

**Lower St Johns Technical Advisory Committee (TAC)
Meeting Summary
Host: Florida Dept. of Environmental Protection
Small Business Association-Jacksonville
December 12, 2006**

Attendees

Alex Ainza, CCUA
Shelley Beville, The Nature Conservancy
Felicia Boyd, SJRWMD-WAV
Mary Brabham, SJRWMD
Richard Bryant, National Park Service
Russell Brodie, Florida Fish and Wildlife Conservation Commission
Ray Bowman, UNF
Dean Campbell, SJRWMD
Ed Cordova, FDEP
Cindy Cosper, DEP Watershed Monitoring
Barry Cotter, COJ-EQD
Dean Dobberfuhr, SJRWMD
Ebenezer Guajjarlapudi, City of Jacksonville
John Hendrickson, SJRWMD
Tom Kallemeyn, FDEP
Mike Hollingsworth, USACE
Lynn Lisenby, FCCJ
Wayne Magley, FDEP
Rob Mattson, SJRWMD
Kraig McLane, SJRWMD
Mike McManus, The Nature Conservancy
Dana Morton, COJ-EQD
Alan Obaigbena, FDOT
Patrick O'Connor, FDEP
Todd Z. Osborne, UF-SWS
Margaret Palmer, HydroMentia
Nicole Robinson, DEP/CAMA-Northeast FL Aquatic Preserves
Brad Russell, JEA
Lucy Sonnenberg, MWL-JU
Scott Turner, DCHD
Mark Zivojnovich, HydroMentia

Welcome and Introductions

The meeting began at 10:10 am. Vince Seibold welcomed everyone. The participants introduced themselves.

No comments were made on the August 17, 2006 meeting summary.

Presentation: “*Evaluation of a Set of Organic Matter Characterization Techniques for Use in Assessing Landscape Change Effects on the Trophic State of Surface Waters*”

John Hendrickson gave an introduction to this presentation. He noted that a problem had been identified with eutrophication and nutrient enrichment methods for measuring inorganic nitrogen and ammonia. Organic nitrogen accounts for one-half to three-fourths of total nitrogen in Florida. There is the question of what forms it takes and how easily it is assimilated.

With this project, they set out to enhance our chemistry and analytical tools by testing the lability of organic carbon and the likelihood that nitrogen would be incorporated into biota. This project was conducted by the University of Florida with Florida State University (FSU) as a contributor as well.

Mr. Hendrickson noted that drought prevented some sampling during the variety of rainfall conditions that was planned. Mr. Hendrickson then introduced Todd Osborne from the University of Florida-Institute of Food and Agricultural Sciences (IFAS).

Mr. Osborne noted that the export of carbon is a major system driver. The investigators on this project looked at energetics. In the Everglades, organics are utilized as water flows south through the system.

Mr. Osborne reviewed the regulators of organic matter including decomposition. He reviewed the sources of organic matter (OM) and the fate of OM in biotic and abiotic forms. He mentioned mineralization, sedimentation and assimilation (building biomass). The ecological functions of dissolved organic matter (DOM) include: 1) Energy; 2) Carbon storage; 3) Source/sink of essential nutrients; 4) Source/sink of metals and major cations; and 5) Light attenuation.

The research area includes the Upper, Middle and Lower St Johns River Basins.

The phases of the project include: 1) Trial of methods and evaluation; 2) Refinement of techniques and incorporating seasonal and synoptic sampling; and 3) Synthesis of data and modeling effort to develop metrics of organic matter.

In Phase 1 they worked on characterization of organic matter. They reviewed techniques to look at particulate organic matter (POC) and dissolved organic matter (DOM). They looked at carbon isotopes (^{12}C , ^{13}C and ^{14}C). With ^{13}C analysis they can use the differences in photosynthetic rates of different plants to predict what kind of plants are associated with carbon processing. With ^{14}C analysis, they use to predict the age of the carbon using the known half life of ^{14}C . There is an issue with this procedure as process/lab method to date the ^{14}C is expensive.

There was discussion and questions about the radioisotope results from Phase 1 of the study.

Mr. Osborne also reviewed their analysis of stable isotopes. C^{13} and N^{15} analysis was performed on both DOM and POM samples. There was a big variation in the results which makes them valuable to assess organic matter and to pinpoint changes.

Mr. Osborne described their spectrofluorometric analyses. These are rapid, inexpensive techniques that yielded information on the structure of DOM and functional groups. Through these techniques they looked at specific ultraviolet absorbance (SUVA). The results yielded a minimum of 2.03 and a maximum of 4.17 SUVA. The results rated the amounts of aromatic functional groups using ultraviolet light. The results correlate to the type of organic matter and

the source (soil, terrestrial, etc.). They used a fluorescence index to differentiate between autochthonous and allochthonous sources of carbon. Mr. Osborne noted that fulvic and humic acids are the primary components—terrestrial is low on the index and phytoplankton is high on the index.

Mr. Osborne reviewed Excitation Emission Matrix (EEM) Scanning techniques. He noted that fluorescence spectrophotometry permits measurement of excitation.

There was discussion about man-made compounds that would interfere with fluorescence. Mr. Osborne acknowledged that it is possible that wastewater treatment plant (WWTP) discharge could affect fluorescence. Work is being done by another group to identify those effects.

There was a question about optical brighteners and whether they could interfere with the results. Mr. Osborne responded that he wasn't sure but it was an interesting question.

Mr. Osborne used an example of an Alaskan lake that demonstrated carbon material breaking down through bacterial processes and light degradation.

Mr. Osborne reviewed enzyme assay techniques that were evaluated such as Beta-glycosidase and phosphatase. Bioavailability assays were done where particulate organic matter and dissolved organic matter were subjected to microbial decomposition in controlled settings to measure potential loss of carbon to decomposition. The assay allows for decomposition of the total bioavailable fraction. They ran the assay for 28 days using 2 ppm of phosphate and 6 ppm of nitrate plus NH_4 . There was high variability in the results—from five percent to 50 percent range and that does not include photolytic decomposition.

Mr. Osborne reviewed the future work planned in Phase 2 of the project.

Someone asked what is driving this work.

John Hendrickson responded that these are diagnostics for the water quality model. There is a distinction of organic carbon in the model. The District scientists would like to have a defensible methodology for defining organic carbon in the water quality model and they have been frustrated with current analytical techniques.

Wayne Magley asked if there were plans for longer-term experiments.

Mr. Osborne responded that they have done longer term assays in other areas--up to 80 days--but most of the carbon is used after 28 days (with optimal nutrient levels maintained), so there is little reason to run longer tests.

Mr. Magley asked if there were plans to look at anaerobic processes in the sediments.

Mr. Osborne replied that they are not planning to look at those in this project.

Lucy Sonnenberg asked if they saturated the samples with dissolved oxygen and whether they had considered running the experiments with lower dissolved oxygen.

Mr. Osborne noted that they never got above 10 mg/L of dissolved oxygen so they were not hypersaturated with oxygen.

Ms. Sonnenberg asked about chemical decomposition.

Mr. Osborne stated that they don't show any chemical oxygen demand.

Presentation: “Using Algal Scrubbers to Reduce Nitrogen and Phosphorus Pollution”

Tiffany Busby introduced Mark Zivojnovich & Margaret Palmer with HydroMentia Corporation. Mark Zivojnovich reviewed some of the alternatives for treating phosphorus (P) and nitrogen (N) to improve water quality. For point sources, there are technologies available to achieve increased nitrogen and phosphorus reductions. For nonpoint sources, there are best management practices

(BMPs) and regional treatment systems. Their company provides a technology to treat nonpoint source pollution based on a technology that was developed at the Smithsonian to clean aquariums; it used periphyton to capture N and P. Application of this technology includes a California site for secondary treatment and treatment of agricultural runoff in South Florida. In South Florida they have been able to take water with 10-20 mg/L of P and reduce the P concentration to 6 mg/L P. They are conducting a pilot program in Lake Okeechobee to lower N and P levels as low as possible at the lowest possible cost.

The system is a single stage pass through system that was the cheapest alternative for the South Florida site. The system treats 11 million gallons per day (MGD). There is a 300 foot flow path and a seven to ten minute detention time. The water pulse-flows through the system which increases the productivity of the periphyton.

In the treatment system, organic P is converted to ortho-phosphorus. Both organic and inorganic P are removed. The periphyton mat is removed periodically. The periphyton is a native algal species—the species change depending on the local temperature. Maintenance includes removing the solids and de-watering the materials.

At the Lake Okeechobee site, they centralize the solids recovery and they can be composted for a fertilizer product. A 25 MGD facility produces 250-500 tons of product per year. There is a good market for these materials. It is also possible to use the solids for energy production by using an algal digester. There are four facilities currently in Florida that are under construction or almost complete. You can also have a split system to divert water to one side while harvesting the other.

Mr. Zivojnovich reviewed the removal rates of N and P using the system. Advantages include: 1) Increased pollutant removal rates; 2) Reduced land requirements; 3) Reduced treatment costs; and 4) Quantifiable performance. Technology applications include regional stormwater treatment and wastewater treatment upgrades.

There was discussion about how the operator removes the periphyton mat and the equipment used.

A TAC member asked if nutrients have to be added to achieve optimal removal.

Mr. Zivojnovich responded that with hyacinth pre-treatment, they did supplement with nutrients. With the algal scrubber system, they have not added nutrients.

Cindy Cosper asked if the finish water is discharged to Lake Okeechobee.

Mr. Zivojnovich answered that, yes, it is.

Dana Morton asked what the watershed land use is for the pilot project.

Mr. Zivojnovich responded that in the Okeechobee watershed, the land use is agriculture. In the Indian River Lagoon, the land use is citrus converting to urban. The other project watersheds are primarily urban.

Mr. Zivojnovich noted that with a 300 foot flow way, the system removes 29 percent of nitrogen and 33 percent of phosphorus (incoming water has 1.8 mg/L of nitrogen and 383 parts per billion of phosphorus).

At some point, the system becomes carbon limited. But through lengthening the flow way or by putting systems in series helps to allow the pH, etc. to stabilize.

Someone asked about possible sources of CO₂ (e.g., a power plant).

Mr. Zivojnovich noted that Massachusetts Institute of Technology (MIT) is studying that right now. The main issue is that phytoplankton is hard to get out of the water.

Vince Seibold and Tiffany Busby thanked Mr. Zivojnovich for his presentation.

Lower St Johns TMDL Update

Ed Cordova described the recent legal challenges to the changes to the impaired waters rule at the federal level. He noted that at the federal level, when a challenge is filed, the State-adopted measures stay in place during the challenge process. The site-specific alternative criterion (SSAC) has been challenged in federal court. Motions to intervene have been filed by several parties including the Florida Department of Environmental Protection (FDEP), the pulp and paper industry, and JEA. Currently, there is an interpolated estimate of the TMDL based on the SSAC. The State and the Water Management District are working on the model run to verify the reductions needed (TMDL) to meet the SSAC.

In the meantime, the State is taking steps to develop a new TMDL based on the SSAC for dissolved oxygen in the Lower St Johns main stem. There was debate about the final allocations which will affect the model run. It was noted that the point source numbers are well-known. The nonpoint source numbers for the individual entities have recently been determined and there is not consensus on the fairness of the allocation. It was noted that the project collection sheet was about to be sent to the nonpoint source entities (urban and agricultural sources, as well as MS4 permittees).

Mr. Cordova acknowledged there had been much discussion about the nonpoint source allocations in the joint TMDL Executive Committee and Stakeholders meetings in recent months. He noted that once a new TMDL has been determined based on the model run, then the basin management action plan (BMAP) will be adopted. The BMAP will be enforceable through National Pollutant Discharge Elimination System (NPDES) permits and through the BMAP itself.

SWIM Plan Update/Review of SWIM Objectives

Kraig McLane gave an introduction to the plan to update the 1993 Lower St Johns SWIM plan. He noted that two River Summits had been held since the SWIM plan was adopted and those plans and accomplishments supported and furthered the SWIM plan objectives. However, it seemed an appropriate time to formally update the SWIM plan at this time with TAC input and agency contributions. The St Johns River Water Management District staff is taking the lead in initiating the various sections of the document but TAC input and volunteer writers/editors are welcome.

Tiffany Busby explained that as a first step to updating the SWIM plan, the goals and objectives require review and updating. She then led the group through a discussion of the 1993 goals and objectives and suggestions for updating the language. The revised goals and objectives, based on the TAC recommendations, are attached in a separate table.

Update on Report Card Effort

Dana Morton noted that the most recent proposal from the University of North Florida (UNF) and Jacksonville University (JU) had been sent out via e-mail to the TAC members in the past week. Mr. Morton reported that the City of Jacksonville Environmental Protection Board (EPB) reviewed the proposal on December 11, 2007. The request was for funding of \$223,012 for a two-year effort. The EPB recommended funding the proposal. Next, the proposal will be forwarded to the Mayor's Review Committee and the full Jacksonville City Council.

This entire process usually takes 12 to 14 weeks (if approved at all levels) before the appropriation is made. Some comments were received on the proposal from the St Johns River Water Management District and the Florida Department of Environmental Protection. JEA provided verbal comments at the EPB meeting.

The project is not controversial but the process is a difficult one. The proposal steers away from the Chesapeake model for report cards where progress is categorized as “improving” or “not improving,” because in some cases there may not be sufficient information to make these judgments.

Lucy Sonnenberg noted that the proposal has targets were data can be located.

Mr. Morton added that the proposal does not include any new monitoring—only data collection and analysis.

Ray Bowman noted that the project team will seek guidance and input from the TAC.

Regular Updates

Final list of funded projects for FY07

Kraig McLane noted that the project list that was presented at the August TAC meeting was submitted to the Governing Board for approval. The list of projects is essentially the same as last year but in different priority order. Mr. McLane noted that the list approved by the Governing Board has two projects listed as the top priority and they are listed as “1A” and “1B.” Project 1A requests \$15 million for “Reuse and Treatment Projects.” Project 1B requests \$12 million for “Tributary Remediation.”

Mr. McLane noted that it is unlikely that the Legislature will fund the Lower St Johns Initiative in excess of the total \$27 million requested for the first two projects. Therefore, it is unlikely that projects listed after “1A” and “1B” will receive funding in the next fiscal year. If there are entities that have projects listed as number two or below on the priority list should think about alternate funding sources.

Mr. McLane noted that funds for the current fiscal year are going through the contract process or are underway.

NE Florida Utility Managers Meetings

Kraig McLane reported that the Northeast Florida Utility Managers group evolved from the optimization analysis to meet the TMDL. This group is currently working to develop a project list on reuse and treatment projects for future funding. The next meeting is scheduled for January 26, 2007 at 10 am at the St Johns County Utility Department’s new building off SR 16 in St Augustine. Anyone interested in attending these meetings or receiving their information can contact Mr. McLane or the District’s contractor Charlotte St John.

Fecal Coliform TMDL Update

Vince Seibold reported that there are some adopted TMDLs for fecal coliform impairments in the Lower St Johns tributaries. More TMDLs are expected in 2007. There are 51 listed tributaries for fecal coliform impairments in the Lower Basin. If anyone is interested in participating in the basin management action plan (BMAP) process for the fecal coliform TMDLs, please contact Mr. Seibold or Tiffany Busby to be put on the e-mail distribution list.

Fisheries Data Collection Update

Russ Brodie reported that there have been no changes to routine sampling in the Lower St Johns. The St Johns River Water Management District has provided a second year of funding to expand monitoring in the southern portion of the Lower Basin. The most recent annual report is available to anyone who would like a copy.

Mr. Brodie noted that there were low dissolved oxygen measurements at three sites. There are two years of data for two of three sites. There is now sufficient data to start analyzing the results.

Shortly, there will be a paper out on the fisheries in the St Mary's River.

Mr. Brodie added that they are working on their pompano analysis. The manuscript is almost complete and includes data from Cumberland Sound, the Nassau, and the St Johns outlet.

Mr. Brodie noted that there is interest in a push for re-population of the Atlantic Sturgeon (*Acipenser oxyrinchus*) population in the St Mary's River. They are looking at the feasibility of this type of initiative right now. U.S. Fish and Wildlife Service is the lead on this possibility. Kraig McLane reported that the St Mary's Management Committee's recent newsletter had a report on this initiative.

St Johns River Alliance Update

Tiffany Busby noted that there are changes taking place with Alliance staff and Board members. As more information is known, it will be relayed.

Member Updates

Water Education Festival

Felicia Boyd announced that the Watershed Action Volunteers (WAV) program is hosting the Water Education Festival on February 3, 2007, 10 AM to 4 PM at the Museum of Science and History (MOSH) in Jacksonville. Anyone interesting in having an interactive display or volunteering should contact Ms. Boyd.

Big Fishweir Creek

Mike Hollingsworth stated that the project for Big Fishweir Creek still has federal funding. There is a \$5 million cost limit. The Army Corps of Engineers is moving into the environmental assessment/NEPA coordination phase. This is a year-long process followed by a six month approval process and six months of design following by the project's construction. The TAC members will receive a scoping letter. There will be a possible site visit to the Creek and alternatives. There are no selected alternatives yet.

Change to TAC Co-Chair

Mr. Hendrickson announced that he had enjoyed his tenure as a TAC co-chair but it seemed an appropriate time to rotate this responsibility among the District staff. Dean Dobberfuhl has agreed to act as the future TAC Co-chair representing the St Johns River Water Management District. The TAC members thanked Mr. Hendrickson for his time and service to the Technical Advisory Committee and welcomed Mr. Dobberfuhl to the co-chair post.

Next Meeting Date

The next meeting will be held in February or March 2007. The host will be the St Johns River Water Management District. No dates or conferences were mentioned to avoid for

the meeting date. Tiffany Busby and Dean Dobberfuhl agreed to work on setting a meeting date and location.

Adjournment

The meeting adjourned at approximately 2:15 PM.

Meeting notes taken by Tiffany Busby, Wildwood Consulting. Please send comments to busbytl@bellsouth.net or call 904-797-2721.