

State of the Lake

Current Indicators of Pollution Problems at Jordan Lake, 2005- 2006

Report by the Haw River Assembly, 9/28/06



Dead crappie from Upper New Hope fish kill reported to DWQ, Friday, March 24, 2006 (photo by Doug Wakeman)

While the process drags on to create new rules to reduce nutrient pollution at Jordan Lake, effects of excessive algae growth due to nutrient pollution are showing the lake is in trouble. Economic concerns about the cost of new rules must be balanced with the cost of not taking action now to protect this resource. The Jordan Lake watershed includes some of NC's wealthiest metropolitan areas, producing over \$50 billion annually in goods and services. (see "Background Information", page 2)

2005 high pH readings from DWQ, HRA

The pH standard (9.0) was frequently exceeded throughout the lake in the summer of 2005. High alkaline pH readings are common in waters with dense algal biomass (pH is related to algal photosynthesis). Normal freshwater pH is 7.0. 8.5 and higher indicates excessive algae growth, and is stressful, even fatal, to finfish and other aquatic animals. In 2005, pH readings of 9.4 were taken on the Morgan Creek Arm on July 25 by Haw River Assembly Lake Watch volunteers, and 9.5 on the Haw River Arm on August 23 by DWQ staff. What stresses may result from such high alkalinity in the aquatic ecosystem, or the effects to recreation users of the lake?

2006 DWQ pH and Chlorophyll *a* data that is in violation of standards

DWQ monitoring data this year to date shows exceedances of both the pH and chlorophyll *a* standards. From January – July there were exceedances in every month of the 40ug/l chl *a* standard, including as high as 82 on the Upper New Hope arm (81A1C station) on 2/21/06. In the total seven month period every monitoring site had at least one violation of the chl *a* standard. DWQ pH data for the first 8 months of 2006 shows readings **over 9.0** on April 11, 2006 at Morgan Creek, Upper New Hope, lower lake (CPF0880A) and at the dam (CPF055E0), and readings up to 9.5 at the stations near the dam and Robeson Creek on July 5, 2006.

March 2006 Fish kill (from DWQ Algal Analysis Results, March 23, 2006)

Date Collected: 3/21/06 @13:30 Phytoplankton samples were collected by RRO as part of a fish kill investigation. Forty nine catfish and 1 shad were found dead in the New Hope Arm of Jordan Lake near HWY 751. Staff found elevated dissolved oxygen (106%) and pH (8.5) indicating a possible algal bloom occurring at the site.

Results: Phytoplankton density was 45,000 units/ml which is considered a severe bloom (>30,000 units/ml). The assemblage was diverse and comprised of blue greens, greens, diatoms, and cryptomonads. The dominant taxon (>30% of total density) was the filamentous blue green *Pseudanabaena* at 17,000 units/ml. *Pseudanabaena* is considered an indicator of nutrient enrichment. (Note: There were also later reports to the Haw River Assembly by fisherman of approximately 40-50 dead catfish and crappies (see photo above) closer to Fearington Pt.)

August 2006 Euglena algae bloom – as reported to HRA and DWQ by recreational boater

"First saw a large green (color of antifreeze) liquid floating on the surface around the exit of Robeson Creek, this was on Monday 8-14, accidentally swam in it, stung my

eyes and smelled, coated the boat with green particulates. Heard from a friend it had been that same way the previous 2 days.”

Boater went back out and collected a sample on 8/16/06 and took it to Mark Vander Bourgh, at DWQ, for identification. He identified it as an Euglenoid form of algae. “Euglenoids are most common in slow moving or still waters with high nutrient concentrations. Blooms are most likely to occur during summer in freshwater ponds and ditches that receive nutrient-rich waste or runoff.”

Background Information:

A Valuable Resource in a Prosperous Region

More than a million people visit Jordan Lake to fish, swim, picnic, boat and camp each year. It is the main drinking water source for many Triangle residents, including Cary, Apex, Morrisville and northern Chatham County. The Jordan Lake region is considered one of the state’s most desirable places to live in. The Greensboro metro region, upstream of Jordan Lake, is the 99th largest metro economy in the world, producing approximately \$42.863 billion in goods and services in 1999, according to a report produced for the US Conference of Mayors and National Association of Counties. Downstream from Jordan Lake, the Raleigh-Durham-Chapel Hill metro area barely trailed its upstream neighbors, producing an estimated \$39.986 billion in goods and services, and ranking 108th among the world’s economies.

But is also a hardworking lake:

- The Haw River/Jordan Lake watershed is home to over 800,000 people whose homes, roads farms and businesses create run-off pollution in every storm. The watershed includes Greensboro, Reidsville, Burlington, Chapel Hill, Apex, and Durham, and many smaller cities and towns. All or part of nine counties are in this watershed. More than 65 permitted wastewater treatment plants discharge into this Haw River and Jordan Lake - including large municipal plants.

Too Much Nutrient Pollution

- Run-off pollution and wastewater effluent contribute large amounts of nutrients - phosphorous and nitrogen- leading to excess algae growth in the lake. Although an important part of the food chain, too much algae creates blooms that discolor water, form surface mats, create odor, taste and increased trihalomethanes in drinking water, can result in fish kills and may produce toxins harmful to humans.
- The state first attempted to address excess nutrients in Jordan Lake in 1997 through H.B. 515, the Clean Water Responsibility Act that directed clean up of the lake by 2002. Instead, further studies were allowed. In 2002 the upper portions of Jordan Lake were listed as EPA “Impaired Waters’ due to this excess algae -- and in 2005 the entire lake, including the Haw River arm was added to the list. The General Assembly passed S.B. 981, the Drinking Water Reservoir Protection Act in 2005, which included a provision that there could be no new or increased nutrient loading allocations to Jordan Lake until permanent nutrient reduction rules are adopted. But this does not address runoff pollution, which increases with every rain as more and more people move into this watershed



Algae bloom on Morgan Creek arm of Jordan Lake, August 29, 2005 (photo by Doug Wakeman)

New rules to reduce nutrients won't be in place until at least 2008. Can Jordan Lake wait that long?