**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 32 - 34 | 33 (2) |
| Total Nitrogen (µg/L) | 1074 - 1222 | 1145 (2) |
| Chlorophyll- uncorrected (µg/L) | 9 - 10 | 9 (2) |
| Secchi (ft) | 3.9 - 5.0 | 4.4 (2.0) |
| Secchi (m) | 1.2 - 1.5 | 1.3 (2.0) |
| Color (Pt-Co Units) | 46 - 50 | 48 (2) |
| Specific Conductance (µS/cm@25 C) | 901 - 957 | 957 (2) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

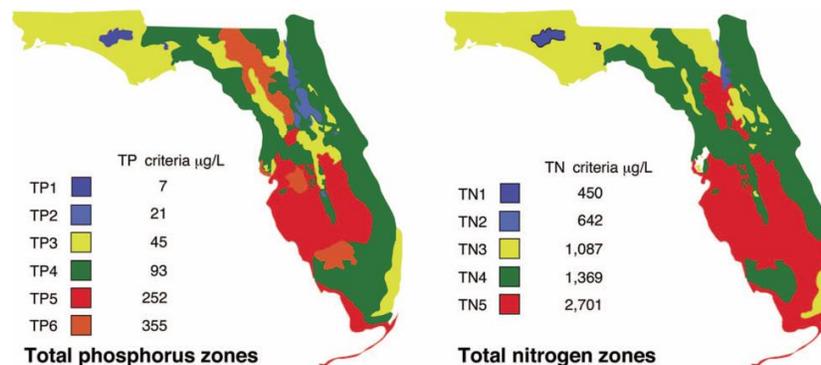| County | Sarasota |
|---|---|
| Name | Bobcat |
| GNIS Number | |
| Latitude | 27.1828 |
| Longitude | -82.4701 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 33 (32 **to** 34) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1145 (1074 **to** 1074) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

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**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 227 - 307 | 260 (4) |
| Total Nitrogen (µg/L) | 1281 - 1490 | 1425 (4) |
| Chlorophyll- uncorrected (µg/L) | 33 - 43 | 39 (4) |
| Secchi (ft) | 2.1 - 2.6 | 2.3 (4.0) |
| Secchi (m) | 0.6 - 0.8 | 0.7 (4.0) |
| Color (Pt-Co Units) | 26 - 855 | 91 (3) |
| Specific Conductance (µS/cm@25 C) | 440 - 749 | 749 (3) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
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- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
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- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

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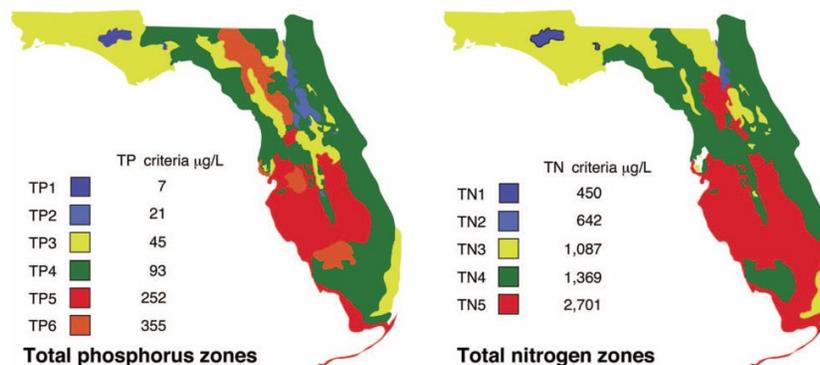| County | Sarasota |
|---|---|
| Name | Cormorant |
| GNIS Number | |
| Latitude | 27.2647 |
| Longitude | -82.4921 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2017 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 260 (227 **to** 307) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1425 (1281 **to** 1281) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
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    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
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3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
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**Nutrient Zones and "Natural Background"**

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**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for Eagle in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO₃ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO₃ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO₃ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 42 - 76 | 56 (2) |
| Total Nitrogen (µg/L) | 762 - 896 | 826 (2) |
| Chlorophyll- uncorrected (µg/L) | 12 - 22 | 16 (2) |
| Secchi (ft) | 2.9 - 3.2 | 3.0 (2.0) |
| Secchi (m) | 0.9 - 1.0 | 0.9 (2.0) |
| Color (Pt-Co Units) | 49 - 103 | 71 (2) |
| Specific Conductance (µS/cm@25 C) | - | (0) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90<sup>th</sup> percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

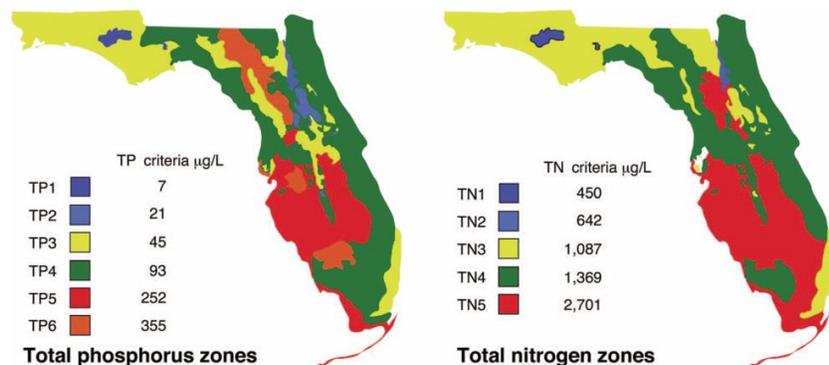| | |
|---|---|
| County | Sarasota |
| Name | Eagle |
| GNIS Number | |
| Latitude | 27.1868 |
| Longitude | -82.4649 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2002 to 2003 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 56 (42 **to** 76) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 826 (762 **to** 762) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO₃ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO₃ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO₃ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 160 - 221 | 188 (2) |
| Total Nitrogen (µg/L) | 1609 - 2335 | 1938 (2) |
| Chlorophyll- uncorrected (µg/L) | 104 - 118 | 111 (2) |
| Secchi (ft) | 1.2 - 1.5 | 1.4 (2.0) |
| Secchi (m) | 0.4 - 0.5 | 0.4 (2.0) |
| Color (Pt-Co Units) | 45 - 45 | 45 (1) |
| Specific Conductance (µS/cm@25 C) | 360 - 360 | 360 (1) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

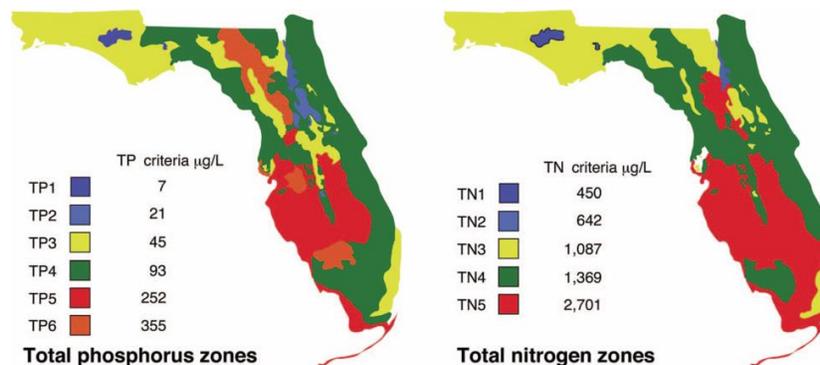| County | Sarasota |
|---|---|
| Name | East |
| GNIS Number | |
| Latitude | 27.2680 |
| Longitude | -81.4376 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2017 to 2018 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 188 (160 **to** 221) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1938 (1609 **to** 1609) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for Egret in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 247 - 283 | 263 (4) |
| Total Nitrogen (µg/L) | 702 - 1057 | 921 (4) |
| Chlorophyll- uncorrected (µg/L) | 1 - 27 | 11 (4) |
| Secchi (ft) | 2.4 - 6.7 | 3.4 (4.0) |
| Secchi (m) | 0.7 - 2.1 | 1.0 (4.0) |
| Color (Pt-Co Units) | 21 - 936 | 77 (3) |
| Specific Conductance (µS/cm@25 C) | 524 - 709 | 709 (3) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

| County | Sarasota |
|---|---|
| Name | Egret |
| GNIS Number | |
| Latitude | 27.2659 |
| Longitude | -82.4914 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2017 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 263 (247 **to** 283) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 921 **(**702 **to** 702) |



| TP criteria µg/L | | TN criteria µg/L | |
|---|---|---|---|
| TP1 | 7 | TN1 | 450 |
| TP2 | 21 | TN2 | 642 |
| TP3 | 45 | TN3 | 1,087 |
| TP4 | 93 | TN4 | 1,369 |
| TP5 | 252 | TN5 | 2,701 |
| TP6 | 355 | | |

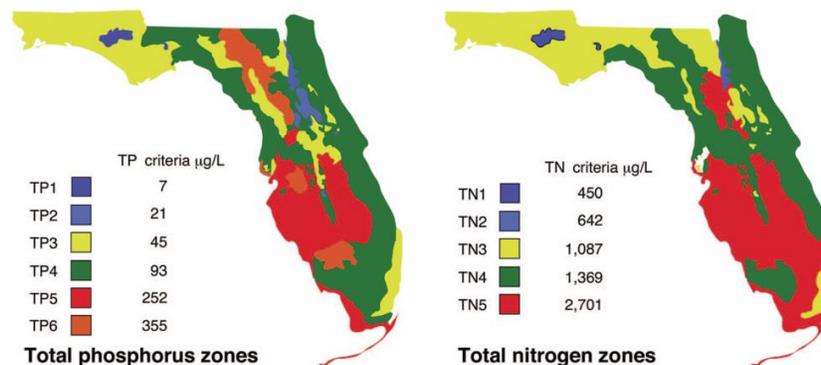**Total phosphorus zones**          **Total nitrogen zones**

**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for Egret 2 in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 143 - 155 | 149 (2) |
| Total Nitrogen (µg/L) | 953 - 989 | 971 (2) |
| Chlorophyll- uncorrected (µg/L) | 2 - 4 | 3 (2) |
| Secchi (ft) | 5.6 - 6.7 | 6.1 (2.0) |
| Secchi (m) | 1.7 - 2.0 | 1.9 (2.0) |
| Color (Pt-Co Units) | 27 - 28 | 27 (2) |
| Specific Conductance (µS/cm@25 C) | 578 - 613 | 613 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

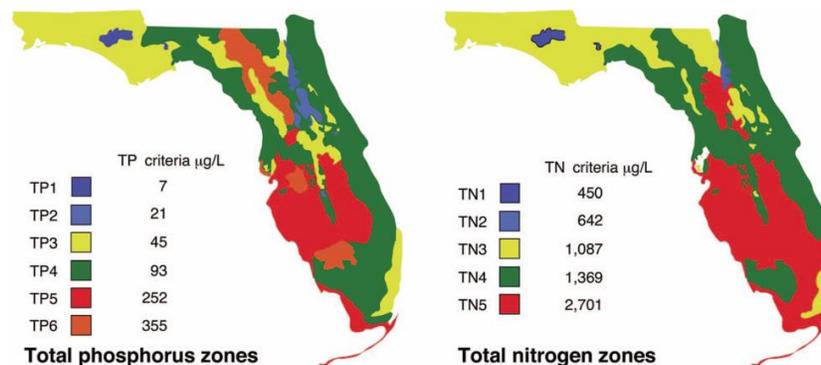| County | Sarasota |
|---|---|
| Name | Egret 2 |
| GNIS Number | |
| Latitude | 27.2536 |
| Longitude | -82.4933 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Oligotrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 149 (143 **to** 155) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 971 (953 **to** 953) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 58 - 75 | 66 (2) |
| Total Nitrogen (µg/L) | 1277 - 1372 | 1323 (2) |
| Chlorophyll- uncorrected (µg/L) | 44 - 47 | 45 (2) |
| Secchi (ft) | 2.4 - 2.5 | 2.4 (2.0) |
| Secchi (m) | 0.7 - 0.8 | 0.7 (2.0) |
| Color (Pt-Co Units) | 21 - 23 | 22 (2) |
| Specific Conductance (µS/cm@25 C) | 594 - 643 | 643 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

| County | Sarasota |
|---|---|
| Name | EVMA 1 |
| GNIS Number | |
| Latitude | 27.0769 |
| Longitude | -82.3832 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 66 (58 **to** 75) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1323 (1277 **to** 1277) |



TP criteria µg/L
TP1   7
TP2   21
TP3   45
TP4   93
TP5   252
TP6   355
**Total phosphorus zones**

TN criteria µg/L
TN1   450
TN2   642
TN3   1,087
TN4   1,369
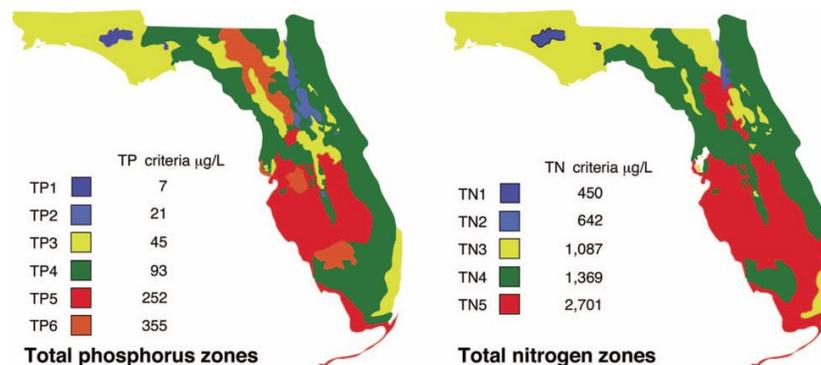TN5   2,701
**Total nitrogen zones**

**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for EVMA 2 in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO₃ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO₃ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO₃ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 44 - 45 | 44 (2) |
| Total Nitrogen (µg/L) | 947 - 947 | 947 (2) |
| Chlorophyll- uncorrected (µg/L) | 27 - 31 | 29 (2) |
| Secchi (ft) | 2.8 - 3.2 | 3.0 (2.0) |
| Secchi (m) | 0.9 - 1.0 | 0.9 (2.0) |
| Color (Pt-Co Units) | 19 - 19 | 19 (2) |
| Specific Conductance (µS/cm@25 C) | 396 - 420 | 420 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90<sup>th</sup> percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

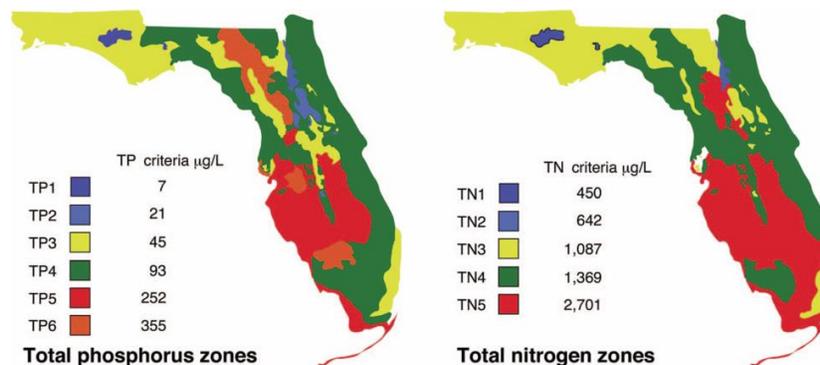| County | Sarasota |
|---|---|
| Name | EVMA 2 |
| GNIS Number | |
| Latitude | 27.0767 |
| Longitude | -82.3786 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 44 (44 **to** 45) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 947 (947 **to** 947) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

<p style="text-align:center"><strong>Florida LAKEWATCH Report for EVMA 3 in Sarasota County<br>Using Data Downloaded 12/9/2020</strong></p>

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 35 - 40 | 37 (2) |
| Total Nitrogen (µg/L) | 1333 - 1373 | 1353 (2) |
| Chlorophyll- uncorrected (µg/L) | 44 - 47 | 45 (2) |
| Secchi (ft) | 2.0 - 2.2 | 2.1 (2.0) |
| Secchi (m) | 0.6 - 0.7 | 0.6 (2.0) |
| Color (Pt-Co Units) | 24 - 24 | 24 (2) |
| Specific Conductance (µS/cm@25 C) | 465 - 527 | 527 (2) |
| Lake Classification | **Clear Hardwater** | |

## Base File Data for Lakes: Definitions and Nutrient Zone Maps

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

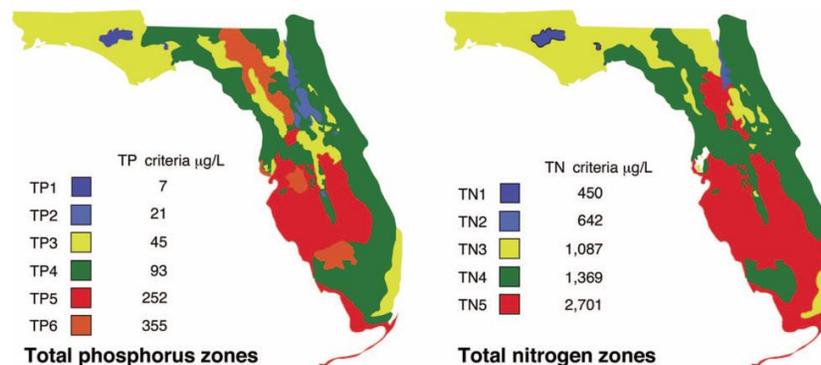| County | Sarasota |
|---|---|
| Name | EVMA 3 |
| GNIS Number | |
| Latitude | 27.0721 |
| Longitude | -82.3800 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 37 (35 **to** 40) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1353 (1333 **to** 1333) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for EVMA 4 in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 33 - 45 | 38 (2) |
| Total Nitrogen (µg/L) | 1279 - 1497 | 1383 (2) |
| Chlorophyll- uncorrected (µg/L) | 31 - 39 | 35 (2) |
| Secchi (ft) | 2.0 - 2.2 | 2.1 (2.0) |
| Secchi (m) | 0.6 - 0.7 | 0.6 (2.0) |
| Color (Pt-Co Units) | 24 - 24 | 24 (1) |
| Specific Conductance (µS/cm@25 C) | 368 - 368 | 368 (1) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

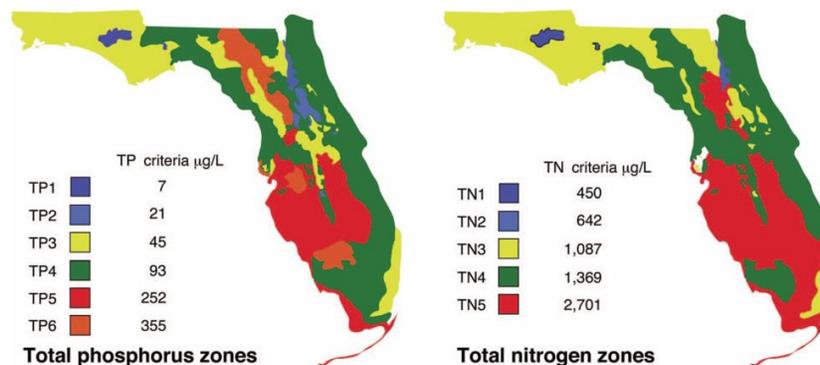| County | Sarasota |
|---|---|
| Name | EVMA 4 |
| GNIS Number | |
| Latitude | 27.0746 |
| Longitude | -82.3766 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 38 (33 **to** 45) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1383 (1279 **to** 1279) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for EVMA 5 in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 31 - 38 | 34 (2) |
| Total Nitrogen (µg/L) | 809 - 936 | 870 (2) |
| Chlorophyll- uncorrected (µg/L) | 19 - 21 | 20 (2) |
| Secchi (ft) | 3.5 - 3.6 | 3.5 (2.0) |
| Secchi (m) | 1.1 - 1.1 | 1.1 (2.0) |
| Color (Pt-Co Units) | 19 - 19 | 19 (1) |
| Specific Conductance (µS/cm@25 C) | 538 - 538 | 538 (1) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

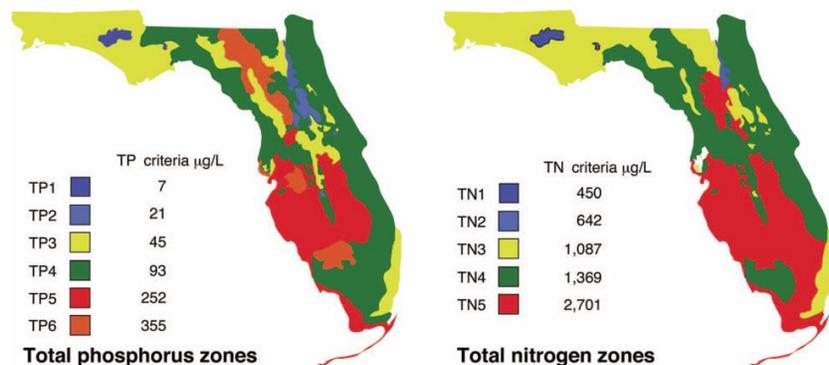| County | Sarasota |
|---|---|
| Name | EVMA 5 |
| GNIS Number | |
| Latitude | 27.0764 |
| Longitude | -82.3737 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 34 (31 **to** 38) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 870 (809 **to** 809) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for EVMA 6 in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 17 - 19 | 18 (2) |
| Total Nitrogen (µg/L) | 697 - 711 | 704 (2) |
| Chlorophyll- uncorrected (µg/L) | 6 - 7 | 6 (2) |
| Secchi (ft) | 5.9 - 7.0 | 6.5 (2.0) |
| Secchi (m) | 1.8 - 2.1 | 2.0 (2.0) |
| Color (Pt-Co Units) | 17 - 17 | 17 (1) |
| Specific Conductance (µS/cm@25 C) | 446 - 446 | 446 (1) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

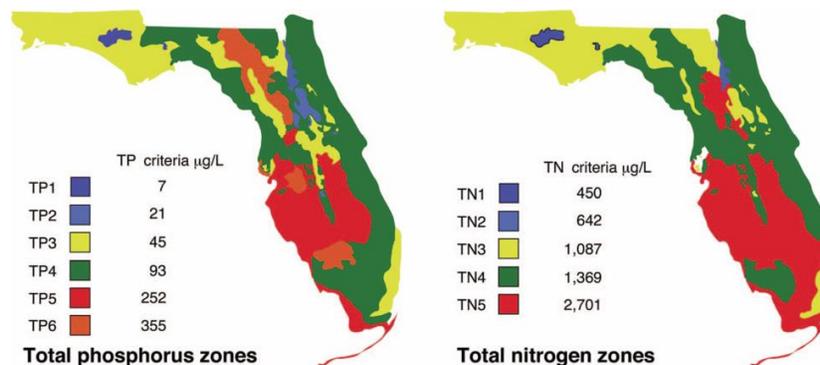| County | Sarasota |
| --- | --- |
| Name | EVMA 6 |
| GNIS Number | |
| Latitude | 27.0750 |
| Longitude | -82.3732 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Mesotrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 18 (17 **to** 19) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 704 (697 **to** 697) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for EVMA 7 in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 53 - 65 | 59 (2) |
| Total Nitrogen (µg/L) | 876 - 1017 | 944 (2) |
| Chlorophyll- uncorrected (µg/L) | 10 - 14 | 12 (2) |
| Secchi (ft) | 3.5 - 5.0 | 4.2 (2.0) |
| Secchi (m) | 1.1 - 1.5 | 1.3 (2.0) |
| Color (Pt-Co Units) | 17 - 17 | 17 (1) |
| Specific Conductance (µS/cm@25 C) | 543 - 543 | 543 (1) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

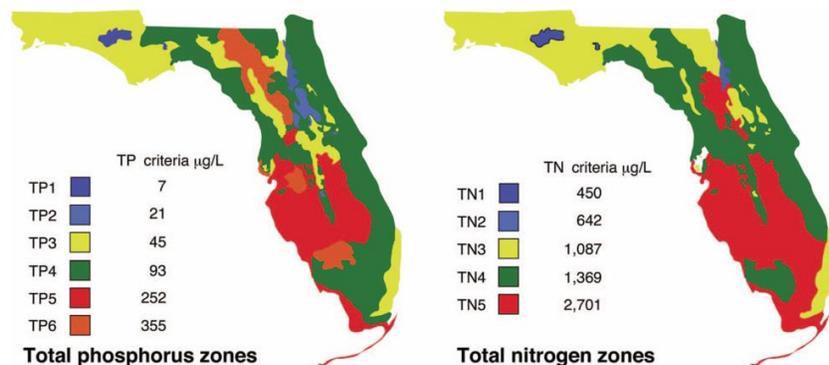| | |
|---|---|
| County | Sarasota |
| Name | EVMA 7 |
| GNIS Number | |
| Latitude | 27.0760 |
| Longitude | -82.3705 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 59 (53 **to** 65) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 944 (876 **to** 876) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for Heron Lagoon in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 84 - 84 | 84 (1) |
| Total Nitrogen (µg/L) | 820 - 820 | 820 (1) |
| Chlorophyll- uncorrected (µg/L) | 14 - 14 | 14 (1) |
| Secchi (ft) | 4.2 - 4.2 | 4.2 (1.0) |
| Secchi (m) | 1.3 - 1.3 | 1.3 (1.0) |
| Color (Pt-Co Units) | 30 - 30 | 30 (1) |
| Specific Conductance (µS/cm@25 C) | 41000 - 41000 | 41000 (1) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

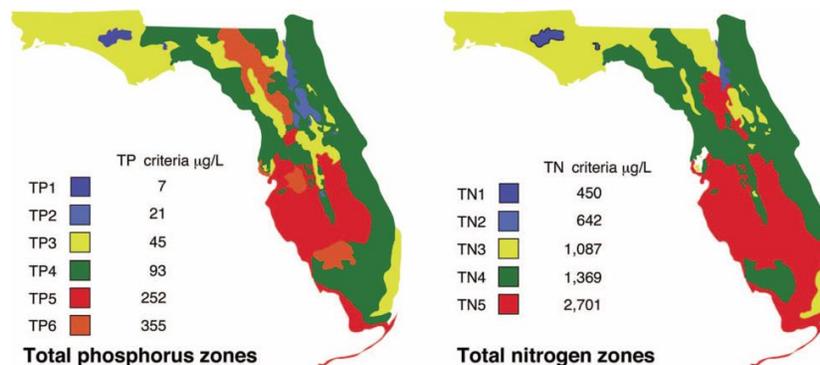| County | Sarasota |
|---|---|
| Name | Heron Lagoon |
| GNIS Number | |
| Latitude | 27.2425 |
| Longitude | -82.5289 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2020 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 84 (84 **to** 84) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 820 (820 **to** 820) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 71 - 71 | 71 (2) |
| Total Nitrogen (µg/L) | 1304 - 1321 | 1313 (2) |
| Chlorophyll- uncorrected (µg/L) | 39 - 42 | 40 (2) |
| Secchi (ft) | 2.1 - 2.4 | 2.2 (2.0) |
| Secchi (m) | 0.6 - 0.7 | 0.7 (2.0) |
| Color (Pt-Co Units) | 22 - 26 | 24 (2) |
| Specific Conductance (µS/cm@25 C) | 329 - 343 | 343 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

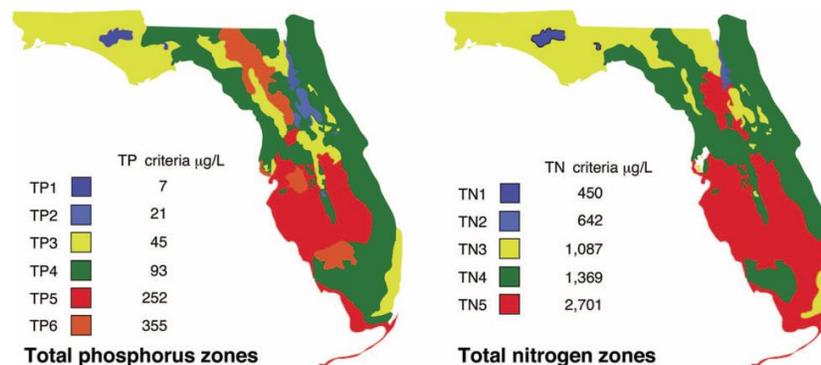| County | Sarasota |
|---|---|
| Name | Lake 37 |
| GNIS Number | |
| Latitude | 27.3701 |
| Longitude | -82.4700 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 71 (71 **to** 71) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1313 (1304 **to** 1304) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 74 - 82 | 77 (2) |
| Total Nitrogen (µg/L) | 760 - 815 | 787 (2) |
| Chlorophyll- uncorrected (µg/L) | 13 - 19 | 16 (2) |
| Secchi (ft) | 4.2 - 4.9 | 4.6 (2.0) |
| Secchi (m) | 1.3 - 1.5 | 1.4 (2.0) |
| Color (Pt-Co Units) | 19 - 20 | 20 (2) |
| Specific Conductance (µS/cm@25 C) | 467 - 642 | 642 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

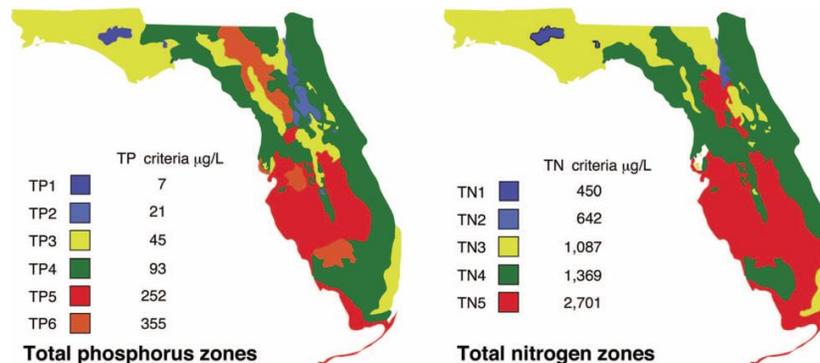| County | Sarasota |
|---|---|
| Name | Lake G-20 |
| GNIS Number | |
| Latitude | 27.3653 |
| Longitude | -82.4866 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 77 (74 **to** 82) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 787 (760 **to** 760) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for Lake M-9 in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 79 - 88 | 84 (2) |
| Total Nitrogen (µg/L) | 1403 - 1494 | 1448 (2) |
| Chlorophyll- uncorrected (µg/L) | 35 - 50 | 42 (2) |
| Secchi (ft) | 2.4 - 2.7 | 2.6 (2.0) |
| Secchi (m) | 0.7 - 0.8 | 0.8 (2.0) |
| Color (Pt-Co Units) | 34 - 40 | 37 (2) |
| Specific Conductance (µS/cm@25 C) | 430 - 456 | 456 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft**): This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

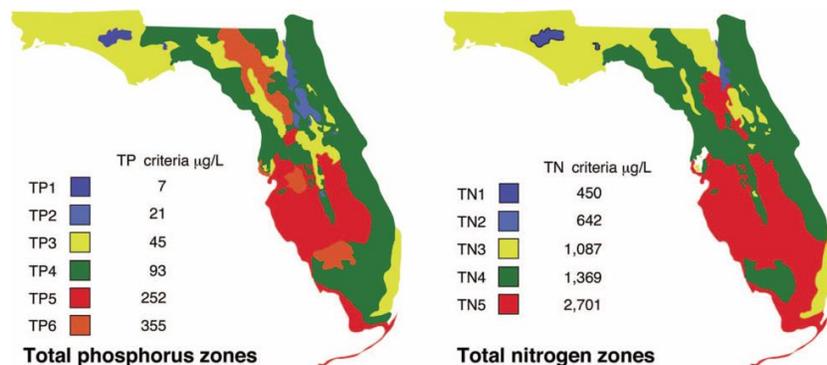| County | Sarasota |
|---|---|
| Name | Lake M-9 |
| GNIS Number | |
| Latitude | 27.3618 |
| Longitude | -82.4598 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 84 (79 **to** 88) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1448 (1403 **to** 1403) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for Middle in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 35 - 53 | 43 (2) |
| Total Nitrogen (µg/L) | 999 - 1247 | 1116 (2) |
| Chlorophyll- uncorrected (µg/L) | 16 - 30 | 22 (2) |
| Secchi (ft) | 3.0 - 3.2 | 3.1 (2.0) |
| Secchi (m) | 0.9 - 1.0 | 0.9 (2.0) |
| Color (Pt-Co Units) | 58 - 59 | 58 (2) |
| Specific Conductance (µS/cm@25 C) | - | (0) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

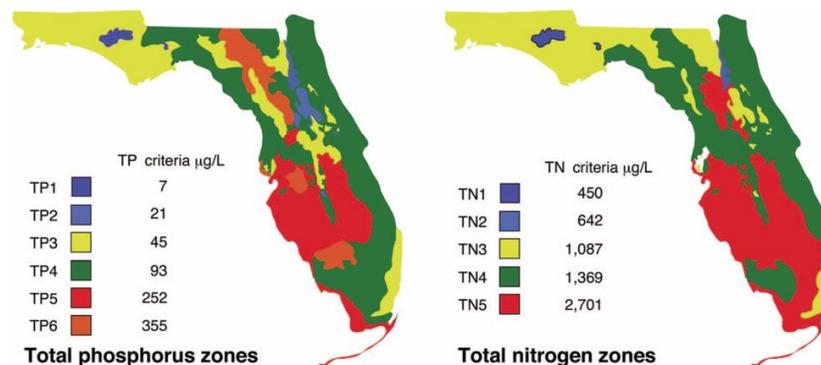| | |
|---|---|
| County | Sarasota |
| Name | Middle |
| GNIS Number | |
| Latitude | 27.1864 |
| Longitude | -82.4640 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2002 to 2003 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 43 (35 **to** 53) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1116 (999 **to** 999) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 50 - 92 | 66 (5) |
| Total Nitrogen (µg/L) | 676 - 1462 | 1010 (5) |
| Chlorophyll- uncorrected (µg/L) | 10 - 19 | 15 (4) |
| Secchi (ft) | 3.7 - 4.5 | 4.0 (4.0) |
| Secchi (m) | 1.1 - 1.4 | 1.2 (4.0) |
| Color (Pt-Co Units) | 44 - 53 | 49 (2) |
| Specific Conductance (µS/cm@25 C) | 533 - 533 | 533 (1) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90ᵗʰ percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

| County | Sarasota |
|---|---|
| Name | Rivendel |
| GNIS Number | |
| Latitude | 27.1824 |
| Longitude | -82.4775 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2002 to 2008 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 66 (50 **to** 92) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1010 (676 **to** 676) |



| TP criteria µg/L | | TN criteria µg/L | |
|---|---|---|---|
| TP1 | 7 | TN1 | 450 |
| TP2 | 21 | TN2 | 642 |
| TP3 | 45 | TN3 | 1,087 |
| TP4 | 93 | TN4 | 1,369 |
| TP5 | 252 | TN5 | 2,701 |
| TP6 | 355 | | |

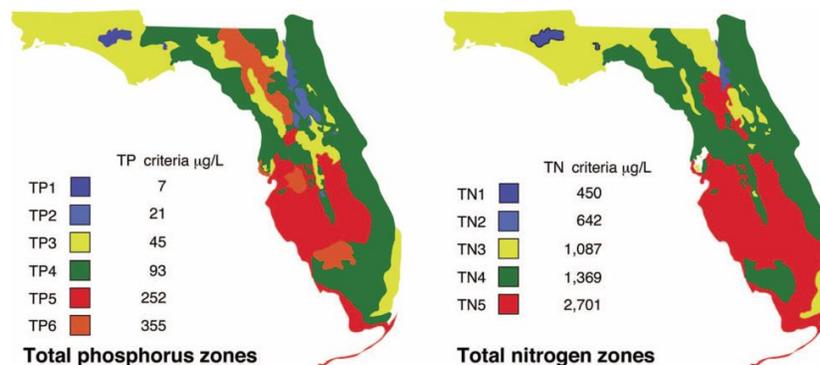**Total phosphorus zones**          **Total nitrogen zones**

**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Figure 2 and Figure 3. 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 4 and Figure 5. 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 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.**

### Rivendel (Sarasota)

$p = 0.75$, $R^2 = 0.06$

No Trend

Total Chlorophyll (µg/L )

Year

### Rivendel (Sarasota)

$p = 0.58$, $R^2 = 0.18$

No Trend

Secchi depth (ft)

Year

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
| --- | --- | --- | --- | --- | --- |
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
| --- | --- | --- |
| Total Phosphorus (µg/L) | 25 - 82 | 41 (6) |
| Total Nitrogen (µg/L) | 1006 - 1607 | 1259 (6) |
| Chlorophyll- uncorrected (µg/L) | 8 - 25 | 15 (6) |
| Secchi (ft) | 3.5 - 5.8 | 4.3 (6.0) |
| Secchi (m) | 1.1 - 1.8 | 1.3 (6.0) |
| Color (Pt-Co Units) | 28 - 67 | 44 (6) |
| Specific Conductance (µS/cm@25 C) | 621 - 742 | 742 (3) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

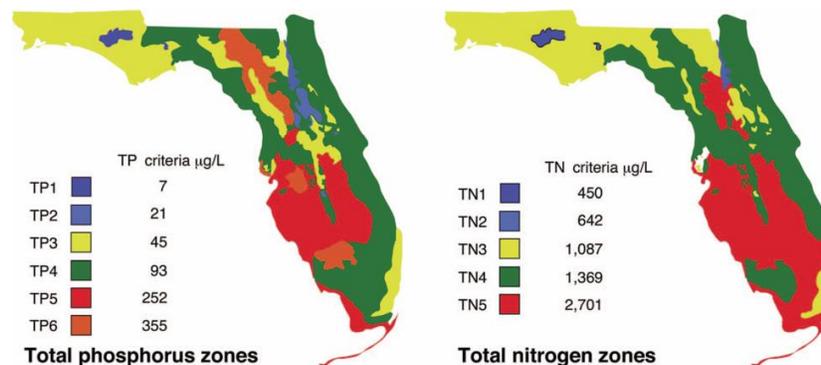| County | Sarasota |
|---|---|
| Name | Scherer |
| GNIS Number | |
| Latitude | 27.1837 |
| Longitude | -82.4671 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or acre |
| Period of Record (year) | 2002 to 2010 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 41 (25 **to** 82) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1259 (1006 **to** 1006) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Figure 2 and Figure 3. 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.**
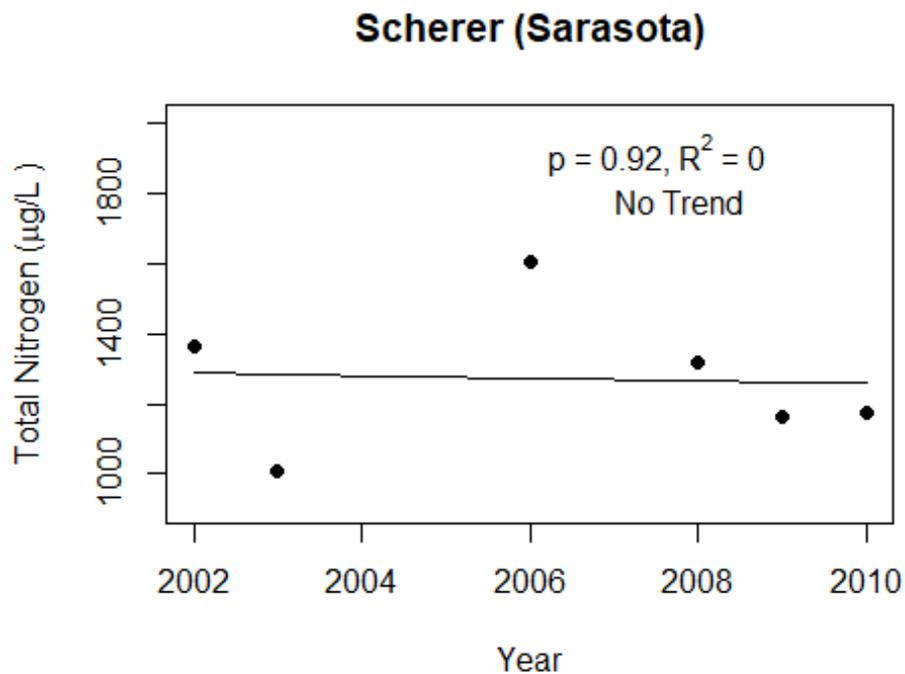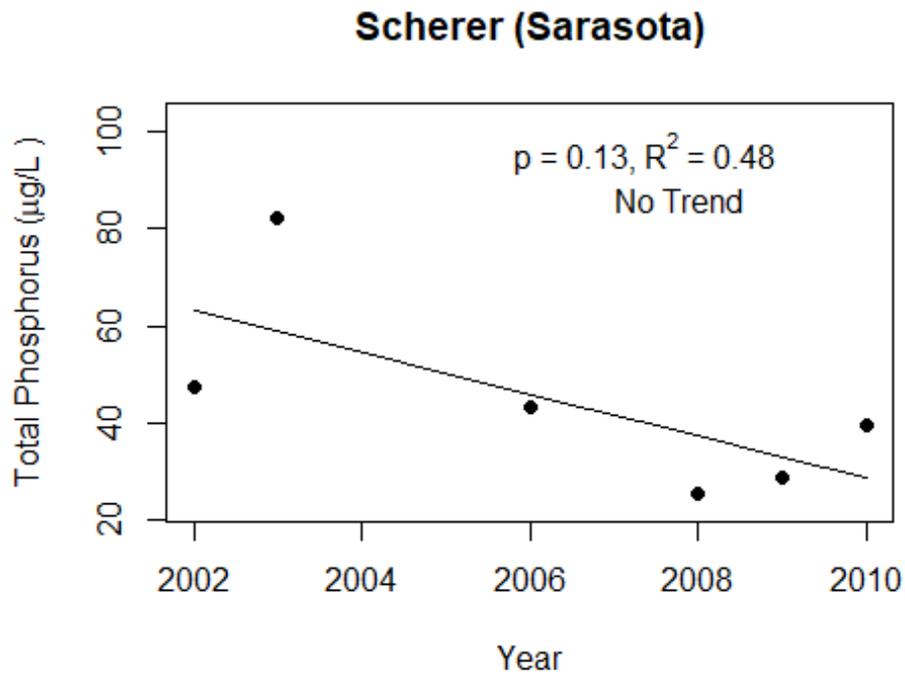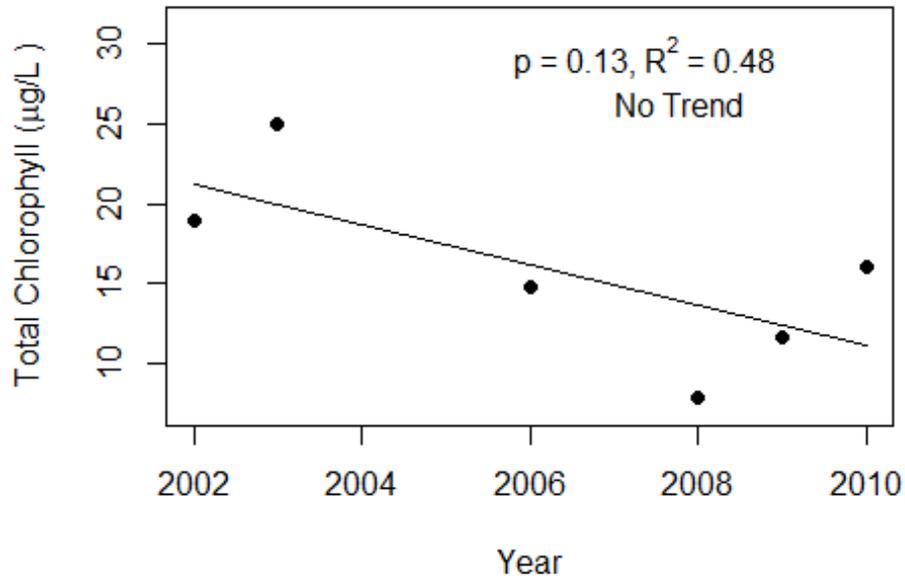
**Figure 4 and Figure 5. Trend plots of annual average chlorophyll and annual average Secchi versus year. The R$^2$ value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R2 the stronger the relations and the p value indicates if the relation is significant (p < 0.05 is significant). Trend status are reported on plots.**



Scherer (Sarasota)

p = 0.13, R$^2$ = 0.48
No Trend



Scherer (Sarasota)

p = 0.32, R$^2$ = 0.24
No Trend

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 90 - 98 | 94 (2) |
| Total Nitrogen (µg/L) | 801 - 887 | 843 (2) |
| Chlorophyll- uncorrected (µg/L) | 7 - 28 | 14 (2) |
| Secchi (ft) | 3.8 - 5.8 | 4.7 (2.0) |
| Secchi (m) | 1.2 - 1.8 | 1.4 (2.0) |
| Color (Pt-Co Units) | 29 - 30 | 29 (2) |
| Specific Conductance (µS/cm@25 C) | 735 - 779 | 779 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

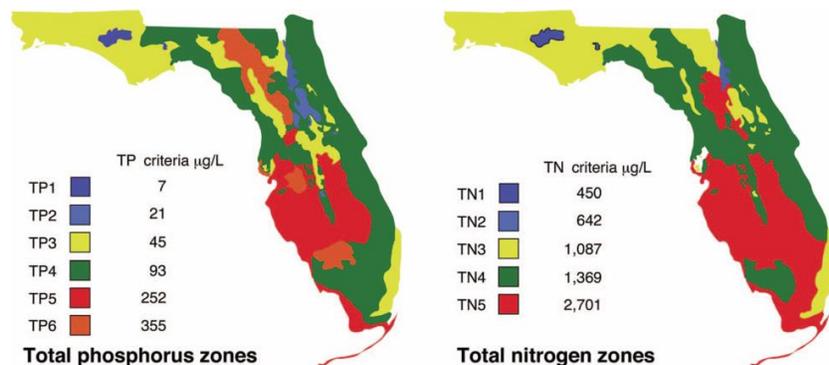| County | Sarasota |
|---|---|
| Name | Spoonbill |
| GNIS Number | |
| Latitude | 27.2533 |
| Longitude | -82.4919 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2019 to 2020 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 94 (90 **to** 98) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 843 (801 **to** 801) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

## Florida LAKEWATCH Report for Upper Myakka in Sarasota County
## Using Data Downloaded 12/9/2020

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 253 - 497 | 359 (12) |
| Total Nitrogen (µg/L) | 1126 - 1839 | 1335 (12) |
| Chlorophyll- uncorrected (µg/L) | 12 - 46 | 20 (12) |
| Secchi (ft) | 1.3 - 2.1 | 1.7 (12.0) |
| Secchi (m) | 0.4 - 0.6 | 0.5 (12.0) |
| Color (Pt-Co Units) | 79 - 290 | 132 (11) |
| Specific Conductance (µS/cm@25 C) | 204 - 473 | 473 (11) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90<sup>th</sup> percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

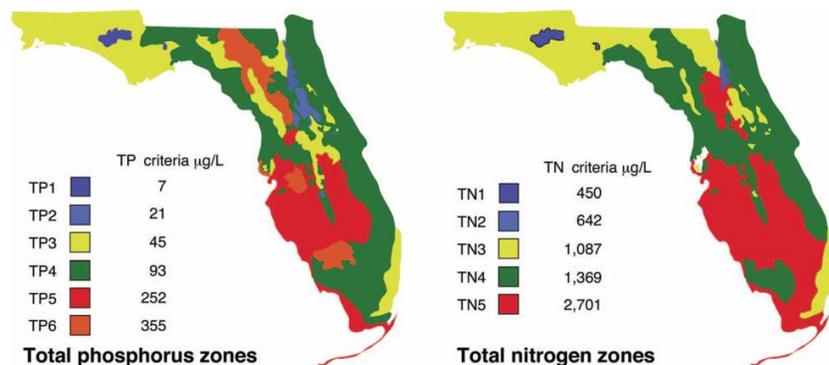| County | Sarasota |
|---|---|
| Name | Upper Myakka |
| GNIS Number | 287499 |
| Latitude | 27.2753 |
| Longitude | -82.2799 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | 395 ha or 975 acre |
| Period of Record (year) | 2001 to 2019 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 359 (253 **to** 497) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1335 (1126 **to** 1126) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1.  Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a.  The *Lake Classification* tells you which row to use in Table 1.
2.  Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a.  Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2ⁿᵈ column) in Table 1.
    b.  If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c.  If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3.  Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4.  If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.
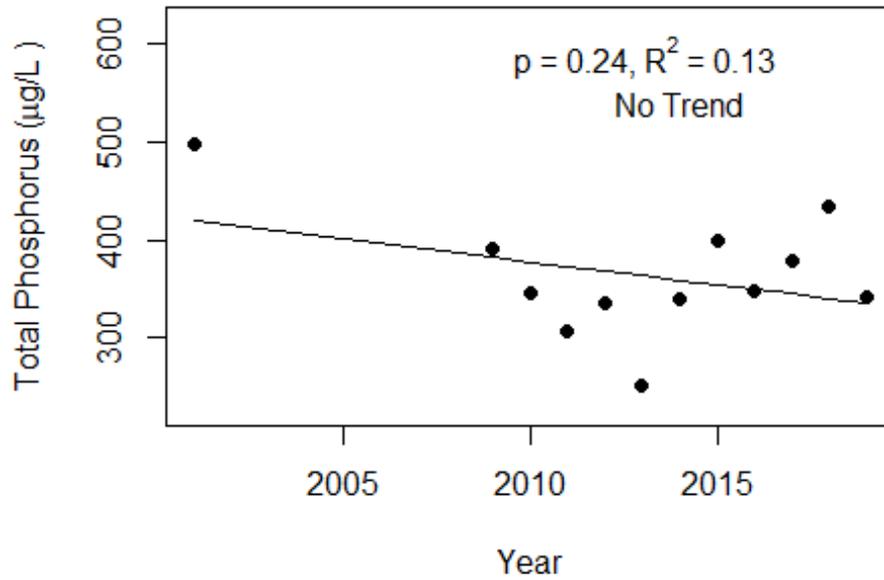

**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1.  Identify your lake's TP Zone in Table 3.
    a.  Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2.  Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3.  Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a.  If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b.  If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4.  Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Figure 2 and Figure 3. 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.**



Upper Myakka (Sarasota)

$p = 0.24, R^2 = 0.13$
No Trend



Upper Myakka (Sarasota)
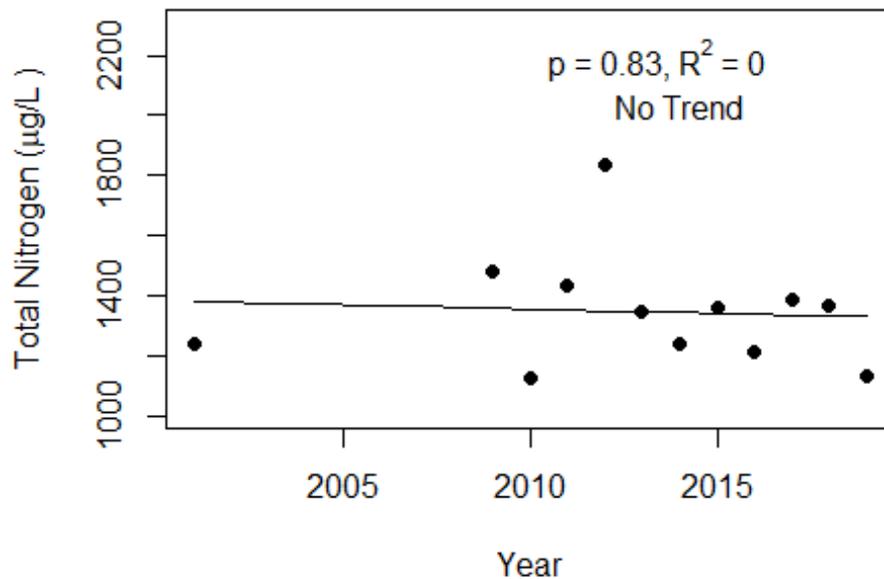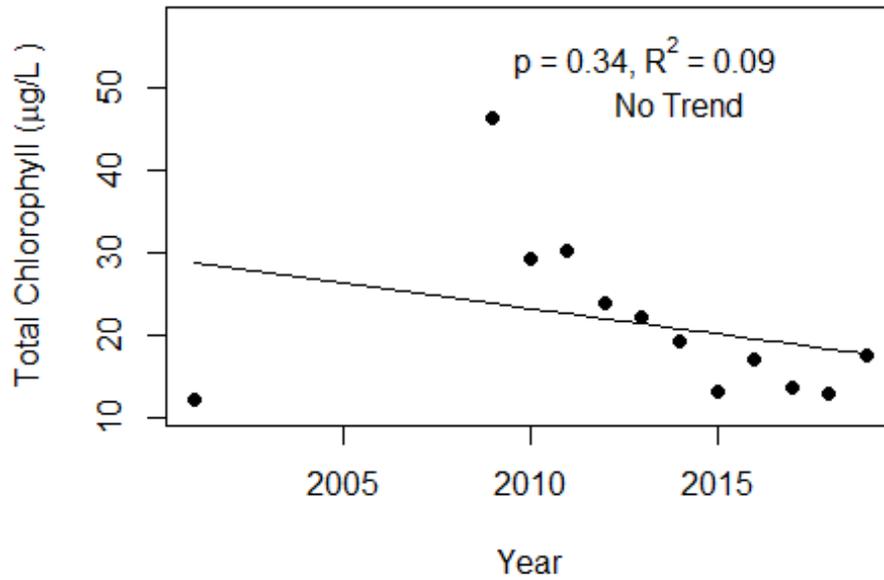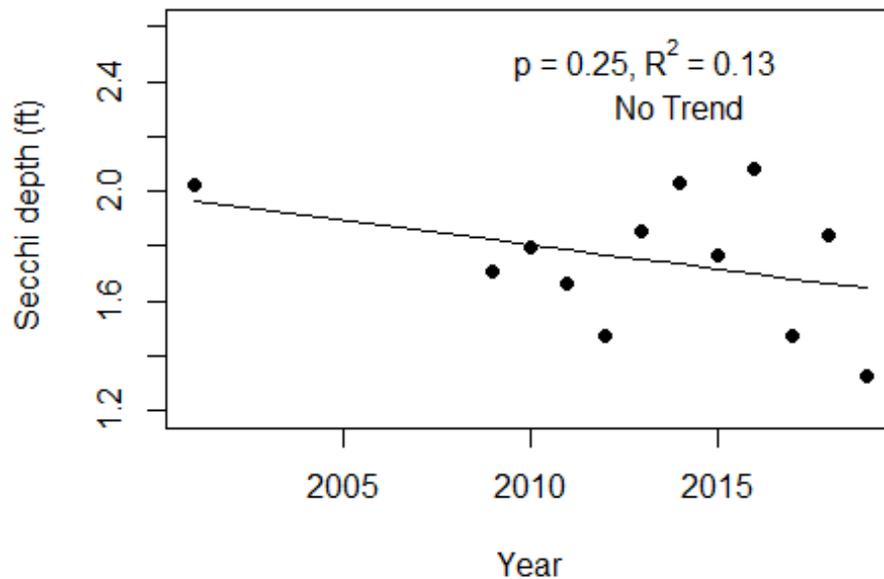
$p = 0.83, R^2 = 0$
No Trend

**Figure 4 and Figure 5. 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 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.**

## Upper Myakka (Sarasota)

$p = 0.34, R^2 = 0.09$

No Trend

## Upper Myakka (Sarasota)

$p = 0.25, R^2 = 0.13$

No Trend

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 92 - 123 | 106 (2) |
| Total Nitrogen (µg/L) | 1728 - 1851 | 1789 (2) |
| Chlorophyll- uncorrected (µg/L) | 74 - 82 | 78 (2) |
| Secchi (ft) | 1.6 - 1.6 | 1.6 (2.0) |
| Secchi (m) | 0.5 - 0.5 | 0.5 (2.0) |
| Color (Pt-Co Units) | 39 - 50 | 44 (2) |
| Specific Conductance (µS/cm@25 C) | 329 - 414 | 414 (2) |
| Lake Classification | **Colored** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90th percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

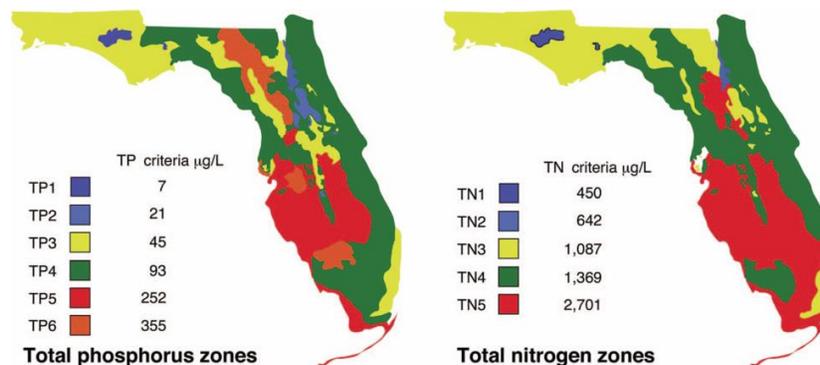| County | Sarasota |
|---|---|
| Name | West |
| GNIS Number | |
| Latitude | 27.2680 |
| Longitude | -82.4389 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2017 to 2018 |
| Lake Trophic Status (CHL) | Hypereutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 106 (92 **to** 123) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 1789 (1728 **to** 1728) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
    a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
    a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
    b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
    c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
    a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
    a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
    b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration

**Florida LAKEWATCH Report for Woodmere in Sarasota County**
**Using Data Downloaded 12/9/2020**

**Introduction for Lakes**

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. Part one allows the comparison of data with Florida Department of Environmental Protection's Numeric Nutrient Criteria. Part two allows a comparison of the long-term mean nutrient concentrations with nutrient zone concentrations published by LAKEWATCH staff (Bachmann et al. 2012; https://lakewatch.ifas.ufl.edu/resources/bibliography/). Finally, this report examines data for long-term trends that may be occurring in individual systems but only for systems with **five or more years of data.** Step by step instructions on how to use the data tables are provided on page 4 of this report.

**Florida Department of Environmental Protection (FDEP) Nutrient Criteria for Lakes (Table 1)**

For lakes, the numeric interpretations of the nutrient criterion in paragraph 62-302.530(47)(b), F.A.C., based on chlorophyll are shown in Table 1. The applicable interpretations for TN and TP will vary on an annual basis, depending on the availability and concentration of chlorophyll data for the lake. The numeric interpretations for TN, TP, and chlorophyll shall not be exceeded more than once in any consecutive three year period.

a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one three lake classification group listed in the table below, then the TN and TP numeric interpretations for that calendar year shall be the annual geometric means of the maximum calculated numeric interpretation in Table 1.

b. If there are insufficient data to calculate the annual geometric mean chlorophyll for a given year or the annual geometric mean chlorophyll exceeds the values in Table 1 for the correct lake classification group, then the applicable numeric interpretations for TN and TP shall be the minimum values in Table 1.

**Long-Term Data Summary for Lakes (Table 2): Definitions**

- **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):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.
- **Lake Classification:** Numeric nutrient criteria for Florida require that lakes must first be classified into one of three group based on color and alkalinity or specific conductance; **colored lakes** (color greater than 40 Pt-Co units), **clear soft water lakes** (color less than or equal to 40 Pt-Co units and alkalinity less than or equal to 20 mg/L as $CaCO_3$ or specific conductance less than or equal to 100 µs/cm @25 C), and **clear hard water lakes** (color less than 40 Pt-Co units and alkalinity greater than 20 mg/L as $CaCO_3$ or specific conductance greater 100 µS/cm @ 25 C).

**Table 1. Florida Department of Environmental Protection's Numeric Nutrient Criteria for lakes.**

| Long Term Geometric Mean Lake Color and Long-Term Geometric Mean Color, Alkalinity and Specific Conductance | Annual Geometric Mean Chlorophyll-corrected | Minimum calculated numeric interpretation | | Maximum calculated numeric interpretation | |
|---|---|---|---|---|---|
| | | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen | Annual Geometric Mean Total Phosphorus | Annual Geometric Mean Total Nitrogen |
| > 40 Platinum Cobalt Units **Colored Lakes** | 20 µg/L | 50 µg/L | 1270 µg/L | 160 µg/L[1] | 2230 µg/L |
| ≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO$_3$ or >100 µS/cm@25 C **Clear Hard Water Lakes** | 20 µg/L | 30 µg/L | 1050 µg/L | 90 µg/L | 1910 µg/L |
| ≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO$_3$ or < 100 µS/cm@25 C **Clear Soft Water Lakes** | 6 µg/L | 10 µg/L | 51 µg/L | 30 µg/L | 930 µg/L |

[1] For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 490 µg/L TP streams threshold for the region.

For the purpose of subparagraph 62-302.531(2)(b)1., F.A.C., color shall be assessed as true color and shall be free from turbidity. Lake color and alkalinity shall be the long-term geometric mean, based on a minimum of ten data points over at least three years with at least one data point in each year. If insufficient alkalinity data are available, long-term geometric mean specific conductance values shall be used, with a value of <100 µS/cm@25 C used to estimate the mg/L CaCO$_3$ alkalinity concentration until such time that alkalinity data are available.

**Table 2. Long-term trophic state data collected monthly by LAKEWATCH volunteers and classification variables color and specific conductance (collected quarterly). Values in bold can be used with Table 1 to evaluate compliance with nutrient criteria.**

| Parameter | Minimum and Maximum Annual Geometric Means | Grand Geometric Mean (Sampling years) |
|---|---|---|
| Total Phosphorus (µg/L) | 39 - 40 | 40 (2) |
| Total Nitrogen (µg/L) | 902 - 1062 | 979 (2) |
| Chlorophyll- uncorrected (µg/L) | 8 - 9 | 8 (2) |
| Secchi (ft) | 5.6 - 6.9 | 6.2 (2.0) |
| Secchi (m) | 1.7 - 2.1 | 1.9 (2.0) |
| Color (Pt-Co Units) | 26 - 27 | 26 (2) |
| Specific Conductance (µS/cm@25 C) | 274 - 336 | 336 (2) |
| Lake Classification | **Clear Hardwater** | |

**Base File Data for Lakes: Definitions and Nutrient Zone Maps**

The long-term data summary will include the following parameters listed with a definition after each one:
- **County:** Name of county in which the lake resides.
- **Name:** Lake name that LAKEWATCH uses for the system.
- **GNIS Number**: Number created by USGS's Geographic Names Information System.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
- **Mean Depth (m and ft):** This mean depth is calculated from multiple depth finder transects across a lake that LAKEWATCH uses for estimating plant abundances.
- **Period of Record (year):** Years a lake has been in the LAKEWATCH program.
- **TP Zone and TN Zone:** Nutrient zones defined by Bachmann et al (2012).
- **Long-Term TP and TN Geometric Mean Concentration (µg/L: min and max):** Grand Geometric Means of all annual geometric means (µg/L) with minimum and maximum annual geometric means.
- **Lake Trophic Status (CHL):** Tropic state classification using the long-term chlorophyll average.

**Table 3. Base File Data, long-term nutrient grand geometric means and Nutrient Zone classification listing the 90ᵗʰ percentile concentrations in Figure 1. Values in bold can be used for Nutrient Zone comparisons.**

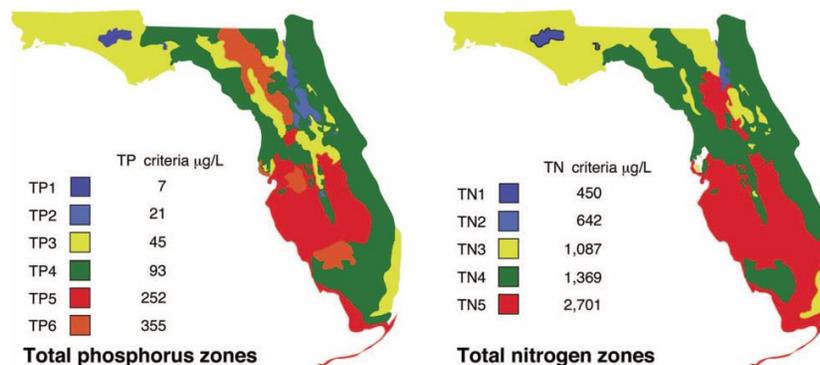| County | Sarasota |
|---|---|
| Name | Woodmere |
| GNIS Number | |
| Latitude | 27.0539 |
| Longitude | -82.3883 |
| Water Body Type | Lake |
| Surface Area (ha and acre) | ha or  acre |
| Period of Record (year) | 2007 to 2008 |
| Lake Trophic Status (CHL) | Eutrophic |
| TP Zone | **TP5** |
| Grand TP Geometric Mean Concentration (µg/L, min. and max.) | 40 (39 **to** 40) |
| TN Zone | **TN5** |
| Grand TN Geometric Mean Concentration (µg/L, min. and max.) | 979 (902 **to** 902) |



**Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.**

**Interpreting FDEP's Numeric Nutrient Criteria (NNC): These are instructions for using Table 1 and 2 to determine impairment status based on FDEP's NNC.**

1. Identify your lake's *Lake Classification* in Table 2 (Colored, Clear Hard Water, or Clear Soft Water) (if no classification is listed then there is not enough data available to classify your lake).
   a. The *Lake Classification* tells you which row to use in Table 1.
2. Identify your waterbody's *Grand Geometric Mean* Chlorophyll-uncorrected in Table 2.
   a. Compare this number to the *Annual Geometric Mean Chlorophyll-corrected* (2nd column) in Table 1.
   b. If your lake's Chlorophyll-uncorrected concentration is greater than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Minimum calculated numeric interpretation* columns.
   c. If your lake's *Chlorophyll-uncorrected* concentration is less than the *Annual Geometric Mean Chlorophyll-corrected* concentration use the *Maximum calculated numeric interpretation* columns.
3. Identify your lake's Total Phosphorus and Total Nitrogen *Grand Geometric Mean* concentration in Table 2 and compare them to the appropriate *Annual Geometric Mean Total Phosphorus* and *Annual Geometric Mean Total Nitrogen* values in Table 1.
4. If your lake's concentrations from Table 2 are greater than FDEP's NNC values from Table 1, your lake may be considered impaired. If they are below, it may be considered unimpaired.


**Nutrient Zones and "Natural Background"**

Administrative code definitions 62-302.200 (19): "Natural background" shall mean the condition of waters in the absence of man-induced alterations based on the best scientific information available to the Department. The establishment of natural background for an altered waterbody may be based upon a similar unaltered waterbody, historical pre-alteration data, paleolimnological examination of sediment cores, or examination of geology and soils. When determining natural background conditions for a lake, the lake's location and regional characteristics as described and depicted in the U.S. Environmental Protection Agency document titled Lake Regions of Florida (EPA/R-97/127, dated 1997, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Corvallis, OR) (http://www.flrules.org/Gateway/reference.asp?No=Ref-06267), which is incorporated by reference herein, shall also be considered. The lake regions in this document are grouped Nutrient Zones according to ambient total phosphorus and total nitrogen concentrations listed in Table 1 found in Bachmann, R. W., Bigham D. L., Hoyer M. V., Canfield D. E, Jr. 2012. A strategy for establishing numeric nutrient criteria for Florida lakes. Lake Reservoir Management. 28:84-92.

**Interpreting Florida LAKEWATCH's Nutrient Zones: These are instructions for using Table 3 and Figure 1 to determine nutrient status based on Nutrient Zones.**

1. Identify your lake's TP Zone in Table 3.
   a. Locate this TP Zone (left map) and its corresponding nutrient concentration in Figure 1.
2. Locate your lake's Long-Term Grand Geometric Mean TP Concentration value in Table 3.
3. Compare your lake's Long-Term Grand Geometric Mean TP Concentration from Table 3 to the appropriate TP Zone nutrient concentration from Figure 1.
   a. If your lake's Long-Term Grand Geometric Mean TP Concentration number is higher than the TP zone nutrient concentration, your lake's nutrient concentration is above "Natural Background".
   b. If your lake's Long-Term Grand Geometric Mean TP Concentration number is lower than the TP zone nutrient concentration, your lake's nutrient concentration is within "Natural Background".
4. Repeat these same steps with the TN Zone and Long-term Grand Geometric Mean TN Concentration