

**LAKEWATCH Report for Ponce Inlet-1 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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	Ponce Inlet-1
GNIS Number	
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**

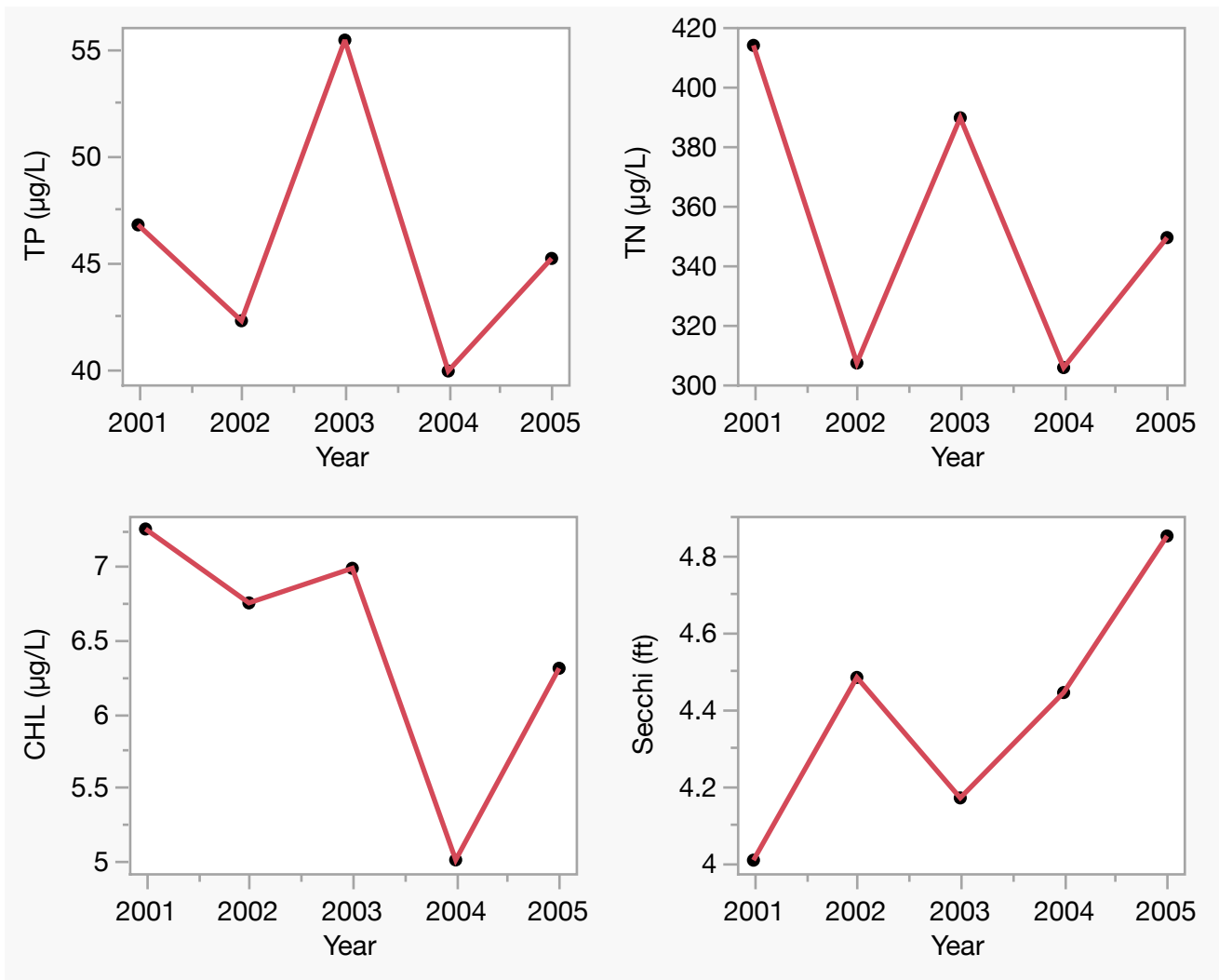
The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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	350 (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 - 30	27 (5)

**Figure 2. Ponce Inlet-1 trend plots of year by average. 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). Total phosphorus (TP No Trend,  $R^2 = 0.02$ ,  $p = 0.81$ ), total nitrogen (TN No Trend,  $R^2 = 0.18$ ,  $p = 0.47$ ), chlorophyll (CHL No Trend,  $R^2 = 0.42$ ,  $p = 0.23$ ) and Secchi depth (Secchi No Trend,  $R^2 = 0.65$ ,  $p = 0.10$ ).**



**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 12/9/2022**

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**Table 1. Base File Data.**

County	Volusia
Name	Ponce Inlet-2
GNIS Number	
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**

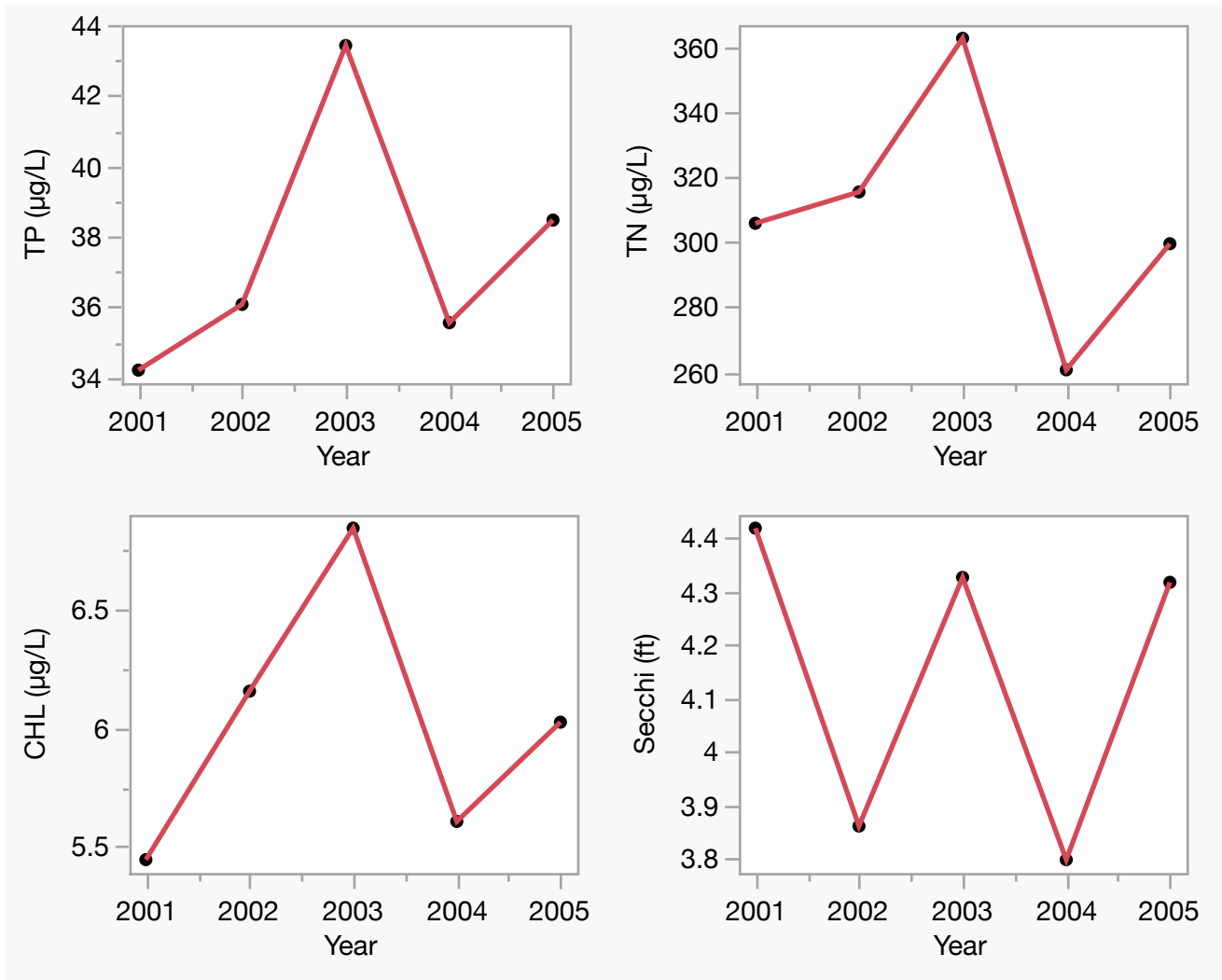
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**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).**

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ( $\mu\text{g/L}$ )	34 - 43	37 (5)
Total Nitrogen ( $\mu\text{g/L}$ )	261 - 363	307 (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 - 31	29 (5)

**Figure 2. Ponce Inlet-2 trend plots of year by average. 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). Total phosphorus (TP No Trend,  $R^2 = 0.12$ ,  $p = 0.57$ ), total nitrogen (TN No Trend,  $R^2 = 0.08$ ,  $p = 0.64$ ), chlorophyll (CHL No Trend,  $R^2 = 0.03$ ,  $p = 0.78$ ) and Secchi depth (Secchi No Trend,  $R^2 = 0.02$ ,  $p = 0.82$ ).**



**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 12/9/2022**

**Introduction for Estuaries**

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**Table 1. Base File Data.**

County	Volusia
Name	Ponce Inlet-3
GNIS Number	
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**

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

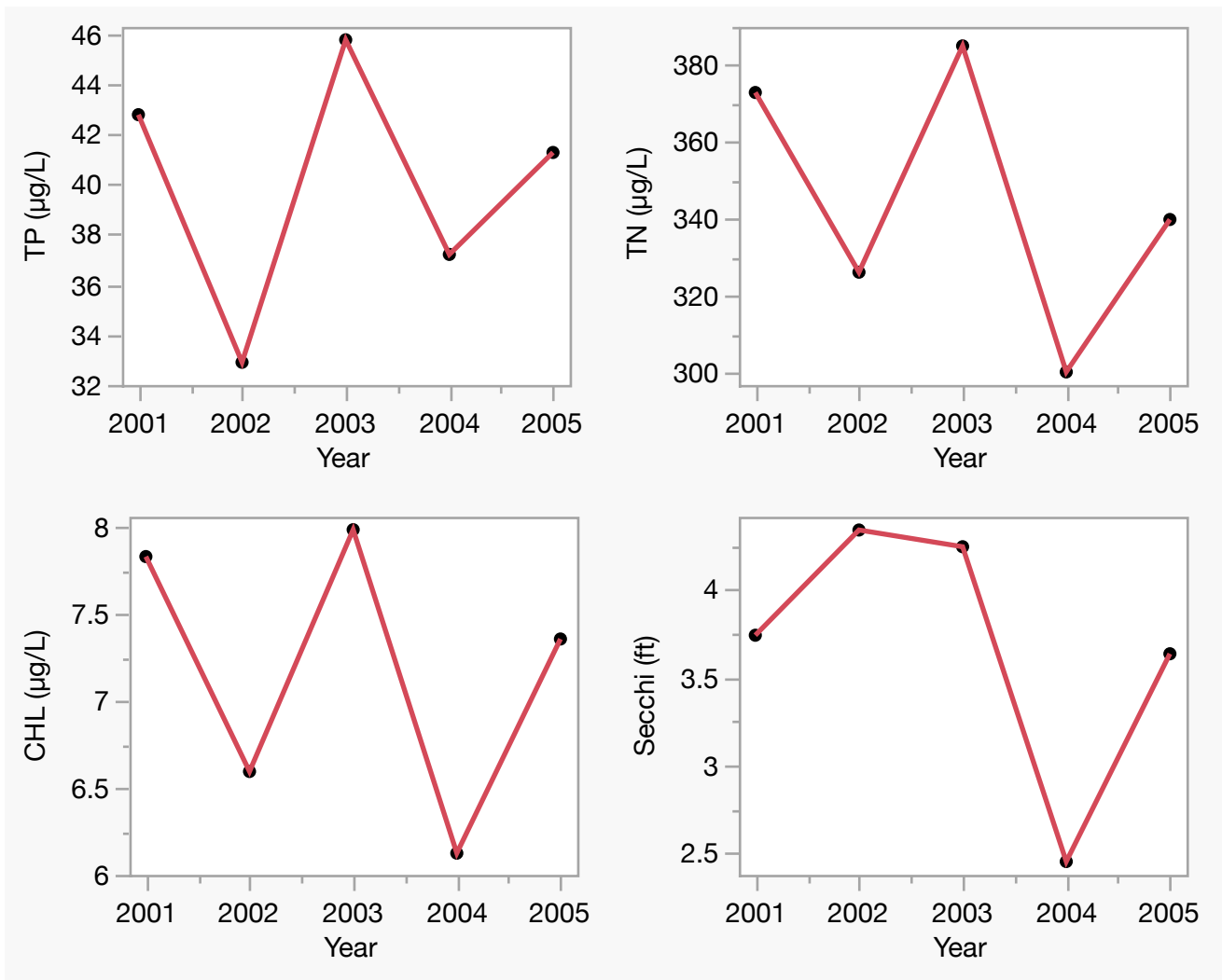
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**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance/salinity (collected quarterly).**

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ( $\mu\text{g/L}$ )	33 - 46	40 (5)
Total Nitrogen ( $\mu\text{g/L}$ )	300 - 385	343 (5)
Chlorophyll- uncorrected ( $\mu\text{g/L}$ )	6 - 8	7 (5)
Secchi (ft)	2.4 - 4.3	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)	27 - 31	30 (5)



**Figure 2. Ponce Inlet-3 trend plots of year by average. 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). Total phosphorus (TP No Trend,  $R^2 = 0.00$ ,  $p = 0.95$ ), total nitrogen (TN No Trend,  $R^2 = 0.18$ ,  $p = 0.48$ ), chlorophyll (CHL No Trend,  $R^2 = 0.08$ ,  $p = 0.65$ ) and Secchi depth (Secchi No Trend,  $R^2 = 0.19$ ,  $p = 0.46$ ).**



**LAKEWATCH Report for Rose Bay-1 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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**Table 1. Base File Data.**

County	Volusia
Name	Rose Bay-1
GNIS Number	289956
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**

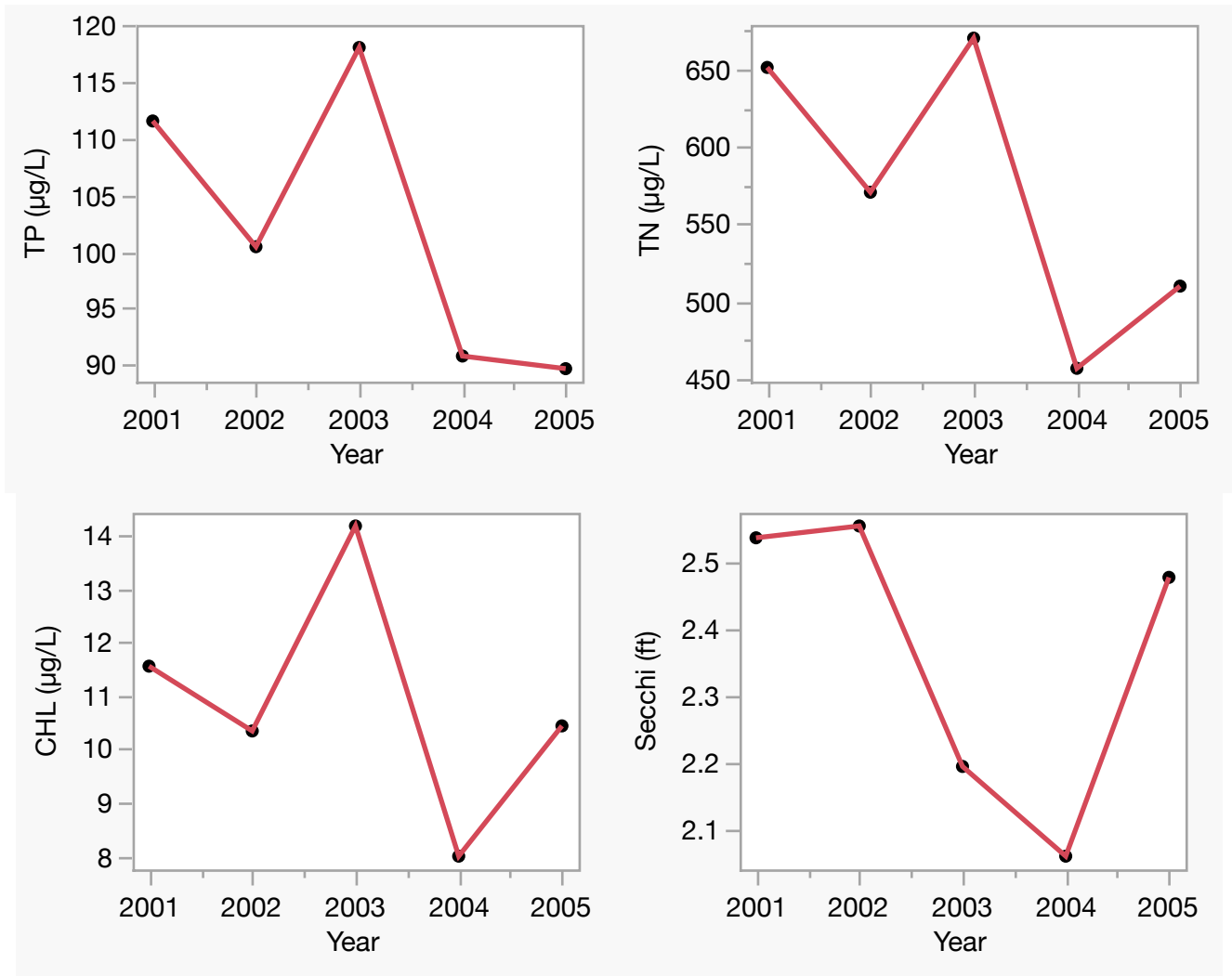
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Total Phosphorus ( $\mu\text{g/L}$ )	90 - 118	101 (5)
Total Nitrogen ( $\mu\text{g/L}$ )	457 - 670	566 (5)
Chlorophyll- uncorrected ( $\mu\text{g/L}$ )	8 - 14	11 (5)
Secchi (ft)	2.1 - 2.6	2.4 (5)
Secchi (m)	0.6 - 0.8	0.7 (5)
Color (Pt-Co Units)	19 - 58	30 (5)
Specific Conductance ( $\mu\text{S/cm@25 C}$ )	11465 - 39229	26017 (5)
Salinity (ppt)	7 - 24	16 (5)

**Figure 2. Rose Bay-1 trend plots of year by average. 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). Total phosphorus (TP No Trend,  $R^2 = 0.45$ ,  $p = 0.21$ ), total nitrogen (TN No Trend,  $R^2 = 0.48$ ,  $p = 0.20$ ), chlorophyll (CHL No Trend,  $R^2 = 0.10$ ,  $p = 0.60$ ) and Secchi depth (Secchi No Trend,  $R^2 = 0.19$ ,  $p = 0.47$ ).**



**LAKEWATCH Report for Rose Bay-2 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomaka River Estuaries Lower Halifax River**  
**Using Data Downloaded 12/9/2022**

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GNIS Number	289956
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**

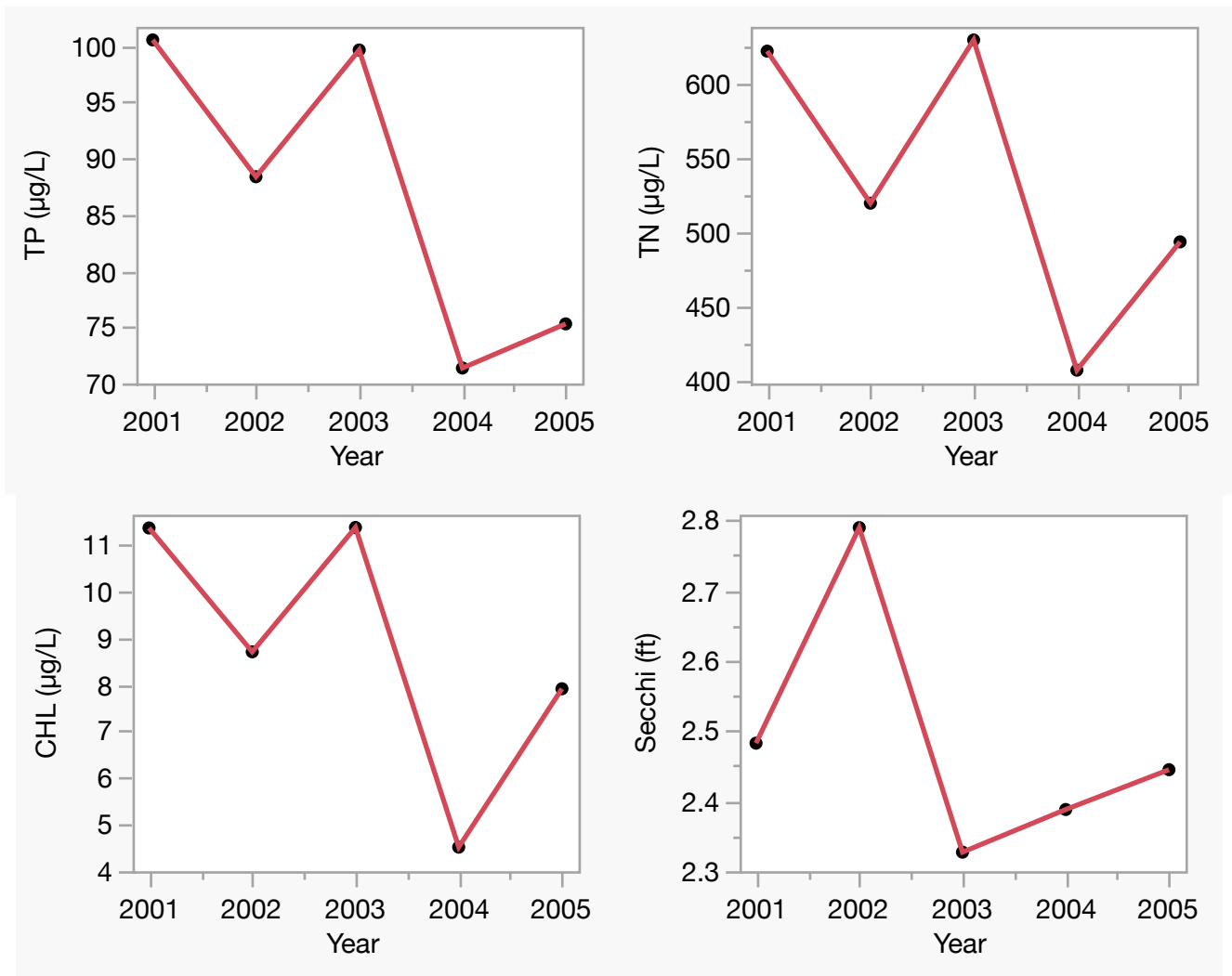
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Total Phosphorus ( $\mu\text{g/L}$ )	71 - 101	86 (5)
Total Nitrogen ( $\mu\text{g/L}$ )	407 - 629	527 (5)
Chlorophyll- uncorrected ( $\mu\text{g/L}$ )	5 - 11	8 (5)
Secchi (ft)	2.3 - 2.8	2.5 (5)
Secchi (m)	0.7 - 0.9	0.8 (5)
Color (Pt-Co Units)	18 - 71	31 (5)
Specific Conductance ( $\mu\text{S/cm@25 C}$ )	19913 - 41086	31391 (5)
Salinity (ppt)	12 - 26	19 (5)

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Latitude	29.0995
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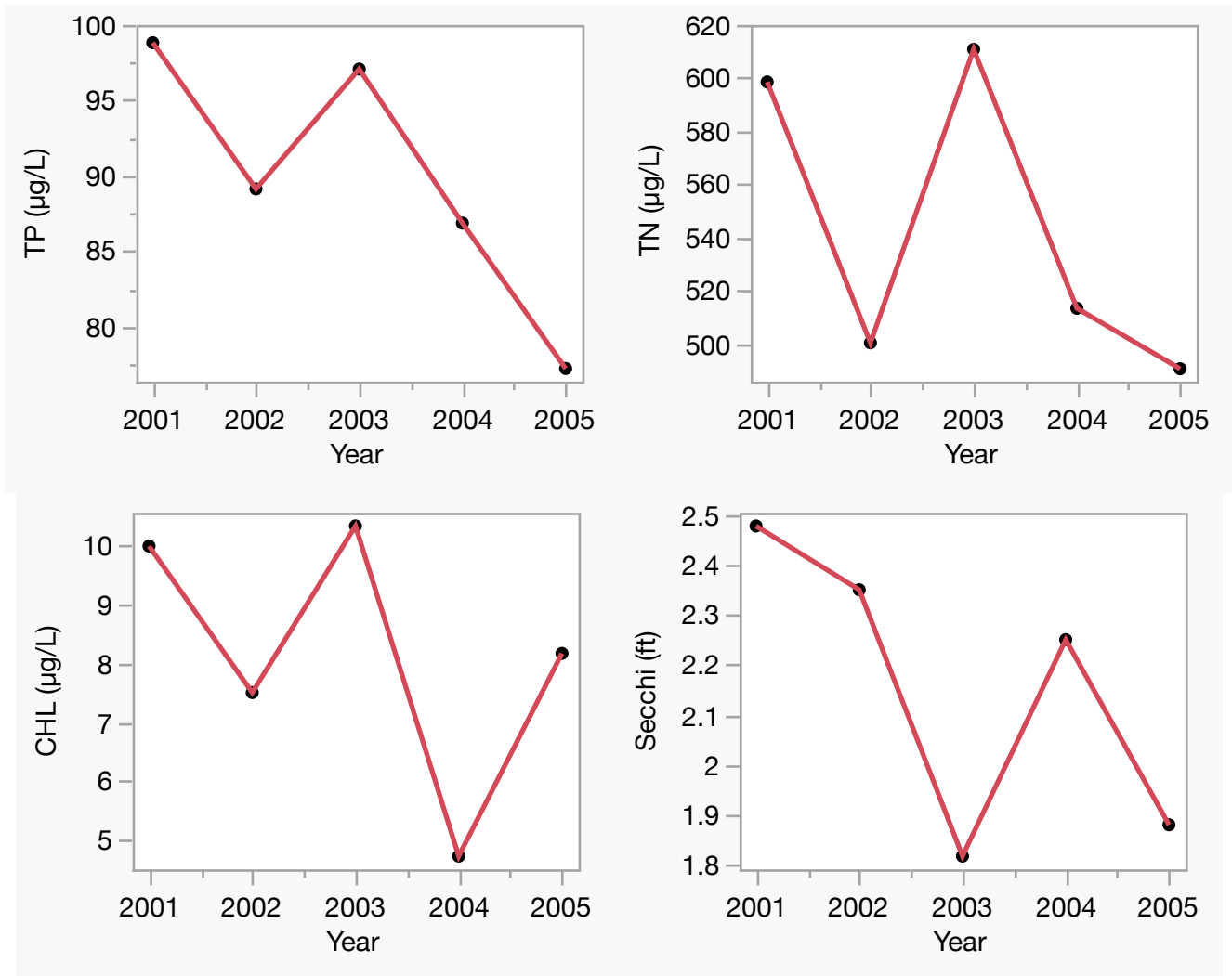
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Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ( $\mu\text{g/L}$ )	77 - 99	89 (5)
Total Nitrogen ( $\mu\text{g/L}$ )	490 - 611	540 (5)
Chlorophyll- uncorrected ( $\mu\text{g/L}$ )	5 - 10	8 (5)
Secchi (ft)	1.8 - 2.5	2.1 (5)
Secchi (m)	0.6 - 0.8	0.7 (5)
Color (Pt-Co Units)	20 - 77	33 (5)
Specific Conductance ( $\mu\text{S/cm@25 C}$ )	20788 - 41538	32365 (5)
Salinity (ppt)	13 - 26	20 (5)

**Figure 2. Rose Bay-3 trend plots of year by average. 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). Total phosphorus (TP No Trend,  $R^2 = 0.69$ ,  $p = 0.08$ ), total nitrogen (TN No Trend,  $R^2 = 0.31$ ,  $p = 0.33$ ), chlorophyll (CHL No Trend,  $R^2 = 0.20$ ,  $p = 0.45$ ) and Secchi depth (Secchi No Trend,  $R^2 = 0.49$ ,  $p = 0.19$ ).**



**LAKEWATCH Report for Tomoka-1 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **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
GNIS Number	292344
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

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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 - 79	73 (2)
Total Nitrogen ( $\mu\text{g/L}$ )	581 - 635	607 (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)	23 - 23	23 (1)

**LAKEWATCH Report for Tomoka-2 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **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
GNIS Number	292344
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

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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 - 25	25 (1)

**LAKEWATCH Report for Tomoka-3 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **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-3
GNIS Number	292344
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

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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)	27 - 27	27 (1)



**LAKEWATCH Report for Tomoka-4 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **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
GNIS Number	292344
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

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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)	29 - 29	29 (1)

**LAKEWATCH Report for Tomoka-5 in Volusia County**  
**Estuary and Estuary Segment: Halifax and Tomoka River Estuaries Tomoka Basin**  
**Using Data Downloaded 12/9/2022**

**Introduction for Estuaries**

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.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **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
GNIS Number	292344
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

The following long-term data are the primary trophic state parameters collected by LAKEWATCH volunteers and classification variables color and specific conductance (LAKEWATCH recently began analyzing samples quarterly for color and specific conductance):

- **Total Phosphorus ( $\mu\text{g/L}$ ):** Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ( $\mu\text{g/L}$ ):** Nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10 (by mass).
- **Chlorophyll-uncorrected ( $\mu\text{g/L}$ ):** Chlorophyll concentrations are used to measure relative abundances of open water algae.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filtered 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 dissolved 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)	29 - 29	29 (1)