Northern Tampa Bay Phase II Local Technical Peer Review Group (LTPRG)
SWFWMD Tampa Service Office, Hwy 301N, Tampa

Meeting 46

March 12, 2009 - 9:30AM

Summary

The following were in attendance: Bob Tyson, Tampa Bay Water; **Warren Hogg**, Tampa Bay Water; Doug Keesecker, Tampa Bay Water; Chris Shea, Tampa Bay Water; **Scott Emery**, EHI/USF**;** Mark Stewart, University of South Florida; Mark Rains, University of South Florida; Nathaniel Goddard, University of South Florida; Anna Deyle, University of South Florida; Patricia Metz, USGS; Terrie Lee, USGS; Alex Roberts, Hillsborough County EPC; Stuart Dawson, Pinellas County Utilities; Diane Willis, GPI; Dan Schmutz, GPI; Mark Nelson, Jones Edmunds; BJ Bukata, Jones Edmunds; Joe Sullivan, Jones Edmunds; **Richard Voakes**, City of St, Petersburg; **Laura Morris**, Quest Ecology; **Michael Hancock**, SWFWMD; Maya Burke, SWFWMD; John Emery, SWFWMD; Christina Uranowski, SWFWMD; **Doug Leeper**, SWFWMD, David Carr, SWFWMD; Lisa Henningsen, SWFWMD; Jessica Sutton, SWFWMD, and Karen Gruenhagen, SWFWMD. Names in bold are designated representatives for the LTPRG.

Doug Leeper provided an update on the status of minimum flows and levels development for priority water bodies in the Northern Tampa Bay area. He noted that in December 2008 the Governing Board approved rule amendments concerning minimum flows for the Weekiwachee River system in Hernando County and proposed minimum and guidance levels for Lake Anoka in Highlands County. He further noted that staff has recently completed a report summarizing water levels, water quality and water management of the middle Hillsborough River (i.e., the river segment between the City of Tampa Dam and Fletcher Avenue) and later this month will be asking the Governing Board to initiate rulemaking to clarify rule language which indicates that minimum flows, minimum levels and guidance levels will not be established for the river segment and other impoundments used for water supply purposes. Mr. Leeper also indicated that staff expect to present rule amendments concerning proposed minimum flows and a recovery strategy for the Alafia River estuary (and Lithia and Buckhorn Springs) to the Board in June 2009. He further noted that staff expect to release a draft report on proposes minimum flows for the Anclote River system in May or June 2009. With regard to lake levels, Mr. Leeper noted that development of minimum and guidance levels for Lakes Raleigh, Rogers and Starvation in Hillsborough County has been delayed as a result of issues associated with a watershed management project designed to evaluate drainage alterations in the respective lake basins. He also noted that minimum and guidance levels for Lake Wimauma would likely not be established until early 2010, due to delays associated with a project evaluating drainage and hydrologic factors that may influence the lake's water levels.

Dr. Scott Emery (Visiting Research Professor, University of South Florida's Institute for Environmental Studies) presented the preliminary results of a study measuring Lichen Line and Normal Pool elevations in isolated cypress wetlands, and using this distance as an indication of cypress wetland hydrologic regimes and overall health. Most lichens are highly intolerant of inundation (that is, are killed by standing water of as short as a

day or two duration). Lichens are often divided into “types”. One of the types is termed “crustose” lichens. Crustose lichens grow very slowly downward on the trunks of trees following die-backs due to short term periods of inundation. Some of these lichens are called “paint brush” lichens, because they appear as white paint or white wash on the tree trunk - like a film on the tree bark. Engineers can determine past (within the last decade) flood elevations from measuring the lower extent of these lichens. Scientists can estimate above-normal/flood wet season high water levels with them.

The most recent Lichen Lines in this part of west-central Florida represent water elevations following the extremely wet summer of 2004 (multiple hurricanes). The elevations for short-term standing water from these Lichen Lines therefore represent elevations that approximate the highest elevations obtainable in isolated wetlands (“top of the bowl” elevations). In contrast, Normal Pool elevations used in Wetland Assessment Procedures (WAP) developed by the SWFWMD represent normal wet season standing water levels. As such, these Normal Pool elevations represent standing water elevations of several weeks or more from a “typical” end of wet season period. Normal Pool elevations are, therefore, expected to be below flood elevations, hence below Lichen Line elevations. The question that is being examined in this study of Lichen Line elevations compared with Normal Pool indicators as identified by the SWFWMD is: “Can the vertical distance between the Lichen Lines and the Normal Pool provide useful indications of health in isolated cypress wetlands?”

To explore this relationship, Lichen Line (LL) elevations in 84 isolated cypress wetlands were measured and compared with the elevations of Normal Pool (NP) (as developed by the SWFWMD). The majority of these wetlands are being studied under the WAP method (as developed by the SWFWMD). Seventy two of these 84 wetlands had usable WAP data (from either the SWFWMD or Tampa Bay Water). Multiple measurements of LL and NP were made on each tree (commonly 11 to 13). The median vertical distances between LLs and NPs ranged from greater than one foot (Lichen Lines above Normal Pool) to some wetlands exhibiting LLs at elevations below the NP elevations. In order to “estimate” which of the 72 wetlands were relatively healthy and which could be considered as impacted, WAP scores for 2006 and 2007 (as measured by either SWFWMD or Tampa Bay Water) were used for comparison with the LL-NP vertical distances. It should be stressed that the WAP method as developed by the SWFWMD was designed to assess the vegetative species within wetlands relative to Normal Pools, as these vegetative species reflect appropriate species relative to the Normal Pool. This WAP method was not specifically designed to quantitatively determine “health” of isolated cypress wetlands. However, this WAP method is currently the best available information to assess relative conditions of these wetlands, and so was used for this purpose in this Lichen Line study.

Preliminary Results: LL to NP vertical differences were plotted against “grand” average WAP scores from the years 2006 and 2007 (“grand” average in this study is the average of the herbaceous plus shrub plus tree scores for 2006 combined with the average of the same three scores for 2007). The resulting regression line indicated an increasing vertical distance between LL and NP with increasing WAP scores. Of the 72 wetlands, 60 exhibited LL elevations between 0.00’ and 0.75’, with only 9 wetlands demonstrating negative LL to NP distances, and only 3 wetlands exhibiting LL to NP distances greater than 0.75’. Wetlands with grand average WAP scores of less than 3 had significantly lower LL to NP vertical distances than did wetlands with grand average WAP scores of 3.5 or higher. LL to NP vertical distances of roughly 0.25’ may represent a demarcation from wetlands with low WAP scores (3 or less) and those with WAP scores more

indicative of healthier systems. All examinations of the data to date show a greater positive difference between the LL elevations and the NP elevations translating into higher scores in the WAP determinations.
The vertical distance alone is not a foolproof determination of wetland "health". This is especially true in some instances where man-made structures to temporarily hold back water for short periods of time have been constructed. Such structures can hold back water during high rainfall periods….can allow water to stage up high for brief periods then quickly drain. In such cases, the wetland may exhibit a "good" lichen score even with evident impacts to vegetation and/or soils. Fires within a wetland can also make LL to NP distance determinations problematic. Heavy moss collars can retard lichen downward movement.

The data suggest that even 4 years after the last above normal rainfall year (2004), the Lichen Lines in many wetlands are still distinct and have moved downward only on the order of less than an 2.5 cm (1 inch). Field notes indicate that many wetlands with Lichen Lines close to or below Normal Pool elevations also exhibit soil loss. Overall, the Lichen Line to Normal Pool vertical distance shows promise of being a reliable indicator of wetland health conditions in isolated cypress systems. The method appears very reliable in cases where Lichen Lines are close to or below Normal Pool…..that is, there is always some type of impact to be found. A large vertical distance is usually a reliable sign that the wetland is in good shape…..but additional indicators should also be consulted to confirm this. The exercise can be performed relatively quickly. When applied to a wetland where there is no prior information, the Lichen Line to Normal Pool data is a good diagnostic of anthropogenic alteration that pertains to hydrologic regime changes.

Christina Uranowski, of the District, along BJ Bukata and Joe Sullivan, of Jones Edmunds, Inc., presented the preliminary results of a project entitled Wetland Classification and Basin Characterization. Wetland ecosystems share a number of common attributes, including periods of inundation or saturation, hydrophytic vegetation and hydric soils. In spite of these common attributes, wetlands occur under a wide range of climatic, geologic and physiographic situations, and exhibit a wide range of physical, chemical and biological characteristics and processes. This variability creates a challenge in determining wetland functions and characterizing hydroperiods even within similar or the same wetland types. Each wetland type should maintain a unique reasonably stable annual hydrologic signature or hydroperiod that shows seasonal variation. Earlier studies have shown that wetlands considered to be in poor health have reduced hydroperiods and their flooded areas do not reach the expected frequency, depth or duration of that wetland class. This study contains four components, which are not completed to date, that attempt to develop a methodology to determine a wetland classification that is based on how individual wetlands function. The components consist of a comparison of Light Detection and Ranging (LiDAR) and traditional surveying for wetland bathymetric mapping, Hydric Soils interface, Hydric Soils Classification and the development of a Wetland Classification System. The intent, with respect to the bathymetry, is to determine how much and how long wetlands are flooded during a given period of record.

The results of the LiDAR versus traditional survey wetland bathymetric mapping pilot project indicate that LiDAR rather than traditional surveying could be an acceptable method to develop flood frequencies for wetlands. Based on results of this pilot project and from a previous study, we are recommending an annual period of record surface water analysis for wetlands to determine if each is approximating its hydrologic

functional capacity. Our task now is to develop a standard operating procedure from what we have learned from the work completed during the Pilot Project. The hydric soils interface analysis is being completed to determine the location and elevation of the hydric/non-hydric soil interface in 119 wetlands throughout the District. The same method was completed 5 years ago and is being repeated this year. Results of this task provide additional indications of wetland health and inundation frequency. The Hydric Soils Classification task is characterizing soils in 46 wetlands to a depth of up to 2 meters. This work will assist in determining if the wetlands have confining layers (clay or spodic horizon) that may to a degree buffer against the impacts of ground water withdrawals. The Wetland Classification System task will be developed by compiling results from the first three tasks along with other resources and data, strongly incorporating the components of hydrology and soils. It is expected that this analysis will provide a higher level of resolution that will lead to accurate estimates of hydrologic needs by wetland type and thus to a more sensitive determination of wetland health. The slides used for this presentation are found on the NTB II website.

The next regular LTPRG meeting is scheduled for 9:30 AM on May 11, 2009 at the SWFWMD's Tampa Service Office.

AGENDA

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1. December meeting follow-up

2. Miscellaneous updates
   - Lake MFL Update

3. Use of Lichen Lines in Relation to Normal Pool Elevations to Assess Altered Hydrologic Regimes in Isolated Wetlands (Scott Emery, USF).

4. Wetland Classification and Basin Study (Christina Uranowski, BJ Bukata, and Joe Sullivan).

5. Issues for next Meeting – May 5, 2009