Introduction for River/Stream

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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.

<table>
<thead>
<tr>
<th>Nutrient Watershed Region</th>
<th>Total Phosphorus Nutrient Threshold¹</th>
<th>Total Nitrogen Nutrient Threshold¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panhandle West</td>
<td>60 µg/L</td>
<td>670 µg/L</td>
</tr>
<tr>
<td>Panhandle East</td>
<td>180 µg/L</td>
<td>1030 µg/L</td>
</tr>
<tr>
<td>North Central</td>
<td>300 µg/L</td>
<td>1870 µg/L</td>
</tr>
<tr>
<td>Peninsular</td>
<td>120 µg/L</td>
<td>1540 µg/L</td>
</tr>
<tr>
<td>West Central</td>
<td>490 µg/L</td>
<td>1650 µg/L</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>County</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Howell Creek-1</td>
</tr>
<tr>
<td>Water Body Type</td>
<td>River/Stream</td>
</tr>
<tr>
<td>Period of Record (years, range)</td>
<td>1 (2015 to 2015)</td>
</tr>
<tr>
<td>Latitude</td>
<td>28.5858</td>
</tr>
<tr>
<td>Longitude</td>
<td>-81.3567</td>
</tr>
</tbody>
</table>

**Long-Term Data for River/Streams: Definitions**

- **Total Phosphorus (µg/L)**: The nutrient most often limiting growth of plant/algae.
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- **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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum and Maximum Annual Geometric Means</th>
<th>Grand Geometric Mean (Sampling years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus (µg/L)</td>
<td>22 - 22</td>
<td>22 (1)</td>
</tr>
<tr>
<td>Total Nitrogen (µg/L)</td>
<td>735 - 735</td>
<td>735 (1)</td>
</tr>
<tr>
<td>Chlorophyll- uncorrected (µg/L)</td>
<td>9 - 9</td>
<td>9 (1)</td>
</tr>
<tr>
<td>Secchi (ft)</td>
<td>2.3 - 2.3</td>
<td>2.3 (1)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>0.7 - 0.7</td>
<td>0.7 (1)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
<td>11 - 11</td>
<td>11 (1)</td>
</tr>
<tr>
<td>Specific Conductance (µS/cm@25°C)</td>
<td>183 - 183</td>
<td>183 (1)</td>
</tr>
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**Blues Creek-1 (Alachua)**

- **Total Chlorophyll (μg/L)**
- $p = 0.17, R^2 = 0.29$

**Blues Creek-1 (Alachua)**

- **Secchi depth (ft)**
- $p = \text{NA}, R^2 = \text{NA}$
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<th>Total Phosphorus Nutrient Threshold$^1$</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Panhandle West</td>
<td>60 µg/L</td>
<td>670 µg/L</td>
</tr>
<tr>
<td>Panhandle East</td>
<td>180 µg/L</td>
<td>1030 µg/L</td>
</tr>
<tr>
<td>North Central</td>
<td>300 µg/L</td>
<td>1870 µg/L</td>
</tr>
<tr>
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<td>120 µg/L</td>
<td>1540 µg/L</td>
</tr>
<tr>
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</table>

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<tr>
<th>County</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Howell Creek-2</td>
</tr>
<tr>
<td>Water Body Type</td>
<td>River/Stream</td>
</tr>
<tr>
<td>Period of Record (years, range)</td>
<td>1 (2015 to 2015)</td>
</tr>
<tr>
<td>Latitude</td>
<td>28.5850</td>
</tr>
<tr>
<td>Longitude</td>
<td>-81.3572</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td>Total Phosphorus (µg/L)</td>
<td>21 - 21</td>
<td>21 (1)</td>
</tr>
<tr>
<td>Total Nitrogen (µg/L)</td>
<td>739 - 739</td>
<td>739 (1)</td>
</tr>
<tr>
<td>Chlorophyll-uncorrected (µg/L)</td>
<td>9 - 9</td>
<td>9 (1)</td>
</tr>
<tr>
<td>Secchi (ft)</td>
<td>1.1 - 1.1</td>
<td>1.1 (1)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>0.3 - 0.3</td>
<td>0.3 (1)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
<td>12 - 12</td>
<td>12 (1)</td>
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<tr>
<th>County</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Howell Creek-3</td>
</tr>
<tr>
<td>Water Body Type</td>
<td>River/Stream</td>
</tr>
<tr>
<td>Period of Record (years, range)</td>
<td>1 (2015 to 2015)</td>
</tr>
<tr>
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<td>28.5831</td>
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<tbody>
<tr>
<td>Total Phosphorus (µg/L)</td>
<td>22 - 22</td>
<td>22 (1)</td>
</tr>
<tr>
<td>Total Nitrogen (µg/L)</td>
<td>877 - 877</td>
<td>877 (1)</td>
</tr>
<tr>
<td>Chlorophyll- uncorrected (µg/L)</td>
<td>9 - 9</td>
<td>9 (1)</td>
</tr>
<tr>
<td>Secchi (ft)</td>
<td>0.7 - 0.7</td>
<td>0.7 (1)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>0.2 - 0.2</td>
<td>0.2 (1)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
<td>13 - 13</td>
<td>13 (1)</td>
</tr>
<tr>
<td>Specific Conductance (µS/cm@25 C)</td>
<td>177 - 177</td>
<td>177 (1)</td>
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Blues Creek-1 (Alachua)

- $p = 0.04$, $R^2 = 0.55$

Blues Creek-1 (Alachua)

- $p = 0$, $R^2 = 0.81$
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<th>Total Nitrogen Nutrient Threshold¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panhandle West</td>
<td>60 µg/L</td>
<td>670 µg/L</td>
</tr>
<tr>
<td>Panhandle East</td>
<td>180 µg/L</td>
<td>1030 µg/L</td>
</tr>
<tr>
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</tr>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>County</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Little Econ-1</td>
</tr>
<tr>
<td>Water Body Type</td>
<td>River/Stream</td>
</tr>
<tr>
<td>Period of Record (years, range)</td>
<td>3 (2015 to 2017)</td>
</tr>
<tr>
<td>Latitude</td>
<td>28.5819</td>
</tr>
<tr>
<td>Longitude</td>
<td>-81.2325</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
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<td>59 - 70</td>
<td>64 (3)</td>
</tr>
<tr>
<td>Total Nitrogen (µg/L)</td>
<td>560 - 919</td>
<td>714 (3)</td>
</tr>
<tr>
<td>Chlorophyll-uncorrected (µg/L)</td>
<td>2 - 8</td>
<td>5 (3)</td>
</tr>
<tr>
<td>Secchi (ft)</td>
<td>3.6 - 5.0</td>
<td>4.3 (3)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>1.1 - 1.5</td>
<td>1.3 (3)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
<td>43 - 84</td>
<td>54 (3)</td>
</tr>
<tr>
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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.

<table>
<thead>
<tr>
<th>County</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Little Econ-2</td>
</tr>
<tr>
<td>Water Body Type</td>
<td>River/Stream</td>
</tr>
<tr>
<td>Period of Record (years, range)</td>
<td>3 (2015 to 2017)</td>
</tr>
<tr>
<td>Latitude</td>
<td>28.5816</td>
</tr>
<tr>
<td>Longitude</td>
<td>-81.2336</td>
</tr>
</tbody>
</table>

Long-Term Data for River/Streams: Definitions

- **Total Phosphorus (µg/L)**: The nutrient most often limiting growth of plant/algae.
- **Total Nitrogen (µg/L)**: Another nutrient needed for aquatic plant/algae growth but only limiting when nitrogen to phosphorus ratios are generally less than 10.
- **Chlorophyll-uncorrected (µg/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).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum and Maximum Annual Geometric Means</th>
<th>Grand Geometric Mean (Sampling years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus (µg/L)</td>
<td>51 - 72</td>
<td>61 (3)</td>
</tr>
<tr>
<td>Total Nitrogen (µg/L)</td>
<td>570 - 873</td>
<td>707 (3)</td>
</tr>
<tr>
<td>Chlorophyll-uncorrected (µg/L)</td>
<td>2 - 7</td>
<td>4 (3)</td>
</tr>
<tr>
<td>Secchi (ft)</td>
<td>3.5 - 6.0</td>
<td>4.5 (3)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>1.1 - 1.8</td>
<td>1.4 (3)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
<td>42 - 82</td>
<td>56 (3)</td>
</tr>
<tr>
<td>Specific Conductance (µS/cm@25°C)</td>
<td>169 - 193</td>
<td>181 (3)</td>
</tr>
</tbody>
</table>
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 the 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 $R^2$ the stronger the relations and the $p$ value indicates if the relation is significant ($p < 0.05$ is significant). Trend status are reported on plots.
Introduction for River/Stream

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.

<table>
<thead>
<tr>
<th>Nutrient Watershed Region</th>
<th>Total Phosphorus Nutrient Threshold(^1)</th>
<th>Total Nitrogen Nutrient Threshold(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panhandle West</td>
<td>60 μg/L</td>
<td>670 μg/L</td>
</tr>
<tr>
<td>Panhandle East</td>
<td>180 μg/L</td>
<td>1030 μg/L</td>
</tr>
<tr>
<td>North Central</td>
<td>300 μg/L</td>
<td>1870 μg/L</td>
</tr>
<tr>
<td>Peninsular</td>
<td>120 μg/L</td>
<td>1540 μg/L</td>
</tr>
<tr>
<td>West Central</td>
<td>490 μg/L</td>
<td>1650 μg/L</td>
</tr>
</tbody>
</table>

\(^1\)These values are annual geometric mean concentrations not to be exceeded more than once in any three calendar year periods.
Base File Data for River/Streams: Definitions

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- **Name**: Stream name that LAKEWATCH uses for the system.
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<td>64 (3)</td>
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<td>Total Nitrogen (µg/L)</td>
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<td>2 - 6</td>
<td>4 (3)</td>
</tr>
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<td>3.4 - 7.0</td>
<td>4.6 (3)</td>
</tr>
<tr>
<td>Secchi (m)</td>
<td>1.1 - 2.1</td>
<td>1.4 (3)</td>
</tr>
<tr>
<td>Color (Pt-Co Units)</td>
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**Blues Creek-1 (Alachua)**

$p = 0.17$, $R^2 = 0.29$

**Blues Creek-1 (Alachua)**

$p = \text{NA}$, $R^2 = \text{NA}$