The Watershed Fund of Florida:

A New Enterprise to Support Watershed Restoration and Facilitate Statewide Water Quality Credit Trading

A Concept Proposal for Stakeholders' Review

By Mary Oakley, with the University of Florida's Center for Landscape Conservation Planning for the Cooperative Conservation Blueprint Initiative

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Introduction

Florida's Agriculture Commissioner Adam Putnam has asserted in numerous public venues that "**Water is the biggest long-term issue facing the state**." Putnam explained at the October 2012 meeting of the Economic Club of Florida that the water challenge confronts not only agriculture but every sector of the state:

> "Whether your mission in life is to plant an orange grove, build a subdivision or save the Everglades, it will be contingent on water—water quantity and water quality—and so we take that very seriously," Putnam said. He predicted that expanding Florida's water supply will come down to investment in rural communities, such as areas where rainfall could be stored by flooding more properties…"It means that we need to approach this from a statewide basis because every corner of the state is facing its own water skirmishes. This is no longer the coast's problem. This is no longer South Florida's problem (Hodges, *Tallahassee Democrat*, October 11, 2012)."

What Commissioner Putnam acknowledged is what other water experts know: that quality and quantity are entwined aspects of water issues. This means that *integrative* solutions are needed along with new partnerships across multiple sectors, especially with rural landowners statewide.

My project partners and I, who have been engaged in the Cooperative Conservation Blueprint (CCB) initiative in Florida, are well aware of the willingness on the part of rural landowners to contribute to resolving the state's water problems by performing watershed services, including surface storage and filtering, as part of a payment for ecosystem services-type program. Such a program already exists and is supported by the South Florida Water Management District, the Department of Agriculture and Consumer Services, the Department of Environmental Protection and the Florida State Legislature. This regional program, the Northern Everglades Payment for

Ecosystem Services Program (NE-PES), pays a fee to cattle ranchers to store and/or filter water on their property, which contributes to the District's greater programmatic goals for dispersed water management and water storage on rural lands in the region. NE-PES is expected to expand to include citrus growers next.

A major goal of the CCB—a statewide initiative launched in 2006 by the Florida Fish and Wildlife Conservation Commission in collaboration with the Century Commission for a Sustainable Florida and its Rural/Agricultural Lands Advisory Committee, conservation scientists and non-governmental organizations, state agencies and local governments—is to develop more incentives, preferably market-based, for conservation on private lands. The CCB project team was more specifically challenged last year by our agricultural lands advisors to find potential additional sources of funding, besides the state government, for an expansion of PES programming for watershed services on rural lands. While CCB participants will welcome the seemingly distant day when society can compensate rural landowners, including foresters, for the range of ecosystem services they provide, our agricultural lands advisors observed that the State of Florida is paying cash to landowners for water-related ecosystem services *today*, as evidenced by the state-funded NE-PES program. The question was (and is), could there be a broader market or multiple sources of payment, or buyers, for such services in Florida?

The answer is yes, or at least potentially so, as the significant challenge facing Florida to meet stricter water quality standards, to be applied to lakes, flowing waters and estuaries, offers an opportunity for urban and rural communities to engage in a water quality credit trading market.

Florida is awaiting a decision by the federal Environmental Protection Agency as to whether EPA will approve either the revised rules developed by the state to establish numeric nutrient criteria (NNC) for water quality standards or EPA's own rules for NNC standards in Florida. Complying with the new standards will be difficult and costly in either outcome. Cost estimates for compliance with EPA's rules in particular ranged from $4.2 - $6.7 billion in project costs for affected wastewater utilities alone, plus annual upkeep costs from $430 - $620 million per year. The cost estimates for compliance in each of the other affected sectors, including agriculture, urban stormwater, mining and industry also ranged in the hundreds of millions or billions for initial structural improvements, and in the multiple millions for annual costs (Reardon, 2010).

No one can know for sure exactly how expensive it will be to comply with the new water quality standards, although few would doubt that it will cost hundreds of millions of dollars if not more. There are no national reference points: Florida will be the first state in the nation to have NNC rules applied on a statewide basis, although many other states are adopting NNC incrementally (Center for Economic Forecasting and Analysis, 2012). The cost estimates I reviewed generally calculated how much each affected entity would need to spend to comply with stricter standards. What was not considered, or at least not included in the estimates, is how costs could drop while environmental co-benefits increase by partnering across sectors through a credit trading market.

Water quality credit trading can work, and there is interest among utilities, agriculturalists and key state agencies in Florida to extend water quality trading (WQT) statewide, as a voluntary option. The statewide impact of NNC calls for high-leverage tools to coordinate cost-effective compliance in Florida. WQT has been successfully pilot-tested in Florida in the Lower St. Johns River region, and formal trading is allowed only in that pilot region at present. WQT requires more than just legislative approval to expand, however. It needs policy leadership and sustained instrumental support, along with initial seed money. And I have found in my reading about many different trading programs that a water quality credit aggregator and broker is often essential in helping to make WQT work between utilities, known as point sources who buy the credits, and agricultural producers, known as nonpoint sources who generate and sell the credits in a point-to-nonpoint trading market. The Watershed Fund of Florida could be a credit aggregator and broker.

Commissioner Putnam's broad framing of Florida's water problems and their potential solutions, which encompasses natural and "working" agricultural lands in watersheds, is consistent with the new and expanded definition of *water infrastructure* proffered by the Aspen Institute:

> The 21st century definition of sustainable water infrastructure includes the traditional man-made or built infrastructure components *and* the natural infrastructure, such as rivers, lakes, streams, groundwater aquifers, floodplains, floodways, wetlands, and the watersheds that serve or are affected by water and wastewater systems. A sustainable water infrastructure integrates the traditional components with the protection and restoration of natural systems, conservation and efficiency, reuse and reclamation, and the active incorporation of new decentralized technologies, green infrastructure and low impact development to ensure the long-term reliability and resilience of our water resources. Sound practice will result in enhancing the triple bottom line of economic, social and environmental sustainability (Bolger, 2009).

The following quoted passage from a complementary report to the Aspen Institute's white paper on water infrastructure, *America 2050: an Infrastructure Vision for 21st Century America*, speaks to the requisite public policy vision and commitment to create a modernized water infrastructure:

> The national water policy choices that will be made over the next several years will determine whether America's water resource managers, in the face of growing challenges and complexity, can produce safe drinking water for over 300 million Americans, dispose of their sewage safely, provide industry and agriculture with the water it needs, and do all of this and much more in a way that is both environmentally sustainable and economically affordable. The task will be to use the successes of the past and the many promising initiatives of the present to create the integrated, multi-dimensional, goal-oriented policies the future demands.
>
> The case for new policy principles that give equal weight to non-structural solutions to water resource problems is clear. Experience over the last fifteen years has demonstrated

> that pollution prevention, water conservation, appropriate pricing, ecosystem services and use of "green infrastructure" approaches that protect or mimic natural systems, and improving management efficiency can provide the same benefits at a far lower cost than the traditional exclusive reliance on larger capital-intensive facilities. These non-structural approaches have also been proven to provide greater flexibility, save money, use less energy, protect and restore wildlife habitat and scenic and recreation areas, reduce flood damage, and create local jobs.
>
> However, no strong, effective coalition of interests has yet proven able to break the status quo and redirect any significant amount of public investment toward non-structural approaches. Federal, state, and local leaders must chart a new path. To be effective, a national infrastructure investment plan must outline how traditional federal mandates and ongoing capital investments in water management will be linked to non-structural alternatives. It should provide powerful incentives for smarter, systematic approaches that link upstream and downstream investments, and green and grey infrastructure investments that provide better cost to benefit ratios. Perhaps most critically, it should break down traditional sector responsibilities and insure cost-effective coordination between land use planning and water resource management *(*America 2050, 2008).

WQT could be designed to help Florida achieve cost-effective coordination across all sectors.

Water Quality Trading Defined

Water quality credit trading is a market-based approach toward Clean Water Act compliance. The EPA regards WQT as an important tool that offers greater efficiency in achieving water quality goals on a watershed basis. Trading is based on the fact that sources in a watershed can face very different costs to control the same pollutant. Trading allows one source to meet its regulatory obligations by using pollution reductions created by another source that has lower pollution control costs, thus achieving the same water quality improvement at lower overall cost.

WQT is also widely recognized, including by EPA, as a way to spur innovations—in treatment techniques, land management and agricultural practices, public-private partnerships and other collaborative conservation or business enterprises that benefit the economy and the environment.

Water quality is one of the most pressing environmental issues facing many parts of the world today. Generally, the pollutant of greatest concern is nutrient pollution. Globally, according to the World Resources Institute (WRI), the majority of nutrient pollution stems from nonpoint sources, principally agricultural lands. In the United States, approximately 80 percent or more of the nitrogen and phosphorous in U.S. lakes, rivers and estuaries comes from nonpoint sources. WQT programs that allow point-to-nonpoint trades are a mechanism for leveraging point source regulatory requirements to incentivise voluntary reductions from less regulated nonpoint sources. Seventy percent of WQT programs worldwide allow trades between point and nonpoint sources.

WQT Program Examples: Point-to-Point, and Point-to-Nonpoint Programs

Making WQT programs work well is not so easy. Making them work well for point-to-nonpoint source trading is harder and quite uncommon among trading programs in the U.S. so far. Across the country to date, only 100 point source facilities have participated in water quality trading at all, and 80 percent of those participating facilities made point-to-point trades in Connecticut's Long Island Sound program alone. According to a new national WQT report commissioned by the USDA's Office of Environmental Markets, *In It Together: a How-To Reference for Building Point-Nonpoint Water Quality Trading Programs*, there were 24 "active" point-nonpoint trading programs in 16 states, as of 2011 (Willamette Partnership, 2012). "Active" means the program design has been completed and the program has received regulatory approval to conduct trades. It does not mean any trades have occurred in the program. A smaller subset of programs supports active *trading*. An even smaller subset supports active trading between point and nonpoint sources, as the Great Miami River Watershed Water Quality Trading Program in Ohio does (a five-year pilot project that is covered later in this section, under point-to-nonpoint programs).

Point-to-Point Program Examples

Trading between point sources is relatively simpler because nutrient concentrations in discharges from a point (end of a pipe) are precisely measured and routinely monitored by treatment plants in compliance with their NPDES[1] permits. There is no guesswork or uncertainty as to how much nutrient reduction a point source can achieve from a plant upgrade. The quantity is known and verifiable. Not so with many nonpoint source control measures: Even if the efficiency of a Best Management Practice (BMP) can be estimated within a narrow range, or even if it can be directly measured, the performance of many BMPs is subject to seasonal fluctuations and influenced by external variables such as rainfall amounts. From the perspective of point source credit buyers who need a certain number of offset credits for permit compliance, they need to know that the offset credits they buy are sufficient, genuine and reliable. Buying credits from other point sources can more readily provide those assurances.

The State of Connecticut established a pioneering WQT program option in 2002 for the state's 79 publicly owned treatment works (POTWs) as a cost-effective, incentive-based approach to meet the nitrogen wasteload allocation for the Total Maximum Daily Load (TMDL) adopted for the Long Island Sound. It is one of the few expansive WQT programs successfully implemented in the U.S. and the first program to be awarded a *Blue Ribbon for Water Quality Trading* by EPA in 2007. Connecticut's Nitrogen Credit Exchange (NCE) program is organized by and regulated under a state-issued Nitrogen General Permit. According to the Connecticut Department of Environmental Protection, "No new regulations had to be written and adopted to institute the NCE, adding both practicality and simplicity to the process (CDEP, 2010)." The intention for the program was to meet an accelerated schedule for waste load reductions at a lower cost through

[1] National Pollutant Discharge Elimination System, NPDES, is a federal permit system that controls discharges from "discrete conveyances," as authorized by the Clean Water Act through the Environmental Protection Agency (EPA).

trading than would be spent if each POTW had no alternative to making on-site plant upgrades. The estimated savings, or cost avoidance, enabled through the NCE is $300 to $400 million over the alternative of implementing additional nitrogen removal projects at every POTW at a total cost of about $800 million. Why the nutrient exchange alternative can save up to half of the total estimated costs of compliance is explained in the state's report on the Nutrient Credit Exchange, as it operates in tandem with the Nitrogen General Permit:

> If all 79 POTWs were required to design their facilities to meet their individual wasteload allocation at all times, there would be a tendency to over engineer to meet those limits under the most extreme conditions. With trading, they can decide upon a level of treatment appropriate to their facility. They are also able to design towards average operational goals and optimal costs. Should an individual plant undergo short-term operational problems and under perform with respect to nitrogen removal, the combined benefit of the reductions for the other 78 facilities would still be met because an individual plant's performance does not dominate the statewide performance statistics in aggregate, virtually eliminating the risk of permit noncompliance. This helps keep both capital and operational costs optimal (Connecticut Department of Environmental Protection, 2010).

Two other states that focus primarily on trading among regulated point sources (as Connecticut does exclusively—nonpoint sources are not a part of the NCE) also include a provision for point sources to purchase nutrient offsets generated by nonpoint sources, after following a sequencing protocol. For example, Virginia's trading program is designed to provide additional compliance options for point sources to meet an aggregate point source load cap in the state's Chesapeake Bay tributaries per Virginia's Chesapeake Bay Watershed Implementation Plan, developed to meet the requirements of the Chesapeake Bay's TMDL. A Chesapeake Bay Watershed General Permit is part of the Implementation Plan. Additionally, a voluntary/non-regulatory not-for-profit membership organization, the Nutrient Credit Exchange Association, was created to facilitate WQT among point sources belonging to the Exchange. According to the sequencing protocol, existing point sources, as well as new and expanding point sources, in need of nutrient offsets must first attempt to secure the offsets from an existing point source. If such offsets cannot be secured, the point source may pay into Virginia's statewide Water Quality Improvement Fund, which finances agricultural BMPs and watershed restoration projects in prioritized watersheds.

Similar in concept and objective to Virginia's Water Quality Improvement Fund, North Carolina allows *in-lieu-fee* payments to a statewide Ecosystem Enhancement Program (EEP). The EEP offers four voluntary in-lieu-fee (ILF) offset or mitigation programs to public and private sectors to satisfy a range of local, state and federal mitigation requirements. The four EEP programs are:

- The Stream & Wetland ILF Program for North Carolina's Department of Transportation;

- The Statewide Stream & Wetland ILF Program, for the private sector, state government agencies, municipalities, schools, military bases and other applicants to meet state and federal stream and wetland mitigation requirements;
- The Riparian Buffer Mitigation Program, offered to the private and public sectors as an option to meet state requirements, applicable in six specific nutrient-impaired watersheds;
- The Water Quality-Nutrient Offset Program, which is connected by rule to WQT programs in specified watersheds (including the Neuse River Basin and the Tar-Pamlico Estuary watershed) and is also offered as an ILF option to meet nutrient reduction requirements pertaining to stormwater for new development and redevelopment.

In North Carolina's ILF programs, accepting the fee means accepting responsibility to complete the appropriate mitigation or offset project. The individual or entity paying the fee is no longer responsible. The EEP usually prioritizes and selects nutrient reduction and restoration projects to implement according to collaboratively developed Local Watershed Plans. The EEP then works with numerous local and regional land trusts, private sector environmental consultants and public and private mitigation banks to implement projects through various forms of partnerships (North Carolina Department of Environment and Natural Resources).

Like Connecticut and Virginia, North Carolina's WQT programs focus primarily on trading among regulated point sources and employ group compliance mechanisms, such as trading coalitions and group NPDES permits. For example, the Neuse River trading program in North Carolina allowed point sources to form *compliance associations* (of point source members) to work collectively to meet their combined requirements under the TMDL. Subsequently, the North Carolina Department of Environment and Natural Resources Division of Water Quality issued a watershed-based permit—the first in the state, in 2002—to a group of dischargers, also known as *co-permittees*, organized as the Neuse River Compliance Association.

According to North Carolina's rules, when a trading association and group (permit) compliance option is chosen, individual limits still apply to the point sources, but the facilities are deemed "in compliance" with the individual limits as long as the group remains in compliance with the combined nutrient limit. If the group should exceed the combined limit, then the group must make an offset payment to the Ecosystem Enhancement Program [EEP] and any facility that has exceeded its individual limit would be in violation as well. (All the co-permittees are required to monitor their own discharge under their individual NPDES permits, which also remain in force.)

In North Carolina, the two group compliance mechanisms working in combination (i.e., the point source trading associations and the group NPDES permitting) have been effective in reducing the nutrient loads—considerably below the group caps and below the forecasted costs. For instance, the Neuse River Compliance Association members have achieved a 69 percent reduction of their total nitrogen loading to the estuary, since 1995, and have not once needed to pay into the EEP (EPA-NPDES).

It is noted here as an example of a missed opportunity, instead of a model for Florida to follow, that payment into the EEP has been established as a penalty for failure to meet group reduction goals instead of an additional way to reach those goals, as the high unit price set by the EEP for nutrient offsets available to the point sources in the WQT program is viewed by the Compliance Association as cost-prohibitive. Compliance Association members have stated that they want a lower price for EEP offsets and/or to be allowed to engage in WQ trading with nonpoint sources. Association members recognize that 80 percent of the nutrient load in the Neuse River Basin is attributable to nonpoint sources, suggesting that WQT exclusively among point sources, even when successful, does not address the bigger problem in most watersheds, including the Neuse (EPA-NPDES).

Neuse River nutrient reduction rules do cover nonpoint agricultural sources, however, just not by WQT. Counties are responsible for reducing nutrient loads, and farmers must either join a county association that applies reduction strategies or individually contribute to meeting objectives by setting aside 50-foot to 100-foot buffers along all streams on their property (National Research Council, 2008).

Point-to-Nonpoint Program Examples

Although two dozen WQT programs in the U.S. have established rules that allow point source to nonpoint source trading, one program stands out as a practical example of how to achieve active trading between point and nonpoint sources: the Great Miami River Watershed Trading Program.

The Great Miami River Watershed Water Quality Trading Program in Ohio was referred to as "arguably the most successful water quality credit trading scheme in the world today (Zwick, 2008)." And academic evaluators of this program stated in their recently published journal article, "Overall, the program structure serves as an effective model for future trading programs in other regions that seek to involve agricultural nonpoint sources (Newburn and Woodward, 2012)." It is an exemplary program for the design of a Florida WQT program that is intended to target the participation of agricultural nonpoint sources because it has demonstrated exceptional success in that aim. The Miami Conservancy District (MCD), which has led the organization and operation of the program, could see from the start that point-to-nonpoint WQT would provide more benefits than a narrow focus on wastewater treatment plant upgrades ever could. The MCD listed in their operations manual the direct and ancillary benefits of their pilot trading program, which covers nearly 4,000 square miles mainly in southwestern Ohio.

Direct benefits include (Miami Conservancy District, 2005):

- Increased use of management practices that benefit water quality.
- More sustainable operations with lower costs for agricultural producers.
- Reduced compliance costs for wastewater treatment plants.
- Increased number of stream miles that meet Ohio's water quality standards.
- Increased recreational use of the Great Miami River Watershed's rivers and streams.

Ancillary benefits from point-to-nonpoint trading include environmental gains listed in Table 1 which would not be realized from just decreasing nutrient discharges by upgrading wastewater treatment plant technology.

Table 1. Potential Ancillary Environmental Benefits

Benefits	Treatment Plant Upgrade	Agriculture Management Practices via Trading
Pollutant of concern reduced	Yes	Yes
Other pollutants reduced	?	Yes
Habitat improved	No	Yes
Canopy enhanced	No	Yes
Stream banks stabilized	No	Yes
Flow velocity decreased	No	Yes
Wetlands created	No	Yes
Floodplains preserved	No	Yes
Assimilative capacity increased	No	Yes

Excerpted from the Great Miami River Watershed Water Quality Credit Trading Program Operations Manual (2005), Miami Conservancy District.

In addition to reading about this program, I met with the program manager, Sarah Hippensteel Hall, in Ohio on October 5, to increase my understanding of how and why this program works. While the model features will be highlighted next, it is clear to me that strong and determined leadership is also key to making a program work. It takes desire, vision and a sustained effort.

Model Features of the Great Miami River Watershed WQT Program:

Inclusive stakeholder participation The program's pragmatic design, intended to be "farmer-friendly" while also offering incentives for early point source participation, arose from multiple meetings—estimated at over 100—MCD staff held with stakeholders during the design phase. Stakeholders (including water utilities, municipalities, agriculturalists and their representatives, notably the Ohio Farm Bureau Federation which became a crucial and instrumental partner, along with the county-based Soil and Water Conservation Districts) were directly involved in designing the program and its rules and eventually formed themselves into a panel, called the *advisory group*. This group plays an important role in the operation of the program. Specifically, the advisory group evaluates the bids to sell credits that are submitted by farmers and prioritizes them for purchase, according to the established ranking criteria the advisory group developed.

Credit aggregator and brokerage service Central to the program's structure and function is the nonpoint credit aggregation and brokerage service, a role played by the MCD. The brokerage service reduces the transaction costs of point-nonpoint trades, which would be very high if each utility had to locate individual farmers willing and eligible to sell credits to them, then negotiate agreements or sales contracts with each seller to purchase their nonpoint credits (an impractical scenario). Instead, the wastewater utilities simply let MCD know when they want to buy a large batch of offset credits and MCD matches those buyers with the appropriate number of certified nonpoint credits. The matching process begins each time MCD announces a bidding round, in

response to the buyers' notice, which invites farmers to submit their competitive bids for credit-generating projects to be considered for purchase. In practice, many projects are selected and the credits are bundled, or *aggregated,* to sell to each buyer in a batch. Each buyer pays MCD for a batch of credits then MCD pays the farmers who were selected to sell the credits. MCD enters into a multi-year agreement with each of the sellers.

The aggregator/broker model, chosen by the program designers, serves three important purposes: it makes trading easier and more accessible to both the buyers and sellers, it minimizes trading transaction costs, and it provides trading program participants some measure of protection from liability. Because the MCD aggregates the credits and serves as a broker between credit buyers and sellers, there is no direct link between buyers and sellers: no specific project that generates credits is traceable to any particular buyer. And for added protection, the program also has an insurance pool of sorts: MCD holds a supply of credits in reserve to be used as replacements in case a nonpoint project fails.

Salient incentives for early "investors" The Miami River program is all the more exceptional because it was launched and has been in successful operation for years in a basin for which a TMDL has yet to be formally adopted. The lack of a "regulatory driver" is a leading reason why numerous WQT programs have gone through feasibility studies, rule development and official authorization but have yet to host a single trade (somewhat like spending ample time and money preparing to throw a big party to which no one comes). Because algae blooms in the river were apparent and of concern to many in the region, there was sufficient interest in being proactive to solve the problem. A salient incentive that utilities were offered for their early participation as an *investor* in the WQT program was a favorable trading ratio. If specified location conditions were met, wastewater utilities could buy credits generated by non-point sources at a 1:1 ratio, whereas the ratio applicable to later participants would be 2:1 (e.g., if 10,000 credits were needed, 20,000 credits would be need to be purchased), or potentially 3:1. The deal was that investors would be able to continue to buy credits at the discounted rate (the 1:1 ratio) even after a TMDL would be adopted. EPA approved this incentive (the favorable ratio) based on the rationale that nutrient reductions could occur in this basin through voluntary trading long before TMDL action plans would be implemented. The money from the utility-investors helped finance the development of the program and served as the required cash match for a Conservation Innovation Grant, which was awarded to MCD in 2005 by the USDA/NRCS.

Adaptive management, but with durable deals The program planners favored early action over waiting longer to start trading, pending further refinement of tools and rules. "Perfection is the enemy of the good" was a motto used in the planning phase. An EPA-approved model, a simple spreadsheet, was selected to estimate the nutrient reductions expected from implementing a particular project or practice and the number of credits that can be generated (and sold) has been determined, based on that estimate. Also, the program incorporates ambient water quality monitoring stations (automated samplers), which were installed as part of this pilot project. This technology can offer empirical insights into the performance of some projects and services, and

that new information should lead to adjustments to the model over time. Program partners expect those changes, and accept *adaptive management* as an operating principle. Still, partners agreed, **a deal is a deal**. Each trading round results in long-term contracts, which will continue to be based on the model's estimates at the time of trade. Recalibrated model results will be applied to new trading rounds (and to new multi-year contracts) only.

An early feasibility study estimated that the Miami River WQT program could save up to $385 million dollars. And Sarah Hippensteel Hall told me that the program has already removed from the watershed 783,000 pounds of nitrogen plus nearly 400,000 pounds of phosphorous through agricultural BMPs, financed via trading, at an average trading price of $1.52 per pound removed. And the market price is now trending downward: the average price in the last trading round was $1.12 per pound (or per credit). Compare that price to the unit costs of nutrient removal through additional controls installed at wastewater plants, which were estimated to average $23.37 per pound of phosphorous removed and $4.72 per pound of nitrogen removed, according to the Miami River WQT economic feasibility study (Kieser & Associates, 2004).

Significant Current Events (National News about WQT):

Conservation Innovation Grant Award In recognition of the fact that point-to-nonpoint trading is desirable but difficult to do, the USDA has directed Conservation Innovation Grant (CIG) dollars to this issue, to enable more states to investigate opportunities or to acquire practical experience with point-nonpoint WQT. One project that was awarded a CIG in 2012 is the bold, boundary breaching Ohio River Basin Interstate Water Quality Trading Program. Organized by the Electric Power Research Institute, the Ohio River Basin program is the country's **first *interstate* nutrient credit trading program**. The purpose of the initial pilot program phase (now through 2015), which involves 16 counties in three states, is to further develop trading policies that will allow water quality credits generated in one state to be applied in another state. The credits will be generated by agricultural producers and pilot trading could start by the end of 2012. A longer-term goal of the program is to expand into an eight-state area in the Ohio River Basin, adding Illinois, New York, Pennsylvania, Virginia and West Virginia to the three pilot-participating states of Ohio, Indiana and Kentucky (Keller, 2012; EPRI, 2012).

Lawsuit filed to block WQT in the Chesapeake Bay program WQT enthusiasts who have not had their ear near the ground in the Chesapeake Bay multi-state watershed were likely surprised by the news in early October (2012), as I was, that two environmental groups filed a joint lawsuit against EPA to have the agency remove the WQT provision from the 2010 plan to clean up the Chesapeake Bay. In short, the plaintiffs want WQT to be disallowed as an option for states in the Chesapeake Bay watershed. The ability to trade, however, had helped unite a broad coalition—industry, agriculture and conservation groups—in support of the formally adopted clean-up plan, which was ten years in the making. Some fear the progress made will be lost, as the coalition and the plan could collapse if trading is removed as a key component of the plan. Yet a few among the great many environmentalists engaged in the development and support of the clean-up plan

have been skeptical of nutrient trading and concerned that it could allow more pollution to flow into the bay. Their fear is that farm regulations in the bay watershed states are lax and there will be insufficient assurances that farmers are selling valid offset credits (Fears, D., Washington Post, 2012; Greenwire, April 30, 2012; Quinlan, May 8, 2012).

One of the organizations that filed the joint lawsuit, Food and Water Watch (the other is Friends of the Earth), posed the question in their press release about the lawsuit, "Why would we allow such an effective piece of legislation [referring to the federal Clean Water Act] to be replaced by a scheme that essentially legitimizes pollution? (Food & Water Watch, 2012)." Food and Water Watch worked with Earthjustice to draft their lawsuit (Greenwire, 2012). Earthjustice is one of the organizations that sued EPA earlier over water quality standards and enforcement in Florida.

Commentary on the Current Events

Thinking big

The federally grant-funded Ohio River Basin multi-state pilot program puts a Florida intrastate program in a new perspective. Programmatic sticking points that seemed daunting now seem far less so, including the physical distance between buyers and sellers or farmlands and cities. Such "location factors" may present a problem in many sub-basins in Florida, but probably not in any water management districts. Stepping back from the problem to see a broader context is helpful. This new perspective now enables me to understand an intriguing quote (that has perplexed me) as the practical advice it was meant to be: "When a problem seems too hard to solve, enlarge it." WQT *might* be simpler and easier to develop on a statewide scale than it was to test in a region.

Targeting the real problem with a new tool

The recent Chesapeake Bay lawsuit notwithstanding, most people acquainted with WQT see it as a win-win-win proposition for public utilities and industry, agriculture, and for the environment. Now that the Clean Water Act (CWA) has been in effect for more than forty years and exerting pressure on regulated point sources for decades to reduce harmful pollutants in their discharges, it makes sense to consider how higher water quality standards can be met more cost-effectively by using a voluntary market as a tool to reallocate some resources for nutrient reductions from the CWA-regulated sectors (point sources) to the non-CWA-regulated sectors (the nonpoints). Proponents of WQT in the Chesapeake Bay have said, for example, "$1 million dollars invested to stop fertilizer runoff in farming areas would go further to clean up the bay than $1 million invested in more high-tech pollution controls at a single treatment plant (Quinlan, 2012)." And the key word in that quote is "more." Today, plants will be adding more technology at a much higher cost per pound of nutrients removed than their previous upgrades. Many wastewater treatment facilities in Florida, for instance, have already upgraded to Advanced Wastewater Treatment (AWT) technology. While there is still room for improvement on the part of many point sources, of course, they are not our biggest problem now.

If every point source suddenly stopped discharging *entirely*, the nutrient load in most watersheds would be reduced by only 20 percent because 80 percent of the nutrient load is attributable to nonpoint sources, which include urban stormwater and septic systems as well as agriculture. WQT provides a way to leverage a 20 percent solution to help solve the 80 percent problem. It makes sense to put that tool to work on the real problem that needs to be fixed in modern times.

Proceeding with caution

Trading does not replace the CWA, as Food and Water Watch claims. Instead, trading extends its reach. The goal is still nutrient reductions. But in a WQ trading program, the reductions required by NPDES permits can be made either at the permitted facilities or elsewhere in the watershed (presumably at a lower cost) if the facilities purchase nutrient offset credits in sufficient number to meet the lowered nutrient discharge limit specified in their permits. *The trading option will result in nutrient reductions in the watershed only if the offset projects achieve the amount of nutrient reductions specified in the credit purchasers' discharge permits.* The lawsuit represents doubt that all offsets will produce genuine reductions in the Chesapeake Bay watershed. That is an important concern to remember in Florida. We must proceed with caution.

WQT with nonpoint sources is a new frontier, but it doesn't have to be "the Wild West," as the lawsuit filers fear. An attorney with Food and Water Watch clarified his concerns about nonpoint offsets in the bay states. On farmland, Scott Edwards said, "there are no measurements, there is no verification, there is no monitoring system in place… We'll never know if they're reducing their loads or just selling make-believe credits." Edwards believes mechanisms and safeguards, which are still under development, should be in place before trading can occur (Quinlan, 2012). Those strike me as reasonable concerns that should serve as constructive guidance for Florida.

Next Step: Begin a Feasibility Phase to Identify Potential Point-Nonpoint Trades

A standard step in the development of a WQT program is to conduct a feasibility study. In the case of Florida, where a WQT pilot project has already been conducted in the Lower St. Johns River region, the next step should be to identify and examine opportunities throughout the state for point-to-nonpoint trading. That is not to say that additional opportunities for point-to-point trading should be ignored. This paper provides examples of how permitting innovations and other group compliance mechanisms have worked well enough elsewhere that they might also be considered for demonstration here. But because point-point trading was successfully established in the St. Johns pilot and that type of "apples to apples" trading is not as tricky as point-nonpoint trading can be, it need not be the focus of the next step study. Rather, nonpoint trading should be.

Outlined in this section are the recommended objectives, approach and intended outcomes of the feasibility study, or feasibility phase.

Two Main Objectives of the Feasibility Phase

The feasibility phase is envisioned as a time of active exploration, lasting from 18 to 24 months, with the two main objectives of: **(1)** Identifying nonpoint practices including agricultural BMPs and projects that will reliably result in water quality improvements, and **(2)** Identifying permitted point sources interested and in the position to buy nutrient offsets, per EPA's trading guidelines.

(Specifically, regarding EPA's guidelines, the NPDES permittee must have the expected, or industry standard technology-based effluent controls installed, at a minimum. Plants may **not** trade to meet a technology-based effluent limit, per EPA rules. Trading may be allowed only to meet a higher standard known as a Water Quality-Based Effluent Limit, or WQBEL ["Q-bel"].)

Approach

1. Inquiry into nonpoint credit generation

   We will request from a range of well-informed sources, via personal interviews with them, recommendations for both the specific type(s) of BMP or structural practices to examine and referrals to interview the persons who have implemented or are planning to implement or install the recommended practices and projects. We will be seeking information especially about potential offsets that could have large, quantifiable impact and can be, or already are, measured and monitored for verification of efficacy.

   Places to visit, people to meet include: Water Management Districts, agriculture producer associations, university researchers, state and federal agencies, nongovernmental organizations (NGOs) and private sector practitioners and consultants. For example:

   - The Southwest Florida Water Management District's FARMS program staff. Tail water recovery systems, which FARMS helps agriculturalists install, are intended to supplant groundwater pumping for irrigation, which they do. But these projects also reduce nutrient runoff and their operations are regularly measured and monitored as part of the FARMS protocol. Stephen Suau, a water resources expert who recently analyzed the FARMS program data for SWFWMD, recognized that the popular tail water recovery projects could also generate quantifiable credits in a WQT program.
   - The executive director and members of the Florida Cattlemen's Association, as well as members of other agriculture producers' associations including dairy associations, citrus growers' associations, the Florida Fruit and Vegetable Association, Florida Nursery Growers & Landscape Association, Florida Sod Growers, and Florida Certified Organic Growers & Consumers, Inc. We expect the Florida Farm Bureau and the Florida Land Council to be excellent resources also.
   - The University of Florida's Institute of Food and Agricultural Sciences (IFAS). We already have a list from the IFAS Deans of numerous research faculty and Extension members who are experts in various practices to explore for WQ trading feasibility.

- State and federal agencies including the Florida Department of Agriculture and Consumer Services (DACS), the Florida Department of Environmental Protection, the Florida Fish and Wildlife Conservation Commission and NRCS (of the USDA).
- Private sector contacts to consult include NGOs who work on water quality issues and conservation planning including the Florida chapters of The Nature Conservancy and Audubon, as well as private practitioners who design nutrient control projects.

Some of the DACS personnel who are very familiar with the implementation of the agricultural BMP programs have expressed concern that, relative to many other states, there is little left in Florida of the lowest cost and easiest to implement BMPs; most of the "low hanging fruit" has been implemented, leaving more expensive BMPs that might not be cost-competitive in a WQT market. Part of the purpose of the feasibility study is to better understand what sort of "fruit" remains and to better understand the costs of the more expensive but effective measures and consider how WQT could contribute to the project financing if coupled with other identifiable sources of support. Methane digesters and edge-of-farm treatments on dairies are expensive, for example, but they can also contribute substantially to reducing nutrient loads in a watershed—which should be the number one goal of any WQT program.

2. Inquiry into the potential credit-buying market

The leadership of the Florida Water Environment Association Utility Council will be consulted to discuss options on how to proceed. Should a brief survey be conducted of the Utility Council's membership, for instance, or can the Council offer a sample of utilities to be interviewed? It is possible that many utilities have investigated what their cost of compliance would be under the potential NNC regulatory scenarios, and some may have weighed trading scenarios as well. Also, the Florida Department of Environmental Protection (DEP) maintains information on NPDES permitting and may have public access data suitable for secondary analysis that can help gauge the market potential on the credit-buying side in regions throughout the state. The Utility Council and DEP have both been interested in exploring WQT and possibly expanding the option to trade statewide in Florida. They will no doubt be strong collaborators in the trading feasibility phase.

The leadership of the Florida Stormwater Association (FSA) will be consulted as well to discuss a potential survey of FSA's membership. Interest in WQT among MS4s (the NPDES-permitted Municipal Separate Storm Sewer Systems) could be significant and should be better understood as part of the feasibility study. Some see great potential in trading between MS4s and nonpoints.

We will also seek the counsel of those representing other categories of permitted point sources, including the industry and mining sectors, such as the Florida Environmental Pulp and Paper Association and Mosaic, an international corporation and the largest phosphate mining company operating in Florida that also has strong commercial ties to the agricultural sector. (Mosaic is a supporter of the Ohio River Basin WQT pilot project, including providing financial sponsorship through the Mosaic Company Foundation.)

Intended Outcomes (1- 4)

1. **Case studies in two categories:**
    a. Nutrient offset case studies. Identify and describe a minimum of seven different nonpoint practices or projects that are good candidates to be certified for credit generation. Descriptions of each type of offset will include its implementation and management costs and how its performance can be directly measured, or otherwise quantified, verified and monitored.
    b. Offset buyer case studies. Describe the circumstances and preferences of a small representative sample of potential credit buyers, roughly five, selected from the total number of nonpoint sources identified in the feasibility phase as potentially interested in WQT. The case studies will describe the type of physical plant or operational upgrade that would be needed if trading were not an option; what type of nutrient offsets would be needed (phosphorous, nitrogen) and in what amounts; what price per credit would make trading attractive; and what other factors could make trading not only feasible but a preferred option in their case.
        i. If the inquiry into the potential credit buying market reveals a demand for shorter-term offsets as well as longer-term, the case studies will address offset term (duration of agreement) as a variable.
        ii. Similarly, if the inquiry into the potential credit buying market reveals an interest in partial offsets, or the desire to meet compliance targets through a combination of treatment technology and the purchase of WQT credits, an example of a partial offset scenario will be covered in the case studies.
2. **Identification and description of potential pilot trades**
    a. The inquiry into interested buyers and sellers of credits, statewide, may reveal specific opportunities to make a trade in one or more watersheds in Florida. Any such opportunities discovered will be documented and described including the suggested terms of the potential trade agreement(s) and the context of the trade (e.g., would the potential trade pertain to a *pre*-BMAP allocation agreement?).
        i. Pilot trades, if reviewed and understood on a case by case basis in the feasibility phase, can lead to sound protocols for a faster, more systematic and agreeable approach to eventually handling heavy trading volume in particular watersheds, should thriving WQT markets emerge in Florida.
3. **Recommendations regarding the systems needed to support trading, such as:**
    a. Credit aggregation and brokerage service, that connects buyers and sellers.
        i. There is early indication that demand for WQT credits could be substantial among point sources in Florida if their buying experience could be similar to a wetlands mitigation banking "pay and go" experience. So a question to answer should be 'how close can an aggregation/brokerage service for WQT come to a pay and go model?'
        ii. What should be the access points to the aggregator for buyers and sellers?

iii. How can the aggregation/brokerage service be self-supporting via WQT?

b. Credit certification, verification and registration; which agencies and entities should be involved (considering the logistics of a possible statewide scope) and what protocols are recommended?
c. Financial accounting systems and controls: how will money be safely handled?
d. Data tracking and reporting mechanisms, and appropriate public access to trading information.

4. Recommendations regarding <u>policy questions</u> or rules to support trading, such as:

a. Trading ratios: Suggestions informed by the findings in the feasibility phase.
    i. The recommendations on this topic might also address buyers' incentives.
b. Location factors: Is there sufficient rationale for trading in a broader geography?
c. Can there be a basic regulatory framework, or guidelines for point-nonpoint WQT, that could apply to *any* watershed in Florida? What would be the elements of a statewide framework? Would basin-customizations be necessary add-ons?
d. The policy discussion could potentially explore the topic of whether or how a water quality offset project's *co-benefits,* such as aquifer recharge or surface water storage or habitat enhancements, might be taken into account in a credit prioritization protocol, or by some other method (if this is feasible to explore).

Scope of the inquiry: Statewide scale, or the option to focus on two critical regions

The feasibility inquiry, if sufficiently funded to do so, should investigate the level of interest in trading among point and nonpoint sources and the potential opportunities for trading *throughout* the state, including any potential—not hypothetical—trades identified anywhere in the state. The systems and policies recommended to support trading will be dependent on solid indications of how widespread and potentially active—meaning high trading volume—WQT could become. It is recognized, however, that policies which include strong incentives for credit buyers to engage in trading could be instrumental in creating a large and active WQT market that would otherwise remain small or inactive, in the absence of such incentives. For this reason it will be important to understand from the potential credit buyers' perspective the circumstances under which buyers would want to purchase offset credits. Ideally, one or more plausible incentives would be tested in a survey of the potential buyers market.

There are two critical regions in Florida that can use all of the water quality tools the state can muster: the Northern Everglades (Lake Okeechobee watershed) and the Suwannee River basin that comprises the greater part of Florida's exceptional springsheds system. Those two multi-county regions are so crucial to Florida's water (and cultural) resources and there are so many challenges and opportunities to examine in each that the entire feasibility phase, as outlined above, could be focused on those two regions alone, instead of conducted at a statewide scale.

That is an option for DEP and DACS to consider, and it would be a reasonable plan to endorse should funding for the feasibility phase be too limited to conduct a statewide study at this time.

The Watershed Fund of Florida: Concept Overview

(Contributing to a Big Goal for Florida)

The Watershed Fund of Florida will be established as a nonprofit nongovernmental organization dedicated to healthy watersheds and sustainable water resources in the state. One of the first of the Watershed Fund's programs to be developed will be a water quality credit aggregation and brokerage service to facilitate a point-to-nonpoint WQT program in Florida, if sufficient interest in that type of trading can be confirmed during the feasibility phase.

In the section on designing and operating a trading program, the authors of the recent report called *In it Together: a How-to Reference for Building Point-Nonpoint Water Quality Trading Programs* advised that the availability of third parties to provide technical assistance and/or to aggregate credits to deliver to buyers as a package "is critical." A third party aggregator/broker enables buyers and sellers to readily access the WQT market. And "aggregators also play an important role in helping reduce risk for buyers," the authors wrote (Willamette Partnership, 2012). A good aggregation/brokerage service should provide a buying experience as close as possible to the 'pay and go' or in-lieu fee ideal that credit buyers would prefer.

Agriculturists interested in WQT also recognize the important role played by credit aggregators. The American Farmland Trust conducted "listening sessions" with 150 agricultural producers from Ohio, Kentucky, Indiana and Illinois to find out what their concerns and preferences were regarding the new interstate pilot program for WQT in the Ohio River Basin. What topped the resulting list of "Critical WQT Program Structure Issues for Agriculture" was the need to identify and engage groups to act as aggregators of water quality credits (EPRI, 2011). Ohio's Miami Conservancy District plays the role of credit aggregator and broker in their management and general support of the Great Miami River Watershed WQT Program—the model of success.

In addition to aggregating credits in support of a WQT program in Florida, the Watershed Fund of Florida will aggregate resources from multiple sources to fund watershed restoration projects. The inspiration for the Watershed Fund of Florida comes from The Nature Conservancy's (TNC) exemplary international Water Funds program. Consistent with that program model, financial support for watershed services and projects in Florida can come from contributions from private corporations and from citizens who are given an opportunity to support watershed restoration via a check-off option on their water utility bills.

TNC's Water Funds program began in Latin America and has been expanding worldwide. The first water fund was established in 2000 in Quito, Ecuador. There are now 15+ water funds in

TNC's Latin America Water Funds Partnership (in Columbia, Brazil, Peru, and in more parts of Ecuador). TNC expects its portfolio of water funds to double by 2015 in Latin America, and additional water funds are under development in other countries and continents, including North America. The first water funds in the U.S. have been launched in Santa Fe, New Mexico and San Antonio, Texas. TNC's international water funds program is recognized as a replicable model. TNC published earlier this year a thorough and practical guide to help others implement water funds (Calvache, 2012).

A TNC water fund is both a financial tool and a set of watershed-specific strategies designed to improve the quality and availability of water. A water fund program is generally a Payment for Ecosystem Services (PES) program. In the basic scheme, *water users* (or *investors*)—usually large businesses, such as beverage bottlers, and public water utilities—voluntarily pay into a water trust fund to finance prioritized projects and services. *Water producers*—usually the foresters and farmers living in the watershed—are paid from the program's trust fund for water restoration projects, best management practices and water-related ecosystem services. Water users/investors participate in the local council that selects and prioritizes services to be funded.

The Watershed Fund of Florida and its programs will be developed in collaboration with leaders of organizations interested or invested in the strategic conservation of the state's water resources, including the Florida Chapter of TNC.

The Fund's initial program to support WQT will be complemented by a PES program that will take a more holistic view of watershed health. The EPA has recognized the limitations, and the limited success, of the narrow focus on point source pollutants through regulatory compliance with the Clean Water Act. In launching the **Healthy Watersheds Initiative** last year, the EPA noted that traditional CWA compliance mechanisms have neither slowed the national increase in the number of "impaired waters" nor have served well to convert impaired waters to "delisted waters." In other words, ever more water bodies are becoming impaired and far fewer are being restored to health. In its 2011 introductory report about the Healthy Watersheds Initiative (HWI), called *Coming Together for Clean Water*, the EPA conceded that "despite our best efforts and many local successes, overall, our aquatic ecosystems are declining nationwide; a trend that has been documented by many (EPA, 2011)." EPA elaborated on the rationale for their Initiative:

> The HWI is a further refinement and enhancement of EPA's existing watershed approaches; an explicit recognition that restoration will not succeed without maintaining healthy watershed "infrastructure" of habitat, biotic communities, water chemistry, and intact watershed hydrologic (surface and subsurface) and geomorphic processes. The HWI is based on a key, overarching concept: the integrity of aquatic ecosystems is tightly linked to the watersheds of which they are a part. There is a direct relationship between land cover, hydrology and key watershed processes and the condition of aquatic ecosystems. **Healthy, functioning watersheds provide the building blocks that anchor water quality restoration efforts.** Without this ecological support system, we will not

> only fail to successfully restore impaired waters, but also waste limited financial resources as additional waters become impaired and other socio-economic benefits are lost (EPA, 2011).

In *Coming Together*, the EPA listed as one of the numerous benefits of healthy watersheds the economic savings realized by water utilities. EPA explained:

> For example, by protecting aquifer recharge zones and surface water sources, costs of drinking water treatment may be reduced. A survey of the treatment costs and watershed characteristics of 27 drinking water utilities found that for every 10 percent increase in forest cover of the source area, chemical and treatment costs decrease by 20 percent (Ernst, C., 2004, as referenced in EPA, 2011).

That concept and those savings are precisely why water utilities and other water users pay into TNC's water funds. The program protects their water supply and saves them money.

A Big Goal for Florida

The regrettable loss of natural storage capacity in our watersheds is a huge problem to correct. But fixing the problem would pay perpetual dividends to our drinking water supplies in Florida. Ernie Barnett, Everglades Policy Director with the South Florida Water Management District, stated in his presentation at the Florida Chamber Foundation's Annual Environmental Permitting Summer School in Marco Island in July 2012 that, **"We don't have a shortage of water in this state. We have a shortage of infrastructure to capture, treat and store the water."** Barnett explained that in South Florida, 1.7 billion gallons of freshwater per day (on average) are wasted to tide through the man-made drainage system. Put another way, roughly 60 percent of historic flows are "artificially shunted" offshore via canals. "The water pie would be bigger if we could capture this," Barnett said.

Productive partnerships with rural landowners will be essential to solving our water problems. That is a point Commissioner Putnam made in his remarks to the Economic Club of Florida in October (quoted on page one of this paper) and it is the approach we will take in the programs that are collaboratively developed through the Watershed Fund of Florida. But those programs should be contributing to a much larger and concerted effort in this state: a big goal for Florida.

We need to repair much cumulative damage that has been done to our watersheds, which began before Florida's statehood. Draining the state for progress's sake was called *land reclamation* then; and it was done with zeal. But the result of that practice is crippling us now and it clouds Florida's future. Our mission today must be to create a new water legacy and reclaim our *water*. Let's commit to the challenge, focus our resources, coordinate efforts, get clever and get going.

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Mary Lucier Oakley (bio sketch on next page)

Center for Landscape Conservation Planning

University of Florida

moakley@ufl.edu

(850) 694-2693 (cell)

Author's Bio Sketch

Mary Oakley has worked on research and public policy at a senior management level in Florida since 1994. She is the project manager and co-principal investigator (with Tom Hoctor, Ph.D.) of the Cooperative Conservation Blueprint Regional Pilot Project (the region includes the Northern Everglades). She was assistant director and the Director of Research for the Century Commission for a Sustainable Florida, which launched the Critical Lands and Waters Identification Project (CLIP) in 2006. She designed, conducted and/or directed statewide-scale research projects for two previous state commissions in Florida as well, while serving as the Assistant Director for the Florida Policy Exchange Center on Aging at the University of South Florida (USF). Prior to joining the Center for Landscape Conservation Planning at the University of Florida in 2010, she served as the Research and Policy Coordinator and chief policy advisor to the Secretary at the Florida Department of Elder Affairs. Mary has a Master's degree in Gerontology (research and policy) from USF and was a 2004 Fellow of the Florida Natural Resources Leadership Institute.