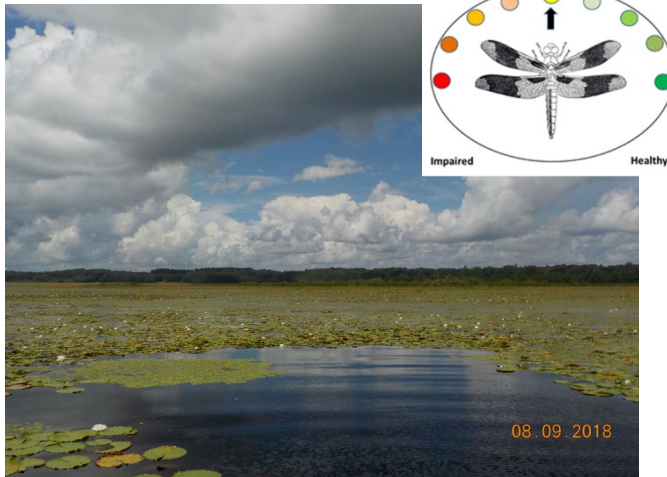


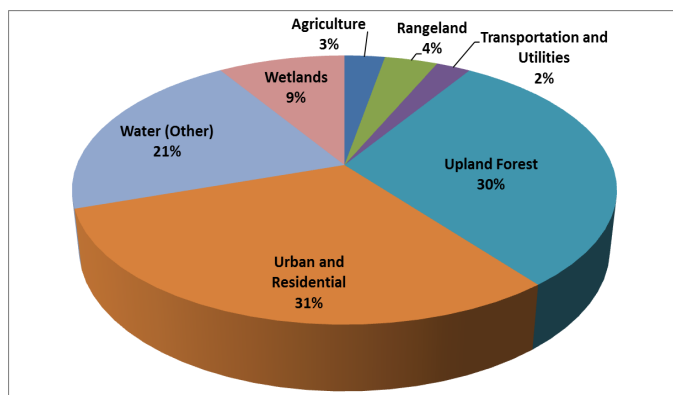
## Waterbody: Lake Jackson



## Basin: Lake Jackson

Lake Jackson is an approximately 4,254 acre, shallow, flat bottomed, prairie lake with two major sinkholes and is located north of the City of Tallahassee. Lake Jackson is a valuable biological, aesthetic, and recreational resource of Leon County and was designated (along with the neighboring Lake Carr and Mallard Pond) as an Aquatic Preserve in 1974 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

As shown in the following pie chart, approximately 40% of land use in the 27,096 acre Lake Jackson Basin is agriculture, rangeland, transportation, utilities, urban and residential. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.



## Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. Water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

## Methods

Surface water, sediment sampling, and a Lake Vegetation Index (LVI) was conducted to determine the health of Lake Jackson and met the collection and analysis requirements of the Florida Department of Environmental Protection (FDEP).

## Results

### Nutrients

Low water levels caused by drought and sinkhole activity meant certain water quality stations could not be sampled during some months. After Tropical Storm Fay (August 2008), Lake Jackson water levels reached full pool conditions; however, subsequent drought conditions lowered lake levels to where staff was unable to collect water chemistry samples in 2012 and the first quarter of 2013. Water levels continued to rise in the latter part of 2013 and reached full pool in 2014. Objective results of nutrient concentration continued to be skewed by water level fluctuations. The effects of water level fluctuation continue to be documented.

The nutrient thresholds and results are found in Table 1. According to FDEP requirements, Numeric Nutrient Criteria (NNC) (expressed as an annual geometric mean) cannot be exceeded more than once in

a three year period. Chlorophyll-*a*, total phosphorus, and nitrogen levels were exceeded several times over the sampling period, with the latest occurring in 2017.

**Table 1.** FDEP’s chlorophyll-*a*, total nitrogen and phosphorus criteria for lakes applied to Lake Jackson. Results in bold signify exceedances of the State criteria. Due to low water the numeric nutrient criteria data requirements could not be calculated for years 2012-2013.

Clear Lake, Low Alkalinity	Chlorophyll- <i>a</i> 6.0 µg/L	Total Nitrogen Threshold 0.51-0.93 mg/L	Total Phosphorus Threshold 0.01-0.03 mg/L
2004	2.2	0.33	0.01
2005	3.2	0.29	0.03
2006	3.0	0.63	0.03
2007	2.1	0.77	0.03
2008	5.7	0.60	<b>0.04</b>
2009	<b>8.4</b>	0.49	<b>0.02</b>
2010	3.2	0.58	0.02
2011	<b>6.9</b>	<b>0.61</b>	<b>0.02</b>
2012-2013	-	-	-
2014	2.6	0.69	0.02
2015	<b>9.2</b>	<b>0.54</b>	<b>0.03</b>
2016	<b>6.4</b>	0.47	<b>0.02</b>
2017	<b>6.5</b>	<b>0.56</b>	<b>0.02</b>
2018	6.0	0.50	0.02

#### Dissolved Oxygen

As Figure 1 shows, several Lake Jackson stations showed percent dissolved oxygen (DO) saturation values that did not meet Class III water quality crite-

ria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours), in addition to organic rich sediments, also contributed to the low DO saturation values.

#### Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

#### Floral Assessment

The Lake Vegetation Index score for Lake Jackson was 54, placing the lake’s vegetative community in the healthy category.

Seventy-one species were found during the survey. The native species, fragrant waterlily (*Nymphaea odorata*) and fanwort (*Cabomba caroliniana*) were the most dominant species in the lake. Other native vegetation included; American lotus (*Nelumbo lutea*), red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*) and watershield (*Brasenia schreberi*).

Unfortunately, Chinese tallow tree (*Sapium sebiferum*), wild taro (*Colocasia esculenta*), hydrilla (*Hydrilla verticillata*), torpedo grass (*Panicum repens*) and water hyacinth (*Eichhornia crassipes*) are listed as Category I Invasive Exotics by the Florida Exotic Pest Control Council <http://www.fleppc.org/> and were found in Lake Jackson. Alligator weed (*Alternanthera philoxeroides*) and rattlebox (*Sesbania punicea*) are both Category II Invasive Exotics that were found in the lake. Additionally, the exotic water spangles (*Salvinia minima*), parrot feather milfoil (*Myriophyllum aquaticum*), and burhead sedge (*Oxycaryum cubense*) were found in and near the lake.

[Click here for more information on the Lake Jackson LVI.](#)

[Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.](#)

### Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Jackson due to elevated levels of mercury.

[Click here for more information about fish consumption advisories in Leon County.](#)

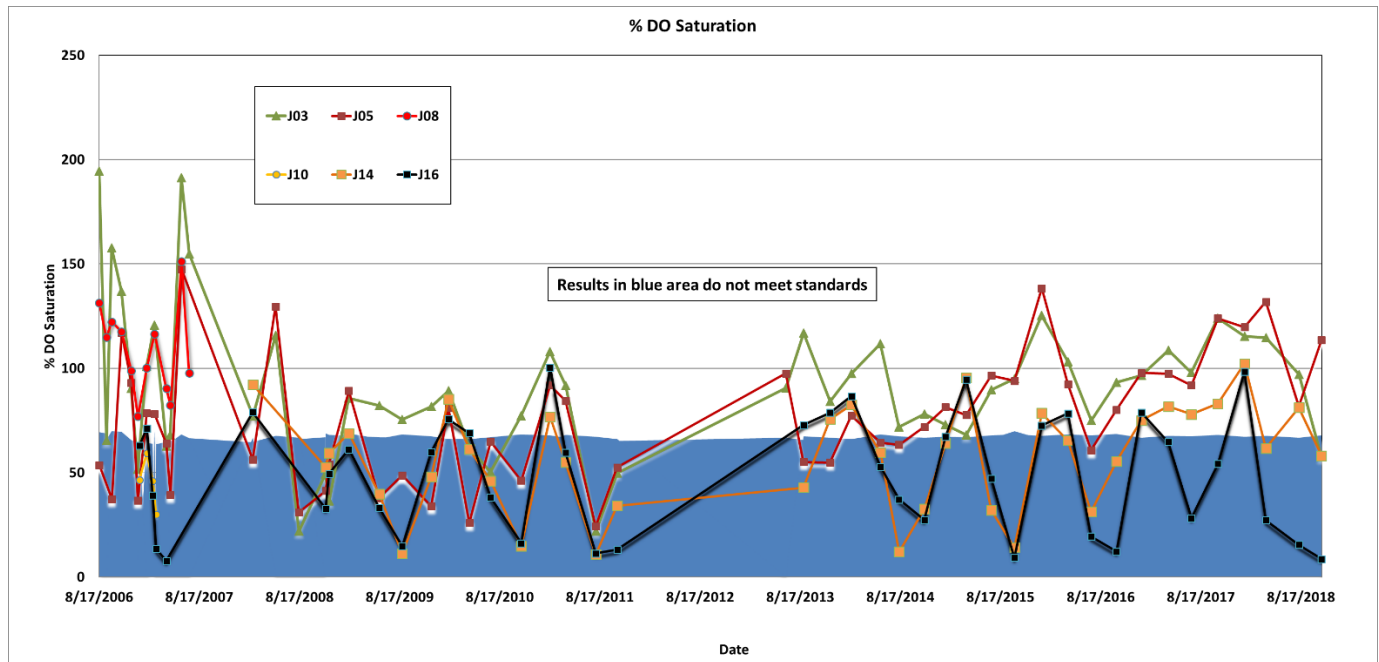


Figure 1. Dissolved Oxygen Percent Saturation results for Lake Jackson.

### Conclusions

Based on ongoing sampling, Lake Jackson NNC for chlorophyll-*a*, total phosphorus, and nitrogen levels were exceeded several times over the sampling period. Ongoing sampling showed percent dissolved oxygen (DO) saturation values did not always meet Class III water quality criteria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, preventing rapid water/atmospheric exchange. Plant respiration and organic-rich sediment also contributed to low DO saturation values. The Lake Vegetation Index score for Lake Jackson was 54, placing the lake's vegetative community in the healthy category.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

### Contact and resources for more information

[www.LeonCountyFL.gov/WaterResources](http://www.LeonCountyFL.gov/WaterResources)

[Click here to access the results for all water quality stations sampled in 2018.](#)

[Click here for a map of the watershed – Sample Sites J03, J05, J14 and J16.](#)

[Click here for a map of all of the watersheds](#)

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