Sustainable Water Resources Roundtable
Meeting at Wakulla Springs State Park, Florida
March 6 - 7, 2013
Proceedings

Putting Sustainable Water Management to the Test

Page

Day 1: Wednesday, March 6, 2013

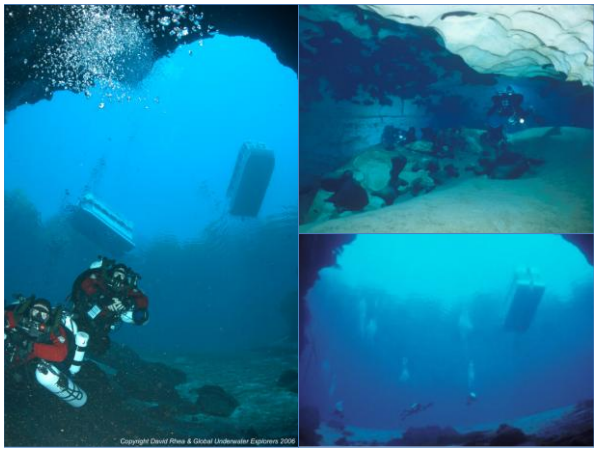
INTRODUCTIONS

Welcome Remarks from SWRR: David Berry, SWRR Manager welcomed the participants to the meeting and reminded them that the Sustainable Water Resources Roundtable was an open informal forum and a place to share information and ideas. Everyone in the room was now by virtue of being there, a member of the SWRR and not merely an observer.

David said that much of the contribution of SWRR over the years has resulted from the connections and collaborations that were initiated at the meeting.

Welcome Remarks from the Florida Hosts: Ron Piasecki, President, Friends of Wakulla Springs welcomed the group and gave a brief background on Wakulla Spring. Wakulla Springs State Park is a protected wildlife sanctuary offering one of the most unique wildlife viewing experiences in Florida. It draws visitors who enjoy fresh water springs, sinkholes, manatees, alligators, wading birds, and other natural wonders.

Ron told the group that underneath them resides the main tunnel of one of the longest and deepest known freshwater cave systems in the world. Wakulla Spring cave descends to 320 feet at its deepest. Divers have surveyed and mapped 12 miles of the cave.



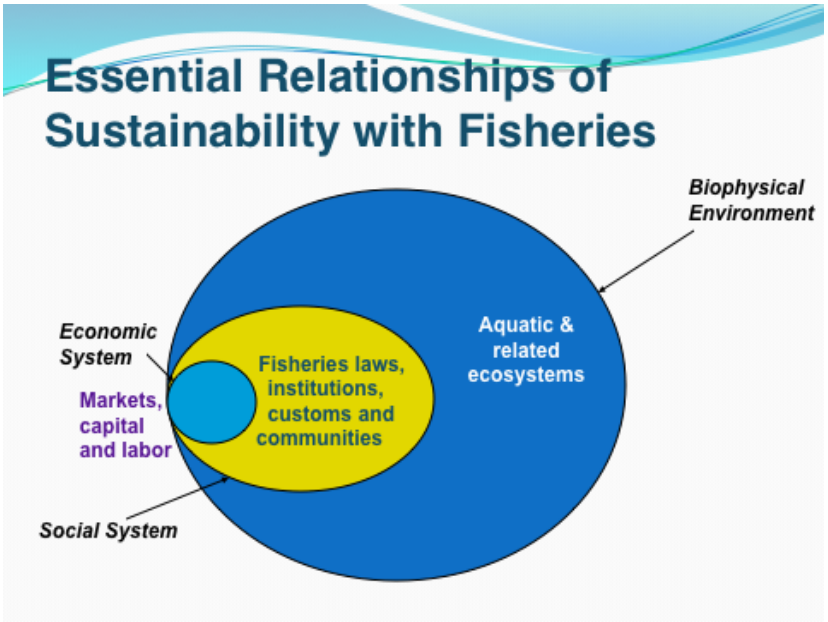
Wakulla Spring divers have set records for lengths and depths of deep water dives. Their efforts have provided data that plays an essential role in understanding and protecting Wakulla Spring. Deep water cave diving is a dangerous activity and the professional divers are respected by the Wakulla community. Imagine that for a 60-minute cave dive it takes about five hours of staged decompression stops during the return to the surface. Recreational diving is not permitted at Wakulla Springs.

Ron invited the group to an evening reception hosted by the Friends of Wakulla Springs.

Sustainable Water Resources Roundtable Activities & History: John Wells, SWRR Co-chair described the roundtable as a national collaboration of federal, state, local, corporate, non-profit and academic interests, as well as a committee of the USGS Advisory Committee on Water Information. The SWRR mission is to promote sustainability of the nation's resources through evaluation of information, development and use of indicators, targeting of research, and engagement of people and partners.

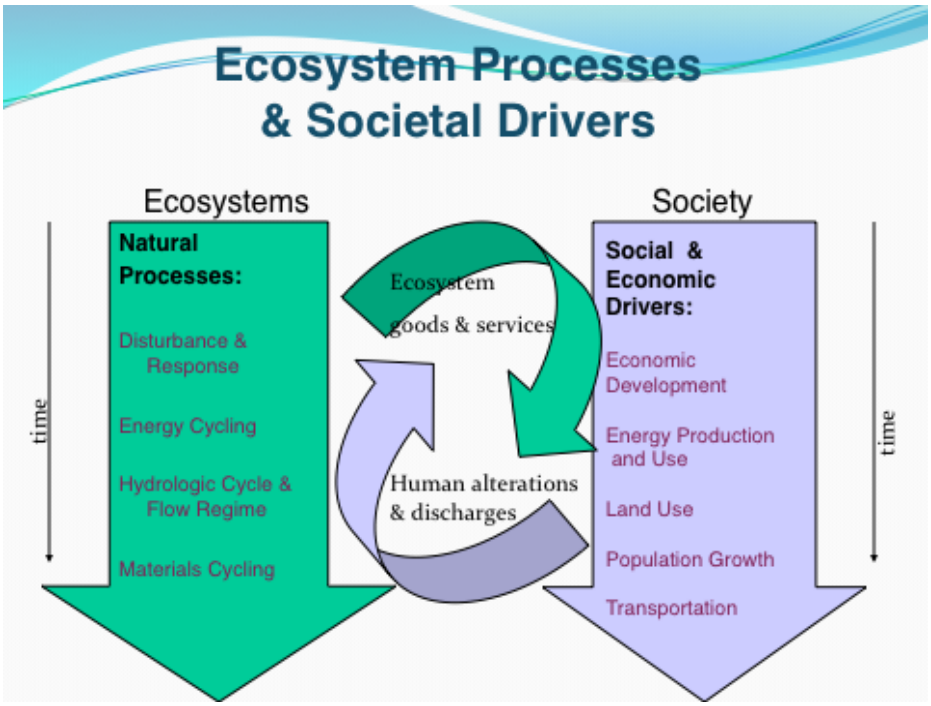
More than 700 participants from federal, state and local governments; corporations; nonprofits and academia have been engaged in SWRR activities, with meetings in California, Colorado, Florida, Maryland, Michigan, Minnesota, Virginia and Washington, D.C. The SWRR website is located at http://acwi.gov/swrr/index.html. Two SWRR reports of note are its 2005 Preliminary Report http://acwi.gov/swrr/Rpt_Pubs/prelim_rpt/index.html and 2010 SWRR Report http://acwi.gov/swrr/Rpt_Pubs/SWRRReportMarch2010.pdf

John discussed the roundtable's "view of the world" to give participants a sense of the intellectual foundation from which the SWRR does its work. He showed the group the "eye" diagram of essential relationships of sustainability with fisheries. The three parts of the eye include the economic system, a subset of the social system, which is in turn a subset of the ecosystem.



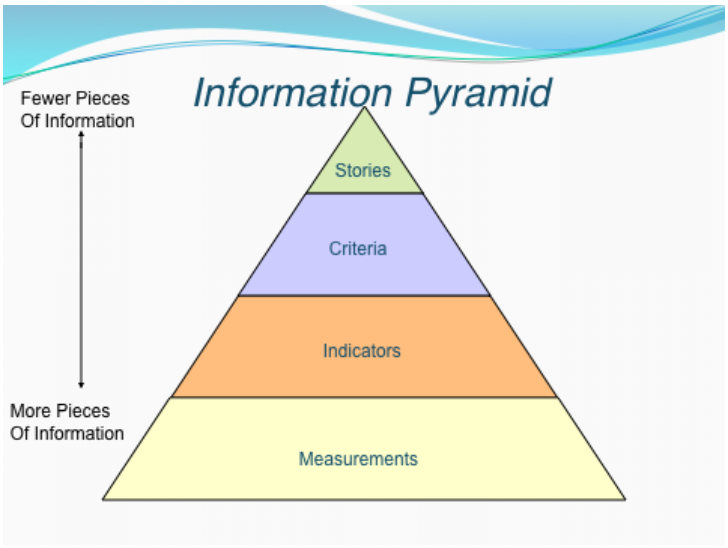
In the case of fisheries, the SWRR refers to the ecosystem of interest as aquatic and related ecosystems – with "related" intended to capture the terrestrial ecosystem elements that affect the aquatic system. The social system includes governmental, tribal and traditional arrangements for managing fishing, and the communities that fishing supports. The economic system includes fishing equipment, labor and market processes for fishing.

Another way the roundtable looks at the world is through the concept of capital. Capital is the capacity to produce value over time. Environmental, social and economic systems produce value through flows of services, experiences, or goods that meet human and ecosystem needs over time. We achieve sustainability by maintaining capital to meet needs.



The processes responsible for natural capital include: disturbance and response, energy cycling, hydrologic cycle and flow regime, and materials cycling. Social and economic drivers that take advantage of natural capital and produce social and economic capital of their own include: economic development, energy production and use, land use, population growth, and transportation.

The figure below represents these forms of "capital" as criteria, which form the basis for indicators of environmental, social and economic well being, and the stories people need to hear about how the environment and society are doing. The roundtable defines indicators as measures that present trends information relevant to water sustainability in a readily understandable way, but John emphasized that indicators that help define and tell stories can have the greatest effect.



The California Water Plan, Blueprint for Integrated Water Management and Sustainability, provides a good example of the role of sustainability indicators in safeguarding water resources. According to the California Department of Water, the entire system – from water and flood facilities to watersheds and ecosystems – has lost resilience and is changing in undesirable ways.

There is an imperative to act to keep pace with a range of changes, from population growth and movement to the shift in permanent crops, increasing flood risk, declining Delta and watersheds, impaired water bodies, climate change profoundly impacting water systems, aging water and flood systems challenged by legal remedies and regulatory protections, to the growing economic and societal consequences of declining water reliability and degraded quality of surface and groundwater supplies. These stories are told by the system of indicators employed in the California Water Plan.

Next John described discussions that the US Army has had with the roundtable. The Army's "water security" efforts have concluded that:

- Water management is largely compliance-driven
- Less attention is directed outward to sustainability of regionally shared water sources
- Long-term water projections are currently not factored early into stationing decisions
- Chronic funding constraints mean attention to Army-owned and Army-operated infrastructure tends to be reactive
- Long-term investment is a challenge

The Army's "Net Zero" program is an important response. It suggests that Army facilities strive for: a) energy installations that produce as much energy on site as they use over the course of a year; b) water installations that do not deplete ground water and surface water resources in quantity or quality; c) waste installations that convert waste streams to resource values with zero solid waste to landfill; d) and installations that capture and commercialize the resource value and/or enhance the ecological productivity of land, water and air.

Finally, John discussed roundtable participation in efforts to aid international water stewardship through the Alliance for Water Stewardship's work in developing an International Water

Stewardship Standard. Its goal is to support water users in taking appropriate actions to evaluate and improve their impacts on watersheds.

The next steps for the SWRR include continuing outreach; building regional connections; adding new private, nonprofit and public sector partners; refining the roundtable's sample indicators; addressing sustainability and scale; linking to national and regional indicator sets; collaborating with other indicator initiatives across the nation; and assisting agencies in describing the need for programs to collect indicator information. More Information is available at http://acwi.gov/swrr

The SWRR Steering Committee also has suggested a number of specific projects it would like to pursue:

- —A handbook for sustainable watershed management
- —A sustainable watershed index generator
- —A framework for indicators in any watershed at any scale by any organization
- —An evaluation of water footprint tools to help organizations understand water sustainability
- —A web-based inventory of water sustainability indicators to share the best ways to grasp water trends

Participants were asked to comment on these or suggest other projects in which they would like SWRR to participate.

Round of Brief Self-Introductions

One of the most popular parts of a SWRR meeting is the one minute round of brief self introduction mentioning each participant's interest in sustainability and water resources. Since an important value of SWRR is the opportunities to make new contacts for collaboration, to hear of the work and commitment of people in the room can be both interesting and inspiring.

PANEL ON REGIONAL FLORIDA WATER ISSUES

Moderator Ron Piasecki, Friends of Wakulla Springs

Natural Gem -- Troubled Waters Jim Stevenson, Former Coordinator of the Wakulla Spring Basin Working Group, Chief Naturalist for the Florida State Park System Retired

Jim Stevenson gave an overview of Wakulla Spring and the water issues it and the region as a whole are facing. Wakulla Spring has a significant impact on the region. It is one of the largest and deepest freshwater springs in the world with one of the world's longest mapped underwater caves. Wakulla Spring discharges 250 million gallons of water per day from the Floridan aquifer to form the Wakulla River. The river flows 10 miles to join the St. Marks River and continues to the Apalachicola Bay.

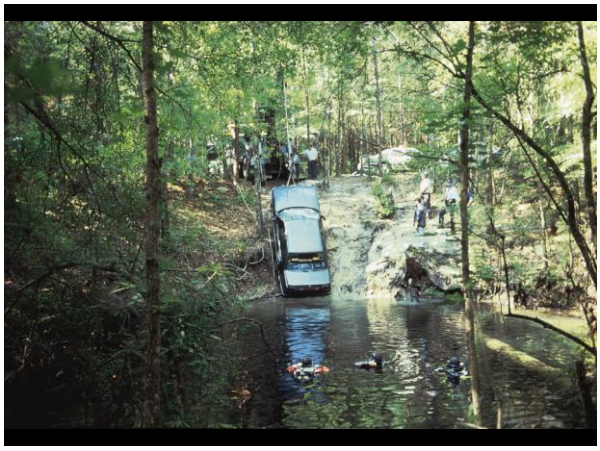
There have been a number of ecological changes in Wakulla Spring over the last twenty years. In 1998 the first manatees showed up, traveling from Kings Bay to winter at Wakulla.

Most of the changes have been detrimental. Wakulla Spring was internationally known for its water clarity; scenes from eighteen feature length films including Tarzan and Creature from the Black Lagoon were made at the springs, and governors, the king of Jordon, and other

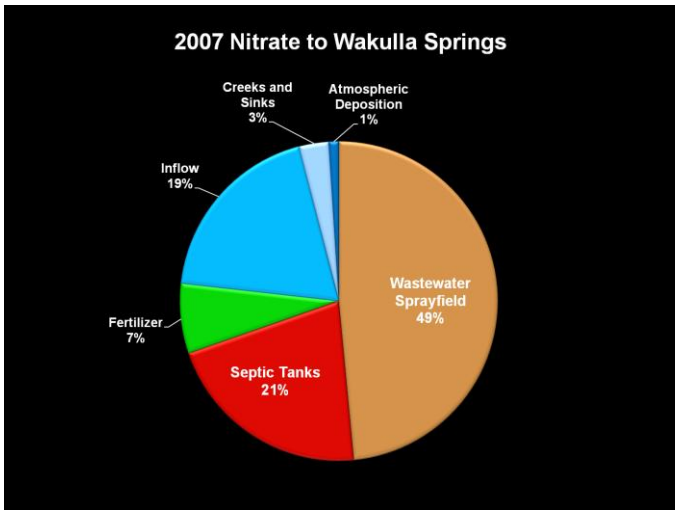
dignitaries regularly visited. Glass bottom boat tours have been a tradition since 1865 but over the last two decades water clarity has decreased and glass bottom boat tours have all but stopped. It is not clear if the change is natural or human caused.

The limpkin, the symbol of Wakulla Spring, disappeared when its primary food source the native apple snail died off. Native eel grass has been taken over by invasive hydrilla and nitrates from septic tanks and agriculture fuel the growth of algae. Together the algae and the hydrilla deplete the oxygen in the water, effectively suffocating the apple snail and other aquatic animals.

In 1992 the Wakulla Spring Working Group was founded to address growing concerns about the health and future of the springs and its ecosystems. Stevenson stressed that one or two agencies alone can not protect the spring, it requires collaboration. Federal, state, and local agencies, scientific, educational, and citizen organizations participated in the Wakulla Spring Working Group. The group focused on education, stakeholder engagement, and development of a restoration plan. Cave divers were a key component of the group. Funding cuts led to discontinuation of the group in 2011.



The Wakulla springshed encompasses both Wakulla and Leon Counties. Lake sinkholes are numerous and surface and ground water are closely linked. Contamination of the sinkholes from activities such as dumping of trash, cattle, and car washing occasionally reach ground water and the Wakulla Spring aquifer. Efforts to protect the sinkholes through fences, purchase of surrounding land, and public education have had some success.



Water quality is a problem for Wakulla. Substantial improvements have taken place through upgrades of wastewater spray fields by the city of Tallahassee. Waste from septic tanks, up to 70mill/liters/tank, percolates down through limestone and reaches the springs. Local governments have agreed to work on the problem.

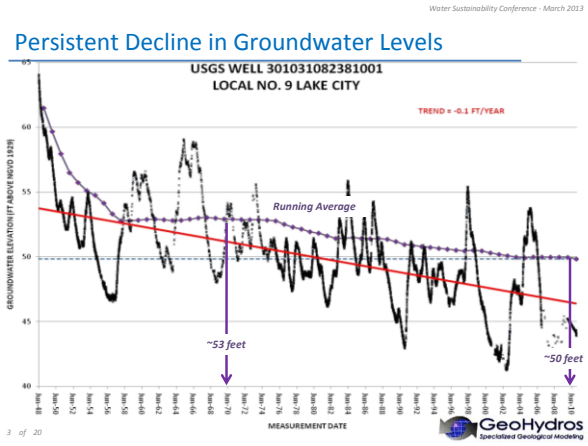
Sustaining the Floridan Aquifer Todd Kincaid, GeoHydros, LLC; Board of Directors, Wakulla Springs Alliance

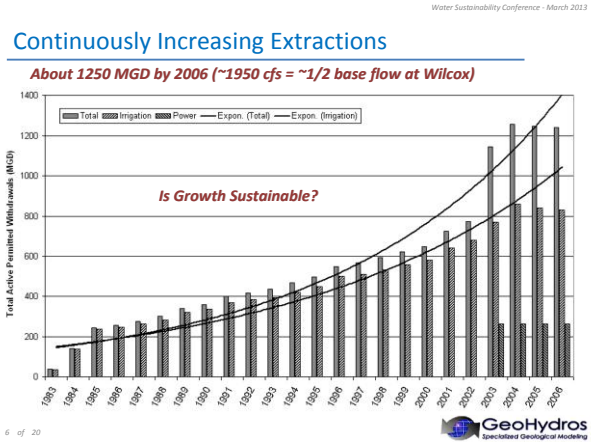
Todd Kincaid spoke about the geography of Wakulla Spring and environs and how the region's karst aquifer affects water flow and management of the aquifer.

Over the last few decades there has been a persistent long-term decline in Floridan aquifer groundwater levels, resulting in a long-term decline in spring and river flows.

The Wilcox gauging station in the Suwannee River Basin provides an example of this pattern. A positive trend in stream flow was recorded in the middle of the last century, now there is a persistent decline in river flow with an average loss of -95 cfs per year.

At the same time water extraction has increased. It is not possible to definitively say that the declines are due to pumping but we do know that permitted pumping extractions from the Floridan aquifer in the Suwannee River Basin have risen exponentially since the early 1980's and are currently about half the base flow of the Suwannee River at the Wilcox station.





The Karstbelt in north Florida extends almost to Tampa and has the largest magnitude of springs on earth. Wakulla Spring can serve as analog to what is happening along the entire Karstbelt.

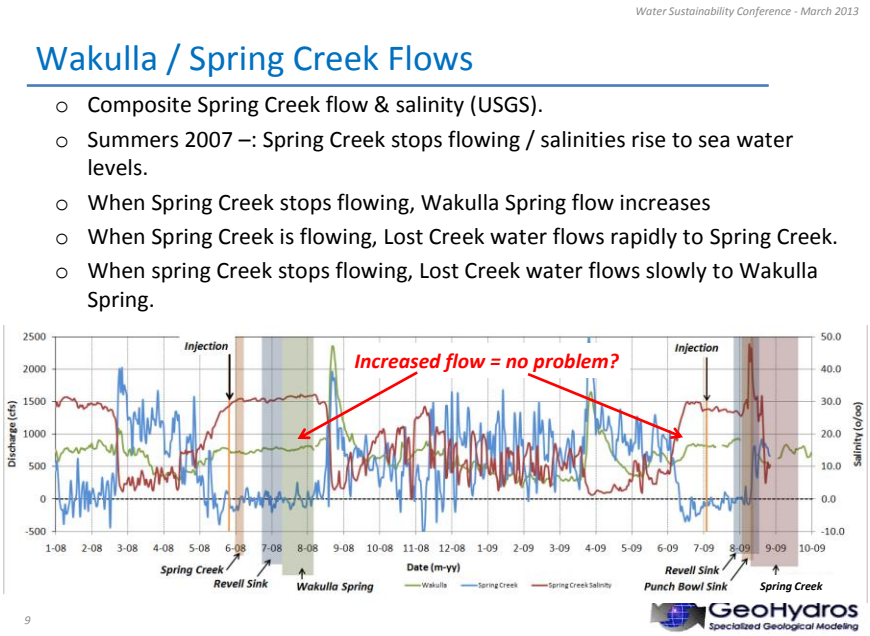
One of the most significant attributes of karst aquifers and what makes them so different from other aquifers is the speed of the flow. They run at hundreds to thousands of feet per day as apposed to 10 to 20 feet in other regions. Groundwater tracing experiments in the aquifer measure these fast velocities. One of the most significant trace studies revealed a rapid flow path connecting the City of Tallahassee's wastewater spray field to Wakulla Spring (~12 miles with a travel time of about 60 days). The trace helped encourage the City to invest $250 million in upgrades designed to reduce nitrate concentrations going to the spray field and thus to the spring.

Another important trace study started in at Lost Creek which flowed to both Spring Creek (as expected) and to Wakulla Spring (unexpected). This shift in flow directions from south to north

occurred as a result of spring flow reversals at Spring Creek that have been occurring at significant levels only since 2006.

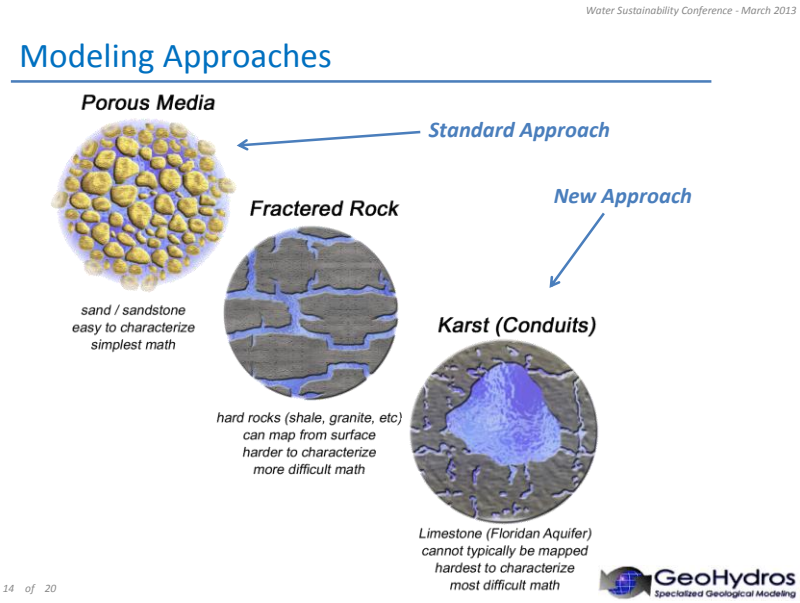
Spring flow reversals are periods when the springs are siphoning water into the aquifer rather than discharging. It is a common occurrence along the Suwannee River when the river floods and drives river water into the caves. When this happens to springs along the coast, it propels saltwater deep into the Floridan aquifer.

The tracer test happened to occur immediately before such a reversal at Spring Creek (the largest spring in Florida). As a result, the reversal was documented and it was discovered that Spring Creek and Wakulla must be connected by one or more large conduits. Those results drew attention to the question of why the coastal springs are reversing and the impact of those reversals on the aquifer and inland spring flows.



Conductivity (proxy for salinity) and the water level were recorded for a sinkhole about 3 miles north of Spring Creek (3 miles inland from the coast) called Punch Bowl Sink, which is connected to the same network of conduits as are Spring Creek and Wakulla Spring. There was an abrupt rise in both conductivity and water level in 2009 when a major Spring Creek reversal period occurred followed by an the abrupt reduction when Spring Creek began flowing again.

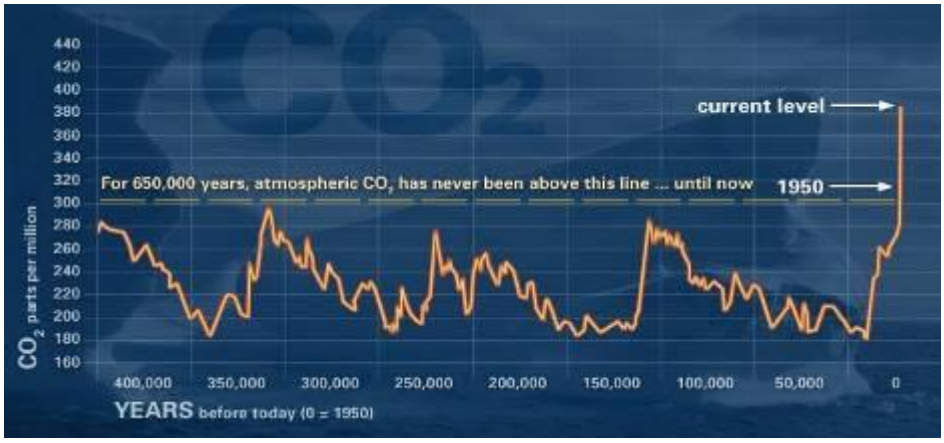
Three types of aquifers are used in modeling of ground water flow paths and travel times: porous, fractured, and karst. The Upper Floridan aquifer is an extremely karstified aquifer in which the spring and river flows are supplied by conduits that drain the aquifer matrix. Yet models for Florida assume a porous media and have not been a good predictor of the declines or the location of impacts.



Tracing studies have found that porous media groundwater flow models have under-estimated travel time as much as two orders of magnitude (100x). The groundwater tracing results negate the veracity of model predictions for both contaminant transport and water supply applications. It is clear that there is a pressing need for better models both for TMDL and for MFL applications.

Potential Effects of Climate Change and Sea Level Rise on Florida's Rivers and Springs-From the Coastlands to the Headwaters Whitney Gray, Sea Level Rise Coordinator, Florida Sea Grant and Florida Fish and Wildlife Conservation Commission

Whitney Grey discussed the potential effects of climate change and sea level rise on Florida's rivers and springs, from the coastlands to the headwaters. She began by providing the current data on climate change and sea level rise and noted that new data from NASA found that levels of C02 are higher now than in the last 650,000 years.

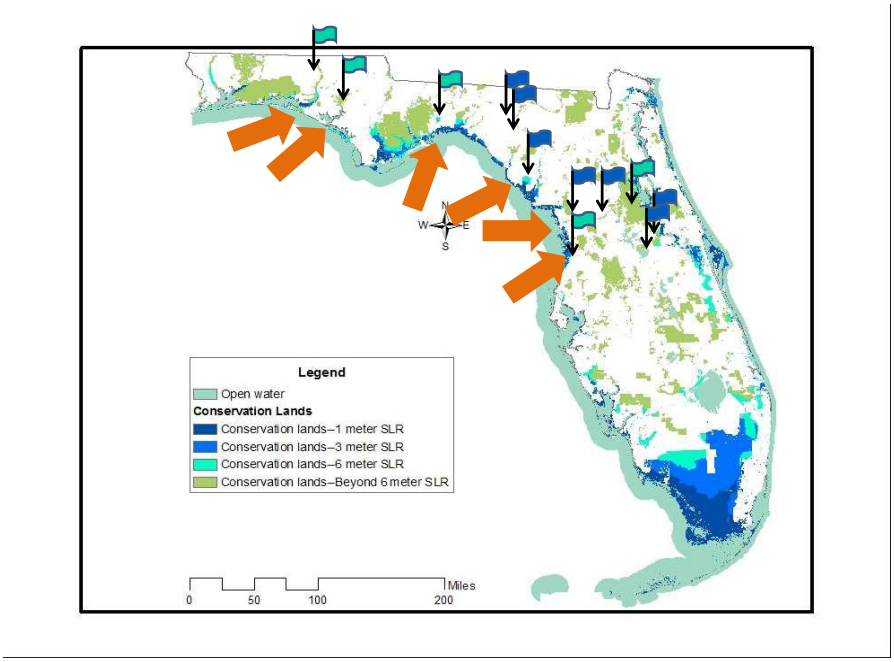


A national climate change assessment is required by law every four years. The third and most recent draft provides predictions for sea level rise by 2100 for four different scenarios. The scenarios used mean sea level in 1992 as a starting point.

- Highest: 6.6 feet
- Intermediate-high: 3.9 feet
- Intermediate-low: 1.6 feet
- Lowest: 0.7 feet

A new approach to planning considers what the intended project is in choosing which scenario to use. For example, with a big, expensive, and permanent project it might be best to look at the worst case scenario. If the project is not a priority, is to be temporary, and or low budget it might make sense to use a low or intermediate-low scenario. It should be kept in mind that in any of these considerations, sea level rise is never zero.

Conservation lands are impacted at different amounts of sea level rise and the impacts are inland as well as along the coast. What is found at the other end of the system you are addressing should also be considered. Coastland, springs, rivers, and creeks are all tied together.



Effects of climate change on the coast

- Inundation
- Changes to tidal regimes
- More frequent overwash from storms
- More intense wave action during storms

Response

- Habitat migration
- Changes to plant and animal communities
- Local extirpation

The migration of salt water in to fresh water will elicit the largest scale of changes in plants and animals. Models predict significant amounts of forest transitioning to salt marsh. In Waccassassa Bay for example, the following changes are expected by 2100, from just one meter of sea level rise.

- 105 ha coastal forest changes to tidal flat
- 6,584 ha coastal forest changes to salt marsh
- 2,602 ha inland forest changes to salt marsh
- 194 ha salt marsh changes to tidal flat

Normally freshwater keeps the salt water out but with climate change the reverse occurs. Lower stream flow from reduced precipitation leads to less fresh water in the estuary and salinity moving further upstream. Increased salinity will have ecological and economic impacts. Numerous questions arise. Since oysters like a balance between fresh and salt water what will happen to the oyster fisheries? How do we deal with coastal populations as they begin to want to move inland to conservation lands?

Gray is now working on a new Natural Resource Adaptation Action Areas Comprehensive Plan. The action areas are those that experience coastal flooding and are vulnerable to the related impacts of rising sea levels for the purpose of prioritizing funding for infrastructure needs and adaptation planning. Preservation of coastal and aquatic ecosystems includes the following actions.

Identify and maintain places where ecosystems can move upland.

- Planning/Zoning
- Natural Resource Adaptation Action Areas (Comprehensive Plan)
- Removal of abandoned infrastructure

Restore degraded habitats

- Oyster reef restoration
- Exotic species removal
- Living shorelines

LUNCH SPEAKER

Greg Munson, Deputy Secretary Water Policy and Eco Restoration, Florida Department of Environmental Protection

Summary excerpted From Janice McFarland, Talking Water: Wakulla Springs Hosts a Roundtable on Water Resources, *Wakulla News, Wed March 13, 2013*

Greg Munson's background in environmental law combined with knowledge from paddling the local rivers enabled him to advise and contribute to water policy issues, a main focus of the department.

Munson said the water policy priorities of Governor Rick Scott are to improve water quality in the Everglades; resolve the dispute with Georgia and Alabama over water flow in to Apalachicola Bay; and coastal and aquatic issues, including the marine sanctuary in the Florida Keys.

Munson's department oversees budgeting, land programs at each of the five Water Management Districts, and an increasing focus on springs, their minimum flows and levels. He went in to detail on budgeting, funding and costs, and on the land programs in each Water Management District. He covered the process for accruing additional land for preservation programs, water supply protection, and flood control, along with processes and procedures for each.

The increasing focus on springs in Florida has opened up a dialogue in seeking data their accurately provides the science to determine facts that affect water policy direction. The question is how much impact there is to Florida's springs based on differing factors, such as how much is based on long-term cyclic changes in Florida, how much is a rainfall-drought issue, how much impact in pumping vs. short-term and long-term drought, etc.

Munson went over the five different Water Management Districts, the springs within each, and each location's issues, and budgeting costs associated with them.

The DEP has a budget amount of $2.4 million this year for springs restoration, and $10.4 million has been spent in the last two years concerning water quality and the springs. Basic Management Action Plans as a process are developed in setting prevention and protection strategies. Daily maximum load values are monitored for chemicals in the springs, mainly nitrates. In the Everglades phosphorus is an issue that is being remediated through their preventive and restorative efforts in the South Florida Water Management District.

Munson said that, 18 months ago, the department began collecting stakeholder input in each Water Management District, in the continuing process of ensuring water quality and water quantity for everyone. Of the consumptive use permits in each district, 80 percent allocate less than 5 percent of the total water supply, according to Munson.

The next phase will include effective ways to save water for utility companies, and working on drought-proofing the water supply. Other areas in this phase include The Tamp Bay area's challenges – such as its desalination plant has cost/effectiveness issues. The growing Jacksonville area and its increasing water needs are another concern.

PANEL ON HIGHLIGHTS OF THE WATER CHOICES MEETINGS

Moderator: Stan Bronson, Director, Florida Earth Foundation

Stan Bronson introduced the Water Choice Meetings and the Florida Earth Foundation (FEF). The Florida Earth Foundation's mission is to bring people together through education, public outreach, and facilitation to ensure the future integrity of Florida's environment and quality of life. It is a partnership of federal, state, and local agencies, educational institutions, industry, tribes, and other organizations. It is a non advocacy organization which is recognized for bringing people together with no hidden agenda.

The Water Choice meetings grew from a format used for a series of successful Florida Land use forums. In October 2010 the first Water Choices Forum was held.

The fora resemble a giant think tank where people from the private and public sectors are brought together in a semi informal setting to discuss a central theme. The participants collaborate on solutions to Florida's water resource challenges. Meetings have been held across universities in Florida including University of South Florida, University of Florida, Gainesville, Florida Atlantic, and others.

The meetings are about creating collaborations. They encourage a long vision on water issues.

Denver Stutler, President, P3 Development Corporation, Former Florida Secretary of Transportation, and Florida Earth Foundation Board Member, reflected on how Water Choices mirrors what FEF is about. FEF sees the alignment of interests among parties as what leads to change. Water quality has improved tremendously in the 40 years since the Clean Water Act was passed. It took a lot of courage by the federal government to pass it at the time. Their generation of conservationists didn't think about water while ours grew up with relatively clean water and air. We have reached the point where incremental costs at the macro level will be our next investment in clean water. It may be we spend as much as all past investments combined.

It takes a lot of courage to change direction and good ideas are being held back. Different groups may have different ideas and negotiation can lead to a third; Water Choices provides the opportunity for dialogue that can lead to new and effective ideas. At the meetings bright people are brought together to figure out answers without being dictated by policy. The resulting ideas may well work back to policy.

The Florida Council of 100 asked the FEF to develop a meeting with industry and environmental groups. Chairs of the boards of various groups were invited. It was a great meeting. For the first 24 hours participants spent time getting to know each other and did not talk about issues. The first question they were asked when the retreat officially began was what they wanted Florida to look like for their grandchildren's generation. Studies have shown that the second generation ahead is where people separate their thinking from the dollar sign. Everyone said the same things, and 80% agreed on how to get there. They could circle the wagons around common ground. Then it is easier to talk about the other 20%.

Tom Singleton, Singleton Consulting, Inc, attended two Water Choices meetings and shared his reflections. He described how in the course of one day people evolve in their thinking. One of the meetings he attended was initiated by the FL Department of Agriculture to test ideas. While outside meetings on the same issues led to conversations in which people talked past each other, at the Water Choices meeting people were frank and productive in their dialogue. He added that networking is also a key aspect of the meetings.

Eric Bush, Chief of Planning, US Army Corp of Engineers, Jacksonville District, described a Water Choices meeting where Colonel Alfred A. Pantano, Jr., District Commander of the US Army Corps of Engineers, Jacksonville District was asked to provide his perspective on water management issues in Florida. Colonel Pantano stepped away from his prepared script and instead talked very frankly about water management in Lake Okeechobee. He criticized the lack of water conservation in South Florida and attested that the lack of a good water quality ethic in the state makes it difficult to reach equitable decisions. His open comments led to a great dialogue. It is not clear how or when the resulting ideas will be used, perhaps incorporated in policy at some point. But it is the dialogue that is important.

He observed that we are enamored with the process rather than outcome. Water Choices focuses on outcome. It is a more holistic approach.

He ended by referring to an earlier comment by Denver Stutler that good leadership knows to get out of the way of the professionals. He added that leaders also need to decide when to jump forward and take the lead, but it is not happening now.

The Florida Earth Foundation website is http://www.floridaearth.org/

Discussion

Denver Stutler noted that we are at a point where there is little trust in partnerships and it is not a healthy situation. There is a legacy of unintended consequences which needs to be rebraided.

Jake Varn brought up a concern that current legislators have little knowledge about the issues. In the past there were individuals with a foundation in key subjects such as ground water. Now one can not have a good conversation with a legislator and they read from a script. It comes down to what input they get from others. If it is bad the outcomes are bad.

Stan Bronson noted that thinking about water issues is beginning to move in the new direction of coupling water resources to large land owners. He says we need to try to connect water resources thinking to the scale of where the resources actually reside.

PANEL ON SOUTH FLORIDA EVERGLADES RESTORATION PROGRAM

Moderator: Jill Parsons, Ecological Society of America

South Florida Everglades, Ecosystem Restoration Program Eric Bush, Chief of Planning, US Army Corp of Engineers, Jacksonville District

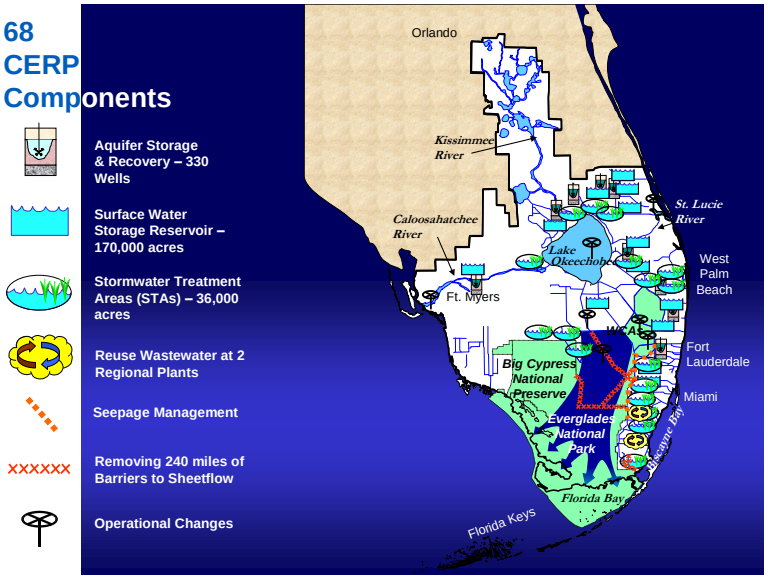
Eric Bush provided an overview of the Everglades from its early development to the status of the present Comprehensive Ecosystem Restoration Program (CERP). Development of the Everglades began shortly after statehood. Canals from east to west were built and hurricanes and floods killing thousands of people led to the building of levees. Levees also protected and compartmentalized hugely productive agriculture. The Everglades National Park was established in 1947.

The $2.9 billion Central and South Florida Project was authorized under the 1948 Flood Control Act of 1948. Its purpose was flood control, water conservation and control, salt water Intrusion, fish and wildlife, water supply to the Everglades National Park, Florida Bay and Florida Keys, and environmental restoration. It featured 46 bridges, 10 locks, 670 miles of canals, 809 miles of levees, 130 control and diversion structures, and 16 pump stations.

By the 1980s it was clear that the ecosystem was in trouble. Broad public awareness led to a groundswell of action with NGOs leading the charge for change. In 1997 CERP was developed, and signed in 2000. It was a great collaboration and easily approved by Congress, but it was not authorized. It has been in litigation for the last 12 years.

CERP is a 50-50 Partnership between the federal government and the State of Florida. It includes the Army Corp of Engineers and South Florida Water Management District among other state, local, and tribal partners. CERP is large and complex.

- 68 Components combined into 56 projects
- To be implemented over a 40-year period
- Dependent on foundation projects that need to be completed
- Expensive (~ $12.5 B *current price levels*)
- Essential to restoring a functioning ecosystem
- Essential to sustaining the economy of South Florida



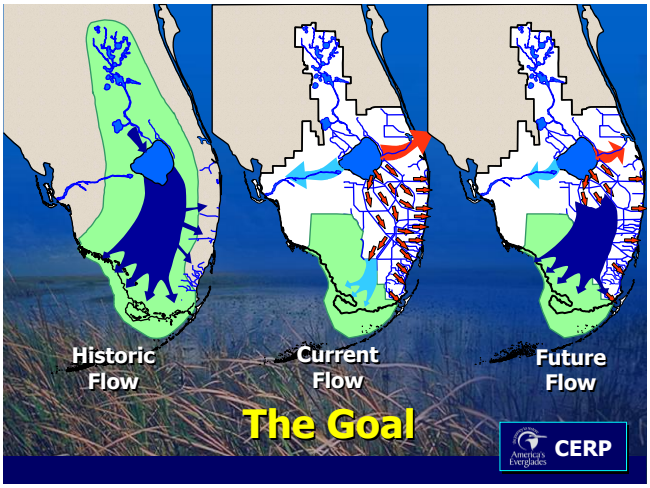
Three CERP projects have been authorized over the last 12 years

- Indian River Lagoon South (Martin/St Lucie Counties)
- Picayune Strand (SW Florida – Collier Co.)
- Site 1 Impoundment (Palm Beach Co.)

There has been no progress toward hydrologic restoration of central Everglades (Everglades National Park and Florida Bay)

In November 2011 the Central Everglades Planning Project (CEPP), an 18 month pilot project that will include a partial implementation of five CERP components, was initiated. In January 2013 tentatively selected plans included providing more water storage, redistribution of flow in the NE Everglades, and removal of critical levees to create a flow way to the Everglades National Park. The cost estimate for CEPP is $2 billion. The next steps depend on other restoration projects that are not fully completed and some that are still not authorized.

A draft EIS is expected to be completed in April but several issues still need to be dealt with. These include concerns by the South Florida Water Management District which needs a legal "Safe Harbor" from Water Quality litigation and questions about how well the cost sharing premise of the program will be managed.

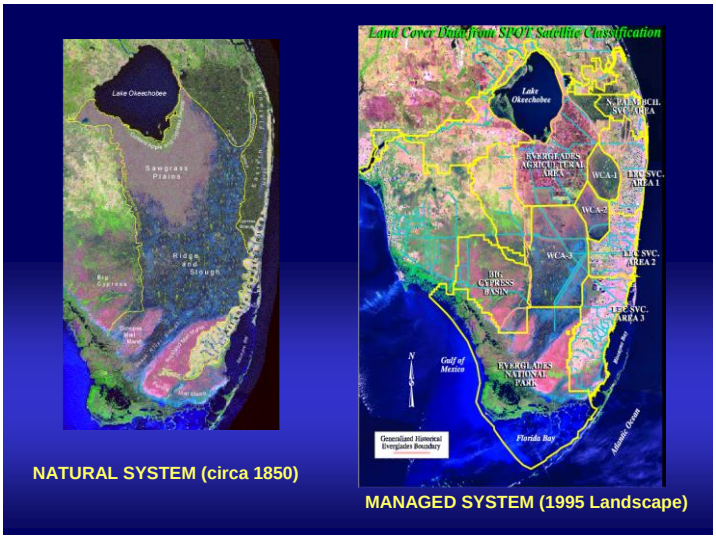


An NGO Perspective on Everglades Restoration Craig Diamond, Regional Manager, Economics for the Balmoral Group, Volunteer Co-Lead for the Sierra Club's Greater Everglades "Out Wild America" Campaign

Craig Diamond provided an NGO perspective to Everglades restoration. The Sierra Club legal foundation has been litigating for the Everglades since 1988. It is its longest lasting case.

Everglades National Park is critically important habitat. Its protection is a key to the biological integrity of South Florida and has international importance. It is listed as an International Biosphere Reserve, a World Heritage site, and the Ramsar Convention list of wetlands of international importance.

The Everglades coalition is an alliance of 57 local, state and national conservation and environmental organizations dedicated to restoration of the Greater Everglades Ecosystem. It is an advocacy body for ecosystem restoration, and does not ordinarily advocate for agricultural or urban supply interests except where these are congruent with advancing the objectives of restoration. The Comprehensive Everglades Restoration Plan is the keystone driver of efforts for restoration and the coalition maintains a positive collaboration with the US Army Corp of Engineers and the South Florida Water Management District in this effort.



Lake Okeechobee, flow to the south of the lake is impeded by the Hoover Dike. The Sierra Club (and some other NGOS in the Coalition) have advocated at length for a flow-way to connect the Lake to the water conservation areas. Flood control and backup storage for all uses (environmental, agricultural and urban supply) are dependent on maintaining control of the lake.

There are over six million people living in the basin with an additional 80 million tourists this year alone. Yet the basin is managed for the density of residents. Agriculture also has intensive water quality impacts. Water quality is part of the four-part test of success for CERP (Quality, Quantity, Timing and Distribution); however, CERP is primarily concerned with system redesign

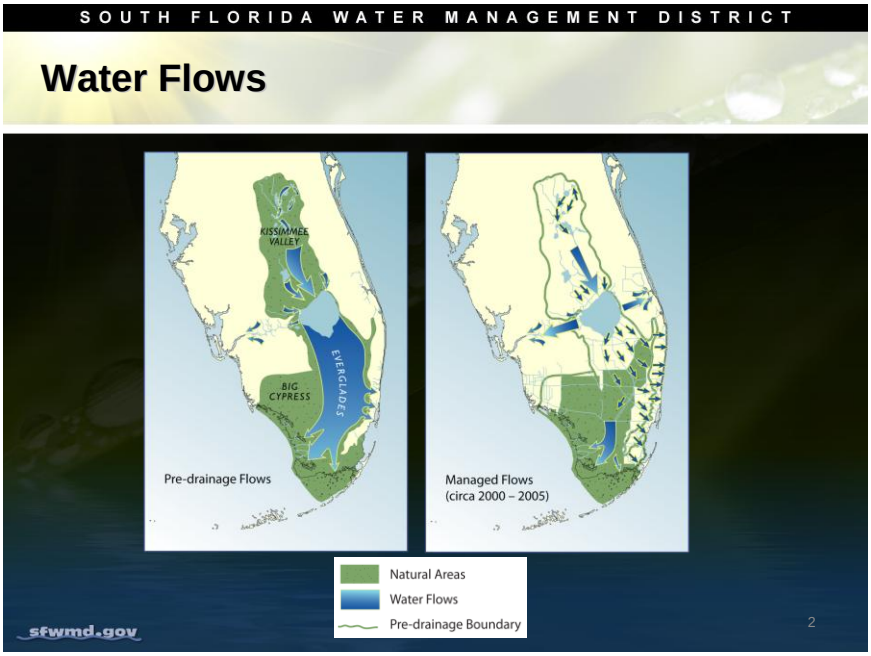
for water quantity and hydroperiod objectives. Water quality is a factor, but not primary and within CERP is more the by-product of successful restoration than the driver of it.

There are other Everglades programs, including CEPP (Central Everglades Planning Project) in achieving key elements of hydroperiod restoration. The Coalition has advocated for robust measures within CEPP to reconnect currently fragmented pats of the water conservation areas

Everglades Restoration: Progress and Opportunities Ernie Barnett, Director of Everglades Policy, South Florida Water Management District

Ernie Barnett discussed the progress and opportunities in Everglades restoration with a focus on water quality.

Historically water flowed from the Kissimmee basin to the Everglades. Now only 19% goes to the Everglades, 60% goes east and west. The main source of water for the Everglades is no longer Lake Okeechobee but the watershed south of it. The alterations have led to a number of problems including freshwater discharges to the St. Lucie and Caloosahatchee estuaries, extreme high and low lake levels, and an imbalance of natural flora and fauna.

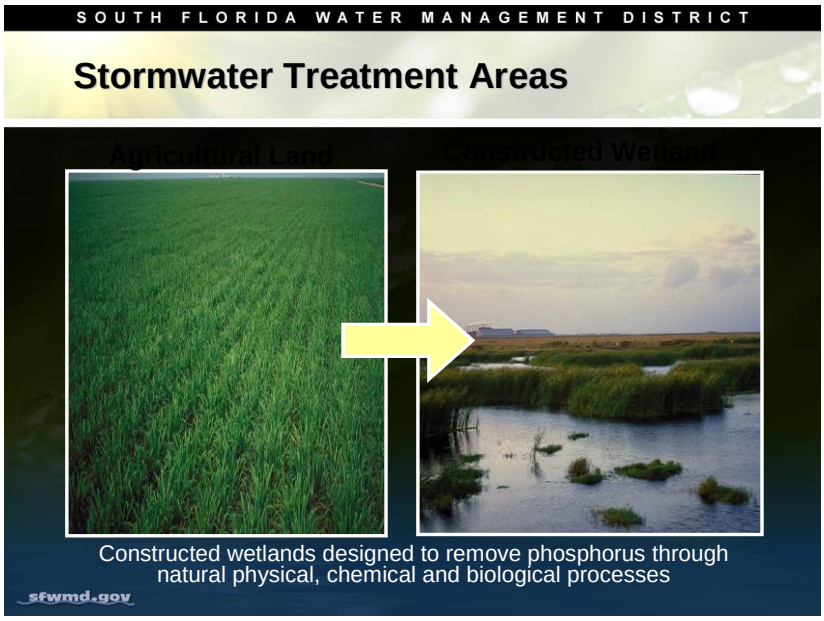


The Everglades are oligotrophic, thus very nutrient poor. It is naturally low in phosphorus, 10 parts per billion. Historically it got the phosphorus it needed through rainfall. The current high level of phosphorus is a serious problem while nitrogen is less of a problem in the system.

The South Florida Water Management District (SFWMD) has invested $1.8 billion to date in Stormwater Treatment Area (STA) construction. 56,700 acres of effective treatment area have

been or are near completion. In 2011 STAs treated 735,000 acre-feet of water, reducing total phosphorus loads to the Everglades Protection Area by 79%.

The STA's are manmade wetlands designed to clean up nutrients primarily from surrounding agricultural areas before the runoff reaches the Everglades. The complex system of wetlands is as large as the island of Manhattan. They have done a good job so far in load reduction, but there is still a long way to go.



Implementation of Best Management Practices on 640,000 acres of land has also had an impact. Over the program's 16-year history the average phosphorus reduction was 55%, more than twice the amount required by law.

A series of proposed water quality projects are being developed to meet discharge limits necessary to achieve 10 parts per billion ambient water quality criterion established in rule for the Everglades Protection Area. A 6,500 acre STA expansion and 110,000 acre-feet of flow equalization basins are scheduled for construction in 2012-2024. Sub-regional source controls are scheduled for 2015-2020. Habitat restoration is also included in the plan.

Discussion

Effects of sea level rise have already been evidenced in peat collapse. It will happen and we will have to adapt. So why spend so much time on Everglades restoration?

Since the shoreline can retract landward with sea level rise the best bet will be for more water to flow south. It is a good reason to go forward with the program.

Although it was not addressed in the original scope of the CEPP the adaptive management element provides for some program changes.

Day 2: Thursday, March 7, 2013

PANEL ON GOVERNMENT POLICY AND PRACTICE

Moderator: Rodney DeHan

Rodney DeHan began the session by asking the group to consider some ideas from an article he recently read. The authors declared that the southeast US is in as much water troubles as the desert southwest. Storage, draught, water flow all play a role. They went on to say that in order for water supply to be considered sustainable no more than 40% of the fresh water can be for human use.

Consumptive Use Permitting in Florida Angela Chellette, Chief, Bureau of Ground Water Regulation at Northwest Florida Water Management District

Angela Chellette discussed Florida water law and the role of Water Use Regulation in water resource sustainability. She began with an overview of the roles of state and federal agencies. They both have regulatory responsibilities regarding water quality while the State is responsible for water supply and quantity. Both use planning and permitting programs for implementation.

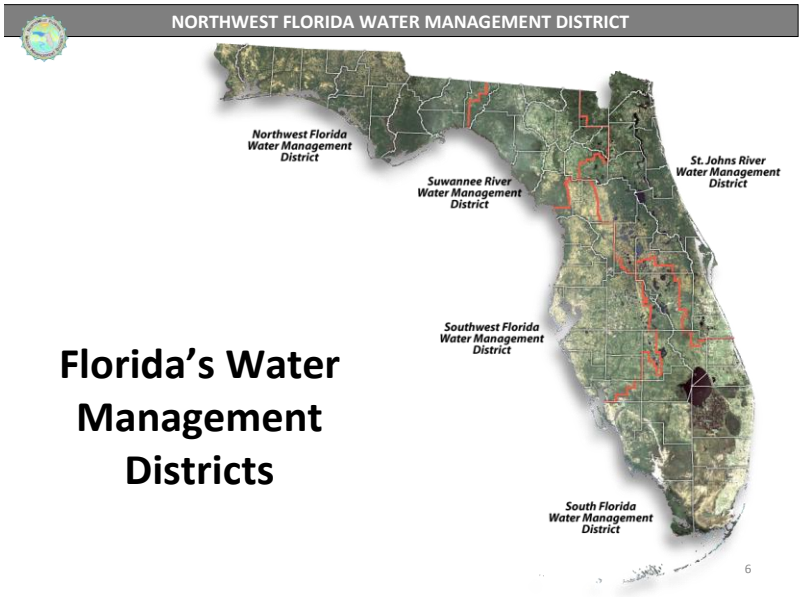
Historically Florida water law was based on a “reasonable use standard” not tied to property rights, and decisions were made in court case by case. Following a 1970 to 1971 drought it was replaced with a new Water Resources Act. The Act provides a statewide permit system for water rights and additional authorities for water supply management.

The Water Resources Act blended the reasonable use doctrine of eastern US Common Law with the western US “prior appropriation” doctrine. In the Eastern doctrine there is no property right in water, only right to use. The Western doctrine is based on scarcity of water where first in time is first in right with perpetual rights and no expiration.

The new blend of eastern and western common law doctrines principles and rules include:

- Certainty & Flexibility
- Users must obtain a permit to have a right to use water in Florida
- Exclusive Water Management District authority
- No property right to water
- Permits expire
- Reclaimed water not subject to regulation until discharged to the “waters of the state”

The statute created five Water Management Districts (WMD) with broad authorities that endorse regional water management and provide insulation from “local” issues. The WMD controls the consumptive use permit program rather than local governments.



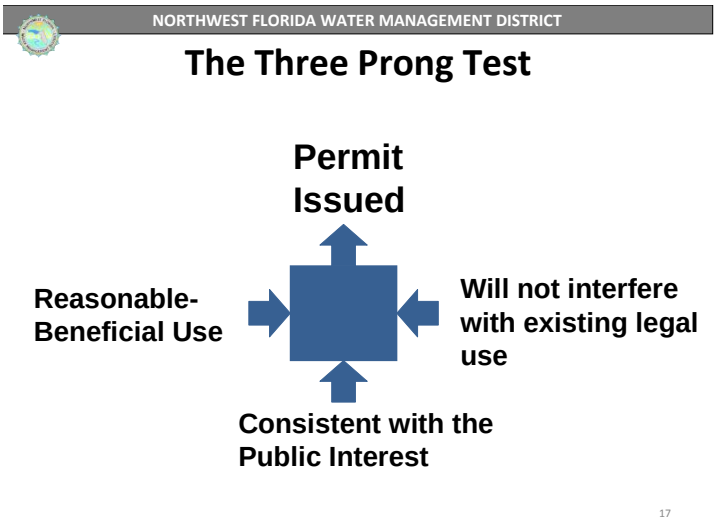
A Water Supply Assessment is performed on a five-year basis. Where resource availability will be exceeded within 20-years, Regional Water Supply Plans are developed. They include:

- Alternative Water Supply
- Water Resource Development
- Conservation Projects
- Reuse Projects

The Regional Plans are updated at least every five years.

Water use permitting and tools for natural system protection include minimum flows and levels (MFL). MFLs are adopted as rules of the WMD. They identify the point at which further withdrawals will cause "significant harm" to the water resources or ecology of an area.

Water supply regulations are the exclusive jurisdiction of the WMDs. Water use permits are based on proving demand for the water and whether the water is available without affecting existing users and harming the water resources. A three prong test is used to determine whether to issue a permit.



Agriculture Best Management Practices Darrell Smith, Assistant Director, Office of Agricultural Water Policy, Florida Department of Agriculture

Darrell Smith described the Florida Department of Agriculture's best management practices (BMP) programs and water supply planning for the state.

Agriculture plays a major role in Florida.

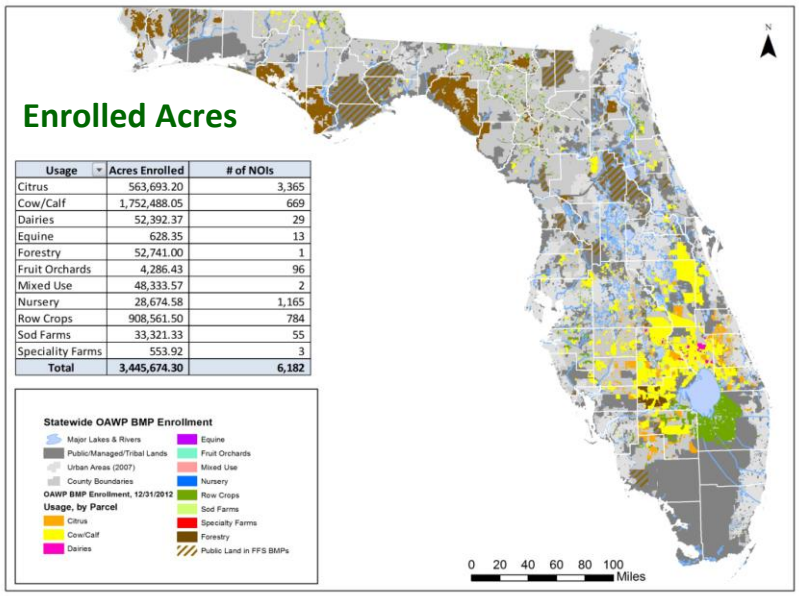
- Approximately 52% of the state's total land use is agriculture, over 18 million acres. Most of the land is unimproved, only 8.2% irrigated.
- Provides for biological diversity, aquifer recharge, flood control, wetland preservation, and wildlife habitat.
- Consists of 40,000 private farms, generates $100 billion in farm-related economic activity, and provides 750,000 associated jobs.
- Farmland provides net economic benefit to the public. For every $1.00 paid in property tax agriculture only requires $0.29 in public services.

The Office of Agricultural Water Policy (OAWP) was established in 1995 by the legislature to address agriculture water policy issues, water quality and conservation, and water supply planning. It is the lead for agriculture in working with DEP on the TMDL program with field staff in the Water Management Districts.

Best management practice is defined as "a practice or combination of practices determined by the coordinating agencies, based on research, field-testing, and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural discharges."

OAWP has programs for the state's major commodities: citrus, vegetable and agronomic crops, container nursery, sod, cow/calf, specialty fruit and nut, and commercial equine. BMP manuals developed for these commodities include information on the following topics:

- Nutrient Management
- Irrigation Management
- Sediment and Erosion Control
- Stormwater Management
- Water Resources Protection
- Integrated Pest Management



Usage	Acres Enrolled	# of NOIs
Citrus	563,693.20	3,365
Cow/Calf	1,752,488.05	669
Dairies	52,392.37	29
Equine	628.35	13
Forestry	52,741.00	1
Fruit Orchards	4,286.43	96
Mixed Use	48,333.57	2
Nursery	28,674.58	1,165
Row Crops	908,561.50	784
Sod Farms	33,321.33	55
Speciality Farms	553.92	3
Total	**3,445,674.30**	**6,182**

The Suwannee River Partnership was formed in 1999 as a coalition of state, federal and regional agencies, local governments, and private industry representatives. OAWP supports the partnerships through tools and equipment including:

- Crop Management Tools
- Irrigation System Efficiency Improvements
- Subsurface Drip Irrigation Demonstrations
- Weather Stations
- Computer controlled Irrigation Systems

Improving irrigation is an important part of the BPM program. Mobile irrigation labs are used to evaluate systems to improve irrigation system efficiency and save water.

OAWP is also involved in water supply planning. The Department of Agriculture works with the Water Management Districts in regional water supply planning. OAWP wants to promote and facilitate consistency in methodologies among the districts. Currently the variable methodologies make it difficult to coordinate among districts and predict water for the future.

Darrell explained to the group that OAWP is still learning how to protect and save water and they welcome input. Information about their activities can be found at their website http://www.floridaagwaterpolicy.com/

Discussion: Following the formal presentation a discussion began on interactions among neighboring states in water use planning.

Some interaction exists between Georgia and the Suwannee and St. John's Water Management Districts in Florida. Wakulla deals with other counties but stops at Georgia.

ACF (Apalachicola-Chattahoochee-Flint) water use has been tied up in litigation. ACF Stakeholders group includes coalition members from three states, Alabama, Georgia, and Florida.

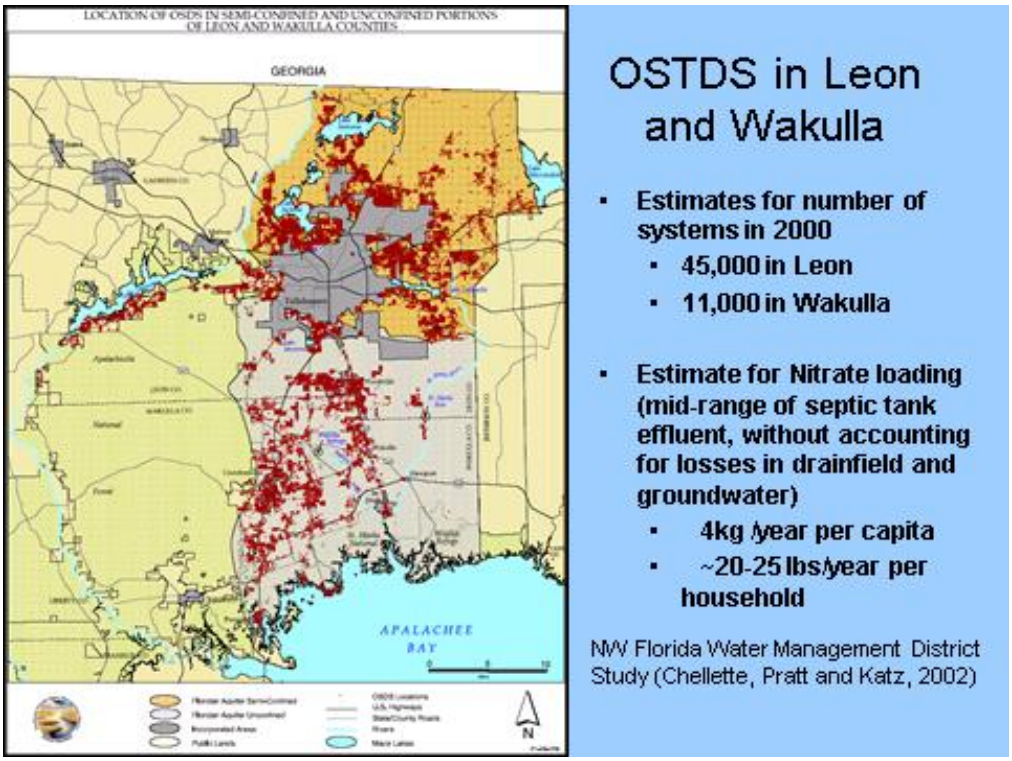
Responsible water planning in Georgia is pretty recent. The Georgia agriculture study was based on real impacts and provides reasonable estimates of water use. Although they did a good job, regulations are lacking. Water use is commodity driven and in Georgia has moved from peanuts, to cotton and corn for ethanol. There was an effort last year to refine irrigation metering in Florida akin to what was done in Georgia.

Protecting Florida's Springs: Land Use Planning Strategies and Best Management Practices Dan Pennington, 1000 Friends of Florida

Dan Pennington provided the perspective of 1000 Friends of Florida on land use planning and best management practices in protecting the over 3000 fresh water springs in Florida.

From the quantity-side of the picture required Minimum Flows and Levels (MFLs) must be completed to manage water to protect the natural functions of the native ecological systems. While at the same time we have to carefully permit human consumptive uses within identified bounds so as not to damage the native systems. The Water Management Districts need to prioritize completing MFLs or they won't be done.

Wakulla first Total Maximum Daily Loads (TMDL) was completed 20 years ago. Non-point sources of pollution such as the City of Tallahassee wastewater spray fields are currently being addressed, but new tools are needed to solve more complicated non-point issues. Nutrient pollution through septic tanks is next on the list. Onsite Sewage Treatment & Disposal System (OSTDS) are a significant issue across Leon and Wakulla counties. Over 65000 septic systems were estimated to be in place in 2000.



In 2009 the City of Tallahassee, Leon County, and Wakulla County jointly funded a study to identify treatment and management alternatives for rural wastewater (septic tanks). The report by Lombardo Associates, Inc. presents the complex issues that occur in the local, unique groundwater environment, and provides considerations and alternatives for rural wastewater treatment, management, and costs.

The report suggests one tool in particular that Dan would like to see embraced. He described the concept of a "Responsible Management Entity" (RME) that would tackle these complex issues. Through use of a RME, integrated sets of solutions can be locally tailored to incrementally reduce nutrients and other pollutants over agreed upon timelines. Since such solution sets are specific to each watershed, a locally-based entity serving one or more local jurisdictions may be appropriate. Basically, if you want to get things done let the locals who have a vested interest in their springs get in on the action.

Such an entity could be set up similar to stormwater utilities. An RNME (Responsible Nutrient Management System) may serve as a one-stop management agency, planning and managing projects and operations for watershed-based responsible nutrient management. For example, it could work with the central sewer system provider in removal of systems, and coordinate with local land planning agencies. Areas of emphasis might range from inventories and mapping, education and training, to financial aspects including assisting owners in replacing existing septic systems.

Discussion

The discussion began with a focus on septic systems. Ron Piasecki told the group that the Department of Health (DEH) tested septic systems in Wakulla County and came up with three types that would decrease the outflow from 30 or 40 mg/liter to 10. Three hundred systems were

installed and when they were tested later the outflow was still high. The new systems are a lot more expensive, need to hook up with electricity, and need annual maintenance. The county is backing away from requiring them and people are disconnecting their systems. Friends of Wakulla Springs is trying to work with DEH to push for a new “membrane” system that is more efficient and closer to the cost of traditional systems. Septic systems are the number one priority for Friends. He also noted that property rights issues lead to conflicts with septic systems.

Dan Pennington noted that beyond septic systems, sewers and other nutrient sources need to be tackled. A management umbrella for all these sources is needed.

Todd Kincaid followed up on the idea that to be sustainable no more than 40% of available fresh water can be for human use. He noted that the currently 65% of the base flow from the Suwannee to the Gulf of Mexico is permitted. At some point we have to cap permitting. He asked if the Management District looks at this.

Angela Chellette responded that they look more to total flow of ground water, river discharge, and seepage from the coast.

The possible use of drones for irrigation was brought up as well as their use for remote sensing. It was noted that at present there is a moratorium on drones.

Dan Pennington said that the first ecological impact of water draw downs is to depress wetlands. Florida is a state of wetlands but nobody speaks for wetlands except maybe local NGOs.

PANEL ON UNIVERITY PROGRAMS ON TEACHING SUSTAINABLE WATER RESOURCE MANAGEMENT

Moderator: Robert Wilkinson, Bren School, University of California Santa Barbara

The University of Florida - Opportunities for Sustainable Water Resource Planning Walter Rosenbaum, Director Emeritus, Bob Graham Center for Public Service

Tony Rosenbaum talked about the interdisciplinary opportunities in sustainability research and activities at the University of Florida (UF). He described the cross campus programs for sustainable water resources planning as well as the problems they are facing.

The University of Florida provides uncommon opportunities for sustainable water resource planning. While most land grant schools separate their land grant and liberal arts colleges, the UF professional schools are all on one campus. This provides a huge resource of skills and disciplines. But the large sprawling campus makes it hard to coordinate and amplifies the potential for duplication of effort.

The UF was one of the first among the major national universities to make a campus wide, leadership commitment to promoting sustainability as an institutional mission. It created an Office of Sustainability in 2006 with a part-time Director and staff at the highest administrative level within the UF. Its mission is to promote sustainable planning and living on the campus and to coordinate sustainability activities across campus and between campus and community [http://sustainable.ufl.edu/].

The Office of Sustainability has a diverse set of priority areas, all of which have potential relevance for sustainable water resource planning.

a. Energy Conservation and Climate Change
b. Land and Resource Management
c. Agriculture and Dining Services
d. Built Environment
e. Waste Reduction
f. Procurement
g. Investment
h. Transportation
i. Health
j. Equity
k. Cultural Climate
l. Stewardship

On the main UF campus, perhaps the most active sustainable water resource planning both on and off the campus is associated with four institutional networks.

1. The College of Urban Planning
- Working on urban design to adapt to sea level rise, including some consulting and planning in conjunction with the South Florida Climate Coalition.
- Created a Florida Natural Areas Inventory which is the primary source for information on Florida's conservation lands. [http://www.fnai.org/conservationlands.cfm]

2. Water Institute
- Responsible for coordination of all water resource research on campus.
- Works closely with utilities and water districts on long term water resource planning springs protection. Works closely with the Florida Water and Climate Alliance, an association of public and private utilities, the water districts, and focuses on issues specifically related to climate change and variability.

3. UF College of Law and Center for Governmental Responsibility
- Sponsors annual Florida environmental conferences often focused on water resource issues.
- Has sponsored law student internships exposing students to issues associated with the Everglades Project and coastal preservation in Costa Rica and in South America.
- Runs a ‘Conservation Clinic’ to assist organizations and communities in issues related to water resource management.

4. Engineering School for Sustainable Infrastructure and Environment
- One of the most recent (2011) and interesting campus sustainability innovations.
- Combined departments of Environmental Engineering Science and Civil and Cultural Engineering and created a new school. It was able to get two additional faculty members and a half-Dean, and its own budget.
- A response to pressure upon civil engineering to do more ‘sustainable’ work. Now has an MS in Engineering Water Resource Planning. Focuses on interdisciplinary planning.

In addition, the Center for Wetlands offers a unique focus on the integration of wetland science, engineering, and policy. It was set up in the 1960s due in large part to H.T. Odum's vision of the

Center as a campus-wide focal point for both basic ecological research on wetlands and their sustainable use in meeting environmental management needs of society on the Florida campus. The Center has been a national leader in the creation and promotion of an interdisciplinary concentration in Wetland Sciences for graduate students.

The UF recently started undergraduate BA/BS programs in Sustainability Studies. There are 100 students minoring in the program and 30 majoring. Eight students have graduated from the first class. The program does not have its own faculty and most courses borrow from other departments and faculty.

The UF is currently facing major challenges and problems in creating sustainable water resource planning activities on campus.

Despite the increasing emphasis on 'sustainability' planning, there is not a lot of new money available for implementation in campus colleges and institutions. Money for undergraduate and graduate internships and graduate stipends is drying up; a big problem for the Law School, the Water Institute, Engineering, and Wetlands Center.

A lack of administrative support for campus-wide programs and a lack of faculty to support concentrated sustainable water resource planning is a serious problem. It is hard to attract faculty when their departments do not encourage their participation and make it clear that it will not help in obtaining tenure. An additional issue is insufficient coordination among campus programs because of the size and scale of the campus.

One program, the Institute of Food and Agricultural Studies is generally provided with considerable resources for a great diversity of sustainable water resource activities. But it does not have many linkages across campus.

Another big challenge is the lack of agreement concerning what 'sustainability' contributes to existing programs; in some cases it is suggested that the term adds little to whatever is already being done.

Rosenbaum concluded by acknowledging the good faith effort of UF to coordinate water resources planning across campus. But he says there is a lack of muscle behind it as well as a lack of funding. To move forward they will need to flesh out the possibilities and decide which are the most important to do.

OPEN DISCUSSION ON FLORIDA ISSUES

Stan Bronson and Craig Diamond mentioned that they took part in the UF Natural resources leadership Institute [http://nrli.ifas.ufl.edu] as did Eric Bush and Tom Singleton who also participated in the SWRR meeting. It is a year-long training for professionals to work on mediation on tough environmental issues. It supports 5-25 people per year and goes to where the conflicts occur. They consider the program to inherently address sustainability even if it is not its stated charge.

Tony Rosenbaum noted that lots of courses at the University include climate change issues but that there are no courses on climate change itself.

Mbuya Odemari informed the group about collaborative efforts at the Florida Agricultural and Mechanical University (FAMU). They hold an agroecology course that is a cross pollination among departments within the University, and across universities and other institutions. He believes the impacts of these types of programs trickle down to K-12 education. He wants to encourage other institutions to take advantage of the people involved in this program and in FAMU's National Science Foundation NEON site.

Todd Kincaid said that until people understand the cost of lack of sustainability they won't get it. In the Edwards aquifer in Texas they were able to tag action to aquifer water levels. If the aquifer falls to a certain level it triggers cut backs and every stakeholder feels the pain. In response, impacted parties got together and worked collaboratively to find an answer. But they needed the threat of economic pain to do it. Maybe from an educational standpoint we need to not just teach the benefits of sustainability but also the cost of lack of it. It has to be clear that nobody can escape.

FIELD TRIP: EXPLORATION OFTHE SPRINGS BY BOAT

The participants that were able to stay on for the afternoon of Day 2 were treated by the Wakulla Springs State Park and the Friends of Wakulla Springs to a wonderful exploration of the springs in a pontoon boat. The tour was guided by Todd Kincaid, of GeoHydros, LLC who is also on the Board of Directors of the Wakulla Springs Alliance.

The abundance and diversity of bird life and other wildlife including manatees and alligators were impressive and brought home for the out of state participants the importance of protecting the rich and rare environments and habitats of the Florida Springs. Thanks to all who made the SWRR Florida Meeting such a useful and enjoyable meeting.