

LAKEWATCH Report for Howell Creek-1 in Orange County
Watershed Region: Peninsular
Using Data Downloaded 12/9/22

Introduction for River/Streams

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

For decades Florida has had a narrative nutrient water quality criterion in place to protect Florida’s waters against nutrient over-enrichment. In 2009, the Florida Department of Environmental Protection (FDEP) initiated rulemaking and, by 2011, adopted what would be the first set of statewide numeric nutrient standards for Florida’s waters. By 2015, almost all the remaining waters in Florida have numeric nutrient standards (see for FDEP Regulation Nutrient Criteria’s for: Streams, spring vents: <https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.531>).



Figure 1. Map showing nutrient thresholds areas for streams set forth by FDEP.

Table 1. The nutrient thresholds for streams are listed in table below along with the map showing zones.

Nutrient Watershed Region	Total Phosphorus Nutrient Threshold ¹	Total Nitrogen Nutrient Threshold ¹
Panhandle West	60 µg/L	670 µg/L
Panhandle East	180 µg/L	1030 µg/L
North Central	300 µg/L	1870 µg/L
Peninsular	120 µg/L	1540 µg/L
West Central	490 µg/L	1650 µg/L
South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.

¹These values are annual geometric mean concentrations not to be exceeded more than once in any three calendar year period.

Base File Data for River/Streams: Definitions

- **County:** Name of county in which the system resides.
- **Name:** Stream name that LAKEWATCH uses for the system.
- **GNIS Number:** Number created by USGS's Geographic Names Information System.
- **Water Body Type:** Four different types of systems; lakes, estuaries, river/streams and springs.
- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
- **Latitude and Longitude:** Coordinates identifying the exact location of station 1 for each system.

Table 2. Base File Data.

County	Orange
Name	Howell Creek-1
GNIS Number	
Water Body Type	River/Stream
Period of Record (years, range)	1 (2015 to 2015)
Latitude	28.5858
Longitude	-81.3567

Long-Term Data for River/Streams: Definitions

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

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

Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	22 - 22	22 (1)
Total Nitrogen ($\mu\text{g/L}$)	735 - 735	735 (1)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	9 - 9	9 (1)
Secchi (ft)	2.3 - 2.3	2.3 (1)
Secchi (m)	0.7 -0.7	0.7 (1)
Color (Pt-Co Units)	11 - 11	11 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	183 - 183	183 (1)

LAKEWATCH Report for Howell Creek-2 in Orange County
Watershed Region: Peninsular
Using Data Downloaded 12/9/22

Introduction for River/Streams

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

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Peninsular	120 µg/L	1540 µg/L
West Central	490 µg/L	1650 µg/L
South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.

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Base File Data for River/Streams: Definitions

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

Table 2. Base File Data.

County	Orange
Name	Howell Creek-2
GNIS Number	
Water Body Type	River/Stream
Period of Record (years, range)	1 (2015 to 2015)
Latitude	28.5850
Longitude	-81.3572

Long-Term Data for River/Streams: Definitions

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

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

Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	21 - 21	21 (1)
Total Nitrogen ($\mu\text{g/L}$)	739 - 739	739 (1)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	9 - 9	9 (1)
Secchi (ft)	1.1 - 1.1	1.1 (1)
Secchi (m)	0.3 -0.3	0.3 (1)
Color (Pt-Co Units)	12 - 12	12 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	183 - 183	183 (1)

LAKEWATCH Report for Howell Creek-3 in Orange County
Watershed Region: Peninsular
Using Data Downloaded 12/9/22

Introduction for River/Streams

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

For decades Florida has had a narrative nutrient water quality criterion in place to protect Florida’s waters against nutrient over-enrichment. In 2009, the Florida Department of Environmental Protection (FDEP) initiated rulemaking and, by 2011, adopted what would be the first set of statewide numeric nutrient standards for Florida’s waters. By 2015, almost all the remaining waters in Florida have numeric nutrient standards (see for FDEP Regulation Nutrient Criteria’s for: Streams, spring vents: <https://www.flrules.org/gateway/RuleNo.asp?title=SURFACE%20WATER%20QUALITY%20STANDARDS&ID=62-302.531>).



Figure 1. Map showing nutrient thresholds areas for streams set forth by FDEP.

Table 1. The nutrient thresholds for streams are listed in table below along with the map showing zones.

Nutrient Watershed Region	Total Phosphorus Nutrient Threshold ¹	Total Nitrogen Nutrient Threshold ¹
Panhandle West	60 µg/L	670 µg/L
Panhandle East	180 µg/L	1030 µg/L
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Peninsular	120 µg/L	1540 µg/L
West Central	490 µg/L	1650 µg/L
South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.

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- **County:** Name of county in which the system resides.
- **Name:** Stream name that LAKEWATCH uses for the system.
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- **Period of Record (years):** Number of years a system has been in the LAKEWATCH program.
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Table 2. Base File Data.

County	Orange
Name	Howell Creek-3
GNIS Number	
Water Body Type	River/Stream
Period of Record (years, range)	1 (2015 to 2015)
Latitude	28.5831
Longitude	-81.3572

Long-Term Data for River/Streams: Definitions

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

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

Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	22 - 22	22 (1)
Total Nitrogen ($\mu\text{g/L}$)	877 - 877	877 (1)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	9 - 9	9 (1)
Secchi (ft)	0.7 - 0.7	0.7 (1)
Secchi (m)	0.2 -0.2	0.2 (1)
Color (Pt-Co Units)	13 - 13	13 (1)
Specific Conductance ($\mu\text{S/cm@25 C}$)	177 - 177	177 (1)

LAKEWATCH Report for Little Econ-1 in Orange County

Watershed Region: Peninsular

Using Data Downloaded 12/9/22

Introduction for River/Streams

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

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Table 2. Base File Data.

County	Orange
Name	Little Econ-1
GNIS Number	285677
Water Body Type	River/Stream
Period of Record (years, range)	5 (2015 to 2022)
Latitude	28.5819
Longitude	-81.2325

Long-Term Data for River/Streams: Definitions

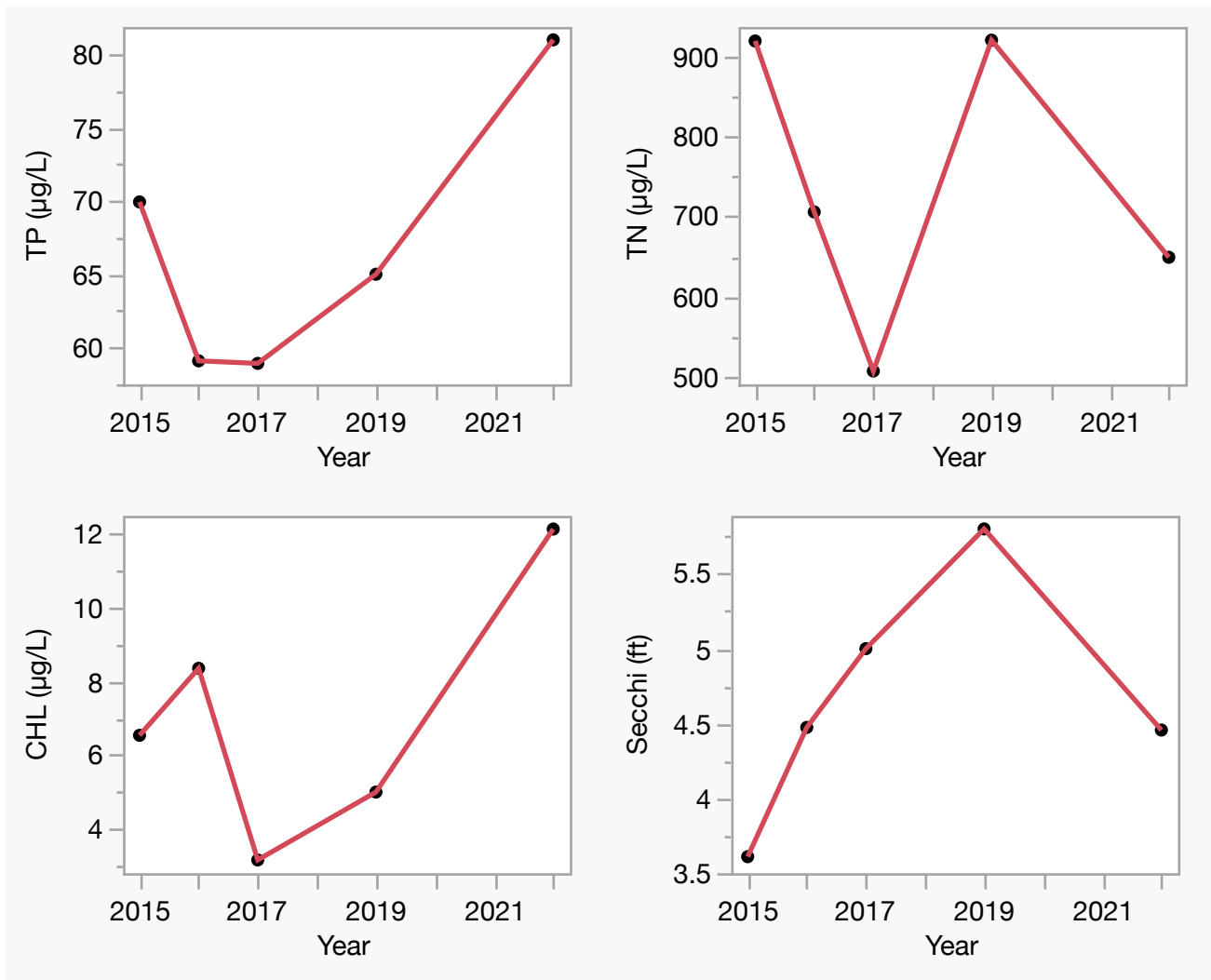
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- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
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Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	59 - 81	66 (5)
Total Nitrogen ($\mu\text{g/L}$)	508 - 920	722 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	3 - 12	6 (5)
Secchi (ft)	3.6 - 5.8	4.6 (5)
Secchi (m)	1.1 - 1.8	1.4 (5)
Color (Pt-Co Units)	33 - 95	58 (4)
Specific Conductance ($\mu\text{S/cm@25 C}$)	128 - 209	162 (4)

Figure 2. Little Econ-1 trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Total phosphorus (TP No Trend, $R^2 = 0.46$, $p = 0.21$), total nitrogen (TN No Trend, $R^2 = 0.04$, $p = 0.73$), chlorophyll (CHL No Trend, $R^2 = 0.31$, $p = 0.33$) and Secchi depth (Secchi No Trend, $R^2 = 0.15$, $p = 0.51$).



LAKEWATCH Report for Little Econ-2 in Orange County
Watershed Region: Peninsular
Using Data Downloaded 12/9/22

Introduction for River/Streams

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South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.

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Base File Data for River/Streams: Definitions

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

Table 2. Base File Data.

County	Orange
Name	Little Econ-2
GNIS Number	285677
Water Body Type	River/Stream
Period of Record (years, range)	5 (2015 to 2022)
Latitude	28.5816
Longitude	-81.2336

Long-Term Data for River/Streams: Definitions

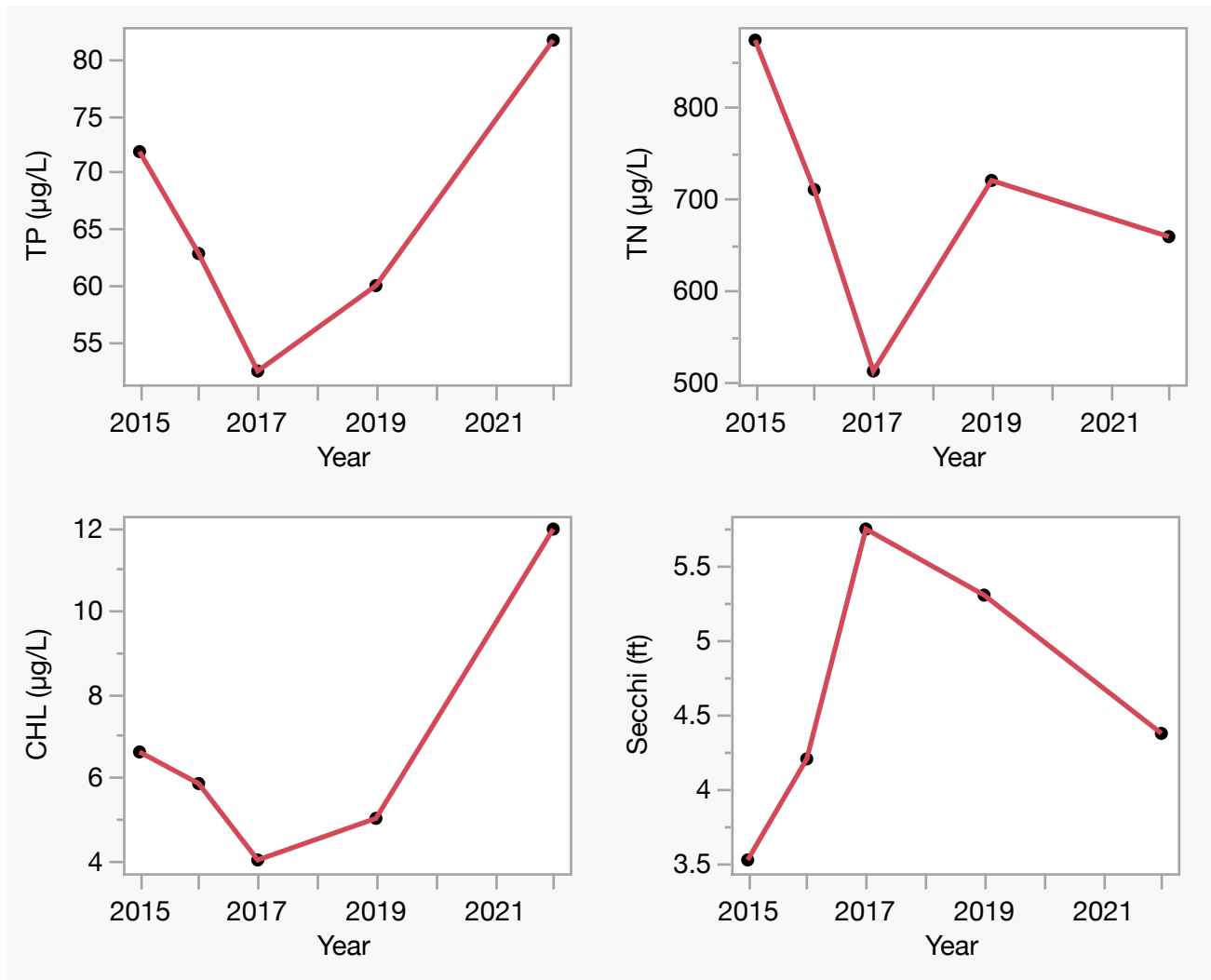
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- **Chlorophyll-uncorrected ($\mu\text{g/L}$):** Chlorophyll concentrations are used to measure relative abundances of open water algal population.
- **Secchi (ft), Secchi (m):** Secchi measurements are estimates of water clarity.
- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.

Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	52 - 82	65 (5)
Total Nitrogen ($\mu\text{g/L}$)	512 - 873	685 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	4 - 12	6 (5)
Secchi (ft)	3.5 - 5.7	4.6 (5)
Secchi (m)	1.1 -1.8	1.4 (5)
Color (Pt-Co Units)	42 - 112	67 (4)
Specific Conductance ($\mu\text{S/cm@25 C}$)	135 - 193	168 (4)

Figure 2. Little Econ-2 trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Total phosphorus (TP No Trend, $R^2 = 0.22$, $p = 0.42$), total nitrogen (TN No Trend, $R^2 = 0.12$, $p = 0.57$), chlorophyll (CHL No Trend, $R^2 = 0.49$, $p = 0.19$) and Secchi depth (Secchi No Trend, $R^2 = 0.07$, $p = 0.66$).



LAKEWATCH Report for Little Econ-3 in Orange County

Watershed Region: Peninsular

Using Data Downloaded 12/9/22

Introduction for River/Streams

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Base File Data for River/Streams: Definitions

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Table 2. Base File Data.

County	Orange
Name	Little Econ-3
GNIS Number	285677
Water Body Type	River/Stream
Period of Record (years, range)	5 (2015 to 2022)
Latitude	28.5813
Longitude	-81.2349

Long-Term Data for River/Streams: Definitions

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

- **Total Phosphorus ($\mu\text{g/L}$):** The nutrient most often limiting growth of plant/algae.
- **Total Nitrogen ($\mu\text{g/L}$):** Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
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- **Color (Pt-Co Units):** LAKEWATCH measures true color, which is the color of the water after particles have been filter out.
- **Specific Conductance ($\mu\text{S/cm@25}^\circ\text{C}$):** Measurement of the ability of water to conduct electricity and can be used to estimate the amount of dissolved materials in water.

Table 3. Long-term trophic state data collected monthly by LAKEWATCH volunteers and color and specific conductance (collected quarterly).

Parameter	Minimum and Maximum Annual Geometric Means	Grand Geometric Mean (Sampling years)
Total Phosphorus ($\mu\text{g/L}$)	57 - 85	67 (5)
Total Nitrogen ($\mu\text{g/L}$)	493 - 862	689 (5)
Chlorophyll- uncorrected ($\mu\text{g/L}$)	4 - 15	6 (5)
Secchi (ft)	3.4 - 6.5	4.6 (5)
Secchi (m)	1.1 -2.0	1.4 (5)
Color (Pt-Co Units)	41 - 90	63 (4)
Specific Conductance ($\mu\text{S/cm@25 C}$)	144 - 194	172 (4)

Figure 2. Little Econ-3 trend plots of year by average. The R^2 value indicates the strength of the relations (ranges from 0.0 to 1.0; higher the R^2 the stronger the relation) and the p value indicates if the relation is significant ($p < 0.05$ is significant). Total phosphorus (TP No Trend, $R^2 = 0.44$, $p = 0.22$), total nitrogen (TN No Trend, $R^2 = 0.02$, $p = 0.84$), chlorophyll (CHL No Trend, $R^2 = 0.60$, $p = 0.13$) and Secchi depth (Secchi No Trend, $R^2 = 0.05$, $p = 0.72$).

