

Water Quality Credit Trading

July 24, 2014

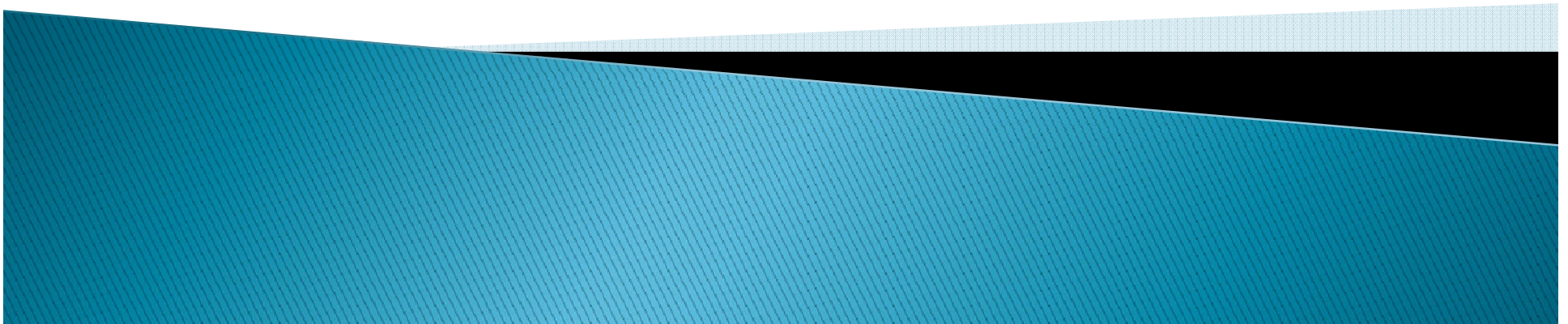
28th Annual Environmental Permitting Summer School

David Childs, Hopping Green and Sams, P.A.

Thomas Frick, Florida Dept. of Environmental Protection

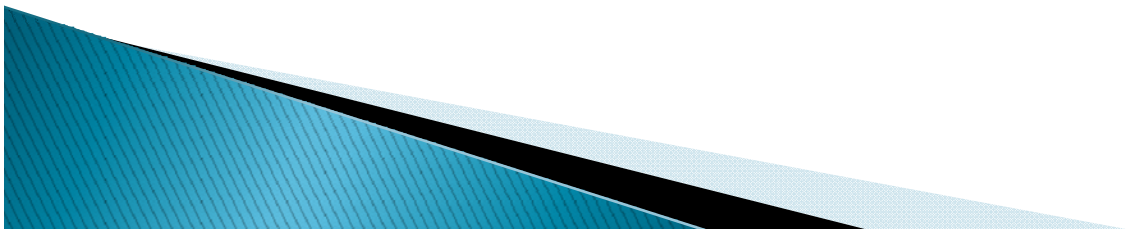
Terry Pride, Florida Dept. of Agriculture and Consumer Services

Kurt Spitzer, Florida Stormwater Association

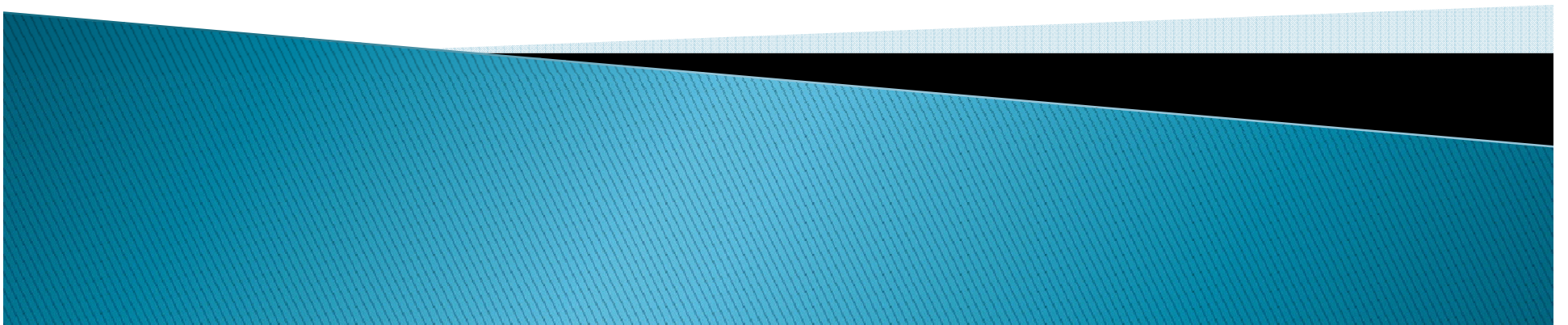


Water Quality Credit Trading

- ▶ **Overview** (David Childs, Hopping Green & Sams)
 - Regulatory Backdrop
 - Market Creation
- ▶ **Introduction to WQCT** (Terry Pride, FDACS)
 - Concept, Elements, Market Structures, Risks
 - WQCT Efforts Elsewhere, Lessons Learned
 - Ag Participation
- ▶ **Legal Framework** (Tom Frick, FDEP)
 - How it works in Florida
 - St. Johns River Pilot Program
 - 2013 Legislation and New Rule Development
- ▶ **Florida Trades and Stormwater Issues** (Kurt Spitzer, FSA)
 - Stormwater Participation
 - Examples of Trades



Overview.....



▶ **Regulatory Backdrop**

▶ **Market Creation**

- Numeric Nutrient Criteria Implementation
- Total Maximum Daily Loads Water Quality Credit Trading

***What is the regulatory
framework within which
trading can occur?***

Backdrop: Clean Water Act

- **Water Quality Criteria**
 - Protect “designated uses” of water bodies
 - Translated into discharge permit limits
 - Updated every 3 years
- **TMDL Program** (safety net)
 - Restoration program
 - Point and non-point sources allocated pollutant loads
- **Discharge Permits**
 - Wastewater Treatment Plants
 - Municipal Storm Water Discharges

Backdrop: Clean Water Act

▶ TMDLs

- More complicated TMDLs are implemented via basin management action plans (BMAPs).
- A single BMAP may address various impaired stream segments and water bodies within a watershed
- *The pollutant reduction requirements of TMDLs create the market in which trading can occur*

Why is water quality credit trading a timely topic?

State NNC Overview

- ▶ FDEP Rule (Rules 62-302, 303, F.A.C.)
 - **Lakes & spring numbers ≈ EPA numbers**
 - Springs: 0.35 mg/L-Nitrate
 - Lakes: Variable based on color, alkalinity
 - **EPA stream numbers + “Biological Confirmation”**
 - Streams are more narrowly defined
 - **Estuaries**
 - Existing conditions, TMDLs, & reference sites
 - **Coastal Waters: Chlorophyll-a**
 - **Overall Costs:**
 - \$51 to \$150 million per year (FSU)

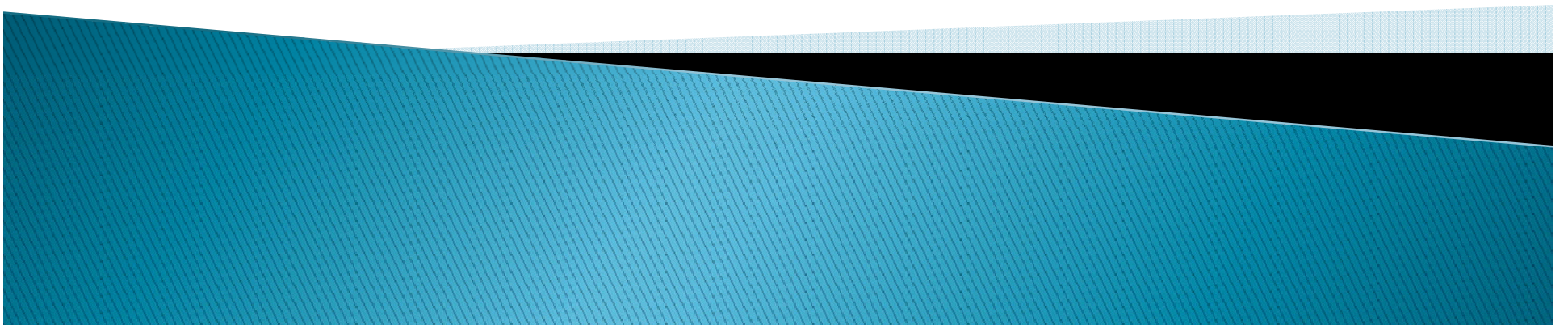
What impact can we expect on Florida's TMDL program?

Nutrient TMDLS

- ▶ Florida already has more than 100 nutrient TMDLs
 - *FDEP NNC Rule approval means even more TMDLs*
- ▶ Significant nutrient reductions, particularly for storm water
 - Bayou Chico: 30% TN & TP reductions
 - North Escambia Bay: 35% TP reduction
 - Hillsborough River (channelized segment): 50% TN & 60% TP reductions
 - Lake Dora: 67% reduction in TP

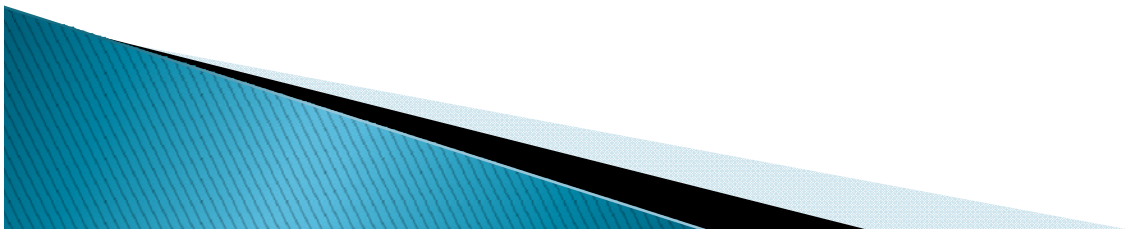
Water quality credit trading can help cities, farmers, dairymen, and industries restore water bodies and comply with nutrient load reduction requirements in a more cost-effective manner.

Introduction to WQCT.....



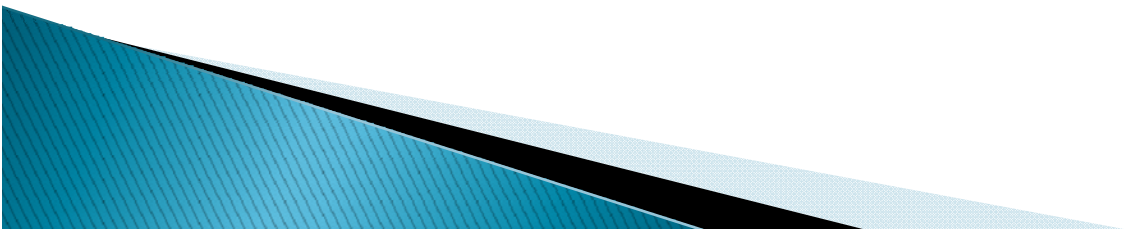
What is WQCT?

- ▶ Voluntary, market-based approach to help protect and restore water quality that allows for more cost-effective reductions in pollutant discharges.
- ▶ Parties trade only if both are better off because of it.
- ▶ A trade is allowed only if the water resource will be better off because of it.



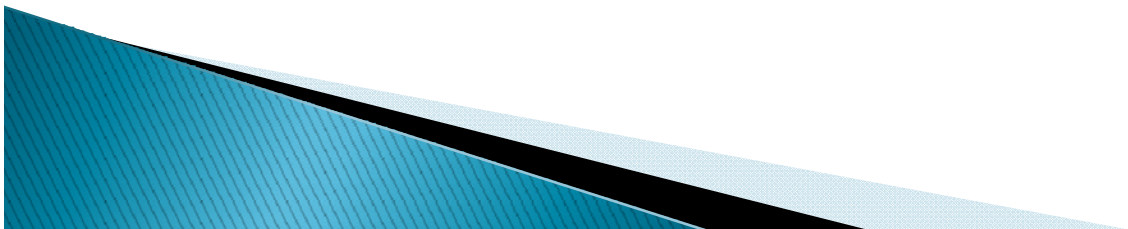
Principles

- ▶ Trading is an adjunct to regulation, not a substitute.
- ▶ Credits are not a right to pollute, but an accounting mechanism to facilitate exchange.
- ▶ Trading is used to improve WQ, not degrade it; need to avoid “hot spots.”
- ▶ Trading is used between sources in the same area of impact.
- ▶ WQCT will not work in all areas. Needs local support. One tool among others, should not be a “forced” alternative.



When/Where? (per EPA)

- ▶ To maintain water quality standards (no verified impairment).
- ▶ Pre-TMDL trading in impaired waters to achieve applicable WQS and potentially avoid TMDL. (part of reasonable assurance?)
- ▶ Pretreatment trading consistent with federal regulations and the applicable NPDES permit.
- ▶ Intra-plant trading between multiple outfalls to the same receiving water from a facility with an NPDES permit.
- ▶ Within same area of impact - can vary in size from a small watershed to an interstate waterbody (e.g., Chesapeake Bay, Ohio River Basin).



Elements of a Credible Trading Program

Clear Legal Authority and Mechanisms - Credit registry, exchange market, credit bank, etc., to facilitate trading.

Common Units of Trade

Creation and Duration of Credits

- Baseline beyond which credits are generated.
- Proximity of credit generation and use periods.
- Reconciliation period consistent with compliance period.

Quantify Credits and Address Uncertainty - (e.g., monitoring/modeling/standardized estimates; trade ratios, location factors, credit reserves, etc.).

Clear Compliance and Enforcement Provisions - Incorporated into applicable permit or other legal mechanism.

Public Participation and Access to Information

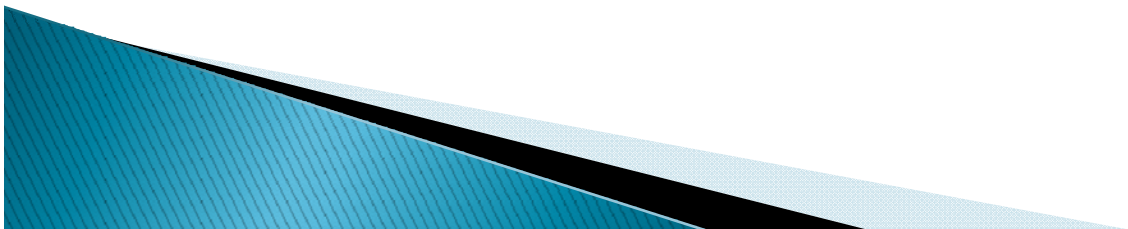
- Stakeholders aware of and involved in program development.
- Trading program information easily accessible to the public.

Program Evaluations - Environmental and economic, built into program design.



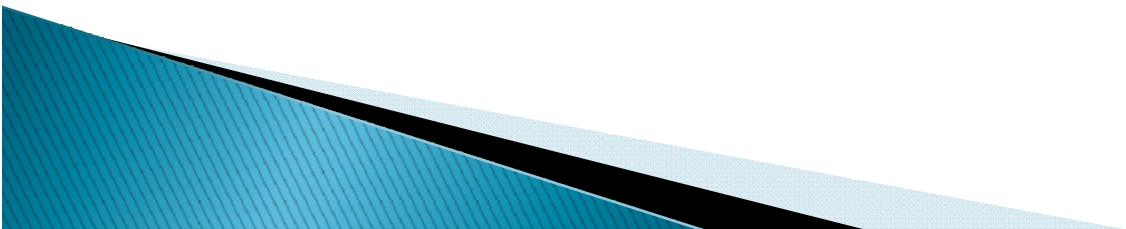
Market Structures

- ▶ **Bilateral Trades:** One-on-one negotiation (high transaction costs).
- ▶ **Sole-source offsets:** Regulated entity increases discharge at one point, reduces at another.
- ▶ **Clearinghouse:** single intermediary links credit buyers and sellers (brokers, aggregators, banks).
- ▶ **Exchange Market:** Buyers and sellers meet in public forum (e.g., online) and prices are transparent.



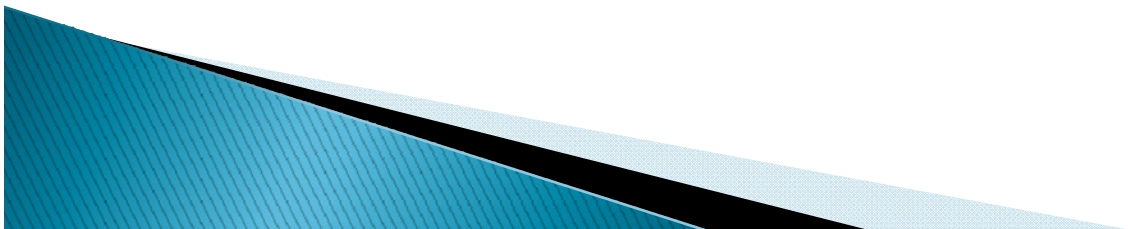
Positives

- ▶ Potential to implement water quality improvements at lower cost and stretch funds to achieve more improvements.
- ▶ Long-term possibility for multiple benefits (habitat, wetlands restoration, etc.) - credit stacking.
- ▶ Allows more flexibility, more local control in determining water quality solutions. Can tailor program to local priorities and realities.



Concerns

- ▶ **Philosophical** - Should not just break even by trading off responsibility. All feasible reductions should be made at points of discharge.
- ▶ **Execution** - If poorly implemented, can create rather than solve water quality problems - or just waste time and money.
- ▶ **Risks and Uncertainties** - for the environment and the participants (*scientific, extreme event, behavioral, regulatory, and market uncertainties*).
 - **Environment** - Ensure true reductions take place, avoid hot spots.
 - **Participants** - Address liability/responsibility for credits, reliability/duration of credits.



Ag/NPS Participation - Questions

- ▶ **Defining Baseline** - TMDL allocations (collective vs. individual), “standard” BMPs, other?
- ▶ **Credit Generation** - Anything above “standard” BMPs? Specified BMPs?
- ▶ **Accountability** - Verification of BMP implementation and of load reduction. Who certifies/verifies? NRCS, FDACS, FDEP, 3rd party contractor? Modeling estimates vs. monitoring. Trends vs. edge of field.
- ▶ **How to Address Uncertainties** - (Daily/seasonal changes, weather, management decisions, etc.) - trading ratios, credit reserves, aggregators, monitoring, etc.
- ▶ **Can cost-shared BMPs generate credits?**
- ▶ **Willingness to participate - What’s the incentive?** (additional cost share for farm improvements, service payments?) **Is it worth the effort? Does it create unacceptable risks/impositions?**



Water Quality Credit Trading Programs Around the Globe

(World Resources Institute, March 2009)

**Program has had at least one trade or offset*

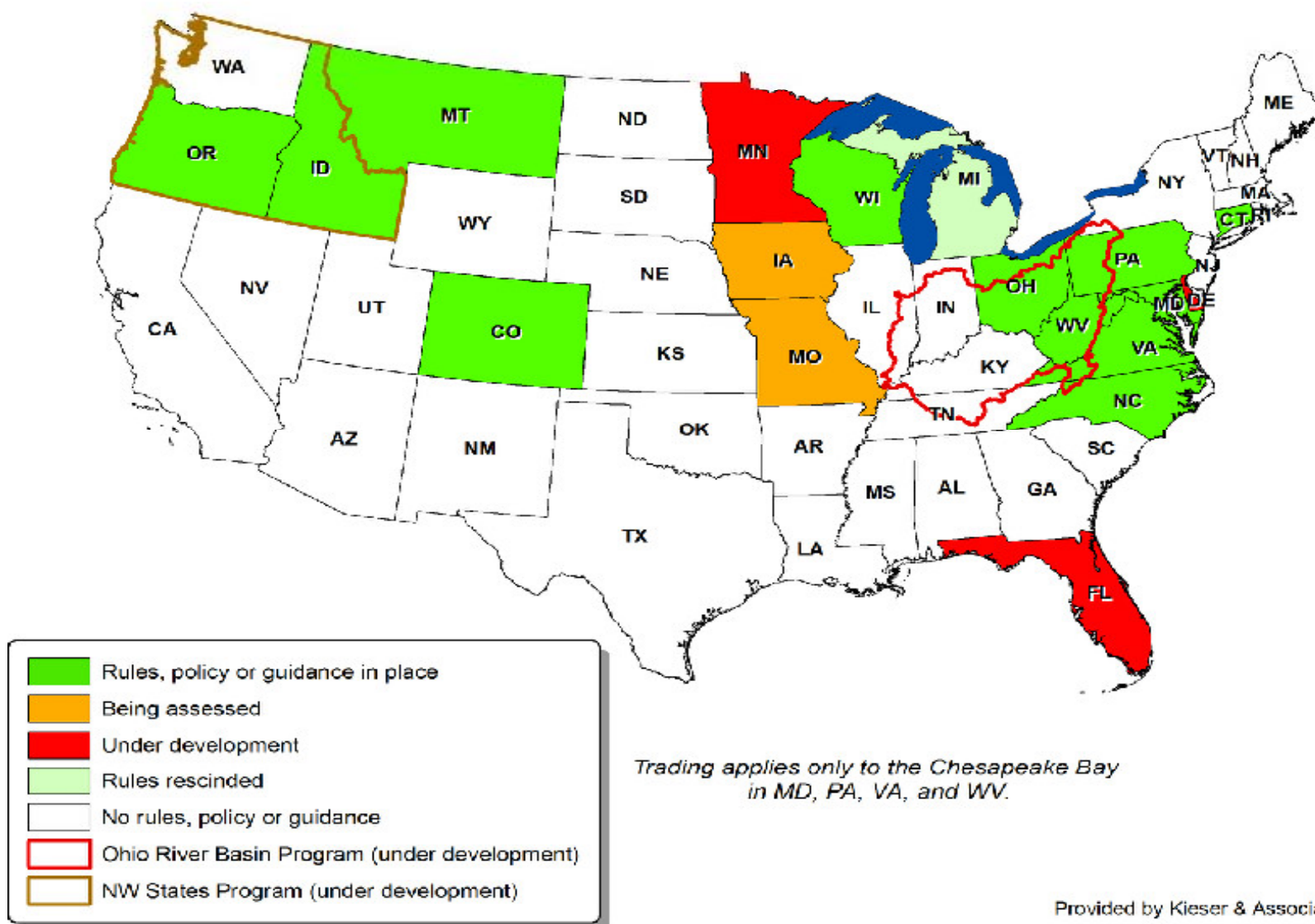
Note: Not all these are strictly credit trading programs (e.g., FRESP)

PROGRAM NAME	STATE/COUNTRY	TYPES OF TRADES	MARKET TYPE ¹
Active Programs/Pilots			
Hunter River Salinity Trading Scheme*	New South Wales, Australia	PS-PS	Exchange market
South Nation River Watershed Trading Program *	Ontario, Canada	PS-NPS	Clearinghouse
South Creek Bubble Licensing Scheme	New South Wales, Australia	PS-PS	Clearinghouse (aggregate permit)
Murray-Darling Basin Salinity Credits Scheme ¹	Southeastern Australia		Bilateral
Grassland Area Farmers Tradable Loads Program*	California, U.S.	NPS-NPS	Bilateral
Bear Creek*	Colorado, U.S.	PS-PS/NPS	Bilateral
Chatfield Reservoir Trading Program*	Colorado, U.S.	PS-PS/NPS	Sole-source offsets
Cherry Creek Reservoir Watershed Phosphorus Trading Program*	Colorado, U.S.	PS-PS/NPS	Sole-source offsets
Lake Dillon (Dillon Reservoir) Trading Program*	Colorado, U.S.	PS-NPS	Bilateral
Long Island Sound Nitrogen Credit Exchange Program*	Connecticut, U.S.	PS-PS	Clearinghouse
Delaware Inland Bays*	Delaware, U.S.	PS-NPS	Sole-source offsets
Lower Boise River Effluent Trading Demonstration Project	Idaho, U.S.	PS-NPS	Bilateral
Middle Snake River Demonstration Project	Idaho, U.S.	PS-PS	Bilateral
Minnesota River Basin Trading Program*	Minnesota, U.S.	PS-PS	Bilateral
Rahr Malting*	Minnesota, U.S.	PS-NPS	Bilateral
Southern Minnesota Beet Sugar Cooperative Program*	Minnesota, U.S.	PS-NPS	Clearinghouse
Las Vegas Wash	Nevada, U.S.	PS-PS	Clearinghouse (aggregate permit)
Taos Ski Valley	New Mexico, U.S.	PS-NPS	Sole-source offsets
Neuse River Basin Total Nitrogen Trading Program*	North Carolina, U.S.	PS-PS/NPS	Clearinghouse (bubble permit)
Tar-Pamlico Nutrient Trading Program*	North Carolina, U.S.	PS-PS/NPS	Clearinghouse
Great Miami River Watershed Trading Pilot	Ohio, U.S.	PS-PS/NPS	Clearinghouse
Alpine Cheese Company/Sugar Creek*	Ohio, U.S.	PS-NPS	Bilateral
Clean Water Services/Tualatin River*	Oregon, U.S.	PS-PS/NPS	Bilateral, Sole-source offsets
Pennsylvania Water Quality Trading Program*	Pennsylvania, U.S.	PS-PS/NPS	Exchange market
Virginia Water Quality Trading Program	Virginia, U.S.	PS-PS/NPS	Clearinghouse/ Bilateral
Red Cedar River Nutrient Trading Pilot Program*	Wisconsin, U.S.	PS-NPS	Bilateral
Programs/Initiatives In Development or Under Consideration			
Moreton Bay Nutrient Trading Scheme	Queensland, Australia	TBD	TBD
Lake Taupo Nitrogen Trading Program	New Zealand	NPS-NPS	TBD
Lower Colorado River Basin	Colorado, U.S.	TBD	TBD
Florida Ranchlands Environmental Services Project	Florida, U.S.	NPS-NPS	TBD
Lake Allatoona	Georgia, U.S.	PS-PS or PS-PS/ NPS	TBD
Maryland Water Quality Trading Program	Maryland, U.S.	PS-NPS	Exchange Market
Massachusetts Estuaries Project	Massachusetts, U.S.	PS-NPS	TBD

PROGRAM NAME	STATE/COUNTRY	TYPES OF TRADES	MARKET TYPE ³
Charles River Flow Trading Program	Massachusetts, U.S.	PS-PS	Bilateral
Kalamazoo- Gun Lake Tribe Trading Initiative	Michigan, U.S.	PS-NPS	Exchange market
Upper Mississippi River Basin	Minnesota, U.S.	PS-NPS	Clearinghouse
Vermillion River	Minnesota, U.S.	TBD	TBD
Cape Fear	North Carolina, U.S.	PS-NPS	TBD
Passaic River	New Jersey, U.S.	PS-PS/NPS	TBD
Lake Tahoe	Nevada, U.S.	NPS-NPS	TBD
Truckee River Water Quality Settlement Agreement	Nevada, U.S.	PS-NPS	TBD
Shepherd Creek	Ohio, U.S.	PS-NPS	Clearinghouse
Upper Little Miami River Basin	Ohio, U.S.	PS-NPS	TBD
Portland Tradable Stormwater Credit Initiative	Oregon, U.S.	PS-PS	TBD
Willamette Partnership	Oregon, U.S.	TBD	TBD
Bear River	Idaho/Utah/Wyoming, U.S.	TBD	TBD
West Virginia Potomac Water Quality Bank and Trade Pilot	West Virginia, U.S.	PS-PS/NPS	Exchange market
<i>Inactive Trading Programs/Completed Pilot or Demonstration Programs</i>			
Clear Creek*	Colorado, U.S.	PS-PS ¹	Sole-source offsets
Boulder Creek Trading Program*	Colorado, U.S.	PS-NPS	Sole-source offsets
Upper Maquoketa and South Fork Maquoketa Watersheds Nutrient Trading Directory*	Iowa, U.S.	NPS-NPS	Bilateral
Sudbury River (Wayland Center)*	Massachusetts, U.S.	PS-PS	Bilateral
Kalamazoo River	Michigan, U.S.	PS-NPS	Clearinghouse
Passaic Valley Sewerage Commission Pretreatment Trading*	New Jersey, U.S.	PS-PS	Bilateral
New York City Watershed Phosphorus Offset Pilot Programs*	New York, U.S.	PS-PS	Sole-source offsets
Lake Champlain*	New York/ Vermont, U.S.	PS-PS	Sole-source offsets
Fox-Wolf Basin	Wisconsin, U.S.	PS-NPS	Bilateral
Rock River	Wisconsin, U.S.	PS-NPS	Bilateral

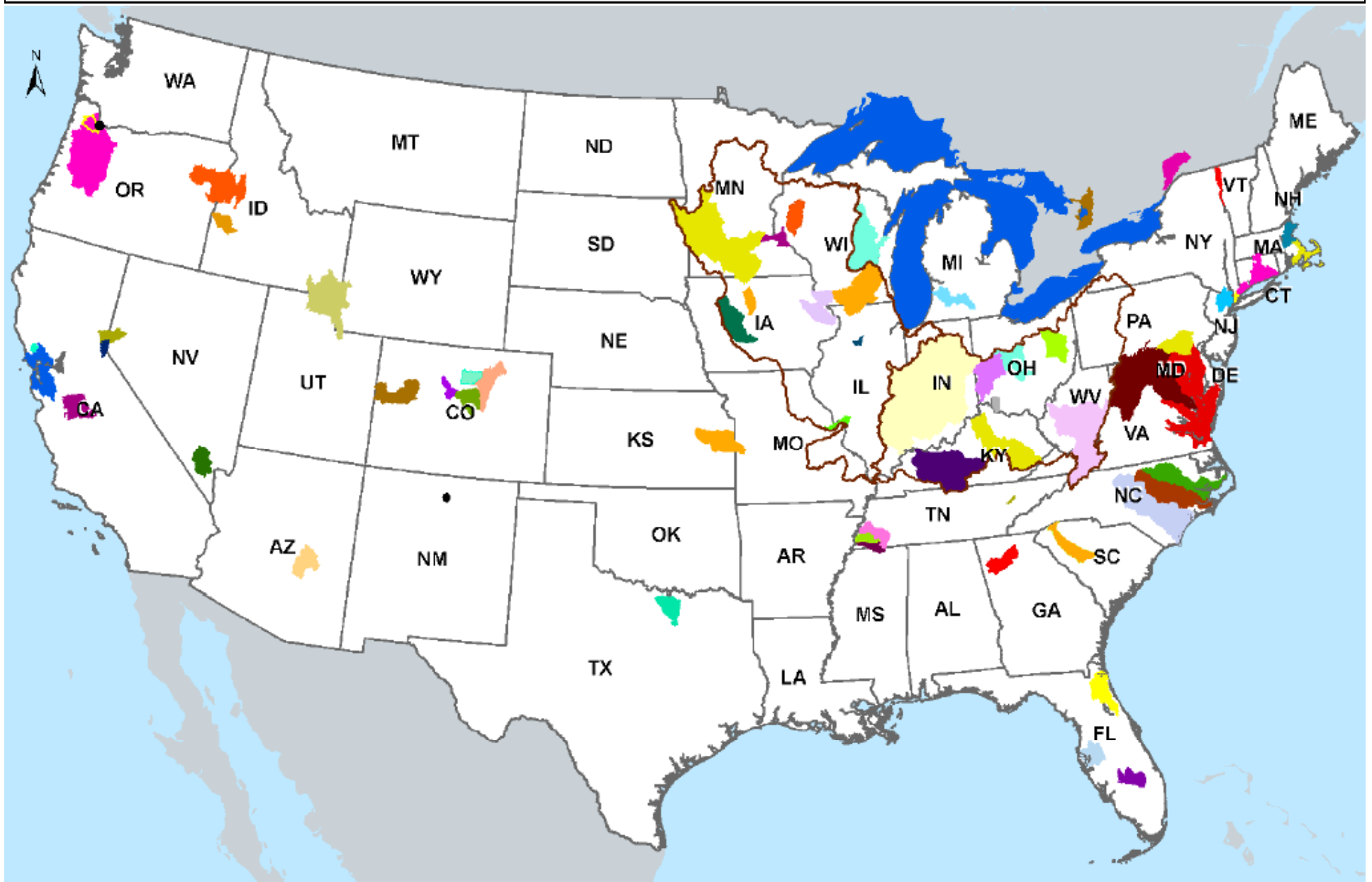
Trading Programs at State Level

(Environmental Trading Network)



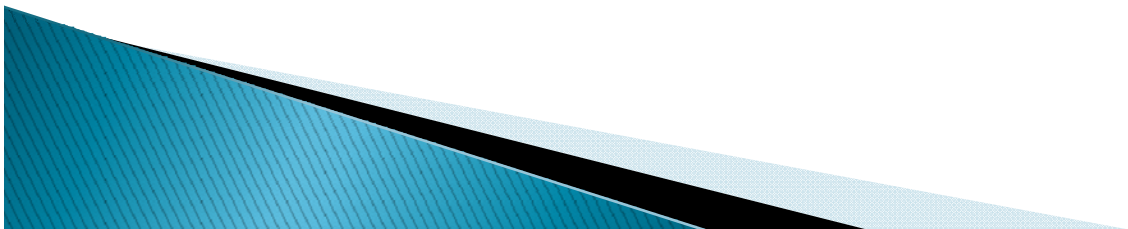
Trading Programs at the Watershed Scale

(Environmental Trading Network)



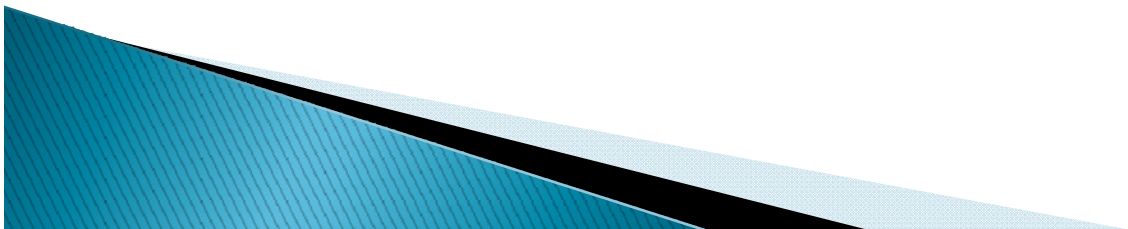
Great Miami River Watershed (southwest Ohio)

- ▶ Pilot program started 2004 - run by Miami Conservancy District.
- ▶ More than 70% agricultural land. Growers contract with SWCDs.
- ▶ More than \$3 million in funding from WWTPs, USDA, EPA.
- ▶ Estimated savings of \$384.7 million (91%) by making nutrient reductions through BMPs (as opposed to WWTP upgrades).
- ▶ Water quality credits calculated using EPA Region 5 load reduction spreadsheet model. NRCS conducting research to improve the model.
- ▶ Sub-watershed monitoring of WQ trends (no conclusive data yet), field inspections by SWCDs to confirm BMPs are maintained.
- ▶ As of May 2014, 397 agricultural projects contracted (about 300 farmers), generating more than 1.14 million credits (*estimated 572-ton reduction in nutrient discharges*). \$1.7 million in credit payments. When NNC are in place, expect many thousands of projects.



Ohio River Basin Interstate WQ Trading Plan

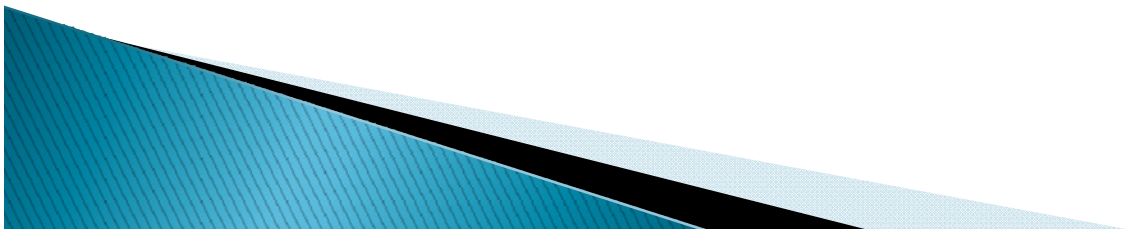
- ▶ Run by Electric Power Research Institute (EPRI) - interstate, in early stages (pilot); regulatory drivers not fully in place; EPRI owns/sells credits. 20% reserved/donated.
- ▶ Growers contract with SWCDs for specific BMPs. EPA Region 5 spreadsheet model used to calculate credits. State agency verifies BMP implementation annually.
- ▶ Three states involved. At full scale, up to eight states and potential credit markets for 46 power plants, thousands of WW facilities and other industries, and approximately 230,000 farmers.
- ▶ Trades to continue through 2015 to test critical features such as an online credit registry and live trading auction.
- ▶ In March 2014, Duke Power, Hoosier Energy, and American Electric Power Co. purchased 9000 “stewardship” credits generated from ag BMP implementation (possible use for flexible permit compliance schedules).



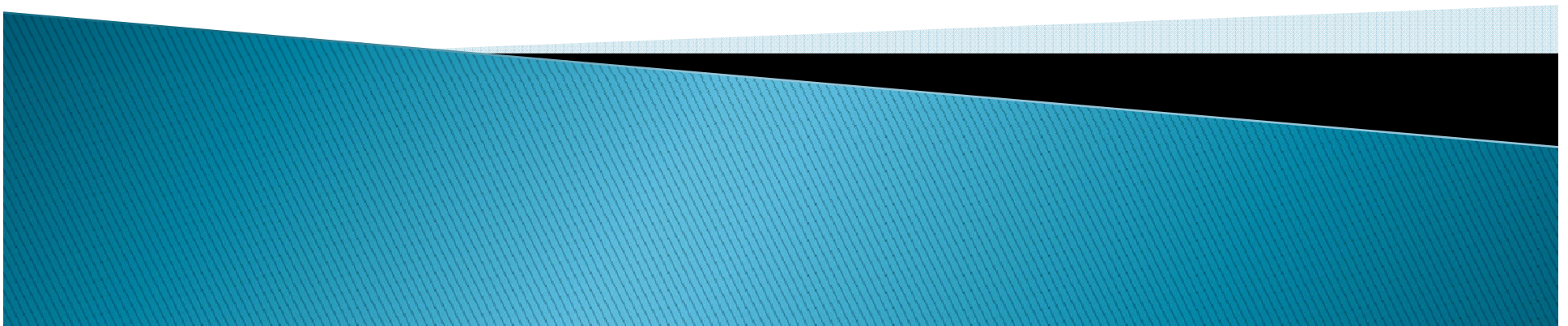
Lessons From Current Efforts

(World Resources Institute, 2009)

- ▶ **Ensure adequate drivers exist for pollutant reductions** (TMDLs, permits, etc.).
- ▶ **Address risks to the regulated community** - when purchasing credits from non-regulated entity (e.g., agriculture) - reliability/duration (credit reserves, aggregators, reconciliation periods).
- ▶ **Standardize NPS discharge and reduction estimates** (spreadsheet tools, national algorithms, models, etc.)
- ▶ **Minimize transaction costs** (model contracts, aggregators, registries...)
- ▶ **Get buy-in** from local government, regulated community, and other stakeholders in the watershed.

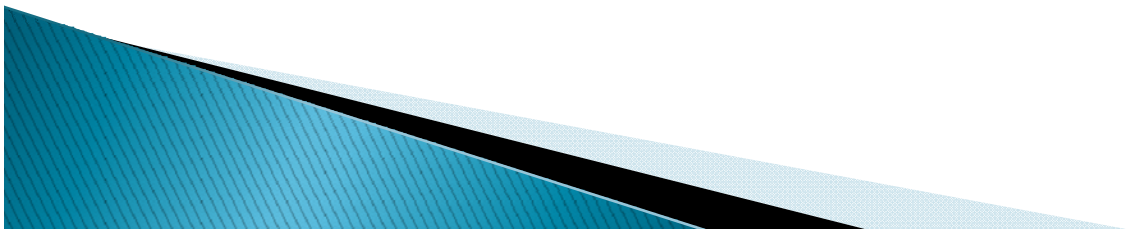


Florida's WQCT Program.....



Florida's WQ Credit Trading Program

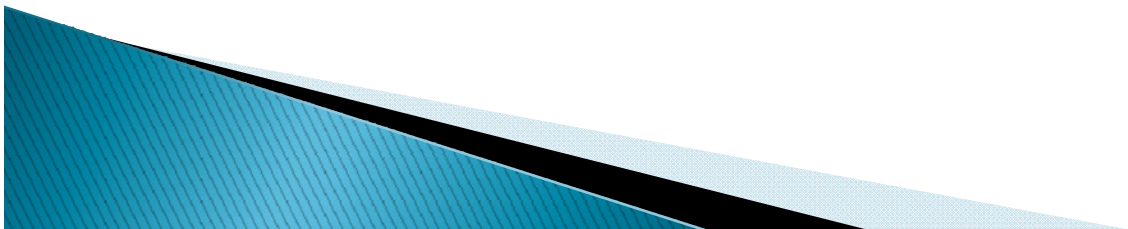
- ▶ The Florida Watershed Restoration Act authorizes DEP to adopt rules for “procedures for pollutant”
- ▶ 2005 amendments to the FWRA required DEP to prepare and submit a report to Governor and Legislature
- ▶ Rule 62-306, Florida Administrative Code
- ▶ Limitations:
 - Geographic - Lower St. John's River BMAP
 - Types of Trades - No NPS to NPS trading



Florida's WQ Credit Trading Program

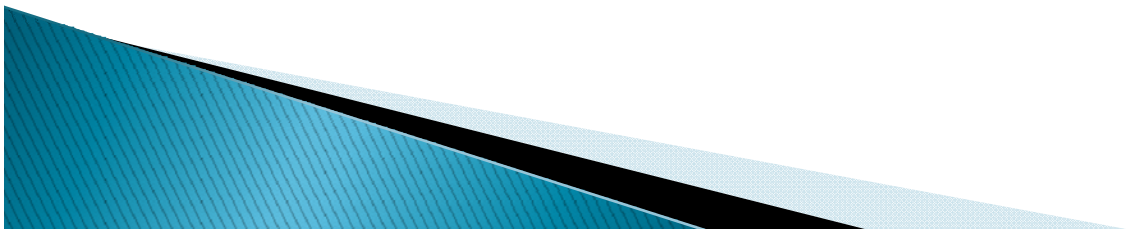
Major Principles

- ▶ Trading must be consistent with federal law
- ▶ Required at least one of trading parties to be permittee
- ▶ Credits only generated when an entity reduces load below its allocation and must be prospective
- ▶ Credits not generated by “standard” agricultural BMPs
- ▶ Included Location Factors to prevent “hot spots” and “Uncertainty Factors” to address any uncertainty associated with estimated credits
- ▶ Very little trading has occurred (2 trades)



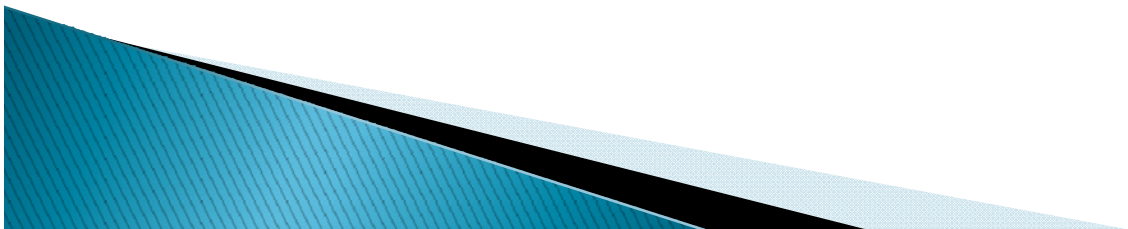
Where Do We Go From Here?

- ▶ HB 713 – Chapter 2013-146, Laws of Florida
- ▶ Initiate rule making to extend trading both geographically and between sources (including NPS to NPS).
- ▶ DEP has a base of experience learned from the Lower St. Johns' pilot project.
- ▶ DEP does not want to restrict good ideas.
- ▶ On the other hand, we want to be certain that projects/credits will restore the waterbody.

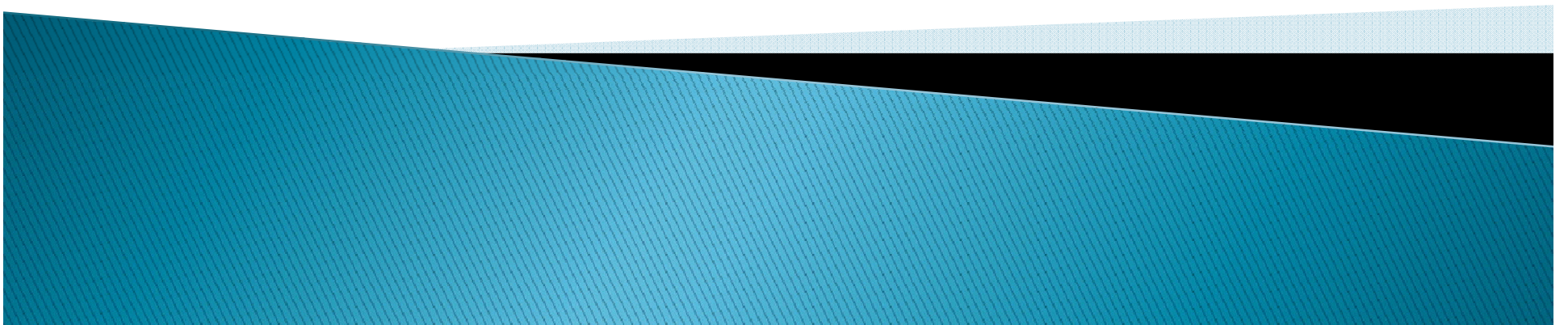


Items to Chew On

- ▶ What scale?
 - Geographic
 - Nutrients
- ▶ Who and how to generate credits?
 - Permit holders
 - Urban
 - Agriculture
- ▶ How to achieve reasonable assurance?
 - Credits
 - Environmental benefit

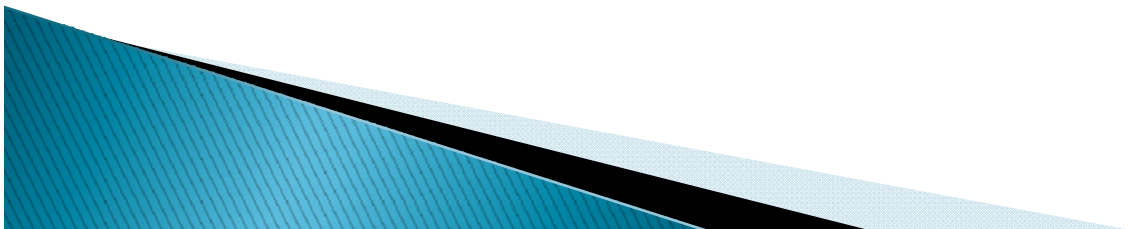


Stormwater Issues.....



Stormwater Issues.....

- ▶ **Cost of Compliance with TMDL program** \approx \$150+ Billion
- ▶ **“Low-Hanging Fruit” is disappearing**
- ▶ **Timing/Availability** – Projects resulting in availability of significant credits take time.
- ▶ **“Performance” Audits** – MS4’s will require ability to determine that operations being funded produce stated load reductions.



Stormwater Issues.....

FINAL Lake Jesup Basin Management Action Plan – April 2010

TABLE 4: TP WASTELOAD ALLOCATIONS FOR 15-YEAR IMPLEMENTATION PERIOD

ALLOCATION ENTITY	TOTAL TP STARTING LOAD (LBS/YR)	NONCONTRIBUTING AREAS LOAD (LBS/YR)	TOTAL TP REDUCTION REQUIRED (LBS/YR)*
Agriculture	1,149	8	764
Atmospheric Deposition	6,834	0	0
Baseflow	7,275	0	0
City of Altamonte Springs	116	21	57
City of Casselberry	1,557	1	1,028
City of Lake Mary	1,229	4	793
City of Longwood	1,122	115	616
City of Maitland	906	212	374
City of Orlando	1,570	73	979
City of Oviedo	1,156	0	776
City of Sanford	2,722	22	1,807
City of Winter Park	1,771	72	1,111
City of Winter Springs	2,301	6	1,539
FDOT District 5	646	37	397
Groundwater	1,323	0	0
OOCEA	23	0	16
Orange County	2,746	1	1,707
Seminole County	10,151	239	6,411
St. Johns River Upstream	11,244	0	0
Town of Eatonville	194	60	70
Turnpike Authority	451	0	303
Water/Wetland/Conservation Areas	7,758	164	0
Total	64,244	1,035	18,748

* Reductions subject to change as new information on the noncontributing areas, natural attenuation, and lake assimilation become available.

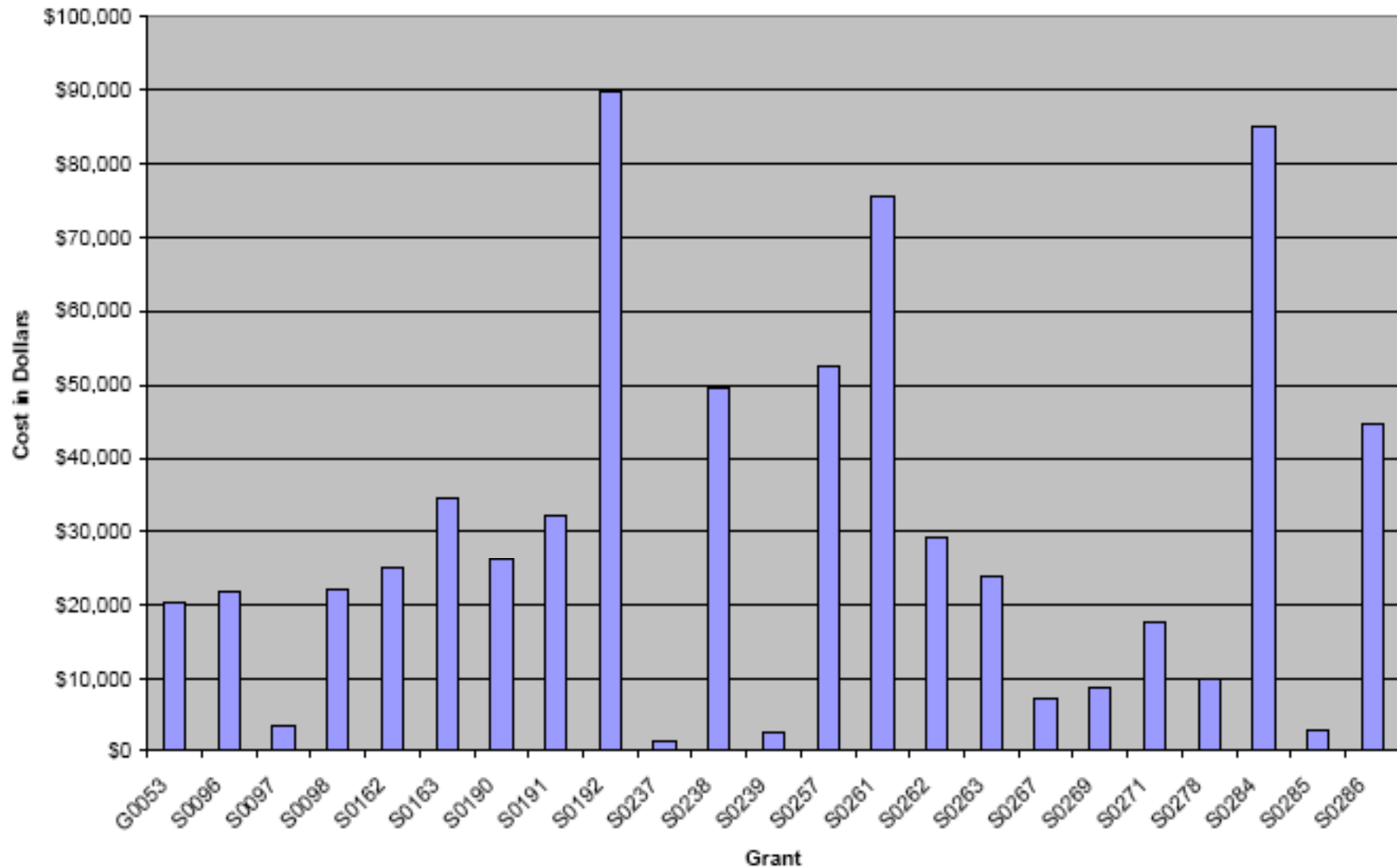
Stormwater Issues.....

TABLE 5: TP WASTELOAD ALLOCATIONS FOR 2010-2014

ALLOCATION ENTITY	2010-2014 TOTAL REQUIRED REDUCTION (LBS/YR)*
Agriculture	254.7
Altamonte Springs	19.0
Casselberry	342.7
Eatonville	23.4
FDOT District 5	132.3
Lake Mary	264.3
Longwood	205.3
Maitland	124.8
OOCEA	5.2
Orange County	569.0
Orlando	326.3
Oviedo	258.7
Sanford	602.2
Seminole County	2,137.0
Turnpike Authority	101.1
Winter Park	370.5
Winter Springs	513.0
Total	6,249.5

Stormwater Issues.....

Estimated Cost to Remove a Kg/Year of Total Phosphorous



Stormwater Issues.....

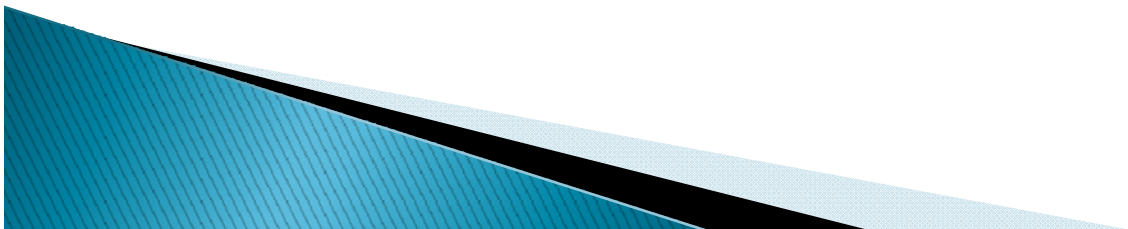
$$2,137 \text{ lbs} / 2.2 = 971 \text{ Kg/year}$$

$$971 \times \$20,000 = \$19.4 \text{ million}$$

Capital only, no maintenance

First five years only

Does not consider “low hanging fruit”



Stormwater Issues.....

Seller	Buyer	Parameter	Amount Traded (kg/yr)	Cost for Trade
Town of Hastings Wastewater Treatment Plant	St. Johns County	Total Phosphorous	271	\$30,000/year
Clay County Utility Authority (CCUA)	Clay County	Total Phosphorous	1,476	\$0
Clay County Utility Authority - Fleming Island Wastewater Treatment Plant	Clay County	Total Nitrogen	409	\$0

Stormwater Issues.....

INTERLOCAL AGREEMENT FOR PURCHASE OF PHOSPHORUS TMDL REDUCTION CREDITS FROM THE TOWN OF HASTINGS LOCATED AT 6195 SOUTH MAIN STREET, HASTINGS, FLORIDA,

THIS INTERLOCAL AGREEMENT (Agreement) is made and entered into between **St. Johns County (County)**, a political subdivision of the State of Florida, by and through its Board of County Commissioners (**Board**), whose address is 500 San Sebastian View, St. Augustine, Florida 32084, and the **Town of Hastings, Florida (Town)**, a municipal corporation of the State of Florida, whose address is 6195 South Main Street, Suite A, Hastings, Florida 32145.

RECITALS

WHEREAS, the **Town** has a wastewater treatment plant (WWTP) system that can generate Phosphorus total maximum daily load (TMDL) reduction credits to be available to the **County** by adding alum to the WWTP; and

WHEREAS, there are an estimated 198 kilograms (kg)/year (435.6 lbs/yr) of Phosphorus TMDL reduction credits that the **County** can purchase annually from the **Town**; and

WHEREAS, the **County** will use these Phosphorus TMDL reduction credits to meet requirements of the NPDES Phase II MS4 Permit's subsection Basin Management Actions Plan (BMAP) for the Lower St. Johns River Basin Main Stem non-MS4 Freshwater Section; and

WHEREAS, the **County** has agreed to pay the **Town** thirty thousand dollars (\$30,000) associated with the additional alum injections and disposal of the increased sludge production from the WWTP beginning October 1, 2010. On October 1, 2011, and each year thereafter, this amount (\$30,000) will be adjusted annually for inflationary increases based on the annual June Municipal Cost Index (MCI) published by the Penton Media, Inc., for American City & County (see attached Exhibit A); and

Stormwater Issues.....

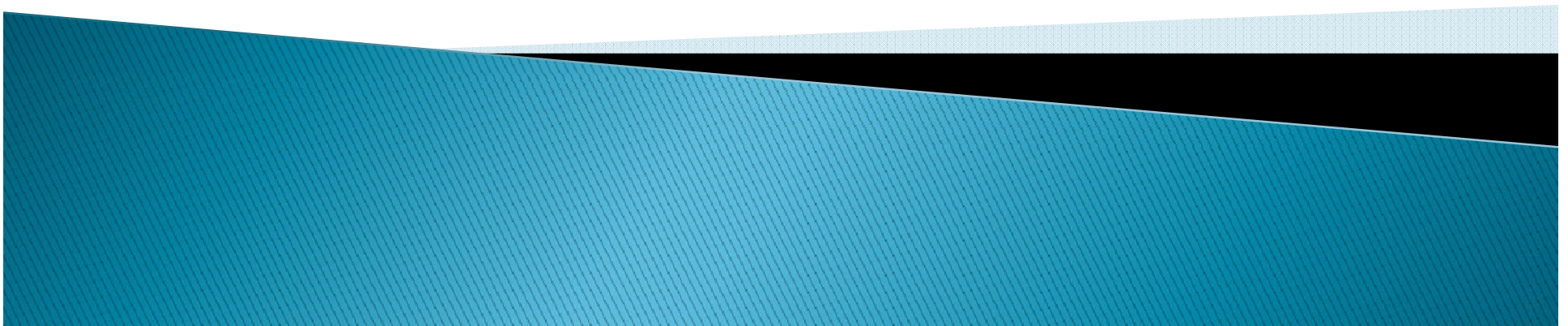
WQ Credit Trades

Clay County – Clay County Utility Authority

- 173 kg/yr TP from CCUA to Clay MS4
- 148 kg/yr from CCUA to Clay County non-MS4

St. Johns County – Town of Hastings

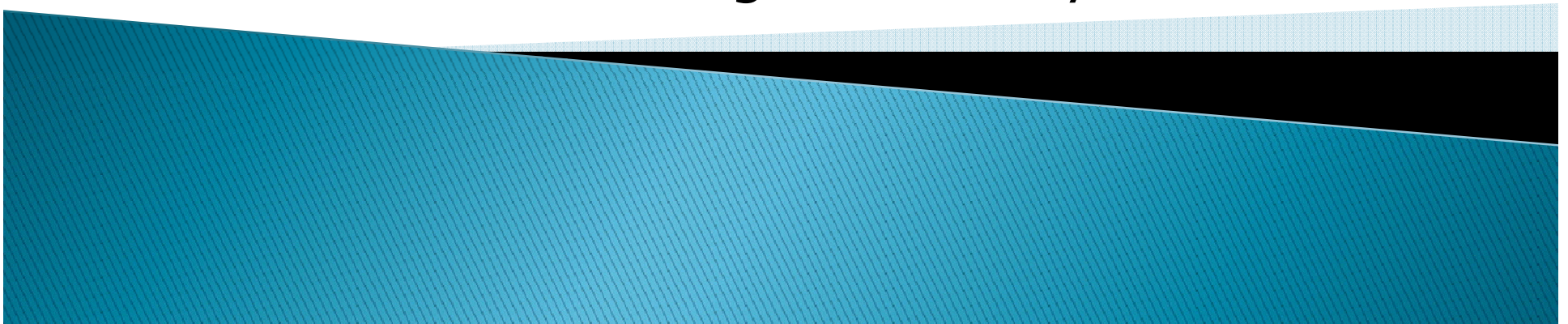
- 198 kg/yr TP from Hastings to St. Johns County



Stormwater Issues.....

Observations

- Trading Can Work – Facilitates lower-cost alternatives for permit compliance
- Market – There must be a supply, in addition to a demand
- Plan Ahead! – Timing/Availability is critical



Water Quality Credit Trading

July 24, 2014

Questions?

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Thomas Frick, Florida Dept. of Environmental Protection

Terry Pride, Florida Dept. of Agriculture and Consumer Services

Kurt Spitzer, Florida Stormwater Association

