)
Salinity (ppt)	22.5 - 30.1	27.2 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

Ponce Inlet-1 (Volusia)



Ponce Inlet-1 (Volusia)

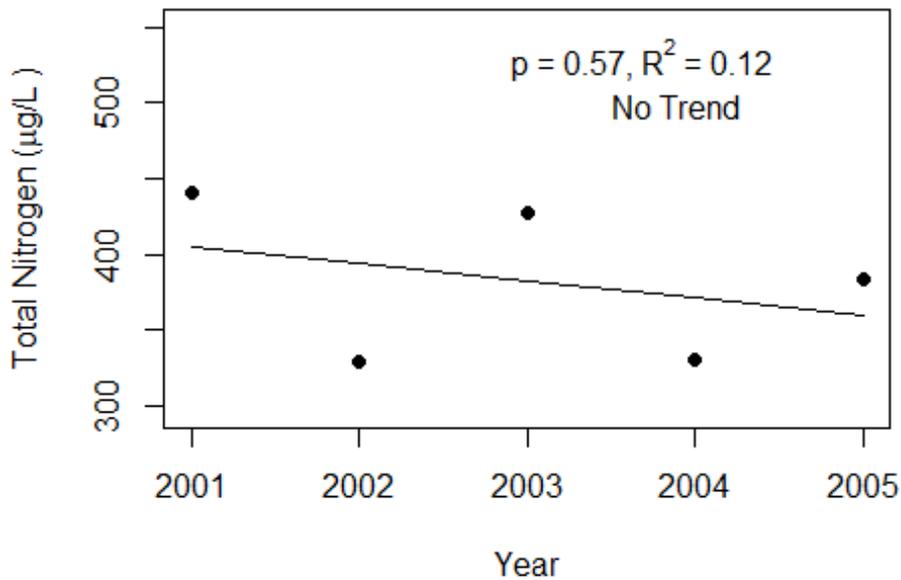
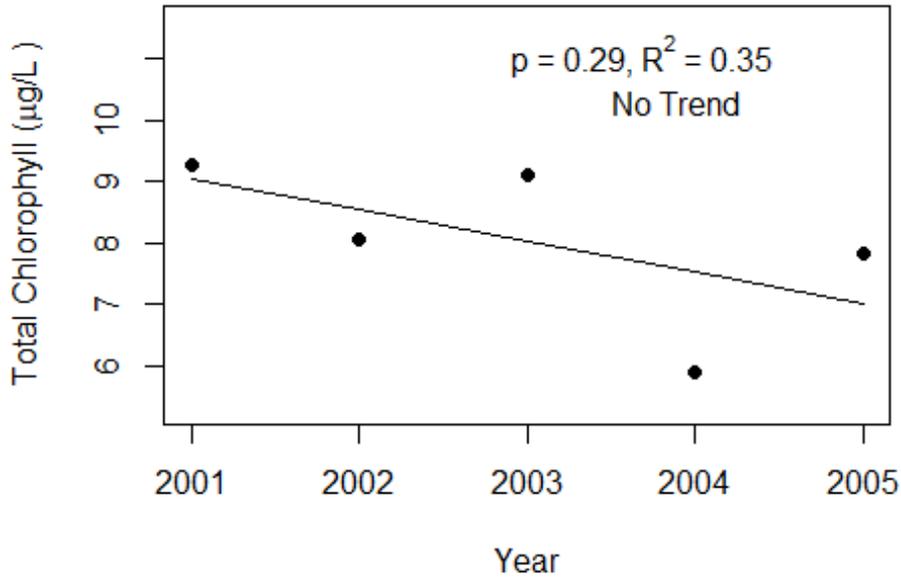
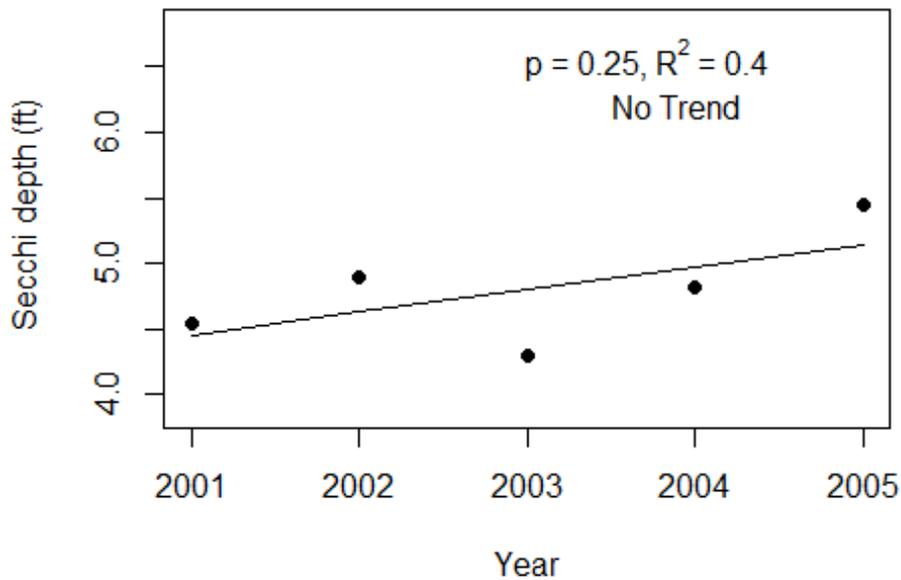


Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relations and the p value indicates if the relation is significant ($p < 0.05$ is significant)). Trend status are reported on plots.

Ponce Inlet-1 (Volusia)



Ponce Inlet-1 (Volusia)



LAKEWATCH Report for Ponce Inlet-2 in Volusia County
Estuary and Estuary Segment: Mosquito Lagoon Mosquito Lagoon: Ponce de Leon to
Edgewater
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

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The maps defining individual estuaries and coastal segments can be found at the following link: <https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

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Table 1. Base File Data.

County	Volusia
Name	Ponce Inlet-2
Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.0586
Longitude	-80.9172

Long-Term Data for Estuaries: Definitions

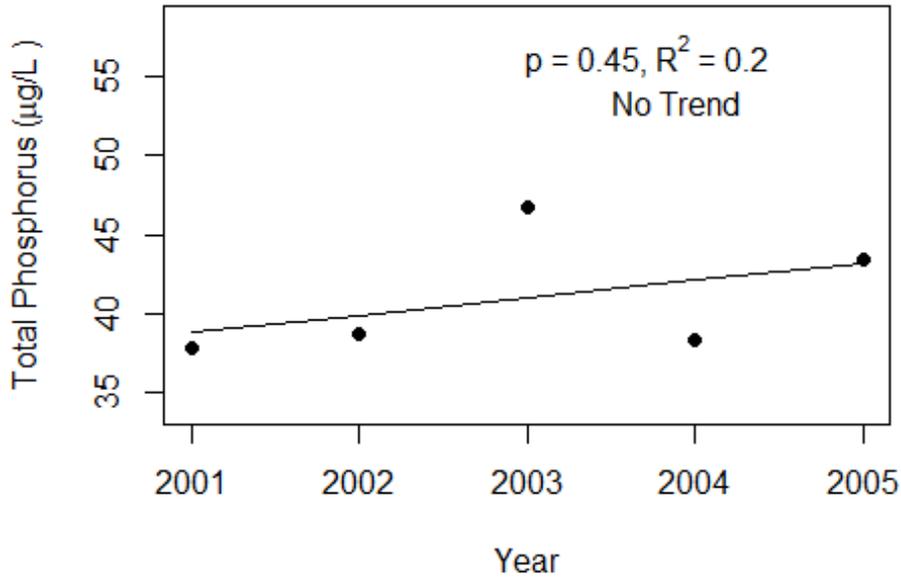
- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
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Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	34 - 43	38 (5)
Total Nitrogen ($\mu\text{g/L}$)	261 - 363	308 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	5 - 7	6 (5)
Secchi (ft)	3.8 - 4.4	4.1 (5)
Secchi (m)	1.2 - 1.3	1.3 (5)
Color (Pt-Co Units)	5 - 16	8 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	43665 - 49985	47142 (5)
Salinity (ppt)	27.2 - 31.2	29.4 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

Ponce Inlet-2 (Volusia)



Ponce Inlet-2 (Volusia)

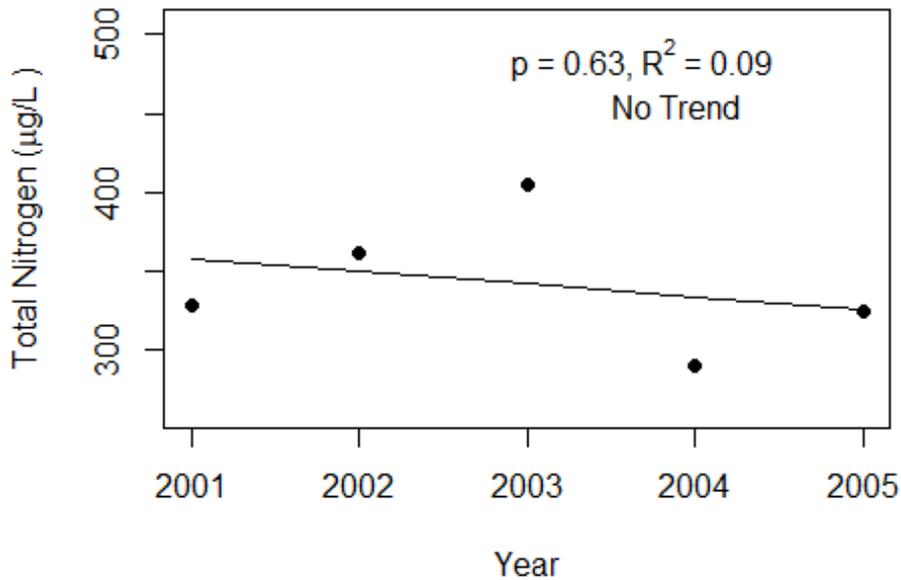
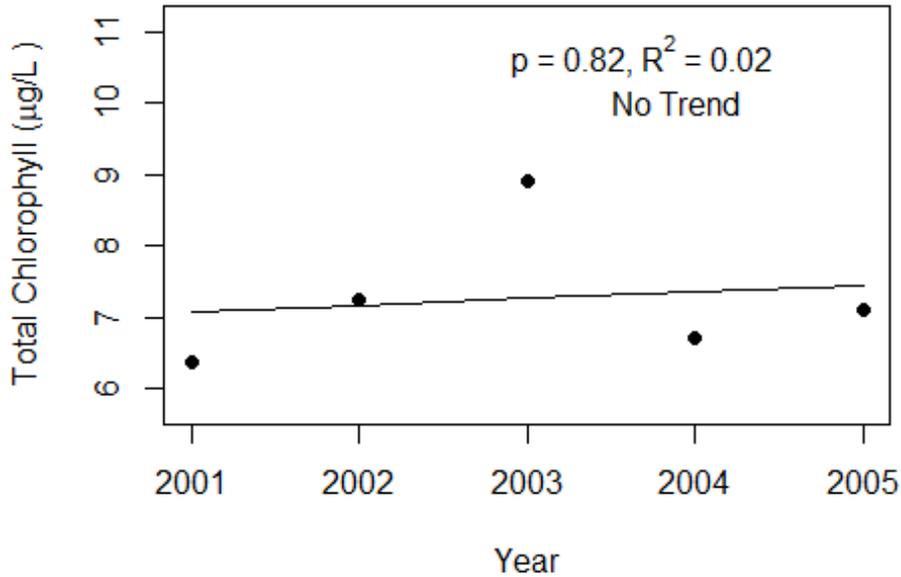
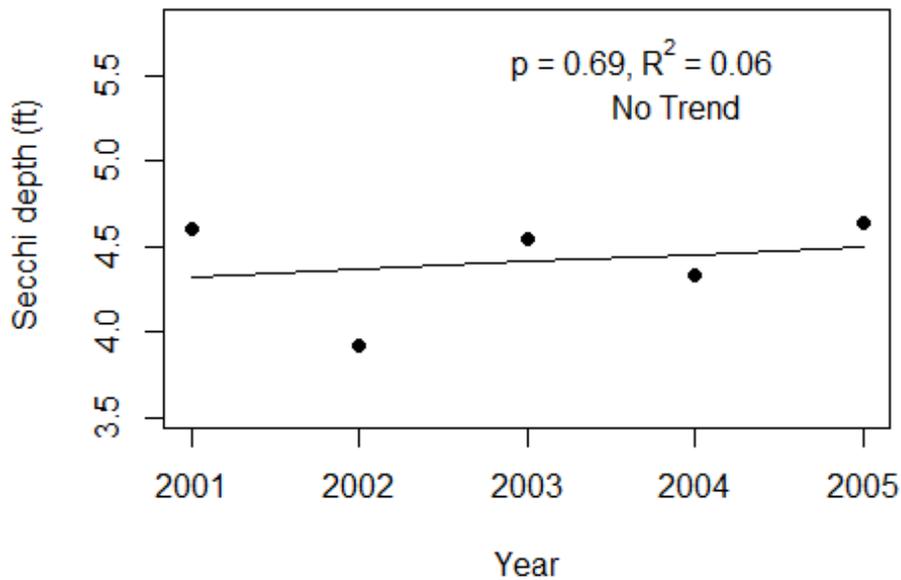


Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relations and the p value indicates if the relation is significant ($p < 0.05$ is significant)). Trend status are reported on plots.

Ponce Inlet-2 (Volusia)



Ponce Inlet-2 (Volusia)



LAKEWATCH Report for Ponce Inlet-3 in Volusia County
Estuary and Estuary Segment: Mosquito Lagoon Mosquito Lagoon: Ponce de Leon to
Edgewater
Using Data Downloaded 2-12-2019

Introduction for Estuary

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The maps defining individual estuaries and coastal segments can be found at the following link: <https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

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Table 1. Base File Data.

County	Volusia
Name	Ponce Inlet-3
Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.0442
Longitude	-80.9103

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
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Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	34 - 46	40 (5)
Total Nitrogen ($\mu\text{g/L}$)	300 - 385	349 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	6 - 8	7 (5)
Secchi (ft)	2.4 - 4.2	3.6 (5)
Secchi (m)	0.7 - 1.3	1.1 (5)
Color (Pt-Co Units)	7 - 13	9 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	43256 - 50498	47549 (5)
Salinity (ppt)	26.9 - 31.5	29.6 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

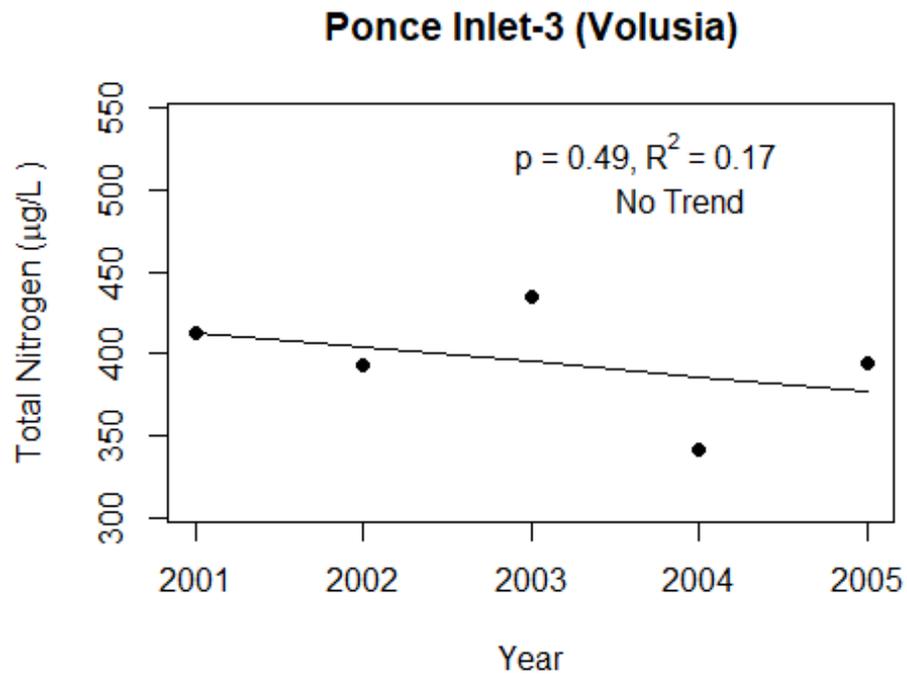
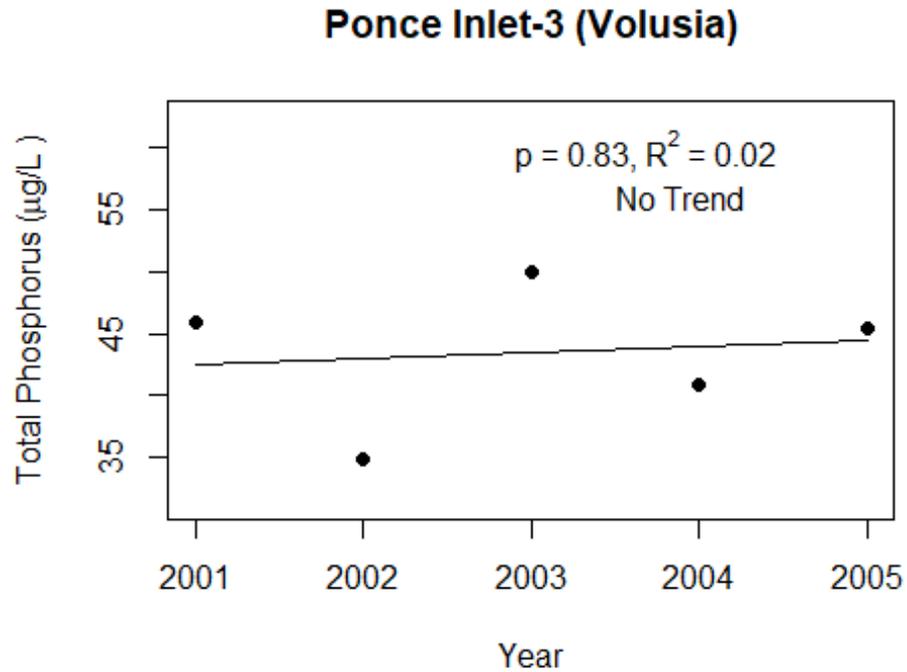
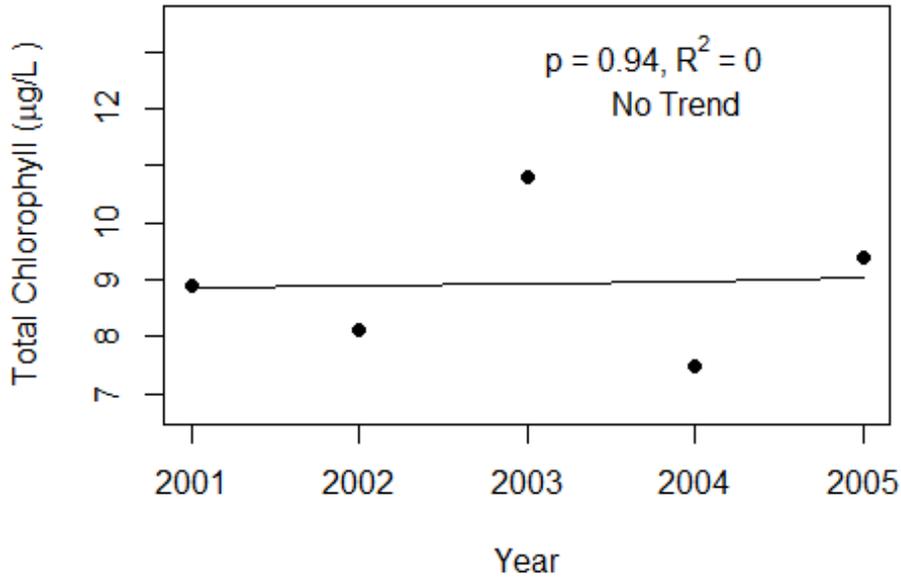
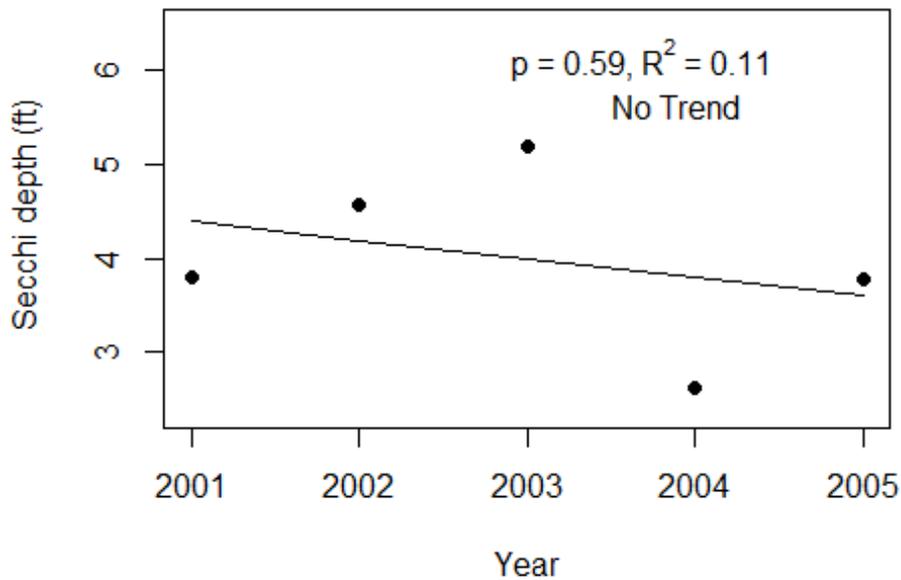


Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relations and the p value indicates if the relation is significant ($p < 0.05$ is significant)). Trend status are reported on plots.

Ponce Inlet-3 (Volusia)



Ponce Inlet-3 (Volusia)



LAKEWATCH Report for Rose Bay-1 in Volusia County
Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River
Using Data Downloaded 2-12-2019

Introduction for Estuary

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Table 1. Base File Data.

County	Volusia
Name	Rose Bay-1
Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.1053
Longitude	-80.9777

Long-Term Data for Estuaries: Definitions

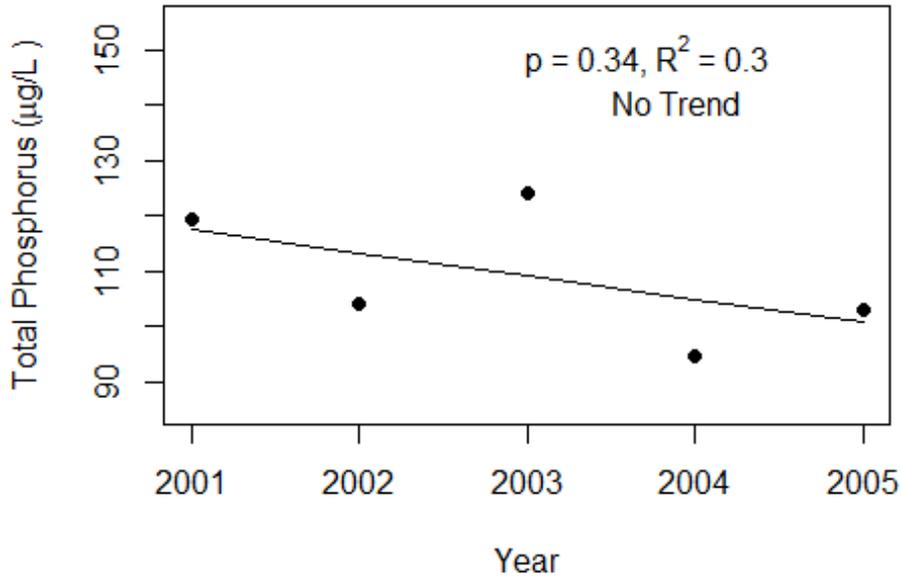
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Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	90 - 118	103 (5)
Total Nitrogen ($\mu\text{g/L}$)	457 - 678	571 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	8 - 14	11 (5)
Secchi (ft)	2.1 - 2.5	2.3 (5)
Secchi (m)	0.6 - 0.8	0.7 (5)
Color (Pt-Co Units)	22 - 58	31 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	11465 - 39229	24778 (5)
Salinity (ppt)	6.9 - 24.4	15.2 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

Rose Bay-1 (Volusia)



Rose Bay-1 (Volusia)

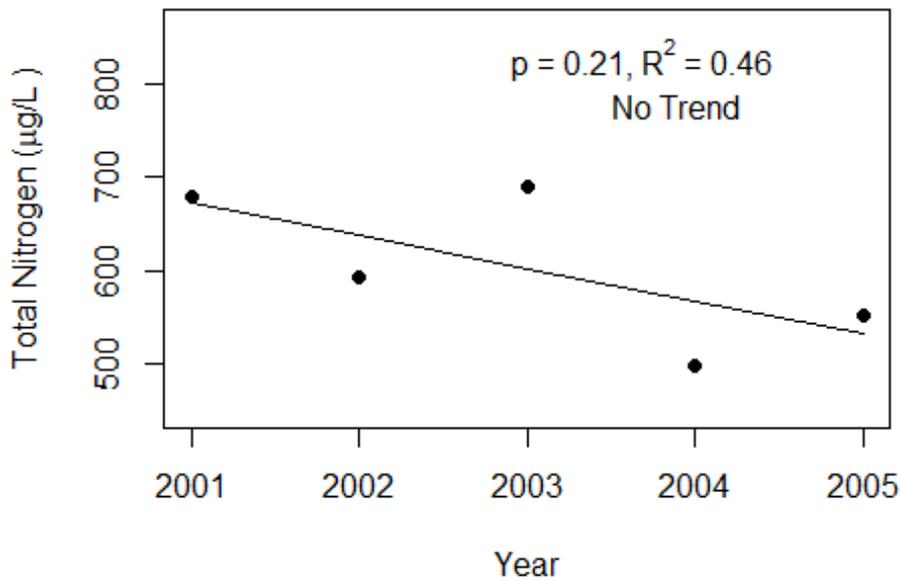
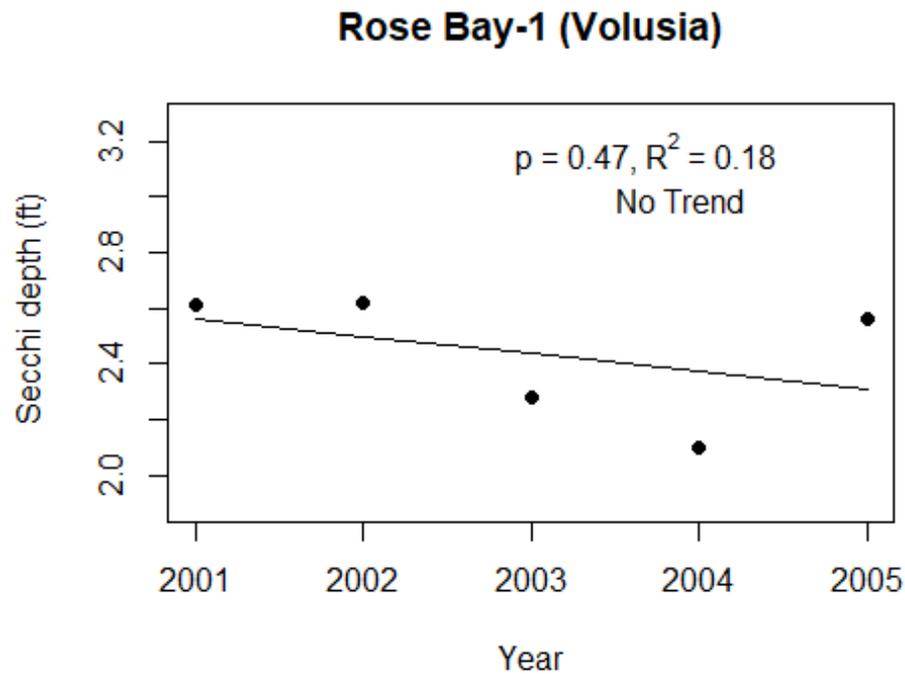
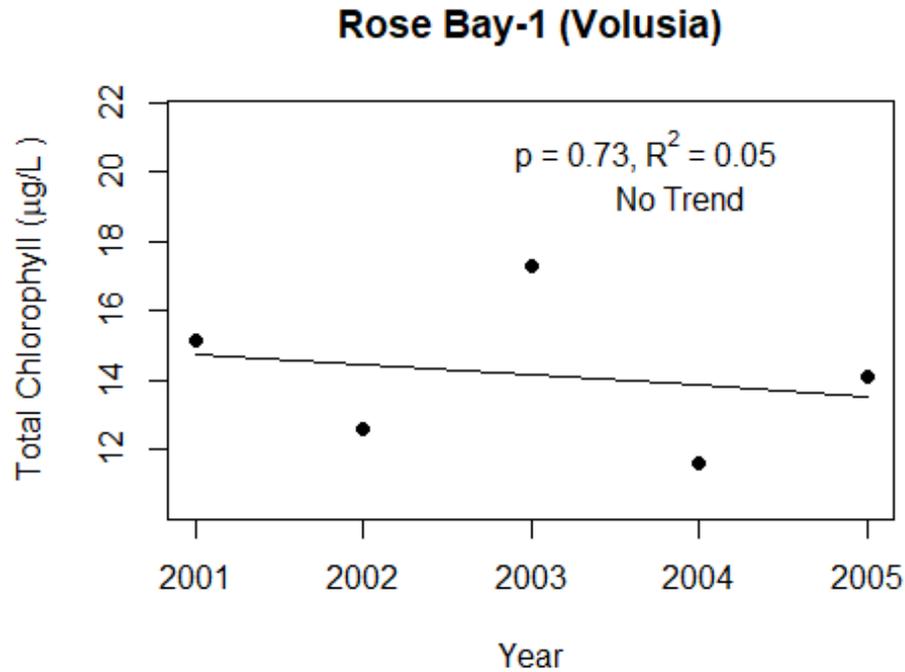


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LAKEWATCH Report for Rose Bay-2 in Volusia County
Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River
Using Data Downloaded 2-12-2019

Introduction for Estuary

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Table 1. Base File Data.

County	Volusia
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Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.1021
Longitude	-80.9644

Long-Term Data for Estuaries: Definitions

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Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	71 - 105	87 (5)
Total Nitrogen ($\mu\text{g/L}$)	407 - 636	531 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	5 - 11	8 (5)
Secchi (ft)	2.3 - 2.8	2.5 (5)
Secchi (m)	0.7 - 0.9	0.8 (5)
Color (Pt-Co Units)	21 - 71	32 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	19913 - 40461	30751 (5)
Salinity (ppt)	12.2 - 25.2	19.0 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

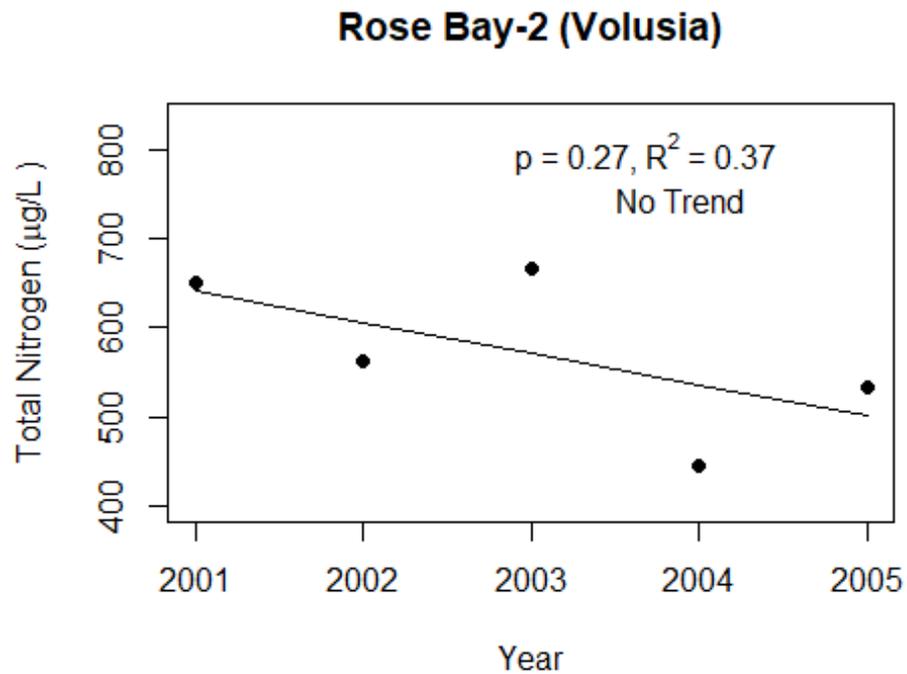
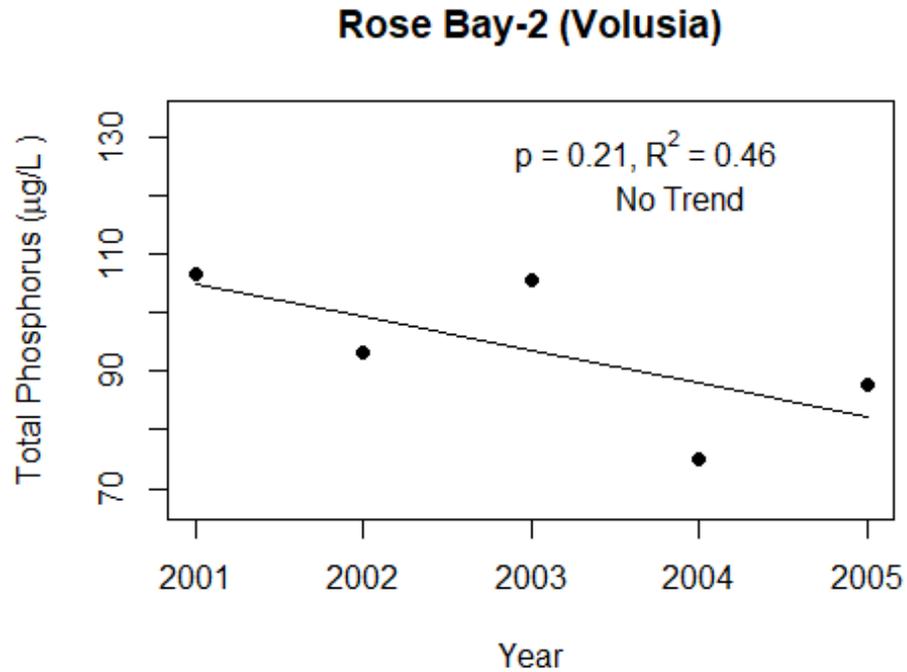
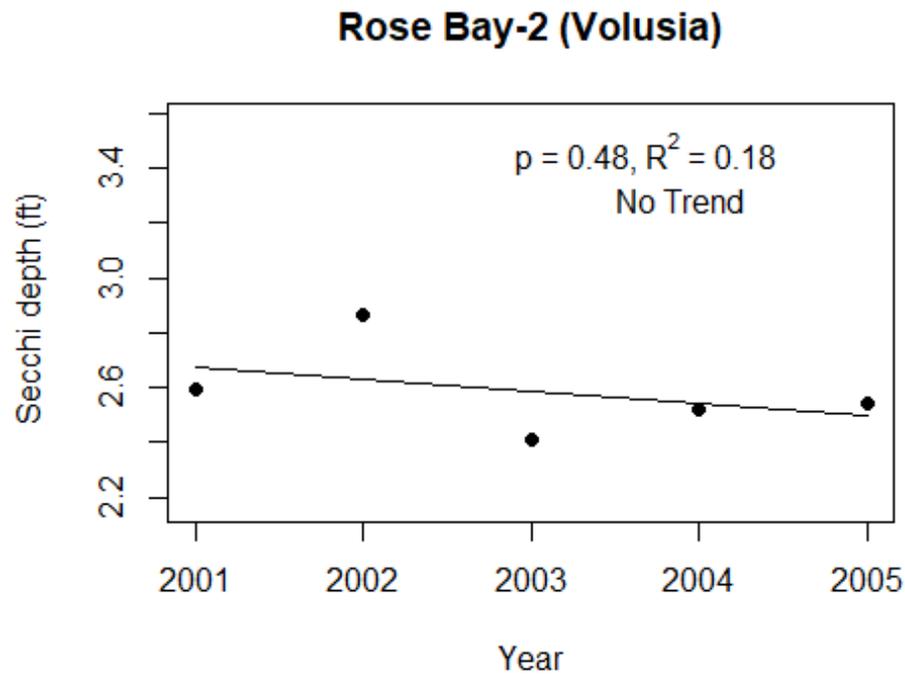
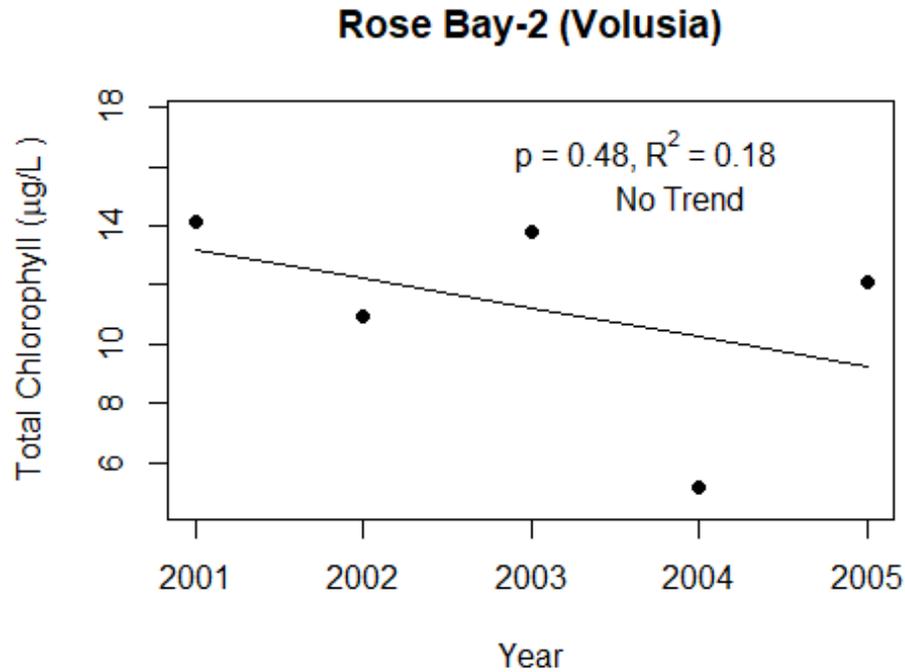


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Introduction for Estuary

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The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link:
<https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link:
<https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
- **Name:** System name that LAKEWATCH uses for the station.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Rose Bay-3
Water Body Type	Estuary
Period of Record (years, range)	5 (2001 to 2005)
Latitude	29.0995
Longitude	-80.9645

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	77 - 103	90 (5)
Total Nitrogen ($\mu\text{g/L}$)	490 - 611	544 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	5 - 10	8 (5)
Secchi (ft)	1.8 - 2.4	2.1 (5)
Secchi (m)	0.6 - 0.7	0.6 (5)
Color (Pt-Co Units)	23 - 77	33 (5)
Specific Conductance ($\mu\text{S/cm@25 C}$)	20788 - 41538	31712 (5)
Salinity (ppt)	12.8 - 25.8	19.6 (5)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.

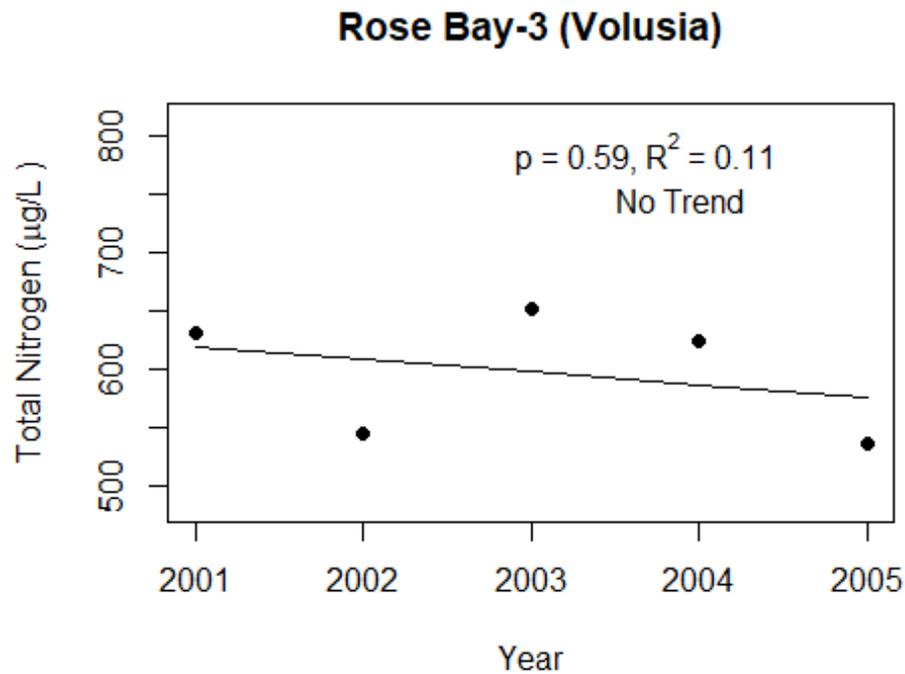
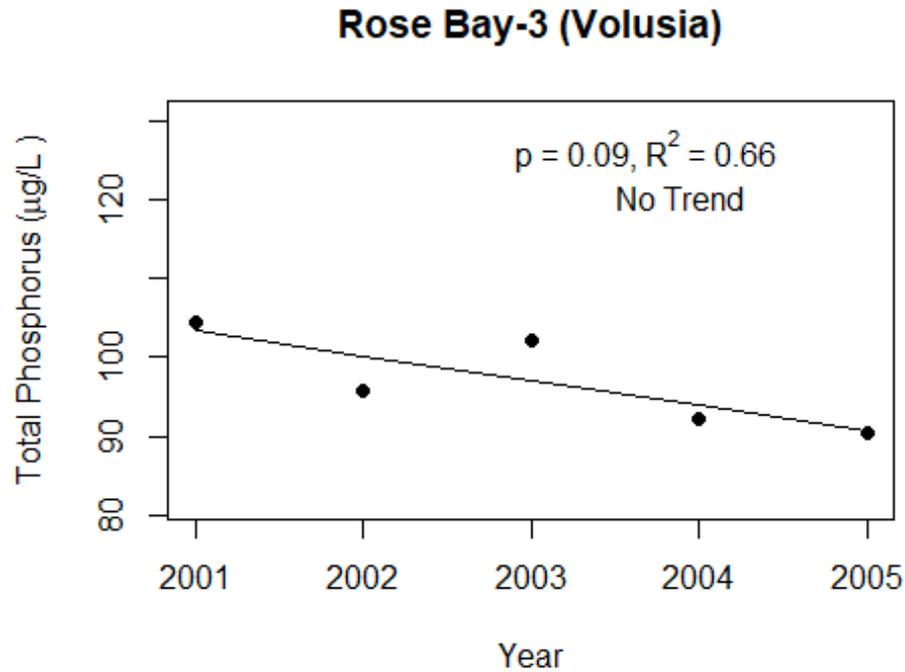
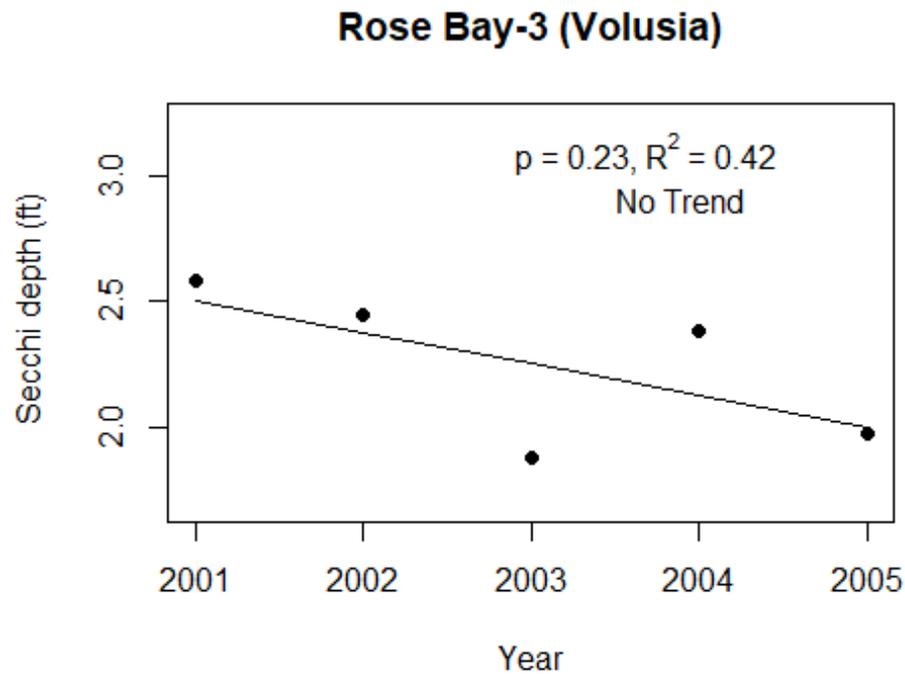
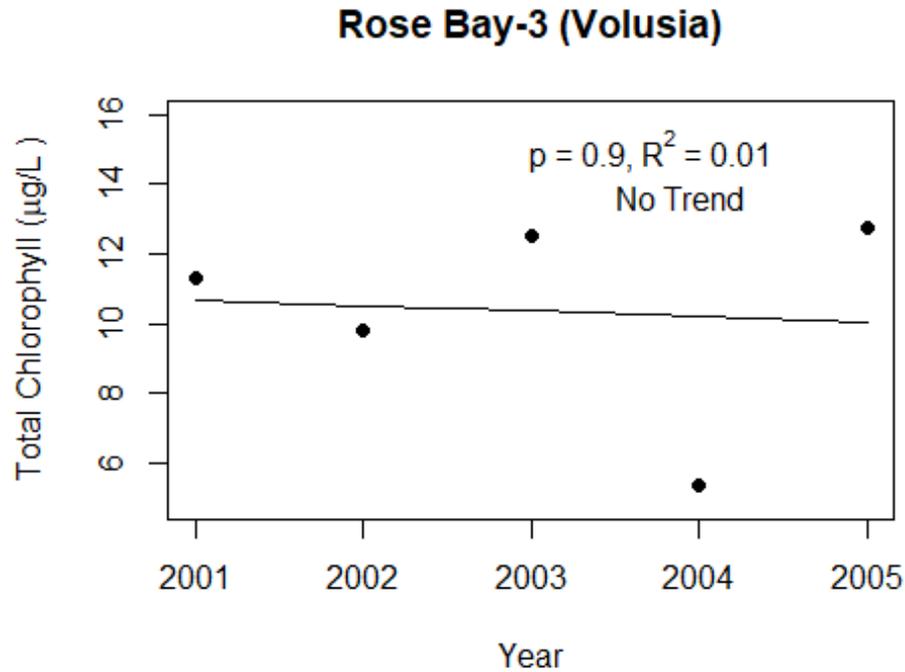


Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relations and the p value indicates if the relation is significant ($p < 0.05$ is significant)). Trend status are reported on plots.



LAKEWATCH Report for Tomoka-1 in Volusia County
Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link: <https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link: <https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
- **Name:** System name that LAKEWATCH uses for the station.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Tomoka-1
Water Body Type	Estuary
Period of Record (years, range)	2 (2000 to 2001)
Latitude	29.3514
Longitude	-81.0919

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	68 - 87	77 (2)
Total Nitrogen ($\mu\text{g/L}$)	581 - 683	630 (2)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	8 - 9	8 (2)
Secchi (ft)	1.4 - 1.7	1.6 (2)
Secchi (m)	0.4 - 0.5	0.5 (2)
Color (Pt-Co Units)	27 - 27	27 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	36787 - 36787	36787 (1)
Salinity (ppt)	22.8 - 22.8	22.8 (1)

LAKEWATCH Report for Tomoka-2 in Volusia County
Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link:
<https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link:
<https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
- **Name:** System name that LAKEWATCH uses for the station.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Tomoka-2
Water Body Type	Estuary
Period of Record (years, range)	2 (2000 to 2001)
Latitude	29.3639
Longitude	-81.0931

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	56 - 71	63 (2)
Total Nitrogen ($\mu\text{g/L}$)	502 - 514	508 (2)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	4 - 10	6 (2)
Secchi (ft)	1.8 - 2.0	1.9 (2)
Secchi (m)	0.5 - 0.6	0.6 (2)
Color (Pt-Co Units)	20 - 20	20 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	40764 - 40764	40764 (1)
Salinity (ppt)	25.3 - 25.3	25.3 (1)

LAKEWATCH Report for Tomoka-3 in Volusia County
Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link: <https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link: <https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
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- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Tomoka-3
Water Body Type	Estuary
Period of Record (years, range)	2 (2000 to 2001)
Latitude	29.3739
Longitude	-81.0906

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	46 - 55	50 (2)
Total Nitrogen ($\mu\text{g/L}$)	394 - 418	406 (2)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	4 - 6	5 (2)
Secchi (ft)	1.7 - 3.0	2.3 (2)
Secchi (m)	0.5 - 0.9	0.7 (2)
Color (Pt-Co Units)	17 - 17	17 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	42786 - 42786	42786 (1)
Salinity (ppt)	26.6 - 26.6	26.6 (1)

LAKEWATCH Report for Tomoka-4 in Volusia County
Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin
Using Data Downloaded 2-12-2019

Introduction for Estuary

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The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link:
<https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link:
<https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

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- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Tomoka-4
Water Body Type	Estuary
Period of Record (years, range)	2 (2000 to 2001)
Latitude	29.3742
Longitude	-81.0869

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	55 - 55	55 (2)
Total Nitrogen ($\mu\text{g/L}$)	413 - 460	436 (2)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	7 - 7	7 (2)
Secchi (ft)	1.9 - 2.3	2.1 (2)
Secchi (m)	0.6 - 0.7	0.6 (2)
Color (Pt-Co Units)	14 - 14	14 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	46084 - 46084	46084 (1)
Salinity (ppt)	28.7 - 28.7	28.7 (1)

LAKEWATCH Report for Tomoka-5 in Volusia County
Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin
Using Data Downloaded 2-12-2019

Introduction for Estuary

This report summarizes data collected on systems that have been part of the LAKEWATCH program. Data are from the period of record for individual systems. The first part of this summary lists background data for each system, the second part lists the long-term data averages and ranges and the final part are trend plots for nutrients, chlorophyll and Secchi depth. Plots were only made for systems with five or more years of data.

The near shore Florida coastline is separated into estuary and estuary segments within the estuary. Deeper coastal waters are separated into coastal nutrient regions and coastal nutrient segments within the regions. Numeric nutrient criteria are established for all estuary segments, including criteria for total nitrogen, total phosphorus, and chlorophyll a. For open ocean coastal waters, numeric criteria are established for chlorophyll a, that is derived from satellite remote sensing techniques. For those locations without defined segments there are narrative nutrient criteria (e.g., Florida Keys Halo Zone).

The maps defining individual estuaries and coastal segments can be found at the following link:
<https://www.flrules.org/Gateway/reference.asp?No=Ref-05420>

The individual nutrient criteria can be found at the following link:
<https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.532>

Base File Data for Estuaries: Definitions:

- **County:** Name of county adjacent to the system.
- **Name:** System name that LAKEWATCH uses for the station.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

County	Volusia
Name	Tomoka-5
Water Body Type	Estuary
Period of Record (years, range)	2 (2000 to 2001)
Latitude	29.3672
Longitude	-81.0825

Long-Term Data for Estuaries: Definitions

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae in Florida's fresh and saltwater environments.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity (how far one can see into the water) and are listed with English and metric units.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$), Salinity (ppt):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolve materials in water.

Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	55 - 62	58 (2)
Total Nitrogen ($\mu\text{g/L}$)	415 - 447	430 (2)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	7 - 9	8 (2)
Secchi (ft)	2.2 - 2.9	2.5 (2)
Secchi (m)	0.7 - 0.9	0.8 (2)
Color (Pt-Co Units)	14 - 14	14 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	45865 - 45865	45865 (1)
Salinity (ppt)	28.6 - 28.6	28.6 (1)