

**Lake Jesup Crane Strand and Long Branch BMAP Technical Subcommittee
Meeting Summary
Sylvan Lake Park
Sanford, FL
December 14, 2006**

Attendees

Mary Brabham, SJRWMD
Sherry Brandt-Williams, SJRWMD
Tiffany Busby, Wildwood Consulting
Chris Ferraro, FDEP
Mark Flomerfelt, Seminole County
Jennifer Gihring, FDEP
Ed Hayes, FWC
Carol Johnson, FDACS
Bob Kelly, SAIC
Robert King, Friends of Lake Jesup
Mary Paulic, FDEP
Marcy Policastro, PBS&J

Welcome and Introductions

Tiffany Busby welcomed the subcommittee and members introduced themselves and the entity they represent. Tiffany noted that the name of the group has been changed to the Technical Subcommittee to better fit their role. The purpose of the meeting is to discuss the Crane Strand knowledge gaps and for Sherry Brandt-Williams to present the data the SJRWMD has collected for Lake Jesup. Jennifer Gihring added that this information will be presented to the entire Working Group at the January 2007 meeting.

Lake Jesup SJRWMD Data Update

Sherry Brandt-Williams gave a presentation on the Nutrient Dynamics in Lake Jesup. The St. Johns River Water Management District (SJRWMD) has been taking water quality data in the lake for over ten years and they feel they now have a better understanding of the natural cycles in the lake. Sherry requested that the Subcommittee let her know if there any gaps in the data because they have some funding for further study if needed.

The SJRWMD goals for Lake Jesup include being able to see the bottom of the lake, healthy grass beds, and increased habitat for fish and wildlife. The SJRWMD has been monitoring the lake and tributaries since 1995 for phosphorus, nitrogen, chlorophyll, zooplankton, metals and micronutrients. The focus has been on bathymetry, dating and characterization of sediments, and lake stage.

The modeling for Lake Jesup includes hydrodynamics, watershed loading and groundwater flow and solute transport. The SJRWMD is in the process of updating some of the modeling using HSPF, a watershed runoff model. Sherry noted that the new modeling should not have a significant effect on the output, but additional data will

provide better calibration. This modeling is for the entire basin, and Sherry was not sure when the Lake Jesup portion would be complete. The watershed modeling results have gone through peer review and they are in the process of addressing minor comments. The results of this effort should be released soon, and Sherry offered to present this information at the next meeting. The groundwater flow and solute transport modeling is more focused on the eastern side of the basin at the freshwater lens near Geneva.

The water quality efforts have focused on nitrogen and phosphorus to determine variability and trends. When compared to the nearby Lakes Harney and Monroe, Jesup is almost double the volume with 13 tributaries coming into it. In addition, total phosphorus (TP) and total nitrogen (TN) are much higher and carbon is almost limiting in Lake Jesup. Other than the characteristics named above, there are not many differences between Jesup and the other lakes so there is hope that the quality can be improved.

There were originally 23 monitoring stations but these were reduced to seven key sites approximately three years ago. The remaining monitoring stations are in the areas with the most problems and fluctuations and near the tributaries with the highest flows.

It has been found that the monthly TP is variable but not on a seasonal basis and the SJRWMD is not sure what causes the variation. Approximately 5% of the time the TP levels meet the Florida Department of Environmental Protection (FDEP) requirements so it is possible to achieve those levels in the lake. There was an increase in the yearly TP in 2004 because of the hurricanes. Approximately 5-10% of the TP is orthophosphate and there is very little correlation in the concentrations of orthophosphate and TP because of the carbon limitation in the lake.

The monthly TN is also variable but not seasonally. The variation is not as much as it is for TP. Approximately 3% of the time the TN levels meet the target concentrations. The yearly average of TN has increased from 1995 to 2001 and this is a Lake Jesup-specific trend. The majority of the TN is organic nitrogen.

There was no relationship found between TP and TN but there is a correlation when looking at the N/P ratio. TP is the limiting factor from 1995-2001 and TN is limiting from 2002-2005. For the majority of the year, nitrogen fixers are the dominant species of phytoplankton.

Since it is more difficult to clean up the open water of the lake, it is important to focus on cleaning the water coming in from the tributaries to make a difference. There is a high percentage of inorganic phosphate coming in from the tributaries from fertilizer. The cleanest water is coming in from the St. Johns River. The worst concentration was found in the neck with the concentrations in the open water falling somewhere in between. There has been discussion about creating three separate pollutant load reduction goals (PLRGs) to focus on the differences within the lake.

From the data, it was found that TN is correlated with chlorophyll, the abundance of two nitrogen fixing phytoplankton, total dissolved solids (TDS) and total suspended solids

(TSS). If the nitrogen levels can be reduced to meet the target, it could bring the chlorophyll levels down. Bob Kelly noted that nitrogen levels could be causing the high amounts of chlorophyll or high chlorophyll could be causing high levels of nitrogen.

Sherry stated that the 100 year stage is about 10 feet, and stages this high have not been seen since the 1940s. Robert King stated that this is probably due to the managing of river levels through discharge structures upstream to protect homes on Stone Island. Sherry added that while the extreme highs do not occur as often as they used to, the overall average is higher over the ten year period of record, most likely due to increased runoff.

It was found that the soft sediment thickness is greatest near the significant tributaries. The sediment thickness data was compared to the bathymetry and the areas of thick sediment do not line up with the deepest areas of the lake. If the inputs to the lake were cut off, depth and sediment thickness would be more closely correlated.

The TP profile shows a net accumulation with a few local pulses in earlier years (1981, 1978, 1971, 1958, and 1870) and the highest sediment accumulation between 1940 and 1980. Most areas show a decrease in accumulation because there is less new development. The diatom diversity was high prior to 1960 and there is evidence that Lake Jesup has not been phosphorus limited since the turn of the century.

The SJRWMD is currently working on a nitrogen fixation study that is focused on both annual and diurnal rates to determine a more accurate nitrogen budget. The SJRWMD is also looking into other methods for sediment dating. In addition, they are reevaluating the targets and are developing load-response relationships. The PLRG should be ready about six months after the final issuance of the watershed loading model. There are two stormwater projects that are about to come online in the area, and the SJRWMD is evaluating new treatment options to be implemented in the next year.

Recently a pay-for-performance request went out for alternative treatment technology in the Lake Jesup Basin. The projects will have to remove at least 1 MT/yr of phosphorus consistently over five years. These projects can either be in the lake or the tributaries, and the entity proposing the project must have the capital funding for the start-up, operations, and maintenance. The goal is to implement two projects and these will not be in lieu of the dredging project. The request is not very detailed but it does provide the goals and objectives for the basin.

It was suggested that Sherry add a slide that states if the phosphorus is controlled it will help with the nitrogen problems. She will also explain the significance of the N/P ratio.

Lake Jesup - Nutrient Focus of the BMAP and How N-Fixation Studies Fit In

Tiffany asked if the Subcommittee wanted to make a decision today that phosphorus should be the focus of the BMAP. Bob noted that the phosphorus is the only factor that can be cost effectively controlled in the lake and that inorganic forms of phosphorus are the easiest to remove. Robert stated that it seems premature to publicly announce that the

BMAP will not look at nitrogen. Fred Calder noted that they could say the confidence in the nitrogen allocation is still uncertain and they are waiting on information from the studies currently being conducted. This statement could be included in the BMAP so that they could move forward with the phosphorus reductions while waiting on the results of the nitrogen studies. Mary Paulic asked if the group thought that TN will be an important factor in reducing algal blooms. It may be too early in the process to decide the nutrient focus of the BMAP. Jennifer stated that the BMAP provides flexibility so that a detailed allocation can be included for phosphorus without including a detailed allocation for nitrogen. Robert noted that people will see that the focus of the pay-for-performance projects is phosphorus but it is too early to publicly state that phosphorus will also be the focus of the BMAP.

Sherry stated that since they do not have a quantitative number for nitrogen, this discussion should occur at a later meeting. There is data to support that something is occurring that appears to be related to nitrogen fixation but those studies are not yet complete. Fred added that the major issue is that there is an allocation for nitrogen in the TMDL but further studies are needed before the nitrogen load can be allocated.

Crane Strand Knowledge Gaps

1. Role of natural groundwater influence in the dissolved oxygen TMDL – still an important gap
2. Bacteria regrowth in sediments (stagnant water) – still an important gap
3. Source identification – new gap identified during the meeting

Robert stated that he has found a ductile iron pipe study from 2003 for sewer transmission lines. The study identifies many pipes in the study area that should have been replaced. These older pipes usually do not have air release valves for hydrogen sulfide, which causes corrosion and potential leaking from the pipes. It would be helpful to find out if there have been any status updates on replacement since the 2003 study. Jennifer stated that she would follow up on this item.

Adjournment

The meeting was adjourned at 12:00 PM.