

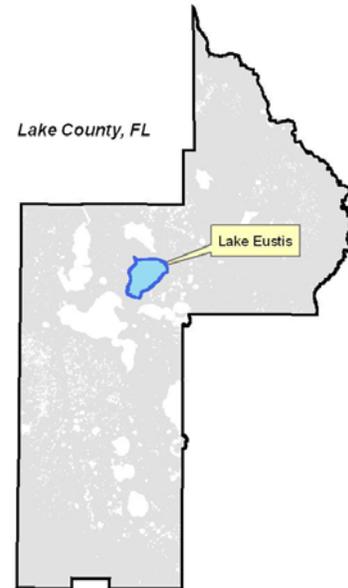


Lake Eustis EcoSummary February 2012

Lake Condition Index (LCI): A biological assessment tool developed by the Florida Department of Environmental Protection to indicate ecosystem health and identify impairment in Florida lakes

Watershed Characteristics

Located in central Lake County, the 7,806-acre Lake Eustis is surrounded largely by a mix of residential, commercial and agricultural lands. Discharges from Lake Dora represented 33.6% of estimated Total Phosphorus (TP) loading and 50.0% of estimated Total Nitrogen (TN) loading. Discharges from Lake Harris-Little Lake Harris represented 9.3% of estimated TP loading and 26.1% of estimated TN loading to Lake Eustis. Aside from Lake Dora discharges, the largest single source of TP loading was from agriculture other than muck farms, which represented 18.9% of estimated TP loading and 4.6% of estimated TN loading. Additionally, in previous years, the City of Eustis discharged waste water into Trout Lake, which subsequently entered Lake Eustis at the north east corner of the lake. There are significant differences in the sediment substrate in Lake Eustis, with the north half dominated by muck and the south half still partially comprised of sand. Because Lake Eustis is larger than 1000 acres in size, two separate LCIs were performed, one on the north end and one on the south end. The benthic grabs for Lake Eustis were taken in February and March of 2012.



Hydrilla fragment in Lake Eustis (2012)

Results

Hydrilla verticillata, an exotic submerged plant which is often problematic in lake systems, was seen in the north portion of Lake Eustis. While some fragments of hydrilla were seen floating at the surface, no stands of rooted hydrilla were observed. Hydrilla may reproduce via fragments (vegetatively), tubers and turions. Both Lake Eustis North and Lake Eustis South received a poor rating on the LCI. Twenty different macroinvertebrate taxa were collected on the north portion. Twelve taxa were collected on the south. On Lake Eustis North and South the most abundant macroinvertebrate collected was the chironomid or midge *Cladotanytarsus sp. B*, comprising 50% and 36% of the total population of macroinvertebrates, respectively. Chironomids or midges were 82% of the total population of macroinvertebrates in the south portion and 59% in the north portion of the lake. While chironomids are generally the most abundant portion of most lake benthic populations, higher percentages result in lower LCI scores. The changes in Lake Eustis North LCI scores from 2008 to 2012, were due largely to changes in the number of different taxa present (diversity). Lake Eustis North increased from eleven taxa in 2008 to 20 taxa in 2012. The principal changes Lake Eustis north included increases in aquatic snail and Hirudinea or leech taxa. Lake Eustis South scores dropped from 26.69 in 2008 to 18.94 in 2012, due largely to an increase in the percentage of Diptera or chironomids present and a decrease in total taxa. Lake Eustis North LCI received a Hulbert Index score of 2. Lake Eustis South received a Hulbert Index score of 3.

LCI SCORES

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2012</u>
Eustis South	19.88	33.12	30.85	26.69	18.94
Eustis North	26.59	26.49	22.89	21.18	28.89

The Hulbert Index is based on the number of pollution-intolerant lake macroinvertebrate species present. Therefore, higher Hulbert Index scores indicate a greater number of pollution sensitive species present or better water quality. Eight of the twelve benthic samples taken in the south portion of the lake were predominately muck while all of the twelve northern lake samples were primarily muck.

HULBERT INDEX SCORES

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2012</u>
Eustis South	2	5	5	1	3
Eustis North	0	2	2	2	2



A Cladotanytarsus sp.B (magnified portion of head)

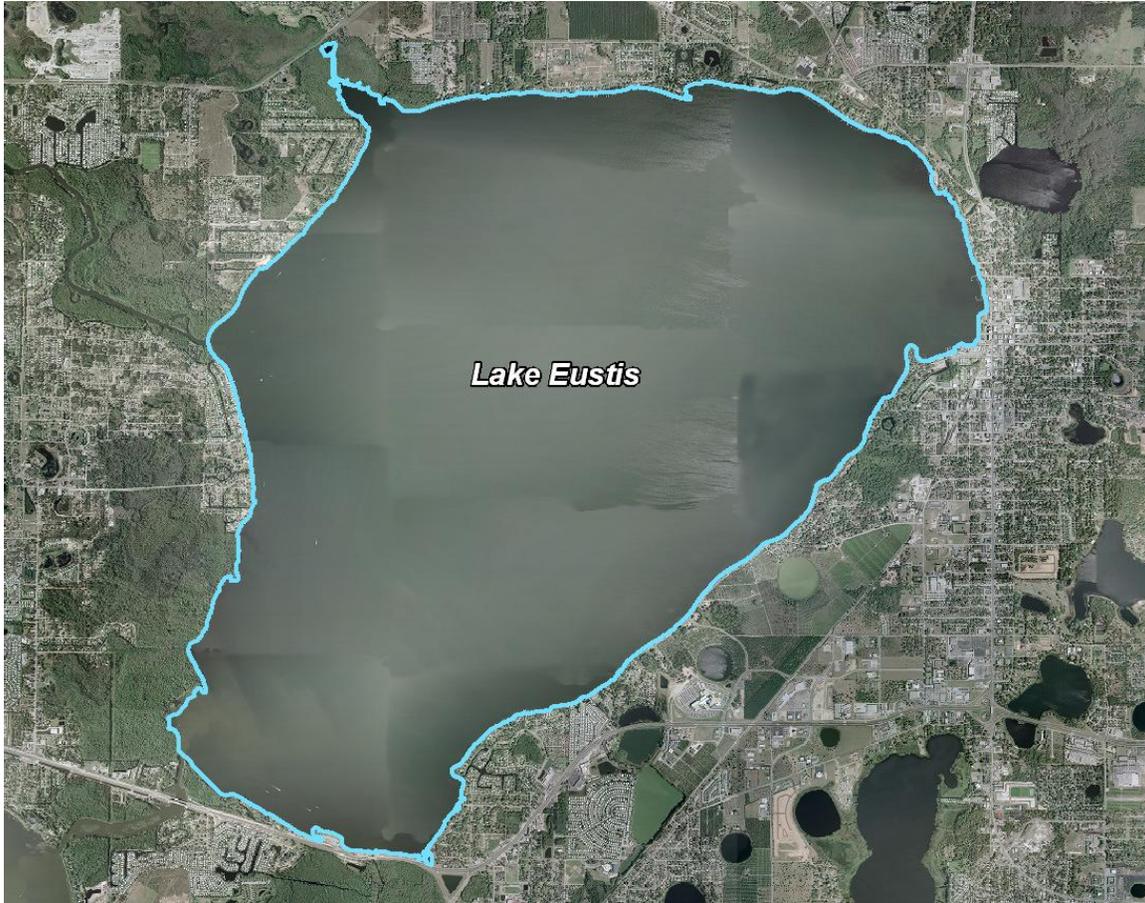
Significance

The Lake County Water Authority has an off-line alum system or NuRF (Nutrient Reduction Facility) located on the Apopka-Beauclair Canal that came online in March of 2009. This will reduce the total phosphorus load from Lake Apopka by as much as 81% annually. Elimination of such a large upstream source of total phosphorus could dramatically improve water quality in Lake Eustis and other downstream lakes. This could increase recreation on the lake by eliminating persistent algal blooms, eventually leading to reestablishment of beneficial vegetation, improved pollution sensitive macroinvertebrate populations with increased macroinvertebrate diversity and a more productive sportfish population. The Lake County Water Authority will continue to monitor the macroinvertebrates in Lake Eustis in order to assess the NuRF project impacts on the ecosystem health

Suggestions

Lakeside property owners can help keep the lake healthy by minimizing, or eliminating, the use of pesticides, herbicides and inorganic fertilizers, by

preserving native shorezone vegetation, by minimizing impervious surfaces on their properties, by being careful with the use and storage of petroleum products, and by properly maintaining septic or sewer systems.



For more information, please contact:
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References

Fulton, R.S., III. 1995. *External nutrient budget and trophic state modeling for lakes in the Upper Ocklawaha River Basin*. Technical Publication SJ95-6. Palatka, Fla.: St. Johns River Water Management District.

Fulton, R.S.,III, C. Schluter, T.A. Keller, S. Nagid, W. Godwin, D. Smith, D. Clapp, A. Karama, and J. Richmond. 2004. *Pollutant Load Reduction Goals for seven major lakes in the Upper Ocklawaha River Basin*. Technical Publication SJ2004-5, Palatka, Fla.: St Johns River Water Management District.