

Leon County Lakes Ecology

Lake Hall

McGlynn Labs Inc.

SECTION 4.4.2: Lake Hall

Surface Area: 172 acres

Drainage basin:

Classification: Oligotrophic

Location: Tallahassee Hills

Number of Stations: 2

Duration of monitoring: 09/91-09/04

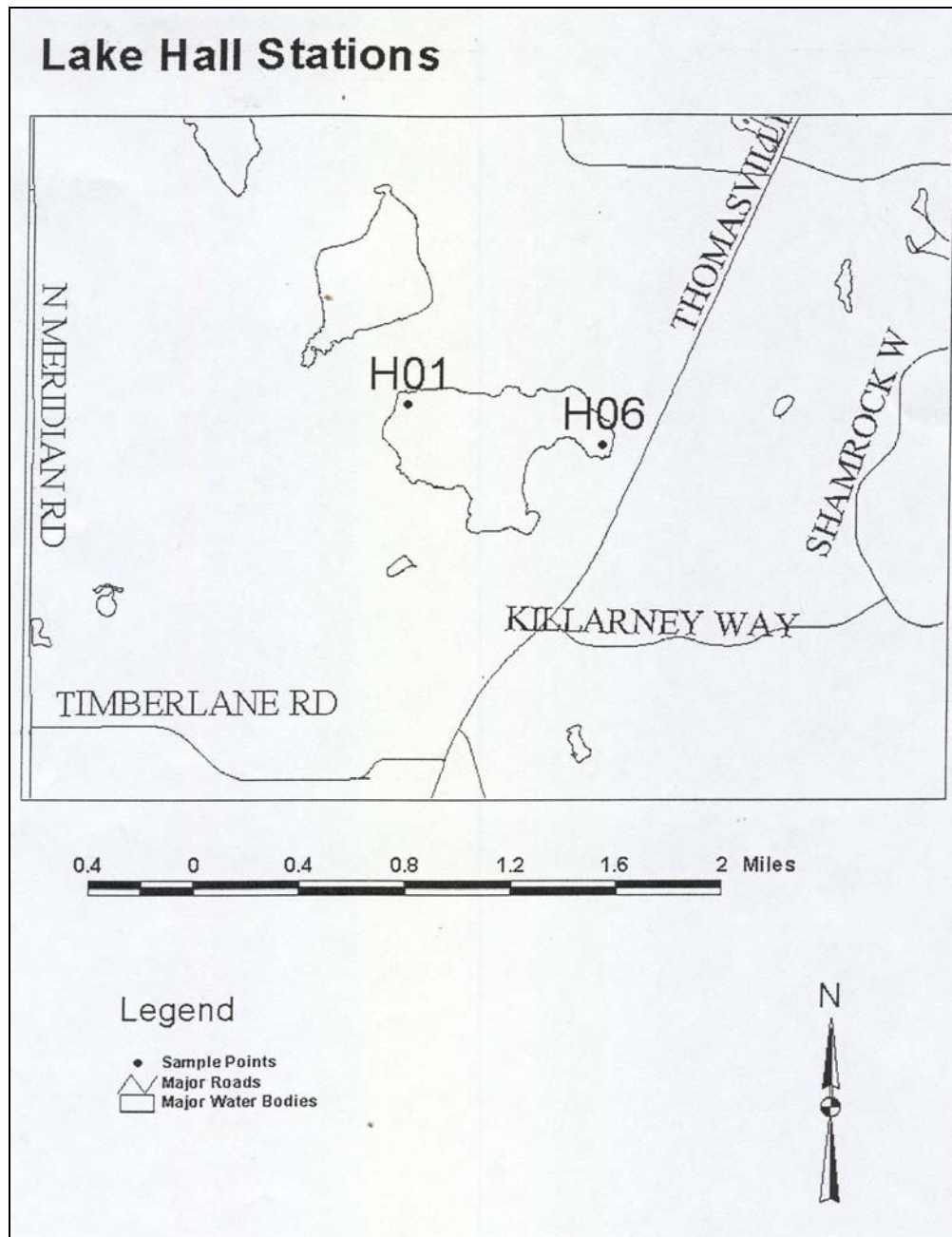


Figure 4.4.2.1: Station Map, Lake Hall

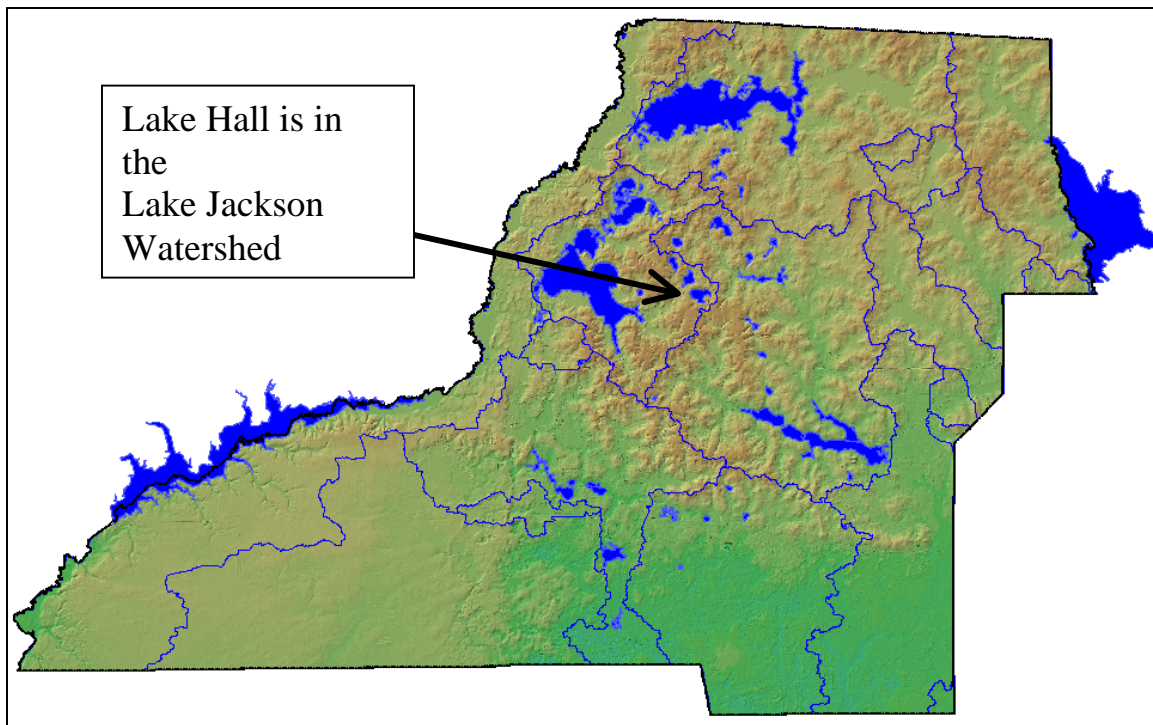


Figure 4.4.2.2: Map by Greg Mauldin, Tallahassee-Leon County GIS

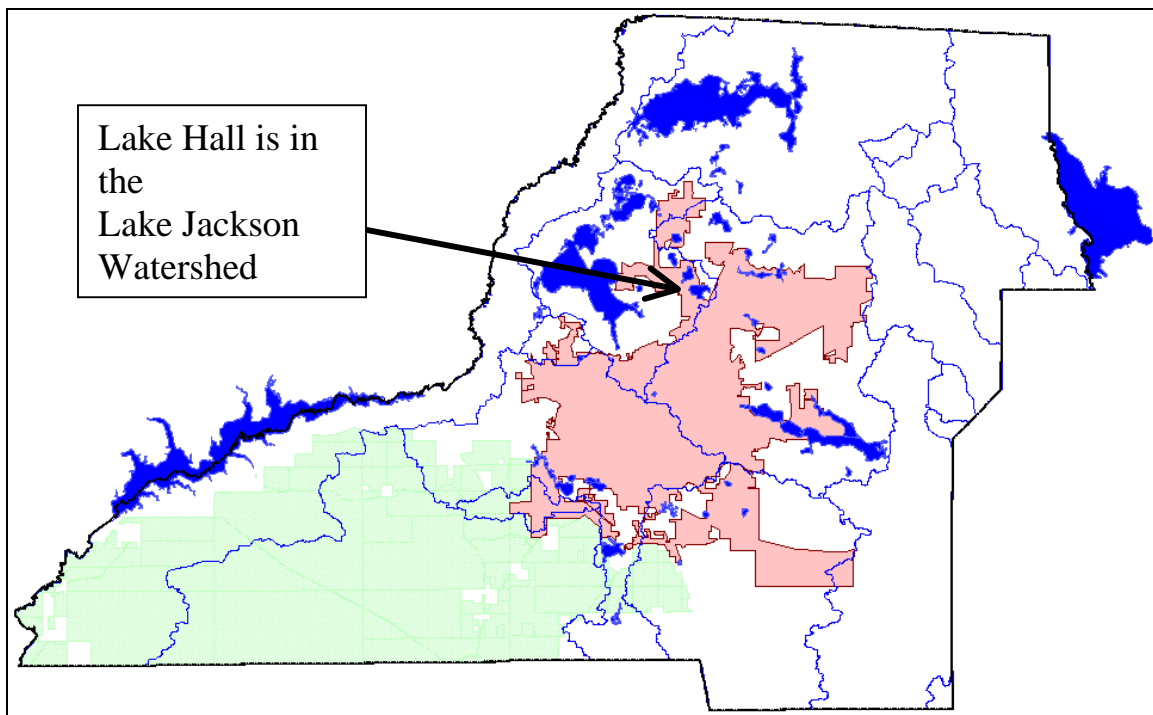


Figure 4.4.2.3: Map by Greg Mauldin, Tallahassee-Leon County GIS

Lake Hall has some of the best water quality in Leon County. It also has exceptionally clear water. There is persistent speculation that it is spring fed, but no flow or issue of spring water has been documented yet, but because of the clarity of the water one is inclined to believe that the water must come from the aquifer. The low conductivities of approximately 30 μS , which are essentially background levels, are not indicative of groundwater input from a carbonate aquifer. During the drought it was evident that Lake Hall is not connected to the aquifer by an open sinkhole, since it did not drain during the drought of 1999-2001. There have been reports of a submerged cavern in the southern lobe of the lake near McClay Gardens, and there are numerous Karst depressions in and around Lake Hall.

Thriving seagrass meadows of *Vallisneria americana* and *Sagittaria stagnorum* are reminiscent of what Wakulla Springs once was like before the introduction of the nuisance invasive exotic, *Hydrilla verticillata*. *Hydrilla* has been found growing in Lake Hall since late 2000 in front of one of the homes near station H06. Following a lake wide survey of the aquatic vegetation, a healthy growth of *Hydrilla verticillata* was found in a small Karst depression, also near this station. The *Hydrilla verticillata* was treated with time release Sonar, and Grass Carp were released into Lake Hall by FDEP in 2001. No *Hydrilla verticillata* was found in Lake Hall in our aquatic plant survey in 2003, but a recent 2005 survey found some of this invasive species present.



Figure 4.4.2.4: Native beds of beneficial aquatic vegetation can still be found in the shallows of Lake Hall. These plants are rapidly disappearing elsewhere in north Florida.



Figure 4.4.2.5: Leon County Lake stations in Lake Hall, H06 and H01 (1999). The first picture is from the eastern end of Lake Hall near Thomasville Road (station H06). Drainages from Thomasville Road were retrofitted during road widening. A karst depression between Thomasville Road and Lake Hall was also retrofitted to treat the stormwater. Previously the runoff into the Lake was untreated. Conditions have been improving at this station. The second picture is from the western side of Lake Hall (station H01) near the Alfred B. McClay House.

Specific conductance in Lake Hall is very low, and has remained remarkably constant over the years, a good indication of ecological stability. Dissolved Oxygen concentrations below 4 mg/L are considered stressful to aquatic life. The surface dissolved oxygen levels at station H06 are good, and they have remained rather stable over the years. Bottom water at station H06 has had some low values; for example, before 1997 there were 10 dissolved oxygen readings below 4 mg/L. Since then there has only been one low dissolved oxygen reading taken at station H06 (October 2003). This is a rather good sign that the water quality of Lake Hall is improving.

Occasional algal blooms are a natural occurrence in our subtropical Florida lakes, and persistent blooms indicate that there may be problems with the water quality. During the past 11 years Lake Hall has experienced four such ephemeral algal blooms, with the most recent being in September 2003. This algal bloom was isolated to the eastern lobe of Lake Hall near where the *Hydrilla verticillat* was observed. The type of algae was identified as a non-toxic species of green algae by FDEP. At the time of the bloom much aquatic vegetation was found floating in this area. Lake Hall rose 3 feet after the March rains of 2003, which finally brought lake levels to a full pool. The water level rise may have caused the die back of aquatic vegetation. With the rise in water levels, the light environment of these plants was lowered. As the plants died back they shed their leaves, which floated to the top of the water column. Persistent winds from the west concentrated most of this dead plant matter on the eastern shore of the lake. The floating mats of plants cut off the light to the submerged vegetation growing under them, causing these plants to die back too. By October 2003 this bloom had subsided and the floating vegetation was gone.



Figure 4.4.2.6: These are views from station H06 taken in October 2003. The first picture is of a tussock, which developed where the Hydrilla was treated with herbicide. This floating island floats around the lake. Note the dramatic large mats of floating plant matter in the second picture (this is the same house and dock in the previous picture (taken in 1999). By November 2003 the water was clear again.

Most other chlorophyll values in Lake Hall are good. Lake Hall is one of the few oligotrophic lakes in the County. The ephemeral algal blooms are a warning that Lake Hall is fragile and needs to be protected. Regression analysis shows that reactive Phosphate levels have not exhibited any statistically significant trends over the years, which are stable if not decreasing. Ammonia levels in Lake Hall are remarkably low, with the few peak concentrations correlating with the chlorophyll peaks occurring during the 4 algal blooms. The ammonia can be a byproduct of the algal activity.

During the summer of 2003 there were problems with bacterial levels in Lake Hall at the swimming area. Total Coliform bacteria were high in Lake Hall and exceeded Department of Health criteria for swimming. This was isolated to the swimming area. Other parts of Lake Hall had very low bacterial counts. DoH closed the swimming area to swimmers in August 2003. Once the swimmers were away for a few days, the bacterial levels returned to normal and the swimming area was reopened. Lake Hall has a lot of small children that swim in a small area, where is very little circulation of water. There is also no chlorine. If one young child has an accident, the bacteria will persist. Bacteria monitoring at the swimming area reveals no recent problems.

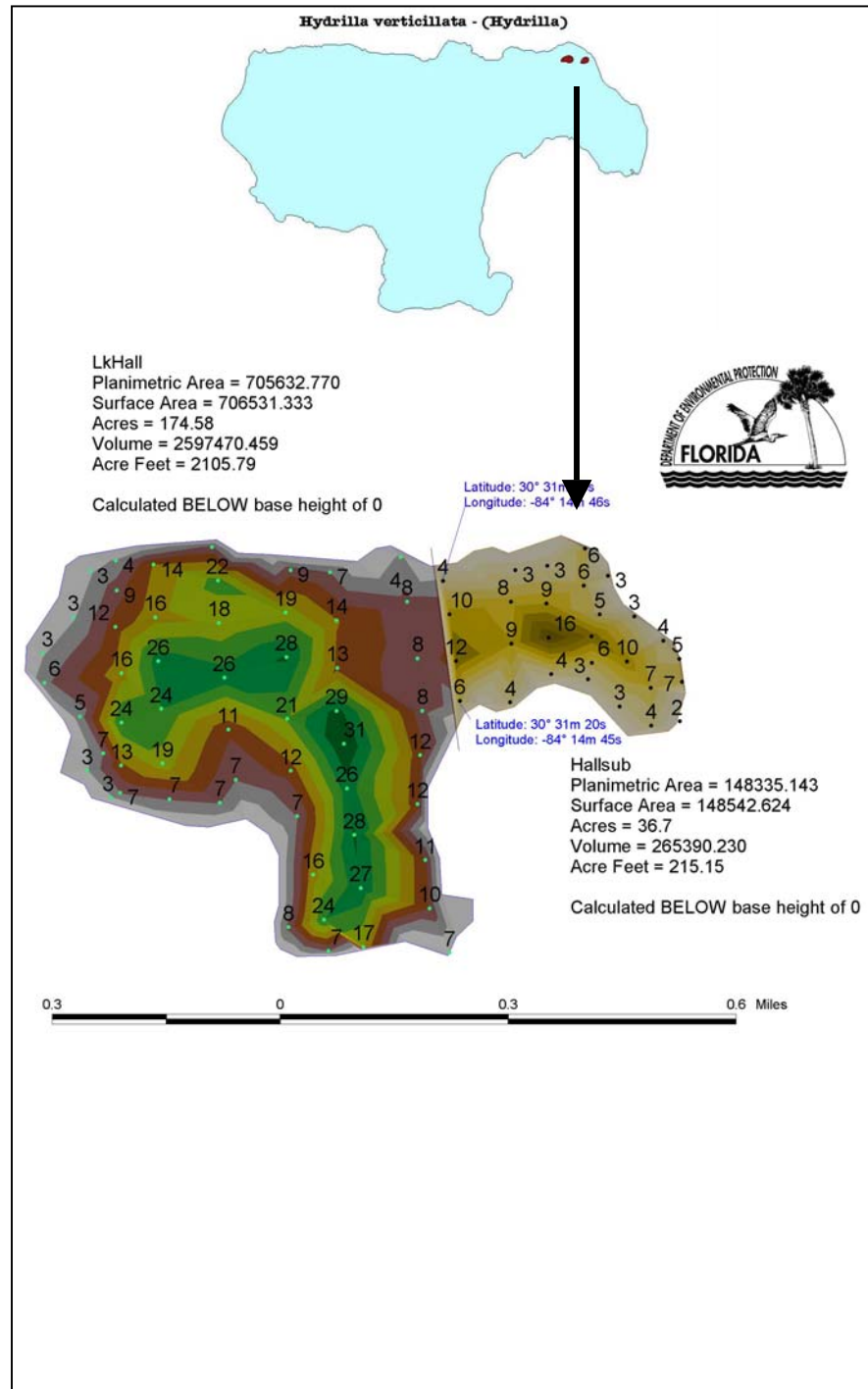


Figure 4.4.2.7: Map of the *Hydrilla verticillata* found in Lake Hall. The invasive exotic vegetation was countered by a combination of Herbicide and Grass Carp (prescribed by FDEP).



Figure 4.4.2.8: Fishing is good on Lake Hall. Just don't bring an outboard motor, they are not allowed in the park area (February 2003).



Figure 4.4.2.9: A pier was constructed adjacent to the swimming to diminish trampling of the littoral zone by boaters and the numerous crew teams utilizing Lake Hall.

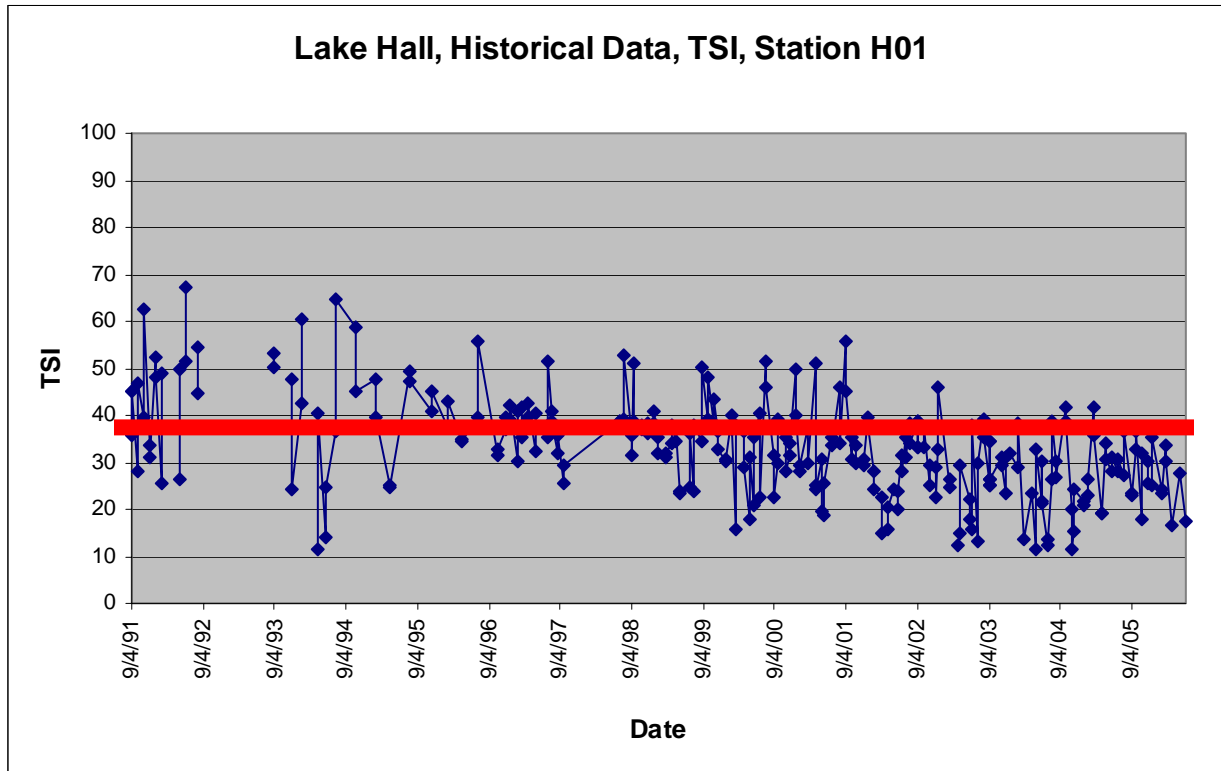


Figure 4.4.2.10: Lake Hall, Station H01, western side of lake

Clear lake,

According to FDEP criteria this lake would be impaired at TSIs greater than 40 units,
Data source LCL Data (McGlynn Laboratories Inc), data from before 1997 LCL Data
(CARRMa).

Data duration 09/91-09/04

*** Result: not impaired and improving.**

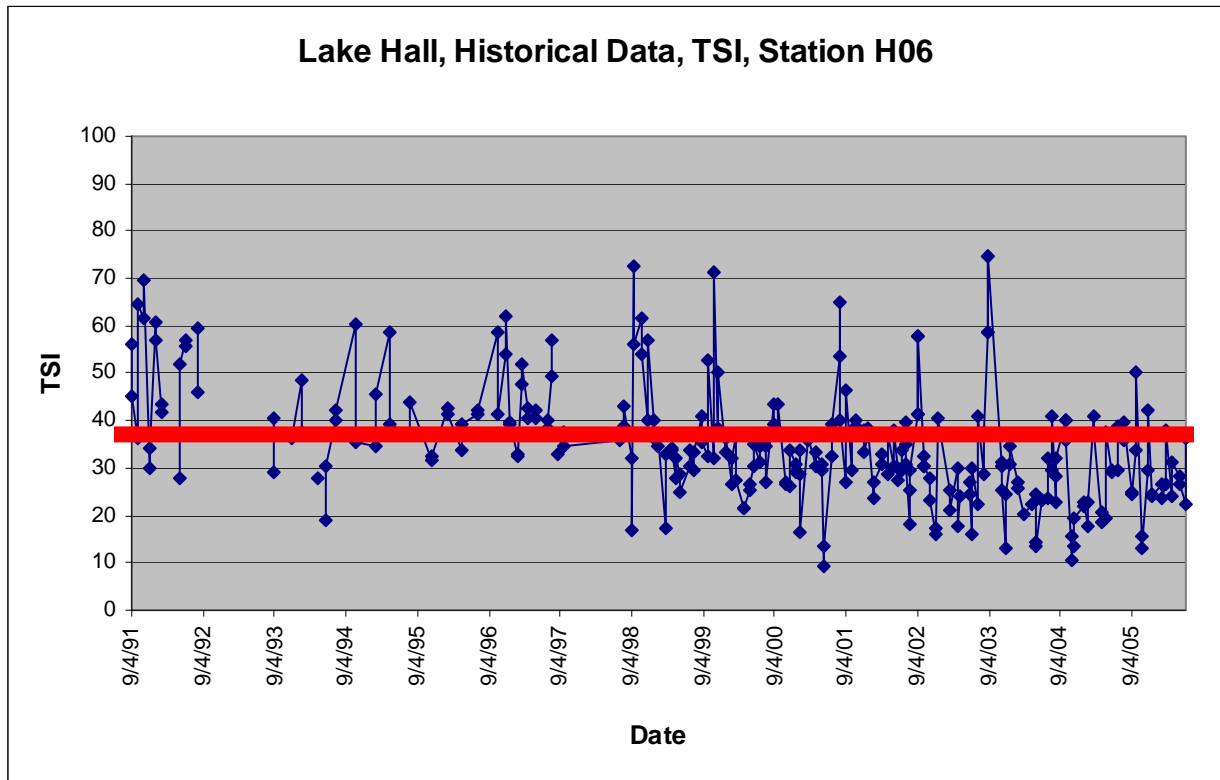


Figure 4.4.2.11: Lake Hall, Station H06, eastern side of lake Clear lake,
According to FDEP criteria this lake would be impaired at TSIs greater than 40 units,
Data source LCL Data (McGlynn Laboratories Inc) data from before 1997 LCL Data
(CARRMa).

Data duration: 09/91-09/04

*** Result: not impaired and improving.**