

LOWER ST. JOHNS TECHNICAL ADVISORY COMMITTEE (TAC) MEETING
University of North Florida – University Center
Room 1059
Jacksonville, FL
April 28, 2009

Participants

Khalid Al-Nahdy, FDEP	Justin Levine, COJ
Shelley Beville, TNC	Pam Livingston-Way, SJRWMD
David Bolam, CCUA	Eduardo Marin, USACE
Richard Bryant, Timucuan Preserve	Kraig McLane, SJRWMD
Robert Storm Burke, SJRWMD	April Moore, UNF
Tiffany Busby, Wildwood Consulting	Dana Morton, COJ
Ivan Chou, SJRWMD	George Myers, FDEP/CAMA
Karen Coffman, SJRWMD	Alan Obaigbena, FDOT
Ed Cordova, JEA	Pat O'Connor, FDEP
Mike Corning, CMC/WSEA	Ying Ouyang, SJRWMD
Barry Cotter, COJ	Marcy Policastro, Wildwood Consulting
Betsy Deuerling, COJ	Dick Powell, USACE
Dean Dobberfuhr, SJRWMD	Radha Pyati, UNF
Jen Heintz, Golder Associates	John Radtke, Putnam County
John Higman, SJRWMD	Ron Roberson, COJ
Mike Hollingsworth, USACE	Vince Seibold, COJ
Jim Horton, MACTEC	Yasmin Serrano, UNF
Nam Huynh, COJ	Lucy Sonnenberg, JU
Chuck Jacoby, SJRWMD	Paul Stodola, USACE
Debbie Kristiansen, St. Johns County	Jessica Weatherby, Jones Edmunds
Michele LaCasse, SJRWMD	Pat Welsh, UNF
J. David Lambert, UNF	Quinton White, JU

Welcome and Introductions

Tiffany Busby welcomed the participants and thanked the University of North Florida (UNF) for the meeting room and arranging the webcast. Tiffany introduced Radha Pyati, the Director of the UNF Environmental Center and host of the TAC meeting. Radha welcomed everyone to the UNF campus and stated that the Environmental Center works with students, faculty, staff, and the community. The St. Johns River is a central focus area for the center. The Environmental Center has two main St. Johns River programs: 1) a houseboat trip with students for 8.5 days and this trip will be discussed during the meeting today; and 2) the State of the River Report, which is prepared in collaboration with Jacksonville University (JU) with the support of the City of Jacksonville. Radha stated that they are thankful for the TAC members that reviewed the report and noted that the report will be publicly released this summer.

UNF Environmental Center St. Johns River Multidisciplinary Transformational Learning Opportunity, April Moore, University of North Florida Environmental Center

April Moore stated that the houseboat trip is part of the Transformational Learning Program, which is a total immersion program through UNF. The trip took place over spring break and involved 11 participants, of which seven were students from a variety of majors. The students met the houseboat at Hontoon Island State Park and they traveled south to Brick Yard Slough. The focus of the trip was on the Middle Basin because the width of the river in that area allowed the students to feel more connected to the river. The houseboat visited several locations in the Middle Basin and the students had the opportunity to meet with experts in various fields along the way. The students are writing an op-ed piece about the trip that will be published in the school paper and potentially other papers. In addition, the trip engaged students in projects where they could learn from each of the disciplines represented by the other students.

The theme of program is to bring students to the St. Johns to become connected to the river through their discipline. The program is funded by UNF, Cummer Family Foundation, and Environmental Center. Students that are juniors, seniors, or graduate students can attend the trip.

George Myers asked if they follow the same route for the trip every year. April responded that they followed the same track the last two years but in previous years a different route was taken. The trip next year will start in Palatka so they can visit Lake George.

Analysis of the Potential Environmental Effects of Surface Water Withdrawals on the St. Johns River – Methods and Preliminary Results, Dean Dobberfuhl, St. Johns River Water Management District

Dean Dobberfuhl noted that this presentation is the same one that Ed Lowe (SJRWMD) gave to the National Research Council (NRC) panel of reviewers. The presentation provides background on why the alternative water supply study was initiated and some of the preliminary results from the Phase 1 analysis, which will be used to focus the topics for Phase 2. The Florida Water Policy lays out the purposes of the water management districts and two of the major roles are to provide water for existing and future uses and to provide sufficient water for natural systems. The ultimate goal is for sustainable use and protection of water resources and this study will use science to help determine the necessary balance. Florida has water issues because although the state receives a lot of rain, it has a high population density. In addition, evapotranspiration is high and the requirements of the natural and man-made systems are high.

Groundwater resources are insufficient to meet the growing needs in the state; therefore, water conservation and alternative sources will need to be utilized. Every five years, the St. Johns River Water Management District (SJRWMD) prepares a water supply plan to identify water supply needs and sources. Throughout the SJRWMD there are existing and planned alternative water supply projects including seawater, brackish groundwater, and surface water. The existing groundwater use in these areas will remain the same but additional water will be provided through alternative sources. SJRWMD also sets minimum flows and levels (MFLs) to provide protection for the waterbodies.

The study seeks to answer questions such as what are the environmental effects of withdrawals, which effects are important endpoints, what mechanisms link endpoints to withdrawals, what metrics can be used to quantify the effects, what level of each metric defines a significant environmental boundary, and what are the requisite hydrological boundaries. The study team includes Ed Lowe (Chief Scientist), Pete Suscy (Chief Engineer), and Tom Bartol (Project Manager). Study groups were formed for hydrology, biogeochemistry, plankton, benthos, littoral zone, fish, and wetlands. The study groups consist of SJRWMD staff and outside experts. In addition, the study is undergoing peer review by the NRC of the National Academy of Science. The study will link the effect of withdrawals through credible mechanistic chains, which include direct effects, indirect effects, and secondary indirect effects. The group will attempt to quantify the effect of each step in chain and look for sensitive endpoints to assess their ecological significance. The significance will be determined based on the strength of the effect, its persistence, and the likelihood of occurrence. The main focus will be on those effects that are strong, persistent, and likely. The study groups held a brainstorming exercise to determine all potential effects of withdrawals, which they then analyzed to identify those effects that should be studied in Phase 2.

To assess biogeochemistry, the study group determined that the phosphorus loading rate is an important endpoint. SJRWMD has fairly extensive phosphorus data that they were able to use in this study. They found that between Mayport and DeLand, the river levels are strongly connected to the ocean and the river withdrawals matter very little. Therefore, the effects from changes in water levels from withdrawals will be negligible in the Lower St. Johns River (LSJR) Basin, very low in the Middle Basin, and low to moderate upstream of DeLand. While water level does not have a big impact, changes in water level can be amplified through the chain of causation. For instance, a small change in water level could greatly affect wetlands. The group used a model to estimate the effects on wetlands based on the full

withdrawal rates. They found that wetlands would be exposed for an additional 19 days over 40 square kilometers, which results in 272 kilograms of total phosphorus per year. The group will need to do further work to determine if this load is significant for the river. John Higman asked how they determined the baseline condition for the wetlands. Dean responded that it was based on current data and the numbers of days the wetlands were dry.

Plankton is a recurring problem in the LSJR and Lake George with algal blooms usually occurring in late spring/early summer. The residence time of the water is a factor in the blooms and the plankton study group focused on the change in flow rate caused by withdrawals that could decrease the flushing rate, which increases water age. Greater flow increases nutrient loading but decreases plankton because the residence time is decreased. This is a sensitive balance and they trying to understand how withdrawals would affect it. An increase in blue-green algae dominance can increase the potential for toxin production and phytoplankton blooms can suppress desired zooplankton. In addition, the number of days wetlands are exposed increases phosphorus, which also affects phytoplankton levels. Dana Morton noted that light is a limiting factor in the river and asked if there is a way to model how long a parcel of water is in the photic zone. Dean responded that the model shows the withdrawal and how it propagates downstream. They can calculate where a parcel of water is located and where the photic zone is so they may be able to get this answer.

When there is an increase in salinity, there is an increase in submerged aquatic vegetation (SAV) mortality and a decrease in growth and reproduction. The study group reviewed literature to create a table of salinity, time, and potential harm. Salinity varies in the river in wet and dry years and historical data were used to model SAV mortality rates based on salinity over time. There is a greater extent of SAV mortality during the dry years. The next step in the process is to add water withdrawals to the model to determine areas where there is an increase in SAV stress and mortality. SAV has already died off in parts of the river due to droughts and they need to determine if the water withdrawals will make the situation worse. The study group is using real time salinity monitoring to see effects on SAV, which is critical because there are major changes in salinity week to week. The group has estimated the increases in salinity in the dry season for different conditions such as withdrawals and channel deepening. The group found that channel deepening has the potential for a large increase in salinity. There is little potential for SAV upstream of the Palatka bridge so any changes would contract the distribution of SAV instead of shifting it. The reduction in SAV would affect macroinvertebrates and, as the salinity increases, there will be a decrease in community diversity and abundance. The benthos study group is focusing on white shrimp and blue crab in freshwater section. In addition, crayfish and apple snails can be used as indicators of changes in hydrology.

There are approximately 170 species of fish in the St. Johns River. The fish study group is working to identify species that could be vulnerable to changes in water levels and that could be directly impacted because of entrainment and impingement. Ichthyoplankton sampling will be conducted at proposed withdrawal sites to determine the magnitude and seasonality of populations. The American Shad is a species of concern and has specific depth requirements for migration for spawning and velocity needs for spawning.

The wetlands study group is studying the effects of withdrawals to determine shifts in plant type or communities and any change in the functions, which would affect the species that use the wetlands. They delineated the watershed to identify areas that could be wetlands and removed any seepage wetlands since their inundation is not driven by river levels.

Phase 2 of the study will refine the response functions to determine how they relate to one another, delineate environmental effects boundaries, identify potential for crossing boundaries at various levels of continuous withdrawal, and recommend approaches for avoiding adverse effects. The group will respond

to peer review by the NRC and also document findings in a final report. The report should go to draft next June (2010).

Quinton White asked how SJRWMD is defining “significant harm.” Dean responded that this is part of the MFL definition. The goal of this study is not to look for levels of significant harm but to identify conditions that do not change the environment unacceptably. They are aiming for a level higher of protection than the MFL because they do not want to push the system to a level of significant harm. Quinton noted that water level is not the only impact because freshwater inputs are also key and he asked if they were going to look at the consequences of a reduction in freshwater. Dean responded that they are trying to include that type of work in the study. The benthos group will be adding benthic collections in the marine reach and efforts have been made to collect ichthyoplankton further downstream than they previously have collected.

Pat Welsh stated that the presentation noted the need for real time data for salinity and he has found that we are losing real time data collection due to funding cuts and reprogramming of efforts. Pat asked if they are making any recommendations to increase the collection of real time data. Dean responded that this is always a recommendation but real time data are expensive to collect. George asked if the water withdrawals would stay relatively constant since the demand is fairly constant. Dean responded that the demand curve is usually smoother than the supply curve. When SJRWMD issues a consumptive use permit they include conditions to limit the effects. In addition, permits are only issued for a set period so the permit conditions can change on renewal if the effects turn out to be harmful.

Pam Livingston-Way asked if the research is being conducted to look at cumulative effects of the withdrawals at all potential sites. Dean responded that they are working in geographic basins using separate models to look at the withdrawal sites within basin. They are considering merging the models to look at the cumulative effects. Pat noted that a major hurricane would have strong and persistent effects, although it is not likely. Hurricanes should be considered with potential storage to put water back in the aquifer. Dean responded that there is storage in the Upper Basin but even with storage there is rarely enough water to satisfy all needs downstream.

Baseline Watershed Scale Evaluation of Oyster Reefs in Northeast Florida, Shelley Beville, The Nature Conservancy

Shelley Beville stated that a baseline survey of oyster reefs in Northeast Florida was conducted from August 2007 to November 2008 in the Nassau River estuary. The project area includes the St. Marys, Nassau, and St. Johns rivers and encompasses many different habitats. In this area, increases in urban growth and coastal development led to declining water quality, which is why the Three Rivers Conservation Coalition was formed. The study includes both water quality and a biotic component. Oysters were selected since they are a key indicator of ecosystem health and the oysters in Northeast Florida have not been evaluated in approximately 13 years.

The Eastern Oyster (*Crassostrea virginica*) is found along the entire coast of Florida and there is very little information on the extent and condition of oysters in Northeast Florida. The oyster has known optimal salinity, temperature, and dissolved oxygen ranges and temperature is the most important factor for spawning. Oysters grow together and form reef habitats. Threats to oysters include disease, parasites, oxygen concentrations, temperature, turbidity, and food availability. Man induced threats include water quality decline, habitat destruction, altered freshwater flows, exotic species, and the shellfish industry.

The goal of the survey project was to examine the current spatial distribution, investigate abundance and size frequency, study historical distribution, and compare oyster data with City of Jacksonville long-term water quality data. They started with ground mapping and aerial photography interpretation and the focus was on three areas: Clapboard Creek, Pumpkin Hill, and Sisters Creek. There are two distinct types of reefs, patch reef and fringe reef, and they also found a combination which they called patchy/fringe.

Global Positioning System (GPS) technology was used to measure the beds and the border of each of the reefs was determined. If a reef was within three meters of another reef, then those reefs were defined as multi-patch. If the reefs were more than three meters apart, they were defined as adjacent.

The Coalition contracted for aerial photography of Clapboard and Sisters creeks. The photography had to be taken at low tide, a specific altitude, and a specific angle of the sun to reduce shadows. In addition, they used a random sampling analysis throughout the project area. They selected sites within five meters of the shoreline and collected field data for water quality, habitat, nearest reef, oyster density, percent cover, and rugosity (measure of topographic complexity of the reef). For the historical data collection component of the project, they searched library databases, shellfish leases, newspapers, and historical maps.

As part of this project, they were able to map 146 reefs in Clapboard Creek, 266 in Pumpkin Hill, and 26 in Sisters Creek. Approximately 80 percent of the reefs were located in marsh habitat and 85 percent were in muddy organic soil. The aerial photography identified 204 reefs in Clapboard Creek and 302 in Sisters Creek. A total of 7 of the 45 random sites had reefs. The water quality data collected were consistent with the city's data for salinity, temperature, and dissolved oxygen. Data on the nearest reef distances were used to determine density. They found that rugosity is higher in patch reefs than in fringe reefs. In addition, the percent cover and rugosity were highly positively correlated. The majority of the oysters were relatively small based on the information from the random sampling. There was a lack of consistent historical documentation to provide information on extent so it was difficult to compare the current extent to historical information.

Through this study, they were able to map 993 reefs in the system. They determined that future studies should include a greater number of samples and focus on mud flats and tributaries. They recommend that the mapping effort should continue because it is essential for long-term monitoring, percent cover quadrant data should be included during ground truthing, and the salinity gradient and its affect on the reefs should be studied.

Ivan Chou asked if the optimum salinity values presented were the minimum and maximum. Shelley responded that those numbers represent the range that oysters grow well and can reproduce. Dana asked if the small size of the oysters is normal for a reef. Shelly responded that oysters in the Southeast region have slow growing populations. The energy required to spawn keeps the oysters small and also leads to overcrowding, which causes them to grow slowly. George noted that historically there was a shellfish plant in Nassau and he asked where those oysters came from. Shelley responded that the oysters came from that area and there used be large amounts of harvesting. Many of the beds in the area were planted by people who had shellfish leases.

Status of the Marine Science Research Institute at Jacksonville University, Quinton White, Jacksonville University

Quinton White stated that they are in the process of a fundraising campaign and they broke ground on the Marine Science Research Institute in September. The institute will be located on the JU campus overlooking the river and will include an outdoor classroom, docking facility, and an experimental stormwater system. The building will be two stories, approximately 35,000 square feet, and Leadership in Energy and Environmental Design (LEED) certified. The facility will include classrooms, faculty and office space, laboratories, a potential internet link to world-wide research, and a solar powered floating laboratory. The majority of the first floor is storage and locker rooms. The second floor will have the large classrooms/multi-purpose rooms with an observation deck overlooking the river. The Florida Fish and Wildlife Conservation Commission (FWC) fish identification program and the St. Johns Riverkeeper will also have office space in the building.

JU currently has a marine science undergraduate program and will have a graduate program in fall 2010. The building will open in summer 2010 and they are looking for funding for the road and parking facility, a boardwalk over wetlands, and stimulus funding to add more “green” components to the building. Anyone interested in making a donation can contact Quinton.

Tour of the Updated TAC Website

Tiffany stated that the TAC website has been updated to make it a better resource for the members. Any information that is sent by TAC members is posted to the website so everyone has access to the information. The site can be used as a central location to refer people to in order to obtain information related to the Lower Basin. The website is www.lsjr.org and the homepage provides a brief history of the TAC. An archive of past TAC meeting documents is provided and is organized by year going back to 2002. For each meeting, the agenda, meeting summary, and available presentations are posted. The LSJR documents page includes the Surface Water Improvement and Management (SWIM) Plan update and previous versions, links to other SWIM plans, the Basin Management Action Plan (BMAP) for the main stem and links to other adopted BMAPs, TMDL documents for the main stem and tributaries, tributaries technical reports, draft verified list, LSJR Initiative documents, State of the River Report, Low Impact Development (LID) information, and other related information. TAC information, instructions for how to join the distribution list, and contact information for the chairs and other key contacts are posted on the website. In addition, there is a separate page for the legislative initiative and economic stimulus funding and upcoming meetings and conferences. Tiffany noted that the City of Jacksonville Environmental Protection Board Environmental Symposium is scheduled for August 28th at the UNF University Center. The website also includes details on current funding opportunities. Wildwood Consulting is maintaining the website and they are looking for any additional information and suggestions for organization.

Technical Updates and Announcements

St. Johns River Alliance

Tiffany stated that the Alliance held its quarterly board meeting last week in the Upper Basin. They are revising their work plan and conducting strategic planning. The Alliance is also working on the proposal for a St. Johns River license plate, which was submitted by Senator King during the last legislative session and is back up for consideration during this session. In addition, they are planning a River Summit for February 2010, which will involve the entire river.

U.S. Army Corps of Engineers

Mike Hollingsworth stated that the Corps is working on the General Reevaluation Report for the deepening of Jacksonville Harbor. They will hold an informal public workshop on May 28th that will include posters and a brief presentation on the process used to evaluate the projects. The Corps has not determined a depth for the project and they are working on the cost and economic analyses for the project. The Jacksonville Port Authority asked the Corps to review depths up to 50 feet. In their analyses over the past ten years, the Corps had not found a sustainable project option or one that is in the federal interest. Once a location and time have been determined for the workshop, Mike will provide the details to Tiffany for distribution to the TAC. In conjunction with this project, the Corps is also looking at the expansion and addition of disposal areas. One option is to expand the offshore disposal site. The Corps met with the Environmental Protection Agency (EPA) about this site and EPA asked about watershed sediment management. This may be a topic that TAC input will be needed.

The Corps is also working on Phase 3 of the deepening project from north of Trout River to the Tallyrand area. The dredging will start in mid-summer and increase the depth from 40 feet to 42 feet with disposal at Bartram Island. In addition, the Corps is looking at the feasibility of removing the wall at the intersection of the St. Johns River and Intracoastal Waterway that is contributing to erosion in that area. The material removed may be used for marsh restoration. The project proposal is moving through the Corps chain and then will go out for public comment. The Mayport project is officially going forward

although it is being reviewed by the current administration. The Corps has not heard if this project has been included in the Department of Defense budget for next year. At Blount Island, the Marine Corps would like to deepen the loading area at their materials transport facility because the intakes on the ships are filling with silt. There is bedrock in the area and a thick concrete sill that was originally containment for offshore power construction. In order to dredge, all or part of the sill would have to be removed so blasting will be required. The Corps is also planning to start maintenance dredging in the Intracoastal Waterway in the Marsh Landing/Palm Valley area in late summer. In addition, it does not look like the Big Fishweir Creek project will be included in the federal budget this year.

“Upstream Updates” from Upper Basin and Middle Basin

Tiffany stated the BMAP for Lake Jesup is underway. Lake Jesup is a major source of nutrients in the Middle Basin. The BMAP should be completed by the end of summer.

Fecal Coliform Total Maximum Daily Load (TMDL)

Dana Morton stated that the city has been conducting monitoring as part of the intensive sampling effort in the tributaries. Thermal imaging was conducted in February for four tributaries and this will help identify problems in those areas, such as illicit connections. There are ten tributaries that are being intensively sampled through July 2009. Dana noted that \$380,000 was appropriated for this effort with an additional \$120,000 to upgrade the city’s laboratory. In addition, separate funding was provided for microbial source tracking with the University of South Florida and Source Molecular. Tiffany noted that there is a tributaries Basin Working Group meeting next Thursday, May 7th, to discuss the first draft of the BMAP.

Dana stated that he is acting as the Artificial Reef Program Coordinator for Jacksonville and they received a grant from FWC for reef placement offshore. Dana is in the process of obtaining enough scrap concrete for the project. The reef is being coordinated through the Environmental Compliance, Parks and Recreation, and Planning divisions at the city.

LSJR Main Stem TMDL

Khalid Al-Nahdy stated that the Florida Department of Environmental Protection (FDEP) has issued permits for approximately 80 percent of the point sources in the basin. In 12 months, FDEP will be able to determine compliance with BMAP reductions based on the data collected at the facilities. Pat O’Connor stated that they are also working on the logistics for the chlorophyll-*a* sampling in the two worst case waterbody identification (WBID) numbers in the freshwater section. The sampling will start tomorrow and will occur every two weeks. A total of 29 sites will be sampled in each of the two WBIDs. In addition, two dissolved oxygen data sondes will be deployed near Sisters Creek (one at mid-depth and one at three-quarters depth) and one sonde will be deployed at mid-depth in the Clapboard Creek area. FDEP will install the sondes and JEA has agreed to do the calibration and maintenance, as described in the main stem BMAP.

Next Meeting Date

Tiffany noted the next meeting will be held in July or August. Usually at that time of year the TAC reviews the legislative funding requests but it does not appear that funding will be available during the 2010 legislative session. Any ideas for presentations at the next meeting are welcome.

Adjourn

The meeting was adjourned at 2:12 PM.

Meeting notes prepared by Marcy Policastro, Wildwood Consulting. Please send edits or corrections to mpolicastro@wildwoodconsulting.net or call 904-829-0394.