LAKEWATCH Report for Blackwater in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands
Blackwater River
Using Data Downloaded 12/9/2020

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	Collier
Name	Blackwater
GNIS Number	278963
Water Body Type	Estuary
Period of Record (years, range)	1 (2001 to 2001)
Latitude	25.9343
Longitude	-81.5956

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	62 - 2001	62 (1)
Total Nitrogen (µg/L)	484 - 484	484 (1)
Chlorophyll- uncorrected (µg/L)	5 - 5	5 (1)
Secchi (ft)	2.3 - 2.3	2.3 (1.0)
Secchi (m)	0.7 - 0.7	0.7 (1.0)
Color (Pt-Co Units)	17 - 17	17 (1)
Specific Conductance (µS/cm@25 C)	51381 - 51381	51381 (1)
Salinity (ppt)	32 - 32	32 (1)

LAKEWATCH Report for Cape Romano in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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	Collier
Name	Cape Romano
GNIS Number	
Water Body Type	Estuary
Period of Record (years, range)	4 (2001 to 2004)
Latitude	25.8569
Longitude	-81.6726

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	23 - 2004	26 (4)
Total Nitrogen (µg/L)	113 - 315	216 (4)
Chlorophyll- uncorrected (µg/L)	1 - 4	3 (4)
Secchi (ft)	1.8 - 7.0	3.7 (4.0)
Secchi (m)	0.5 - 2.1	1.1 (4.0)
Color (Pt-Co Units)	3 - 4	3 (2)
Specific Conductance (µS/cm@25 C)	49000 - 53991	51435 (2)
Salinity (ppt)	31 - 34	32 (2)

LAKEWATCH Report for Clam Bay East-1 in Collier County
Estuary and Estuary Segment: Clam Bay (Collier County) Clam Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Clam Bay East-1
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2311
Longitude	-81.8129

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	359 - 2003	389 (3)
Total Nitrogen (µg/L)	2565 - 3145	2936 (3)
Chlorophyll- uncorrected (µg/L)	22 - 34	28 (3)
Secchi (ft)	0.6 - 0.9	0.7 (3.0)
Secchi (m)	0.2 - 0.3	0.2 (3.0)
Color (Pt-Co Units)	144 - 189	164 (3)
Specific Conductance (µS/cm@25 C)	1000 - 1414	1212 (3)
Salinity (ppt)	0 - 1	0 (3)

LAKEWATCH Report for Clam Bay East-2 in Collier County
Estuary and Estuary Segment: Clam Bay (Collier County) Clam Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Clam Bay East-2
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2416
Longitude	-81.8161

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	95 - 2003	104 (3)
Total Nitrogen (µg/L)	874 - 988	944 (3)
Chlorophyll- uncorrected (µg/L)	13 - 16	15 (3)
Secchi (ft)	1.3 - 1.9	1.5 (3.0)
Secchi (m)	0.4 - 0.6	0.5 (3.0)
Color (Pt-Co Units)	54 - 80	64 (3)
Specific Conductance (µS/cm@25 C)	25403 - 38136	31916 (3)
Salinity (ppt)	16 - 24	20 (3)

LAKEWATCH Report for Clam Bay East-3 in Collier County
Estuary and Estuary Segment: Clam Bay (Collier County) Clam Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Clam Bay East-3
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2385
Longitude	-81.8171

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	101 - 2003	111 (3)
Total Nitrogen (µg/L)	857 - 1004	946 (3)
Chlorophyll- uncorrected (µg/L)	13 - 17	15 (3)
Secchi (ft)	1.3 - 2.2	1.6 (3.0)
Secchi (m)	0.4 - 0.7	0.5 (3.0)
Color (Pt-Co Units)	41 - 58	52 (3)
Specific Conductance (µS/cm@25 C)	25324 - 40988	31614 (3)
Salinity (ppt)	16 - 25	20 (3)

Introduction for Estuaries

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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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- **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	Collier
Name	Clam Bay West-1
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2439
Longitude	-81.8206

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	602 - 2003	727 (3)
Total Nitrogen (µg/L)	2931 - 4322	3790 (3)
Chlorophyll- uncorrected (µg/L)	21 - 53	38 (3)
Secchi (ft)	0.1 - 0.7	0.3 (3.0)
Secchi (m)	0.0 - 0.2	0.1 (3.0)
Color (Pt-Co Units)	214 - 383	287 (3)
Specific Conductance (µS/cm@25 C)	6782 - 12000	9741 (3)
Salinity (ppt)	4 - 7	6 (3)

<p style="text-align:center">LAKEWATCH Report for Clam Bay West-2 in Collier County
Estuary and Estuary Segment: Clam Bay (Collier County) Clam Bay
Using Data Downloaded 12/9/2020</p>

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.**

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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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- **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	Collier
Name	Clam Bay West-2
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2375
Longitude	-81.8129

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	130 - 2003	175 (3)
Total Nitrogen (µg/L)	1179 - 1682	1492 (3)
Chlorophyll- uncorrected (µg/L)	16 - 22	19 (3)
Secchi (ft)	0.3 - 1.4	0.7 (3.0)
Secchi (m)	0.1 - 0.4	0.2 (3.0)
Color (Pt-Co Units)	90 - 108	101 (3)
Specific Conductance (µS/cm@25 C)	33725 - 47879	38380 (3)
Salinity (ppt)	21 - 30	24 (3)

Introduction for Estuaries

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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	Collier
Name	Clam Bay West-3
GNIS Number	284556
Water Body Type	Estuary
Period of Record (years, range)	3 (2001 to 2003)
Latitude	26.2230
Longitude	-81.8167

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	56 - 2003	60 (3)
Total Nitrogen (µg/L)	488 - 510	502 (3)
Chlorophyll- uncorrected (µg/L)	3 - 6	5 (3)
Secchi (ft)	1.1 - 1.7	1.4 (3.0)
Secchi (m)	0.3 - 0.5	0.4 (3.0)
Color (Pt-Co Units)	7 - 21	13 (3)
Specific Conductance (µS/cm@25 C)	34594 - 52493	42604 (3)
Salinity (ppt)	21 - 33	26 (3)

LAKEWATCH Report for Fakahatchee Bay in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Gulf Islands
Using Data Downloaded 12/9/2020

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	Collier
Name	Fakahatchee Bay
GNIS Number	294006
Water Body Type	Estuary
Period of Record (years, range)	1 (2001 to 2001)
Latitude	25.8922
Longitude	-81.4770

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	54 - 2001	54 (1)
Total Nitrogen (µg/L)	520 - 520	520 (1)
Chlorophyll- uncorrected (µg/L)	6 - 6	6 (1)
Secchi (ft)	2.5 - 2.5	2.5 (1.0)
Secchi (m)	0.8 - 0.8	0.8 (1.0)
Color (Pt-Co Units)	18 - 18	18 (1)
Specific Conductance (µS/cm@25 C)	46733 - 46733	46733 (1)
Salinity (ppt)	29 - 29	29 (1)

LAKEWATCH Report for Fakaunion in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Gulf Islands
Using Data Downloaded 12/9/2020

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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- **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	Collier
Name	Fakaunion
GNIS Number	282358
Water Body Type	Estuary
Period of Record (years, range)	1 (2001 to 2001)
Latitude	25.9014
Longitude	-81.5159

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	31 - 2001	31 (1)
Total Nitrogen (µg/L)	369 - 369	369 (1)
Chlorophyll- uncorrected (µg/L)	4 - 4	4 (1)
Secchi (ft)	2.9 - 2.9	2.9 (1.0)
Secchi (m)	0.9 - 0.9	0.9 (1.0)
Color (Pt-Co Units)	10 - 10	10 (1)
Specific Conductance (µS/cm@25 C)	45431 - 45431	45431 (1)
Salinity (ppt)	28 - 28	28 (1)

LAKEWATCH Report for Johnson Bay 1 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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.

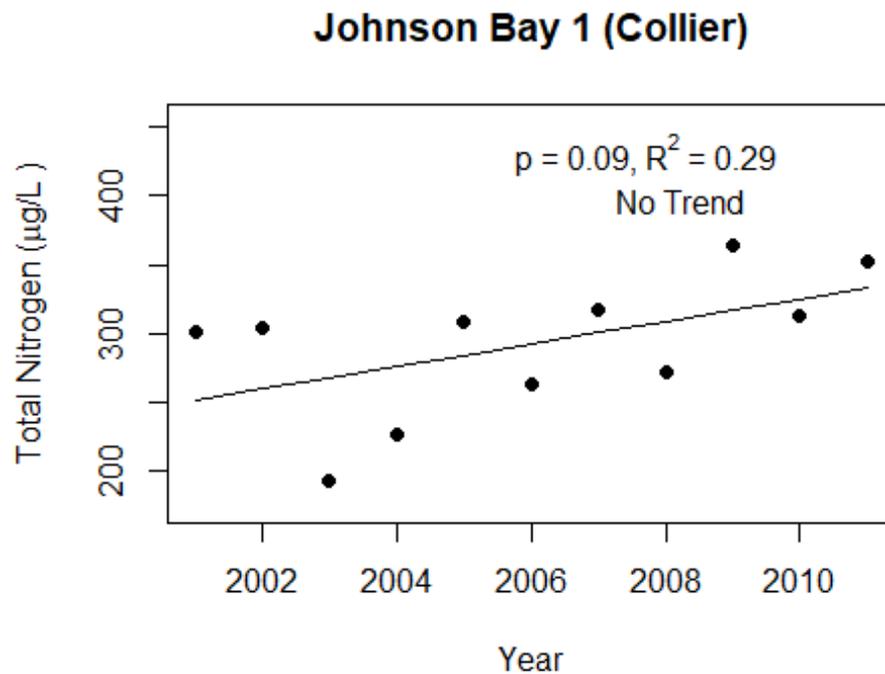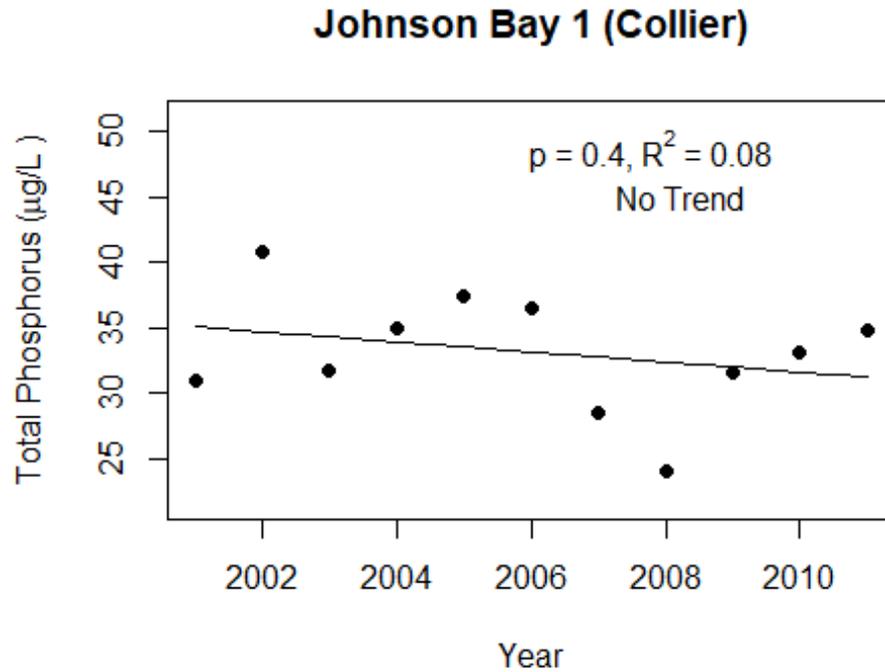| County	Collier
Name	Johnson Bay 1
GNIS Number	284859
Water Body Type	Estuary
Period of Record (years, range)	11 (2001 to 2011)
Latitude	25.9858
Longitude	-81.7256

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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).
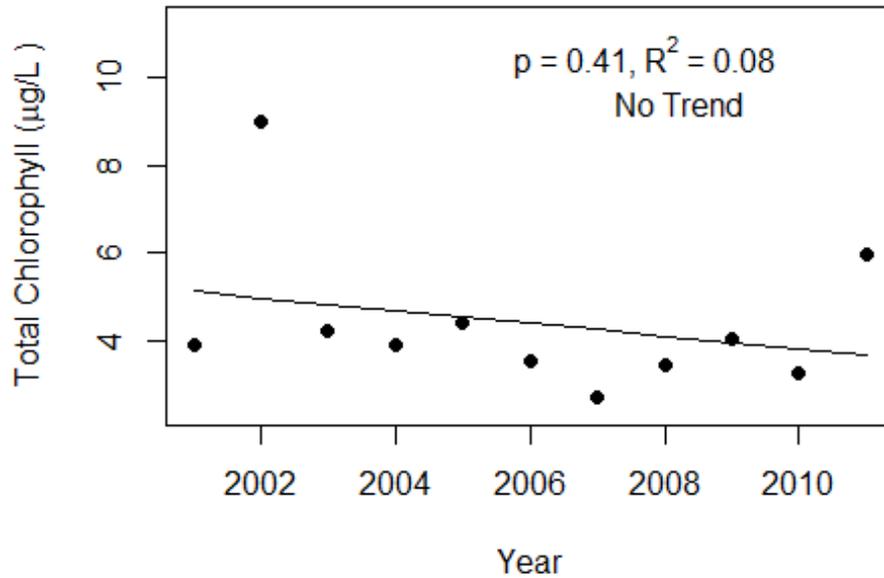
Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus (µg/L)	24 - 2011	33 (11)
Total Nitrogen (µg/L)	194 - 364	288 (11)
Chlorophyll- uncorrected (µg/L)	3 - 9	4 (11)
Secchi (ft)	2.8 - 4.6	3.8 (11.0)
Secchi (m)	0.9 - 1.4	1.2 (11.0)
Color (Pt-Co Units)	4 - 8	6 (10)
Specific Conductance (µS/cm@25 C)	46552 - 52674	49773 (10)
Salinity (ppt)	29 - 33	31 (10)

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.
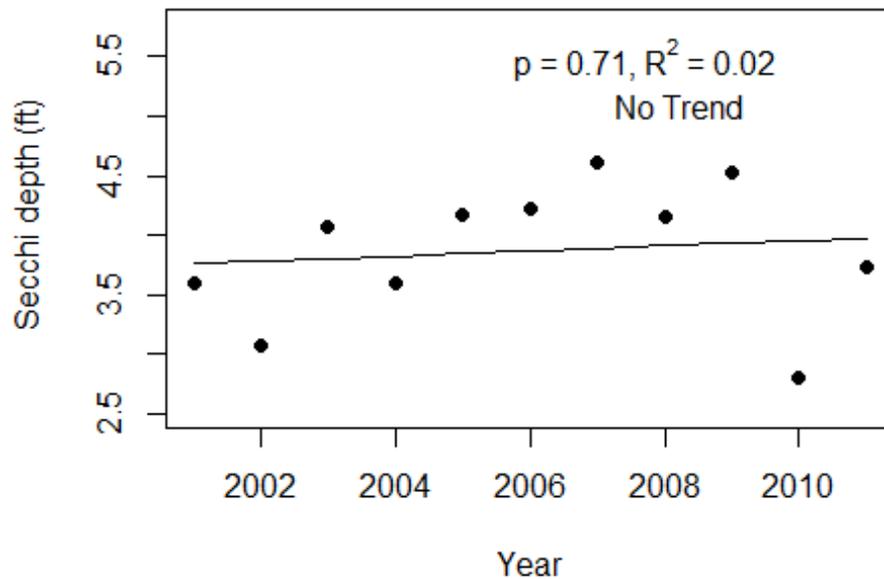

Johnson Bay 1 (Collier)

$p = 0.4$, $R^2 = 0.08$
No Trend

Johnson Bay 1 (Collier)

$p = 0.09$, $R^2 = 0.29$
No Trend

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.

Johnson Bay 1 (Collier)

$p = 0.41$, $R^2 = 0.08$

No Trend

Johnson Bay 1 (Collier)

$p = 0.71$, $R^2 = 0.02$

No Trend

LAKEWATCH Report for Johnson Bay 2 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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.

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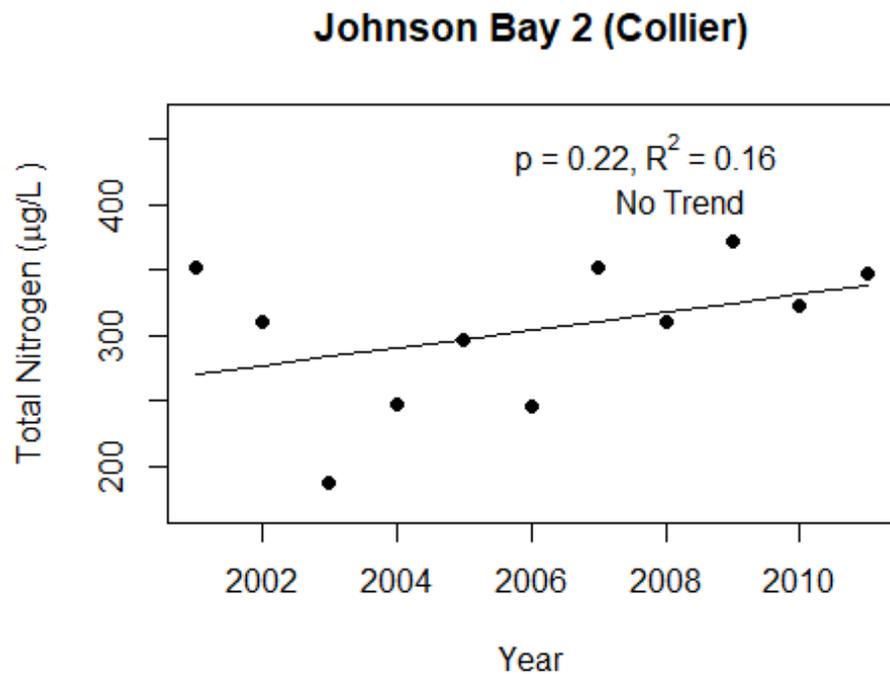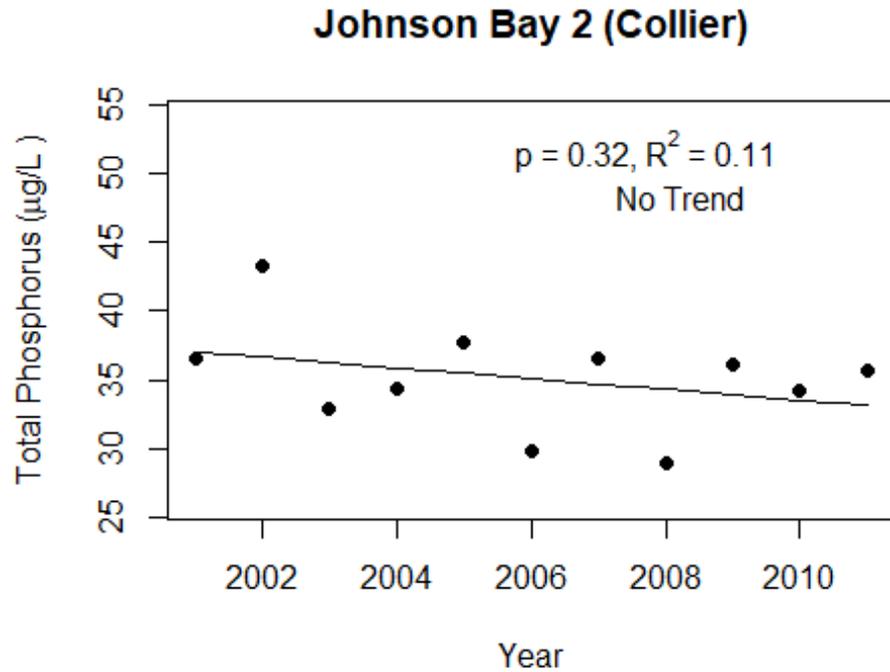| County	Collier
Name	Johnson Bay 2
GNIS Number	284859
Water Body Type	Estuary
Period of Record (years, range)	11 (2001 to 2011)
Latitude	25.9918
Longitude	-81.7207

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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).
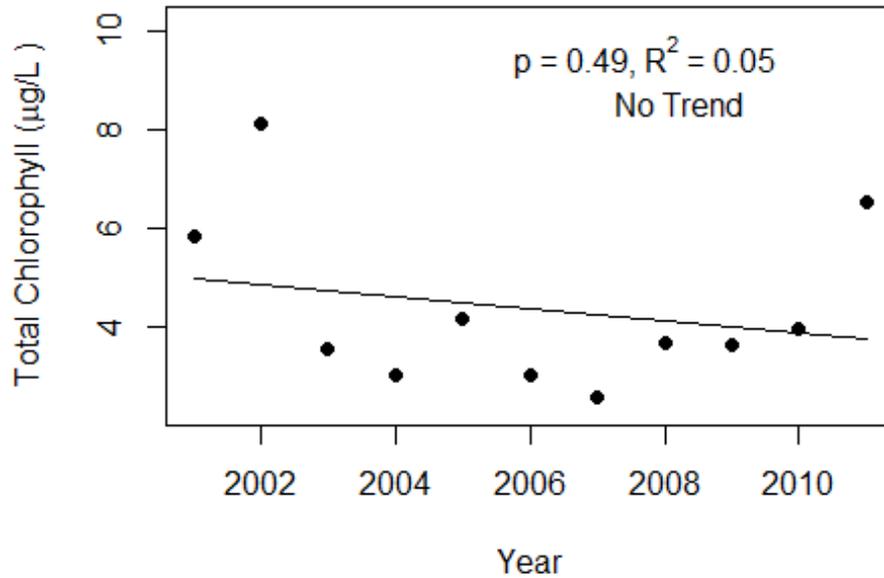
Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus (µg/L)	29 - 2011	35 (11)
Total Nitrogen (µg/L)	188 - 371	299 (11)
Chlorophyll- uncorrected (µg/L)	3 - 8	4 (11)
Secchi (ft)	1.8 - 5.0	3.1 (10.0)
Secchi (m)	0.5 - 1.5	1.0 (10.0)
Color (Pt-Co Units)	4 - 12	7 (10)
Specific Conductance (µS/cm@25 C)	44632 - 51990	48539 (10)
Salinity (ppt)	28 - 32	30 (10)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R² value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R² 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.

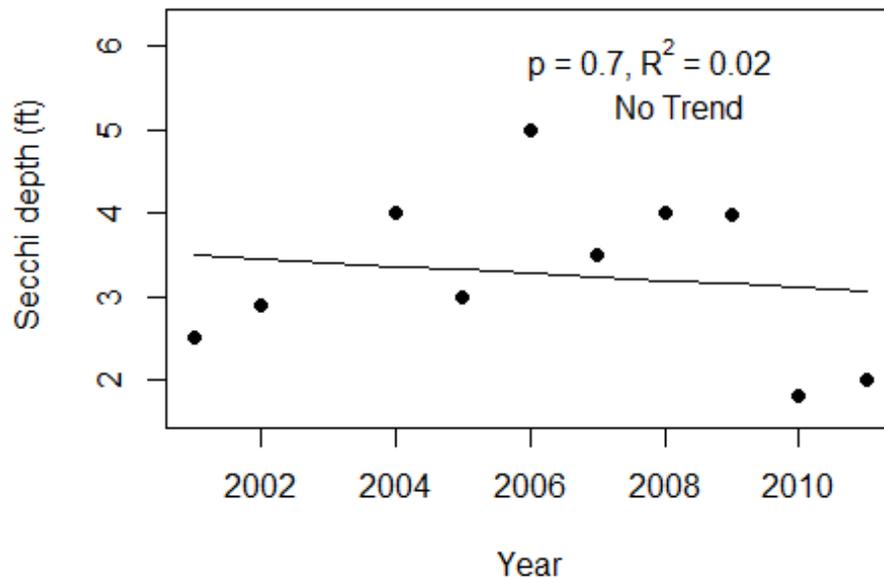

Johnson Bay 2 (Collier)

$p = 0.32$, $R^2 = 0.11$
No Trend

Johnson Bay 2 (Collier)

$p = 0.22$, $R^2 = 0.16$
No Trend

Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R² value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R² 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.

Johnson Bay 2 (Collier)

$p = 0.49, R^2 = 0.05$
No Trend

Johnson Bay 2 (Collier)

$p = 0.7, R^2 = 0.02$
No Trend

LAKEWATCH Report for Johnson Bay 3 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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.**

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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

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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- **Latitude and Longitude**: Coordinates identifying the exact location of station 1 for each system.

Table 1. Base File Data.

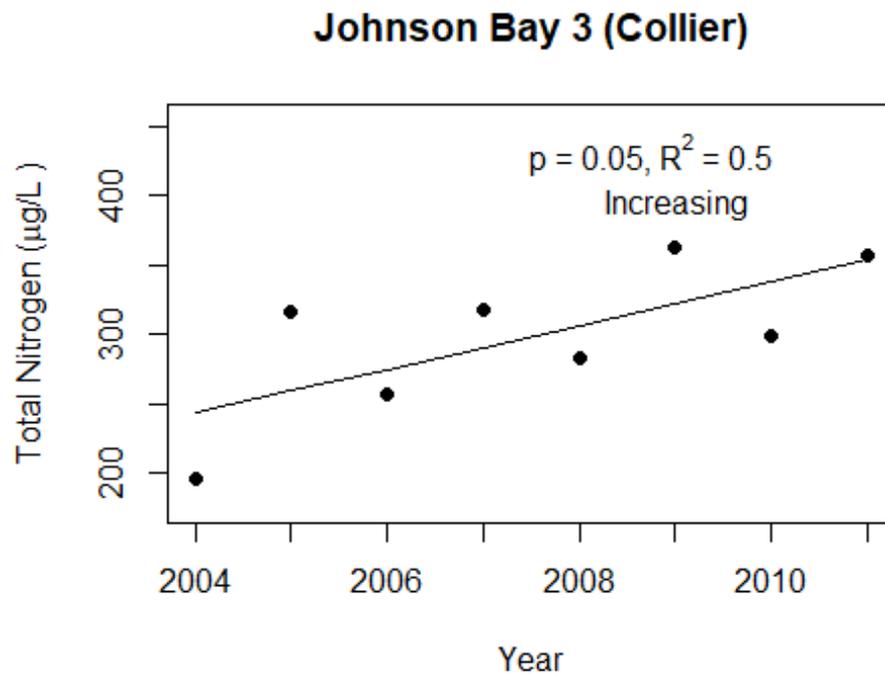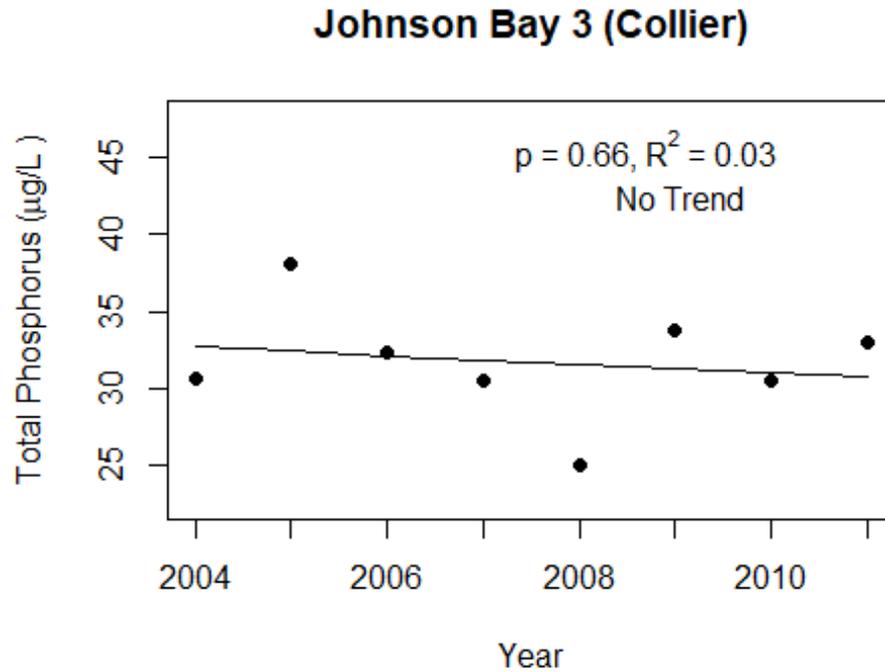| County	Collier
Name	Johnson Bay 3
GNIS Number	284859
Water Body Type	Estuary
Period of Record (years, range)	8 (2004 to 2011)
Latitude	25.9796
Longitude	-81.7320

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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.

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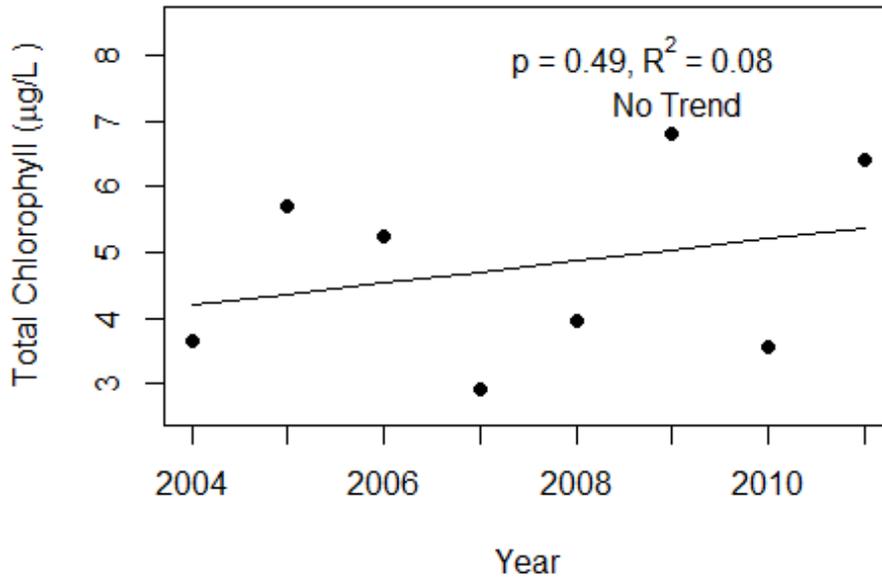
Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus (µg/L)	25 - 2011	32 (8)
Total Nitrogen (µg/L)	195 - 363	294 (8)
Chlorophyll- uncorrected (µg/L)	3 - 7	5 (8)
Secchi (ft)	3.4 - 5.4	4.4 (8.0)
Secchi (m)	1.0 - 1.7	1.3 (8.0)
Color (Pt-Co Units)	5 - 9	7 (7)
Specific Conductance (µS/cm@25 C)	40060 - 52628	48781 (7)
Salinity (ppt)	25 - 33	30 (7)

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.

Johnson Bay 3 (Collier)

$p = 0.66$, $R^2 = 0.03$
No Trend

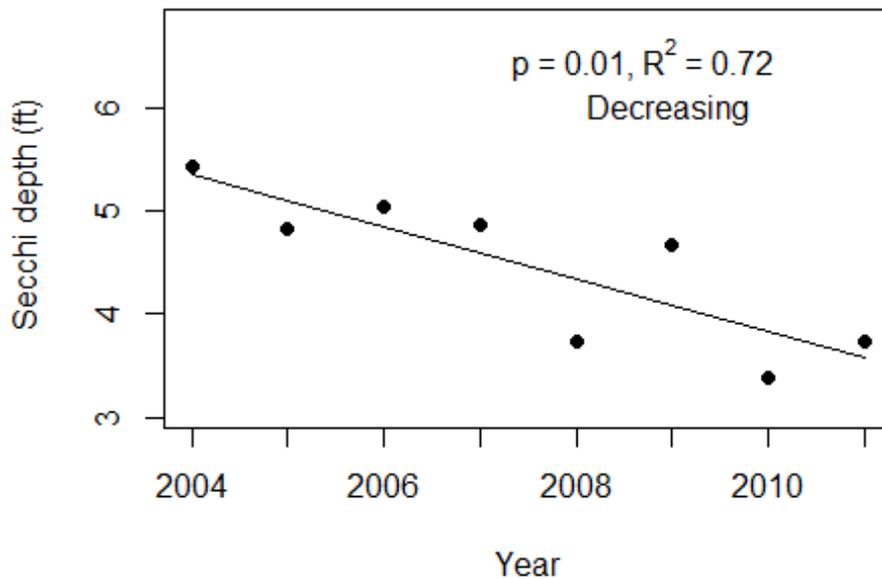## Johnson Bay 3 (Collier)

$p = 0.05$, $R^2 = 0.5$
Increasing

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.

Johnson Bay 3 (Collier)

$p = 0.49, R^2 = 0.08$
No Trend

Total Chlorophyll (µg/L)

Year

Johnson Bay 3 (Collier)

$p = 0.01, R^2 = 0.72$
Decreasing

Secchi depth (ft)

Year

LAKEWATCH Report for Naples Bay in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples
Bay
Using Data Downloaded 12/9/2020

Introduction for Estuaries
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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

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

Base File Data for Estuaries: Definitions:

- **County**: Name of county adjacent to the system.
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- **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	Collier
Name	Naples Bay
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	1 (2001 to 2001)
Latitude	26.1298
Longitude	-81.7921

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	58 - 2001	58 (1)
Total Nitrogen (µg/L)	498 - 498	498 (1)
Chlorophyll- uncorrected (µg/L)	9 - 9	9 (1)
Secchi (ft)	3.1 - 3.1	3.1 (1.0)
Secchi (m)	0.9 - 0.9	0.9 (1.0)
Color (Pt-Co Units)	13 - 13	13 (1)
Specific Conductance (µS/cm@25 C)	45826 - 45826	45826 (1)
Salinity (ppt)	29 - 29	29 (1)

LAKEWATCH Report for Naples Bay-AQS 8 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Naples Bay-AQS 8
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	4 (2004 to 2017)
Latitude	26.1293
Longitude	-81.8012

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 (μg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (μg/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 (μg/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 (μS/cm@25°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 (μg/L)	59 - 2017	68 (4)
Total Nitrogen (μg/L)	486 - 673	576 (3)
Chlorophyll- uncorrected (μg/L)	10 - 14	11 (3)
Secchi (ft)	3.3 - 3.8	3.6 (3.0)
Secchi (m)	1.0 - 1.2	1.1 (3.0)
Color (Pt-Co Units)	14 - 34	25 (3)
Specific Conductance (μS/cm@25 C)	6708 - 36000	19614 (3)
Salinity (ppt)	3 - 22	11 (3)

LAKEWATCH Report for Naples Bay-ARS 896 in Collier County
Estuary and Estuary Segment:
Using Data Downloaded 12/9/2020

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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- **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	Collier
Name	Naples Bay-ARS 896
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	17 (2004 to 2020)
Latitude	26.2114
Longitude	-81.7682

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	21 - 2020	33 (17)
Total Nitrogen (µg/L)	589 - 1059	747 (17)
Chlorophyll- uncorrected (µg/L)	2 - 24	8 (17)
Secchi (ft)	2.6 - 5.4	3.3 (17.0)
Secchi (m)	0.8 - 1.6	1.0 (17.0)
Color (Pt-Co Units)	12 - 31	21 (17)
Specific Conductance (µS/cm@25 C)	373 - 1000	492 (17)
Salinity (ppt)	0 - 0	0 (9)

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.
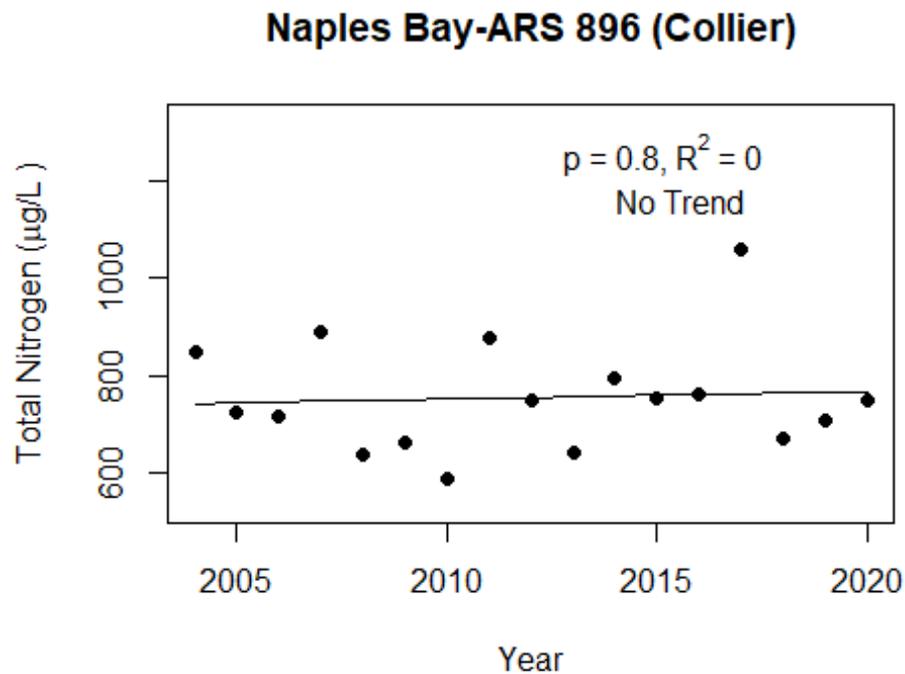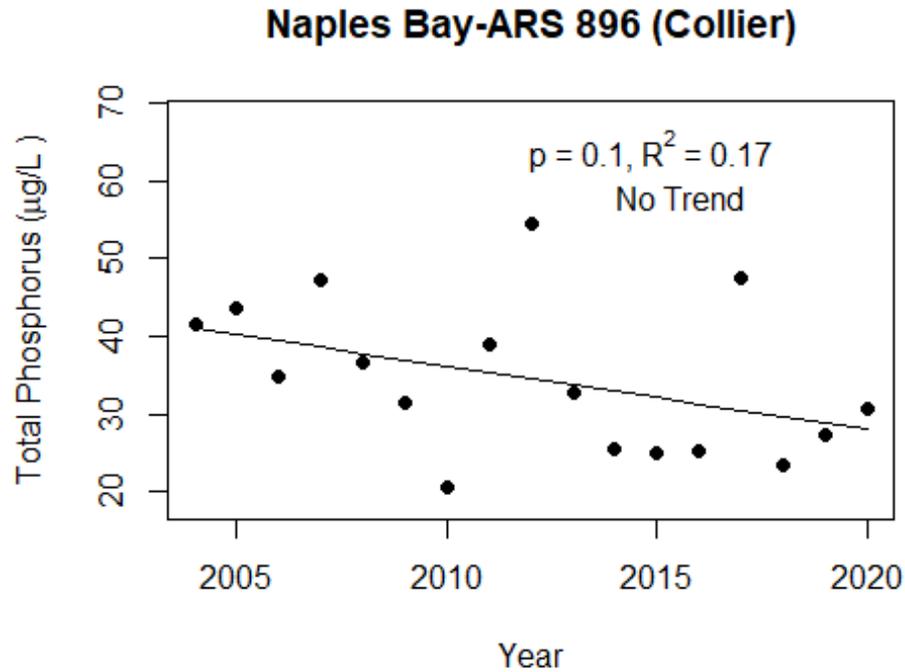
Figure 3 and Figure 4. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R² value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R² the stronger the relations and the p value indicates if the relation is significant (p < 0.05 is significant). Trend status are reported on plots.

Naples Bay-ARS 896 (Collier)

$p = 0.59, R^2 = 0.02$
No Trend

Naples Bay-ARS 896 (Collier)

$p = 0.51, R^2 = 0.03$
No Trend
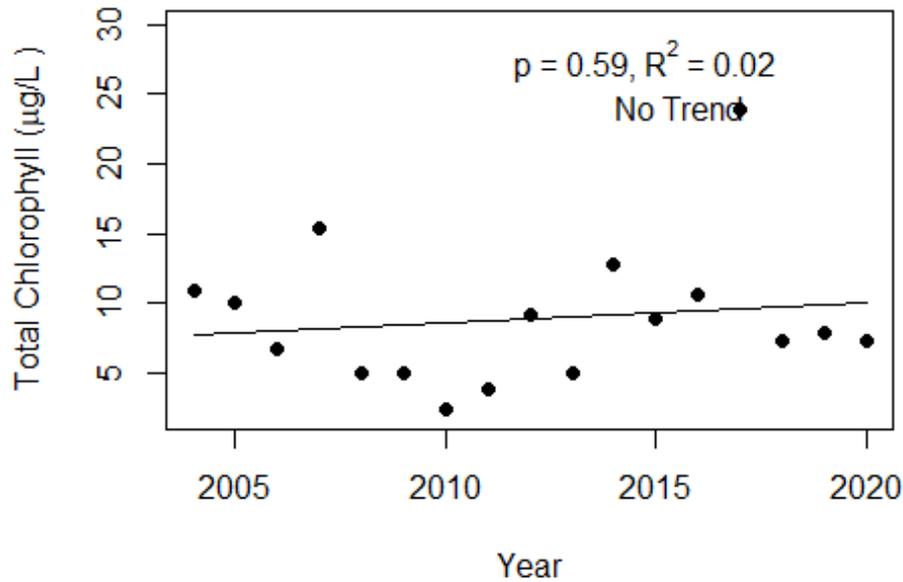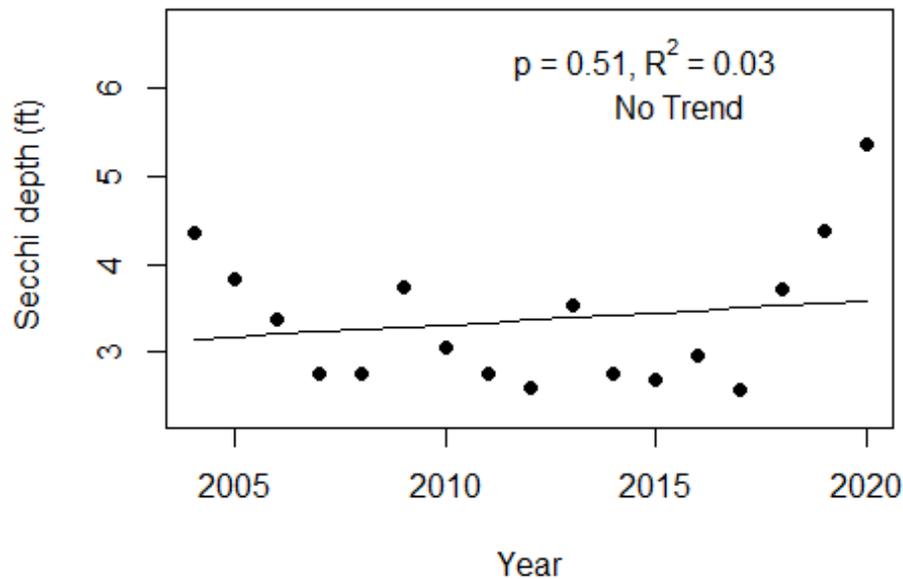
LAKEWATCH Report for Naples Bay-DOLLAR 15 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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	Collier
Name	Naples Bay-DOLLAR 15
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.0895
Longitude	-81.7868

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	37 - 2006	49 (3)
Total Nitrogen (µg/L)	296 - 419	367 (3)
Chlorophyll- uncorrected (µg/L)	5 - 6	6 (3)
Secchi (ft)	2.6 - 4.3	3.5 (3.0)
Secchi (m)	0.8 - 1.3	1.1 (3.0)
Color (Pt-Co Units)	5 - 9	7 (3)
Specific Conductance (µS/cm@25 C)	47000 - 50498	48643 (3)
Salinity (ppt)	29 - 31	30 (3)

LAKEWATCH Report for Naples Bay-GORD 10 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Naples Bay-GORD 10
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.0930
Longitude	-81.7986

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	37 - 2006	44 (3)
Total Nitrogen (µg/L)	264 - 330	300 (3)
Chlorophyll- uncorrected (µg/L)	4 - 6	5 (3)
Secchi (ft)	2.5 - 5.7	3.9 (3.0)
Secchi (m)	0.8 - 1.7	1.2 (3.0)
Color (Pt-Co Units)	6 - 9	7 (3)
Specific Conductance (µS/cm@25 C)	48866 - 50000	49616 (3)
Salinity (ppt)	30 - 31	31 (3)

LAKEWATCH Report for Naples Bay-GORD 70 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples Bay
Using Data Downloaded 12/9/2020

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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- **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	Collier
Name	Naples Bay-GORD 70
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.1520
Longitude	-81.7856

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	56 - 2006	65 (3)
Total Nitrogen (µg/L)	589 - 683	626 (3)
Chlorophyll- uncorrected (µg/L)	7 - 16	10 (3)
Secchi (ft)	2.5 - 4.1	3.4 (3.0)
Secchi (m)	0.8 - 1.2	1.0 (3.0)
Color (Pt-Co Units)	21 - 40	28 (3)
Specific Conductance (µS/cm@25 C)	26870 - 29000	27606 (3)
Salinity (ppt)	17 - 18	17 (3)

LAKEWATCH Report for Naples Bay-GORD 80 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples Bay
Using Data Downloaded 12/9/2020

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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- **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	Collier
Name	Naples Bay-GORD 80
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.1599
Longitude	-81.7838

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	46 - 2006	54 (3)
Total Nitrogen (µg/L)	555 - 686	626 (3)
Chlorophyll- uncorrected (µg/L)	6 - 17	9 (3)
Secchi (ft)	3.0 - 3.5	3.2 (3.0)
Secchi (m)	0.9 - 1.1	1.0 (3.0)
Color (Pt-Co Units)	30 - 44	35 (3)
Specific Conductance (µS/cm@25 C)	15000 - 29496	20649 (3)
Salinity (ppt)	9 - 18	13 (3)

LAKEWATCH Report for Naples Bay-GRE 896 in Collier County
Estuary and Estuary Segment:
Using Data Downloaded 12/9/2020

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.**

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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

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	Collier
Name	Naples Bay-GRE 896
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	17 (2004 to 2020)
Latitude	26.1738
Longitude	-81.7846

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	22 - 2020	32 (17)
Total Nitrogen (µg/L)	492 - 791	667 (17)
Chlorophyll- uncorrected (µg/L)	4 - 14	8 (17)
Secchi (ft)	0.7 - 2.2	1.7 (17.0)
Secchi (m)	0.2 - 0.7	0.5 (17.0)
Color (Pt-Co Units)	18 - 29	23 (17)
Specific Conductance (µS/cm@25 C)	342 - 1000	485 (17)
Salinity (ppt)	0 - 0	0 (7)

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.
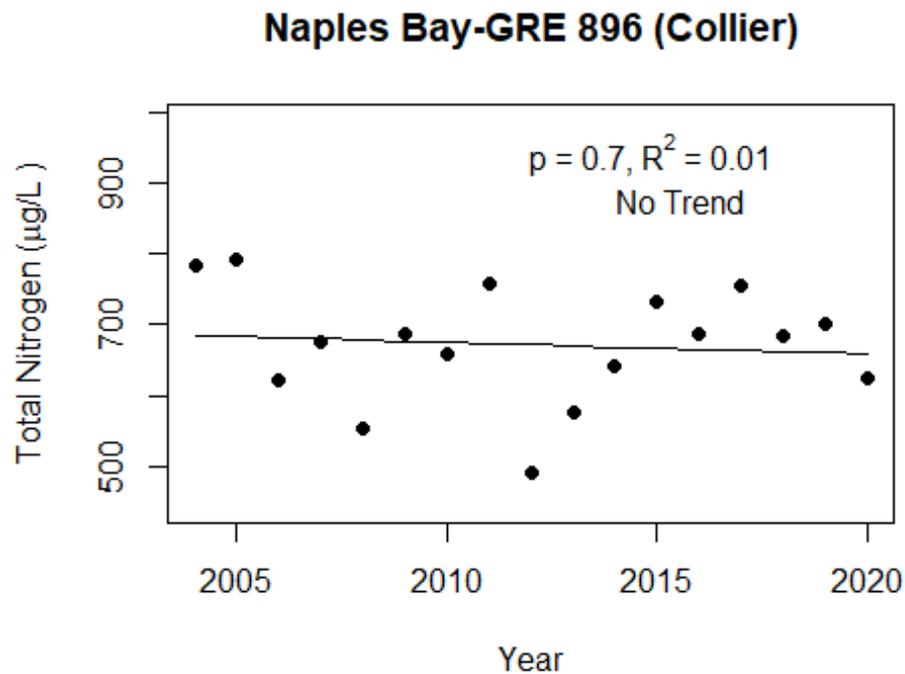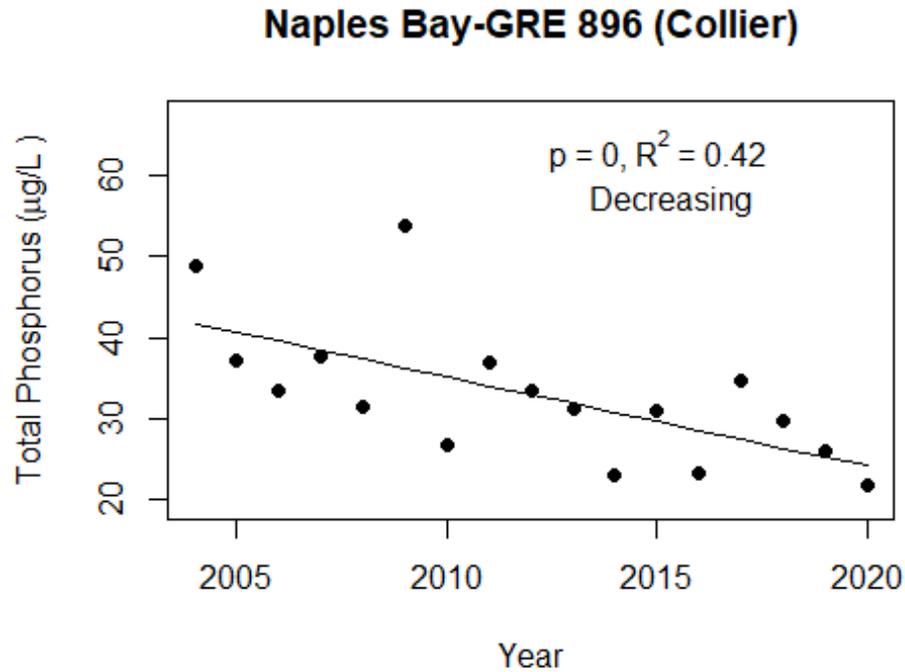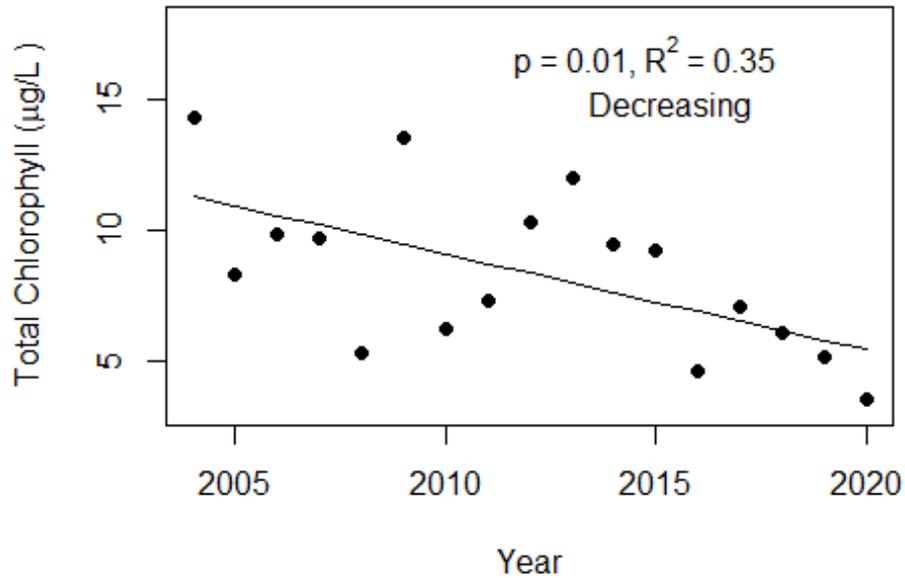

Naples Bay-GRE 896 (Collier)

$p = 0$, $R^2 = 0.42$
Decreasing

Naples Bay-GRE 896 (Collier)

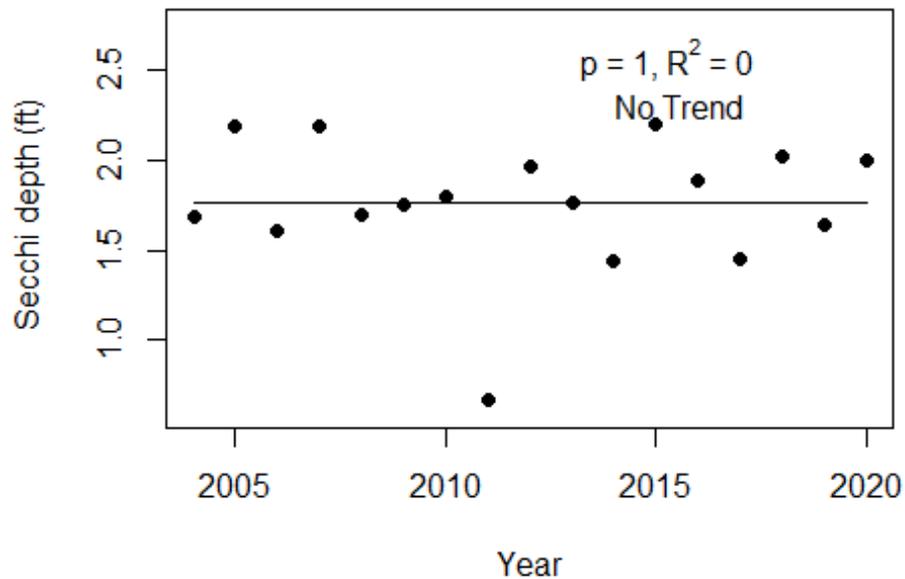$p = 0.7$, $R^2 = 0.01$
No Trend

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.

Naples Bay-GRE 896 (Collier)

$p = 0.01, R^2 = 0.35$
Decreasing

Naples Bay-GRE 896 (Collier)

$p = 1, R^2 = 0$
No Trend

LAKEWATCH Report for Naples Bay-NBAY 22 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples
Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Naples Bay-NBAY 22
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.1095
Longitude	-81.7922

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	42 - 2006	45 (3)
Total Nitrogen (µg/L)	348 - 435	392 (3)
Chlorophyll- uncorrected (µg/L)	7 - 9	8 (3)
Secchi (ft)	2.8 - 4.1	3.5 (3.0)
Secchi (m)	0.8 - 1.3	1.1 (3.0)
Color (Pt-Co Units)	8 - 12	10 (3)
Specific Conductance (µS/cm@25 C)	45219 - 50000	47699 (3)
Salinity (ppt)	28 - 31	30 (3)

LAKEWATCH Report for Naples Bay-NBAY 24 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Naples Bay
Using Data Downloaded 12/9/2020

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	Collier
Name	Naples Bay-NBAY 24
GNIS Number	287529
Water Body Type	Estuary
Period of Record (years, range)	3 (2004 to 2006)
Latitude	26.1132
Longitude	-81.7860

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 (μg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (μg/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 (μg/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 (μS/cm@25°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 (μg/L)	41 - 2006	50 (3)
Total Nitrogen (μg/L)	333 - 404	355 (3)
Chlorophyll- uncorrected (μg/L)	5 - 7	6 (3)
Secchi (ft)	2.0 - 3.6	2.9 (3.0)
Secchi (m)	0.6 - 1.1	0.9 (3.0)
Color (Pt-Co Units)	6 - 11	8 (3)
Specific Conductance (μS/cm@25 C)	43363 - 49477	46873 (3)
Salinity (ppt)	27 - 31	29 (3)

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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- **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	Collier
Name	Pumpkin Bay
GNIS Number	289362
Water Body Type	Estuary
Period of Record (years, range)	1 (2001 to 2001)
Latitude	25.9176
Longitude	-81.5484

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	52 - 2001	52 (1)
Total Nitrogen (µg/L)	435 - 435	435 (1)
Chlorophyll- uncorrected (µg/L)	9 - 9	9 (1)
Secchi (ft)	2.2 - 2.2	2.2 (1.0)
Secchi (m)	0.7 - 0.7	0.7 (1.0)
Color (Pt-Co Units)	10 - 10	10 (1)
Specific Conductance (µS/cm@25 C)	51962 - 51962	51962 (1)
Salinity (ppt)	32 - 32	32 (1)

LAKEWATCH Report for Tarpon Bay 1 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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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- **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	Collier
Name	Tarpon Bay 1
GNIS Number	292035
Water Body Type	Estuary
Period of Record (years, range)	11 (2001 to 2011)
Latitude	25.9860
Longitude	-81.7241

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	35 - 2011	42 (11)
Total Nitrogen (µg/L)	316 - 486	406 (11)
Chlorophyll- uncorrected (µg/L)	3 - 13	8 (11)
Secchi (ft)	3.1 - 7.5	4.4 (10.0)
Secchi (m)	0.9 - 2.3	1.3 (10.0)
Color (Pt-Co Units)	8 - 12	10 (9)
Specific Conductance (µS/cm@25 C)	42426 - 53823	50214 (9)
Salinity (ppt)	26 - 34	31 (9)

Figure 1 and Figure 2. Trend plots of annual average total phosphorus and annual average total nitrogen versus year. The R² value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R² 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.
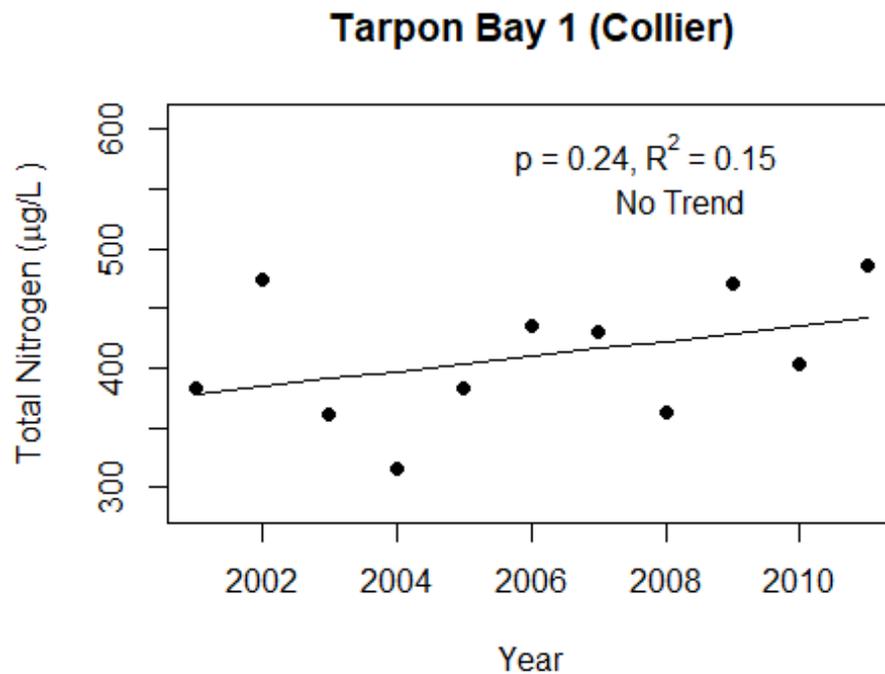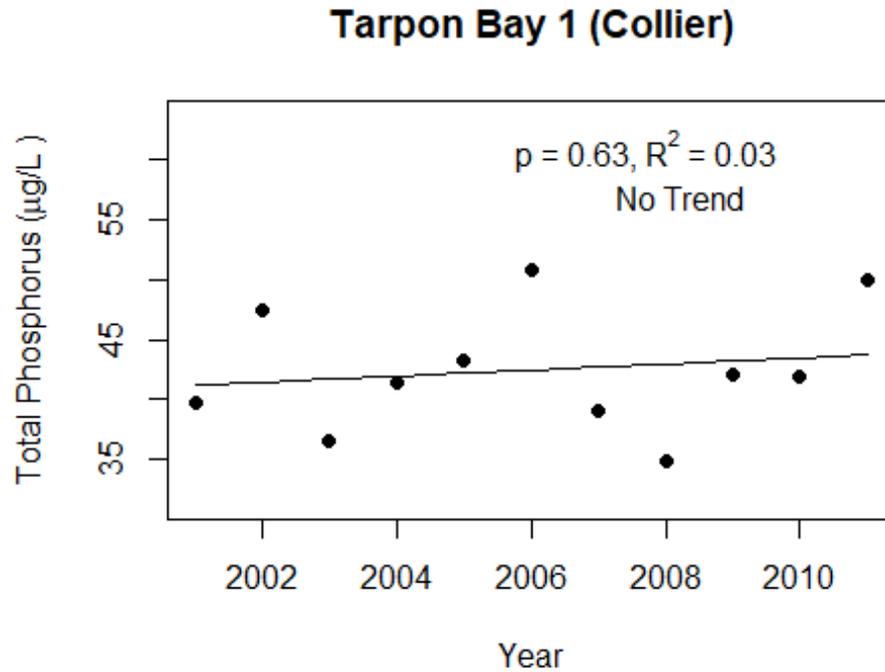

Tarpon Bay 1 (Collier)

$p = 0.63$, $R^2 = 0.03$
No Trend

Tarpon Bay 1 (Collier)
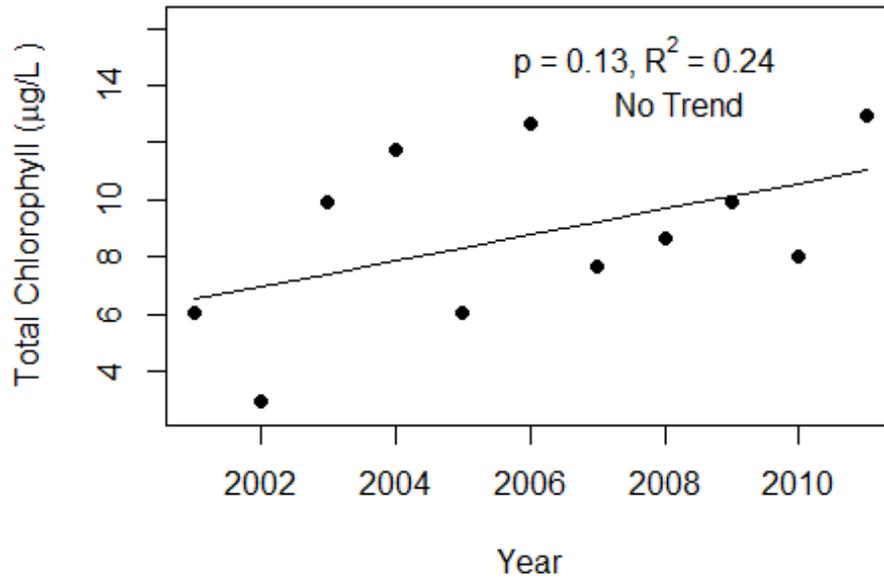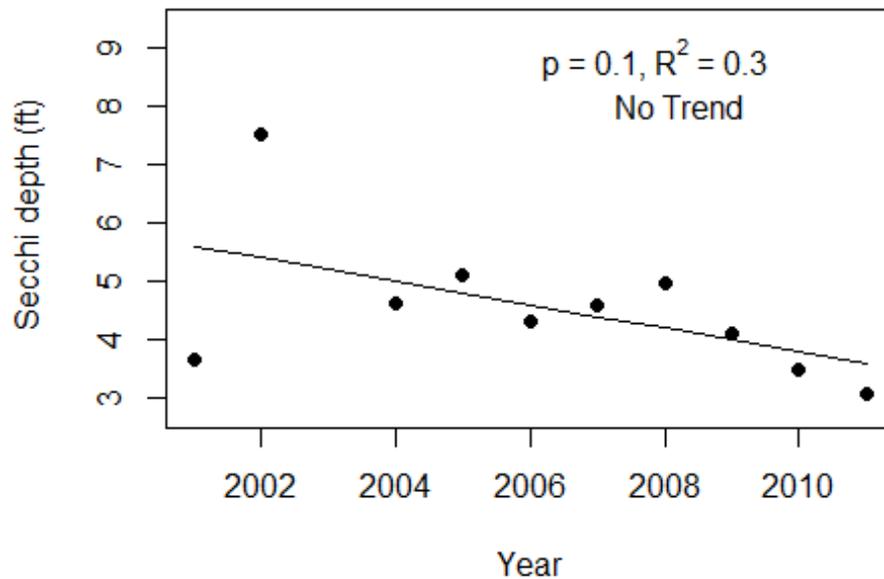
$p = 0.24$, $R^2 = 0.15$
No Trend

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.

Tarpon Bay 1 (Collier)

p = 0.13, R^2 = 0.24
No Trend

Tarpon Bay 1 (Collier)

p = 0.1, R^2 = 0.3
No Trend

LAKEWATCH Report for Tarpon Bay 2 in Collier County
Estuary and Estuary Segment: Tidal Cocohatchee River/Ten Thousands Islands Rookery
Bay Marco Island
Using Data Downloaded 12/9/2020

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.**

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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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- **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	Collier
Name	Tarpon Bay 2
GNIS Number	292035
Water Body Type	Estuary
Period of Record (years, range)	8 (2004 to 2011)
Latitude	25.9786
Longitude	-81.7295

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 (µg/L)**: Nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/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 (µg/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 (µS/cm@25°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 (µg/L)	27 - 2011	33 (8)
Total Nitrogen (µg/L)	232 - 401	320 (8)
Chlorophyll- uncorrected (µg/L)	4 - 7	5 (8)
Secchi (ft)	3.0 - 5.7	4.2 (8.0)
Secchi (m)	0.9 - 1.7	1.3 (8.0)
Color (Pt-Co Units)	5 - 9	7 (7)
Specific Conductance (µS/cm@25 C)	42849 - 55153	49563 (7)
Salinity (ppt)	27 - 34	31 (7)

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.

Tarpon Bay 2 (Collier)

$p = 0.68$, $R^2 = 0.03$
No Trend

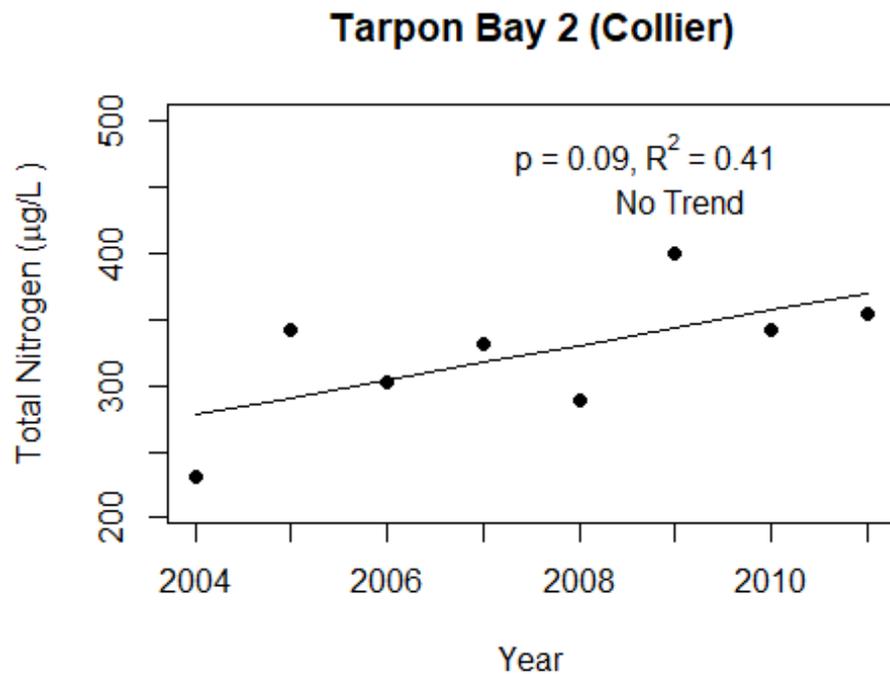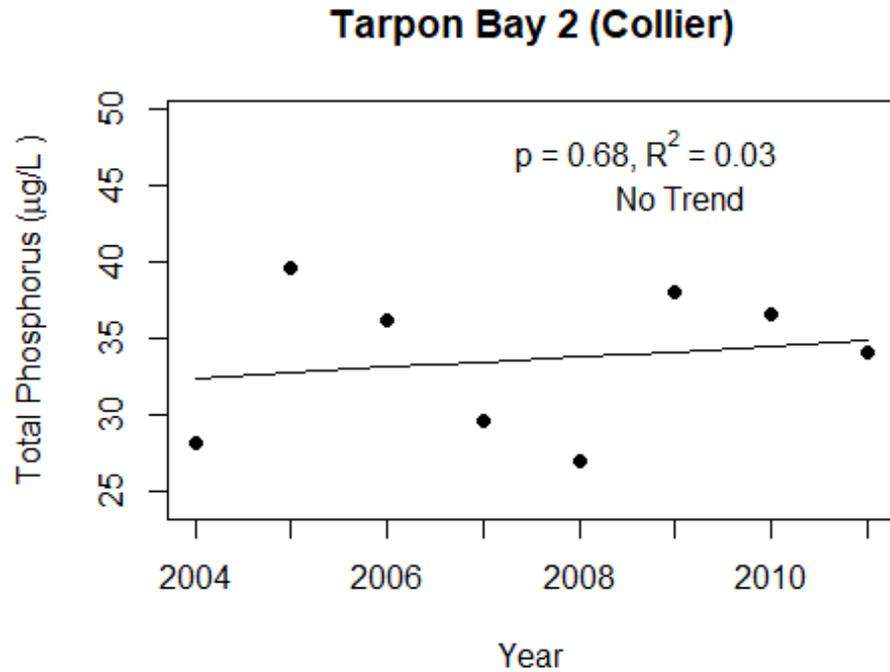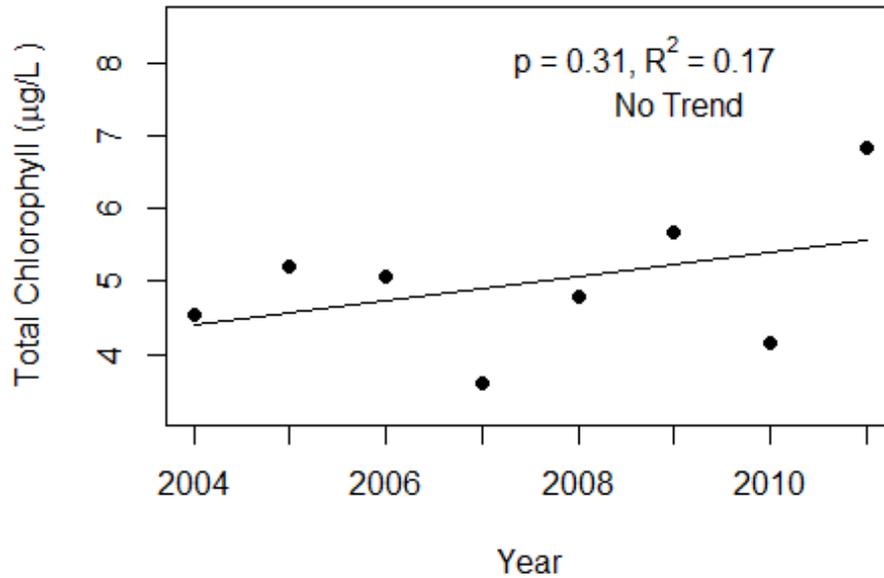## Tarpon Bay 2 (Collier)

$p = 0.09$, $R^2 = 0.41$
No Trend

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.

Tarpon Bay 2 (Collier)

$p = 0.31$, $R^2 = 0.17$
No Trend

Tarpon Bay 2 (Collier)

$p = 0.01$, $R^2 = 0.7$
Decreasing