Florida LAKEWATCH Report for Oak in Hamilton County
Using Data Downloaded 12/9/2022

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 of three lake classification groups 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	510 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)	73 - 336	**127 (10)**
Total Nitrogen (µg/L)	766 - 2318	**1216 (10)**
Chlorophyll- uncorrected (µg/L)	13 - 64	**27 (10)**
Secchi (ft)	1.7 - 3.8	2.6 (10)
Secchi (m)	0.5 - 1.2	0.8 (10)
Color (Pt-Co Units)	73 - 359	136 (8)
Specific Conductance (µS/cm@25 C)	32 - 43	36 (6)
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	Hamilton
Name	Oak
GNIS Number	
Latitude	30.5711
Longitude	-83.2015
Water Body Type	Lake
Surface Area (ha and acre)	. ha or . acre
Period of Record (year)	2002 to 2015
Lake Trophic Status (CHL)	Eutrophic
TP Zone	**TP6**
Grand TP Geometric Mean Concentration (µg/L, min. and max.)	**127 (73 to 336)**
TN Zone	**TN4**
Grand TN Geometric Mean Concentration (µg/L, min. and max.)	**1216 (766 to 2318)**

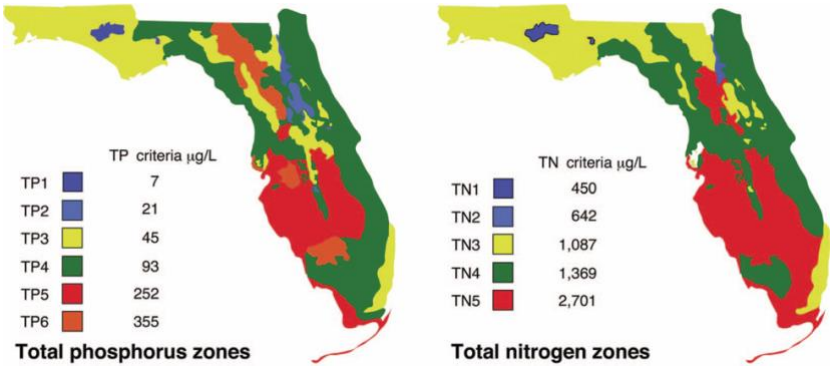


Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.

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.

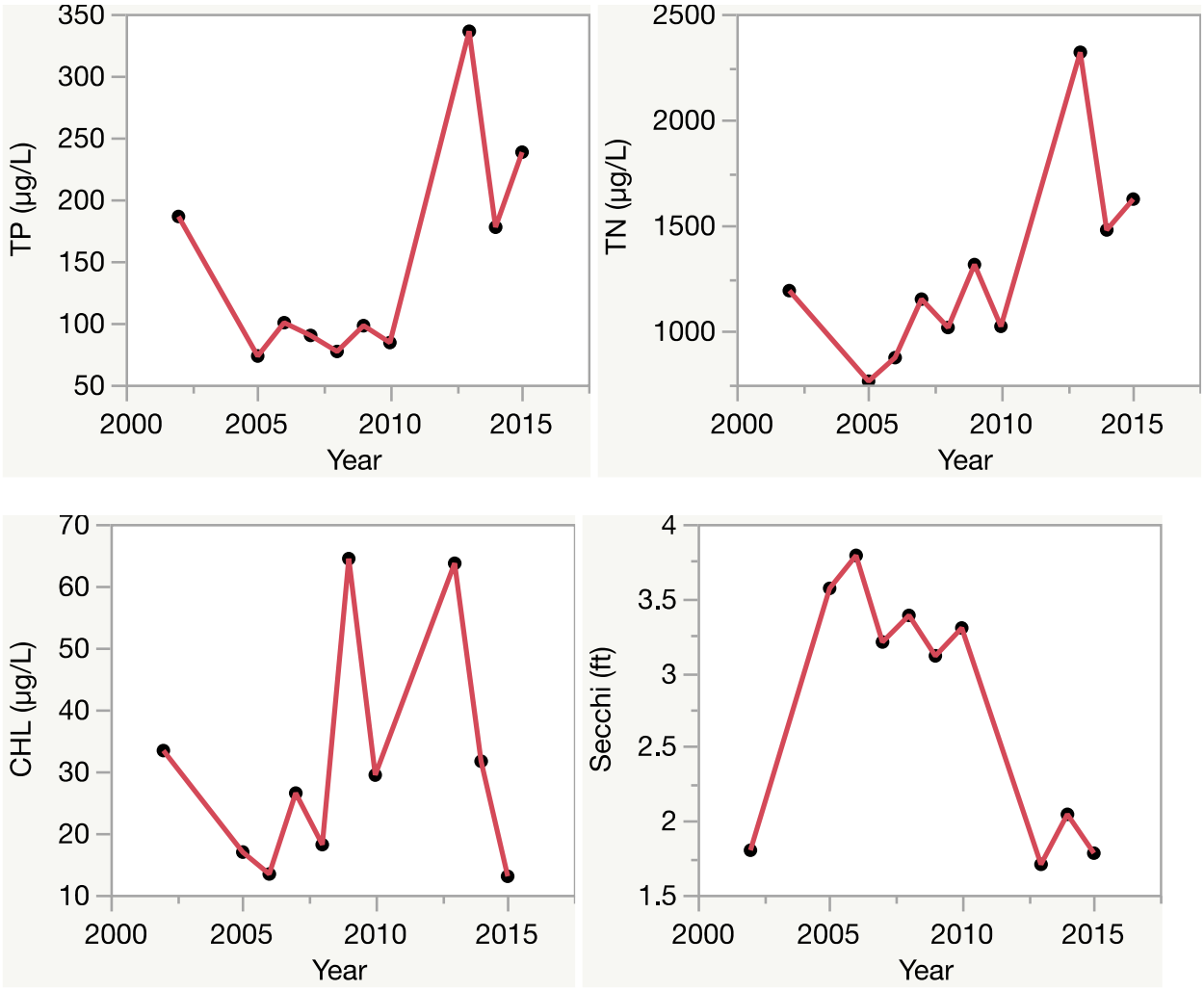
Nutrient Zones and "Natural Background"

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. Lake Oak trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant (p < 0.05 is significant). Total phosphorus (TP No Trend, R^2 = 0.28, p = 0.12), **total nitrogen** (TN Increasing, R^2 = 0.45, p = 0.03)**, chlorophyll** (CHL No Trend, R^2 = 0.04, p = 0.59) **and Secchi depth** (Secchi No Trend, R^2 = 0.21, p = 0.19)**.**



Florida LAKEWATCH Report for Oak Bay in Hamilton County
Using Data Downloaded 12/9/2022

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 of three lake classification groups 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).

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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	510 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)	105 - 105	**105 (1)**
Total Nitrogen (µg/L)	1040 - 1040	**1040 (1)**
Chlorophyll- uncorrected (µg/L)	8 - 8	**8 (1)**
Secchi (ft)	3.0 - 3.0	3.0 (1)
Secchi (m)	0.9 - 0.9	0.9 (1)
Color (Pt-Co Units)	221 - 221	221 (1)
Specific Conductance (µS/cm@25 C)	-	(0)
Lake Classification	**Colored**	

Base File Data for Lakes: Definitions and Nutrient Zone Maps

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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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- **Surface Area (ha and acre):** LAKEWATCH lists the surface area of a lake if it is available.
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- **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	Hamilton
Name	Oak Bay
GNIS Number	
Latitude	30.5689
Longitude	-83.2060
Water Body Type	Lake
Surface Area (ha and acre)	. ha or . acre
Period of Record (year)	2002 to 2002
Lake Trophic Status (CHL)	Eutrophic
TP Zone	**TP6**
Grand TP Geometric Mean Concentration (µg/L, min. and max.)	**105 (105 to 105)**
TN Zone	**TN4**
Grand TN Geometric Mean Concentration (µg/L, min. and max.)	**1040 (1040 to 1040)**

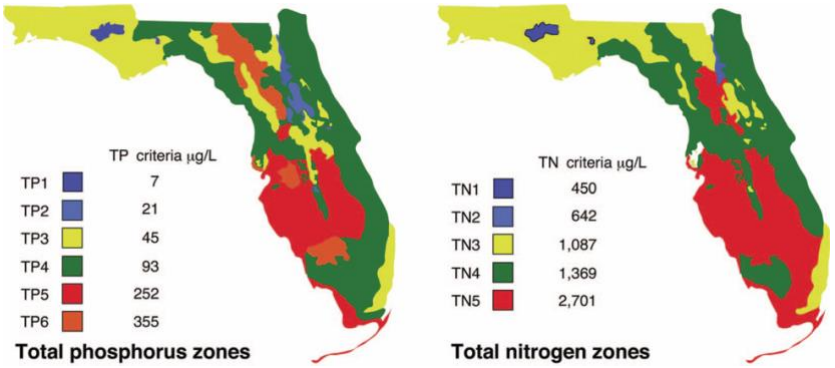

Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.

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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.
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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.
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"

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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 Perch Pond in Hamilton County
Using Data Downloaded 12/9/2022

Introduction for Lakes

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a. If annual geometric mean chlorophyll does not exceed the chlorophyll value for one of three lake classification groups 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	510 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 - 183	**132 (6)**
Total Nitrogen (µg/L)	740 - 1811	**1070 (6)**
Chlorophyll- uncorrected (µg/L)	15 - 72	**38 (6)**
Secchi (ft)	1.8 - 7.1	3.2 (6)
Secchi (m)	0.6 - 2.2	1.0 (6)
Color (Pt-Co Units)	14 - 33	23 (4)
Specific Conductance (µS/cm@25 C)	75 - 102	84 (4)
Lake Classification	**Clear Softwater**	

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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- **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	Hamilton
Name	Perch Pond
GNIS Number	
Latitude	30.5403
Longitude	-83.1039
Water Body Type	Lake
Surface Area (ha and acre)	. ha or . acre
Period of Record (year)	1996 to 2011
Lake Trophic Status (CHL)	Eutrophic
TP Zone	**TP6**
Grand TP Geometric Mean Concentration (µg/L, min. and max.)	**132 (92 to 183)**
TN Zone	**TN4**
Grand TN Geometric Mean Concentration (µg/L, min. and max.)	**1070 (740 to 1811)**

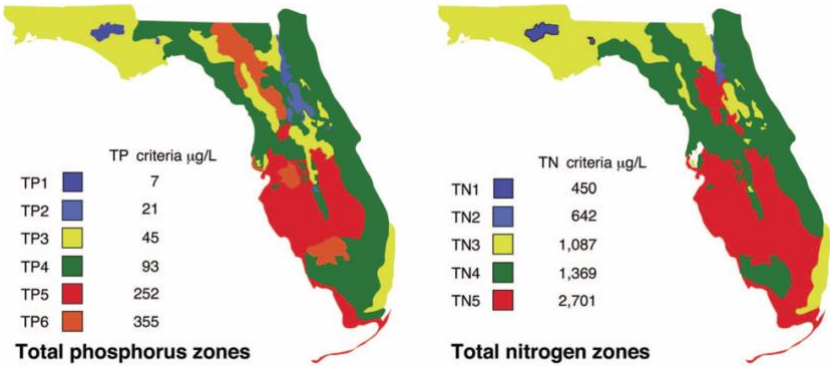


Figure 1. Maps showing Florida phosphorus and nitrogen zones and the nutrient concentrations of the upper 90% of lakes within each zone (Bachmann et al. 2012). Explanation on how to interpret the Nutrient Zones on page 4.

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.

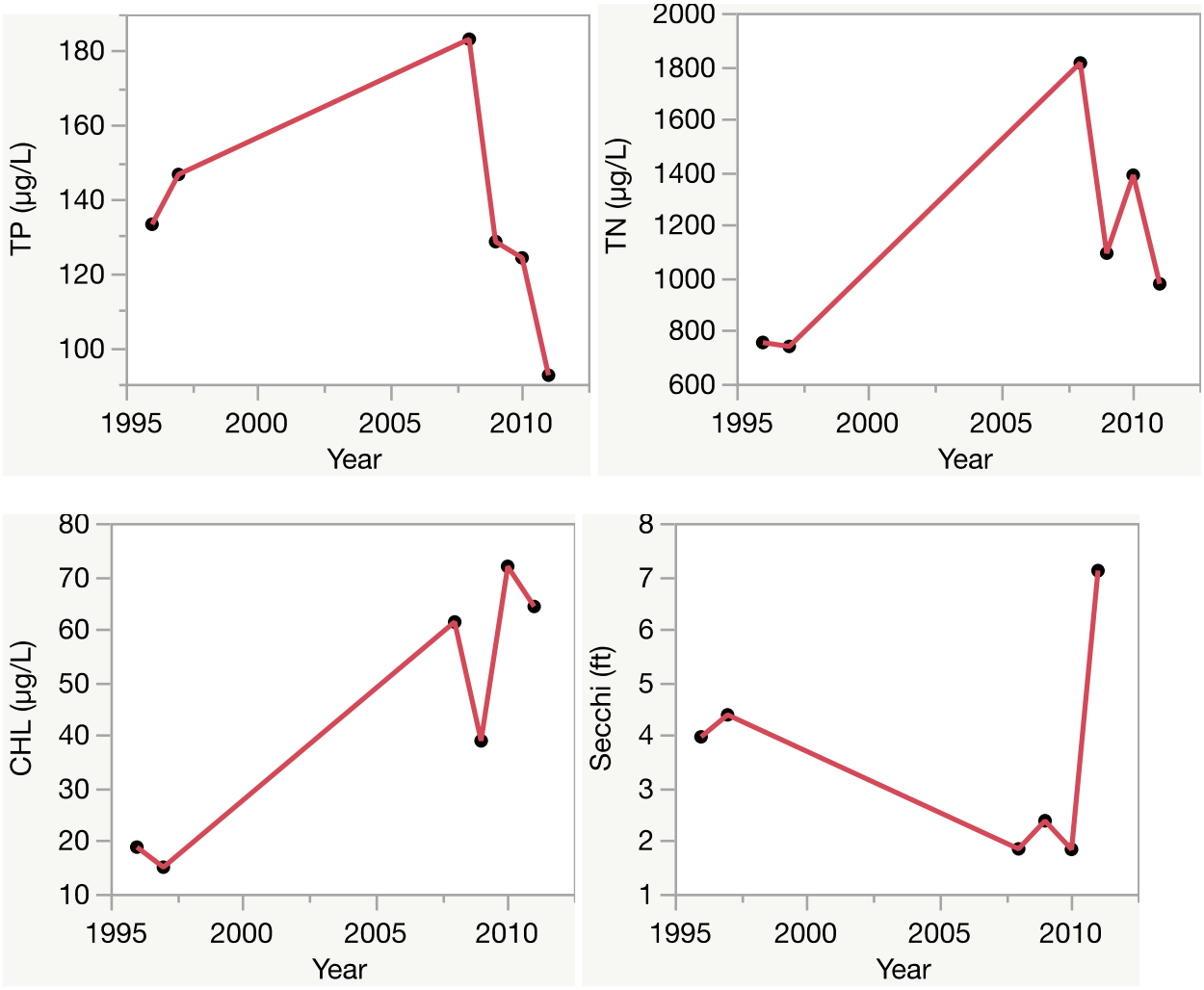
Nutrient Zones and "Natural Background"

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. Lake Perch Pond trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant (p < 0.05 is significant). Total phosphorus (TP No Trend, R^2 = 0.07, p = 0.61), **total nitrogen** (TN No Trend, R^2 = 0.39, p = 0.18)**, chlorophyll** (CHL Increasing, R^2 = 0.82, p = 0.01) **and Secchi depth** (Secchi No Trend, R^2 = 0.01, p = 0.84)**.**



Florida LAKEWATCH Report for Timber in Hamilton County
Using Data Downloaded 12/9/2022

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 of three lake classification groups 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	510 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 - 201	**109 (12)**
Total Nitrogen (µg/L)	823 - 2014	**1467 (12)**
Chlorophyll- uncorrected (µg/L)	9 - 93	**31 (12)**
Secchi (ft)	1.9 - 5.7	3.1 (12)
Secchi (m)	0.6 - 1.7	0.9 (12)
Color (Pt-Co Units)	19 - 38	31 (10)
Specific Conductance (µS/cm@25 C)	60 - 66	62 (4)
Lake Classification	**Clear Softwater**	

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	Hamilton
Name	Timber
GNIS Number	298612
Latitude	30.5431
Longitude	-83.1092
Water Body Type	Lake
Surface Area (ha and acre)	. ha or . acre
Period of Record (year)	1996 to 2011
Lake Trophic Status (CHL)	Eutrophic
TP Zone	**TP6**
Grand TP Geometric Mean Concentration (µg/L, min. and max.)	**109 (31 to 201)**
TN Zone	**TN4**
Grand TN Geometric Mean Concentration (µg/L, min. and max.)	**1467 (823 to 2014)**

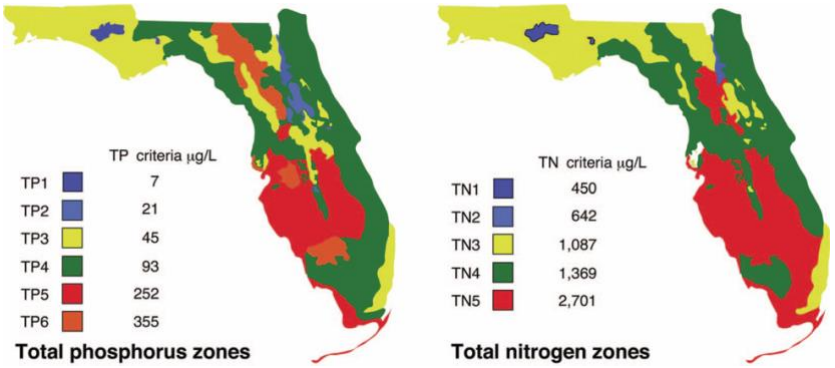


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Figure 2. Lake Timber trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant (p < 0.05 is significant). Total phosphorus (TP No Trend, R^2 = 0.18, p = 0.17), **total nitrogen** (TN No Trend, R^2 = 0.07, p = 0.42)**, chlorophyll** (CHL No Trend, R^2 = 0.03, p = 0.59) **and Secchi depth** (Secchi No Trend, R^2 = 0.17, p = 0.18)**.**