

LEGAL AND POLICY OPTIONS FOR A PAYMENTS FOR ECOSYSTEM SERVICES APPROACH TO BIVALVE AQUACULTURE

Thomas T. Ankersen, Director Emeritus, Conservation Clinic, UF Law
Director Emeritus, Florida Sea Grant Legal Program

Matthew DePaolis, Policy Director
Sanibel Captiva Conservation Foundation



Overview

- Jurisdiction & agency authority
 - *Proprietary and Regulatory*
- Planning Framework
- Ecosystem services: forms of payment
- Conclusions and recommendations

Proprietary Authority: Submerged Lands

Sovereign (State-Owned) Submerged Lands (SSL)

- *Subject to Public Trust Doctrine (common law but constitutionalized)*
 - Fishing, swimming, navigation
 - *Earliest Florida cases were oyster disputes*
- Subject to riparian rights
- *TIITF (Gov. & Cabinet) administers*
 - Ch. 253 – state lands & 258 (aquatic preserves)
 - DEP and FDACS staff
 - Subject to a “public interest” test
 - *FAC 18-21 (SSL) & 18.20 (aquatic preserves)*

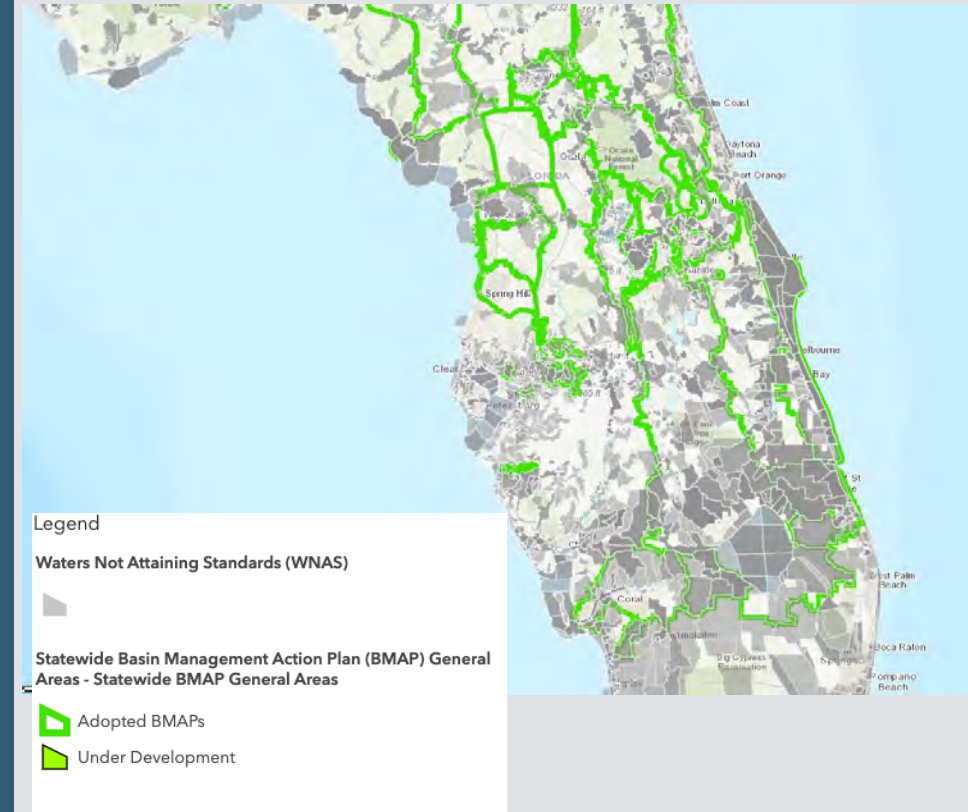
Non-State-owned submerged lands

- Includes SSL owned by private parties & local governments
 - Use Authorization not required
- *But...Public Trust Doctrine may still apply*
 - 5F case
 - May present special opportunities for restoration aquaculture,
 - Example: St. Pete seagrass mitigation bank

Regulatory: Federal Framework

Clean Water Act (EPA - Water Quality)

- Impairment designation (Section 303(d), CWA)
 - *Delegated to State*
 - *Drives the process*
- Triggers Total Maximum Daily Load (TMDL) for pollutants (e.g. nutrients)
- Requires **Basin Management Action Plan** (or Reasonable Assurance plan)
 - “a framework for water quality restoration that contains local and state commitments to reduce pollutant loading through current and **future projects and strategies.**”
 - aquaculture can be a strategy



Note: many estuarine systems and tidal creeks have not been designated as impaired; and hence have no TMDL (or BMAP)

Planning Framework: State Aquaculture Plan

- Legislatively mandated. Sets policy - including funding priorities
- 2020 – First reference to restoration aquaculture for nutrient management
 - *Conduct restorative/conservation aquaculture projects in direct collaboration within industry partners to identify impacts of and address coastal issues such as nutrient pollution, shoreline erosion and restoration of aquatic plant, shellfish and fish populations.*
- 2021
 - *Conduct program development for bivalve shellfish, seagrass, fish and other aquaculture species to be used in a nutrient mitigation, nutrient credit, nutrient trading or similar conservation/restoration program.*
- 2022
 - *Conduct program development for bivalve shellfish, seagrass, seaweed, fish and other aquaculture species to be used in a nutrient mitigation, nutrient credit, nutrient trading or similar conservation/restoration program.*
 - seaweed added.

Florida Aquaculture Plan

October 2022

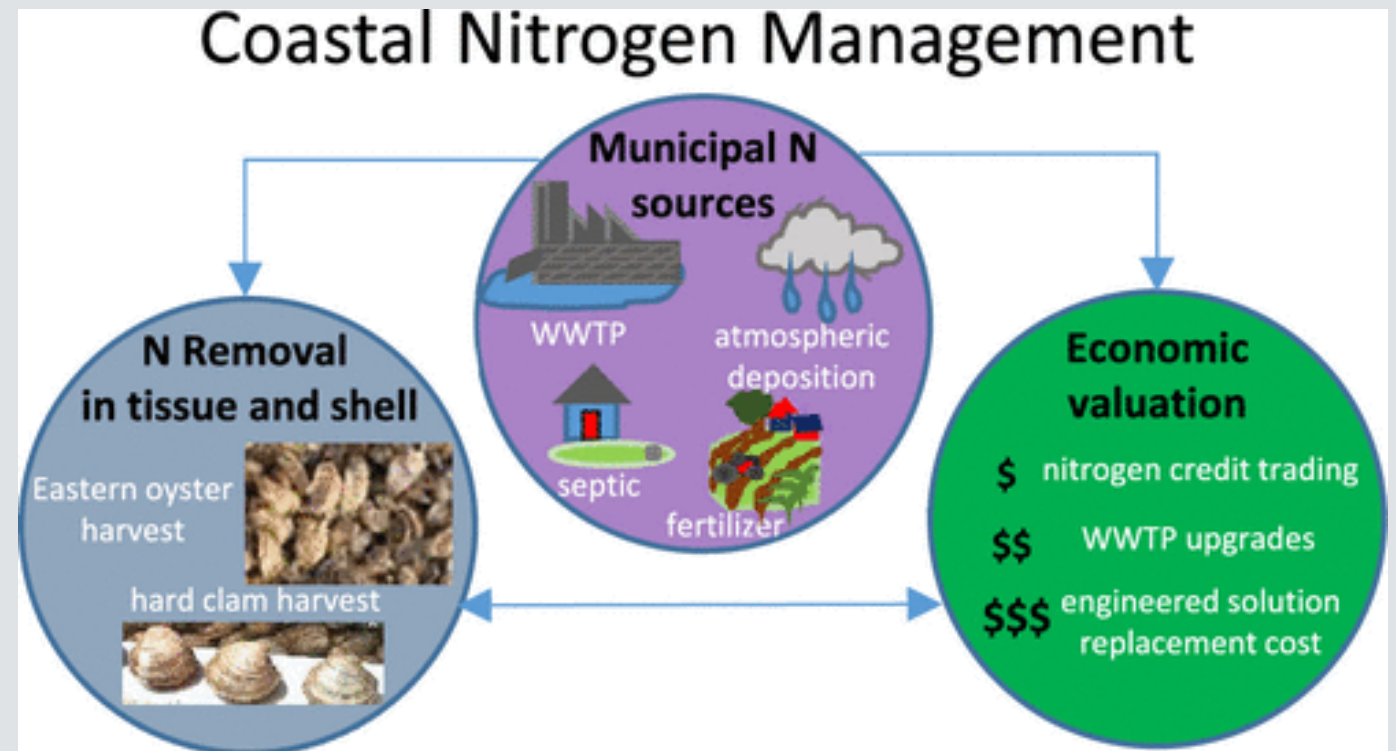


Prioritized recommendations for applied research and economic development by the Aquaculture Review Council for the purposes of creating new technologies, improved farm productivity, increased farm income and employment and other economic and environmental benefits to the state of Florida.



Payments for Ecosystem Services

- Forms of Payments
 - *Credit Markets (buy, sell, trade)*
 - *Fees and taxes*
 - *Grants and subsidies*



Forms of Payments: Nutrient Credit Markets

- Based on the principle of “cap and trade” - a successful pollution control policy in the context of air pollution
- Rewards polluters that reduce discharges below a permit allocation to trade or sell that reduction in a geographically defined market
- Can also be used by entities that reduce pollution to generate credits for sale
 - *More like a mitigation bank*
- Has been more difficult to operationalize in the context of water pollution
 - *Especially in the case of “not-point source” water pollution such as agricultural runoff and urban stormwater*
- Has been promoted as a means to provide payments for ecosystem services for bivalve and other forms of marine aquaculture (seaweed)

Credit Markets: Nutrient Credit Trading in Aquaculture

- As we will show, it is possible to calculate with some precision the nutrient sequestration and removal benefits that clam aquaculture provides and assign it a theoretical monetary value
- There is an active program in Chesapeake Bay
 - *After 6 years of R & D, there have only been 2 aquaculture-based trades*
- Florida has a more generalized nutrient credit trading program
 - *This program began in 2008 in the Lower St. Johns River Basin*
 - *Was expanded to the entire state in 2013*
 - However, Only 4 trades have been recorded
 - All in the St. Johns River Basin
 - None since the statewide expansion

Florida's Program: Section 403.067(8)

(8) WATER QUALITY CREDIT TRADING

...

(b) Water quality credit trading must be implemented through permits, including water quality credit trading permits, other authorizations, or other legally binding agreements as established by department rule.

(c) The department shall establish the pollutant load reduction value of water quality credits and is responsible for authorizing their use.

...

(e) Sellers of water quality credits are responsible for achieving the load reductions on which the credits are based and complying with the terms of the department authorization and any trading agreements into which they may have entered.

(f) Buyers of water quality credits are responsible for complying with the terms of the department water discharge permit.

Florida's Program: FAC Rule 62-306

■ 62-306.300 General Requirements.

(1) Credits may be traded **only within the boundaries of a BMAP or RAP**, or within the boundaries of BMAPs or RAPs addressing **hydrologically-connected waters**, that includes detailed allocations to point sources and detailed or categorical allocations to nonpoint sources.

...

(3) Credits generated by a nonpoint source or an MS4 must be measured where treatment methods allow influent and effluent water quality to be measured or, where direct measurement cannot reasonably be accomplished, **they may be estimated for the type of operation**. When estimating credits for nonpoint source pollution control activities, the estimate shall be the long-term average expected reduction. **If credits are estimated, the Department will use uncertainty factors, as applicable, to adjust the credits available for trading.**

62-306.400 Credit Eligibility.

...

(e) Implementation by agricultural operations of soil or water treatment technologies **or water-quality enhancing production practices** or systems that are confirmed in writing by DACS to reduce nutrient loads below the baseline.

(f) Other pollution controls, technologies or **management practices with a demonstrated ability to reduce nutrient loads** below the baseline established in a BMAP or RAP.

■ 62-306.500 Pre-Approval of Credit Generation.

(1) To obtain Department pre-approval of the number of credits expected to be generated from a project before executing an agreement on a water quality credit trade, **the credit generator must submit information to the Department describing in detail the activities that will generate the credits and the expected nutrient load reduction below the generator's baseline.**

Florida's Program: FAC Rule 62-306

62-306.600 Use of Credits and Credit Adjustments.

...

(7) Use of **Location Factors** to Adjust Credits.

(a) For trades where the seller and buyer discharge to different WBIDs, the amount of credits proposed to be traded shall be adjusted by the applicable LF to provide reasonable assurance that the proposed trade does not result in localized adverse impacts to the waterbody or water segment.

...

(8) Use of **Uncertainty Factors** to Adjust Credits.

(a) For proposed trades involving **estimated credits**, the Department shall use **default UF ratios of 2:1** for urban stormwater (if 2 pounds or kilograms of removal are estimated, 1 pound of credit will be created) and 3:1 for agricultural runoff, unless the Department established the nutrient reduction capability of the activity in the applicable BMAP or RAP, excluding any nutrient reduction capabilities identified as provisional in the BMAP or RAP. However, a buyer or seller may propose and document the basis for a lower UF ratio to the Department if justified by site-specific considerations.

(b) **Site-specific UF** will be based on the Department's best professional judgment, taking into account the scientific support for the estimate, the level of confidence that the BMP will be properly designed, installed, maintained, the potential for failure of the BMP, and the level of uncertainty that the estimated load reduction will be achieved.

Updated 2/17/23

Generator's (Seller's) Name	Generator's Address	Generator's Location of Discharge	Generator's Receiving Water (WBID)	Nutrient Involved	Generator's Baseline (kg/yr)	Generator's Amount of Credits Generated (kg/yr)	Credit Adjustments for Location (1 = No Adjustment)	Credit Adjustments for Uncertainty (1 = No Adjustment)	Actions that Generated Credits	Credits-- Measured or Estimated?	Date of Initial Credit Generation	Date Credit Applied Under Trade	End of Effective Period for Credits	Agency Responsible for Inspections (FDACS or DEP)	Date of Most Recent Inspection	Buyer's Name	Buyer's Address	Buyer's Location of Discharge	Buyer's Receiving Water (WBID)	Amount Traded (kg/yr)	Cost per Kilogram per Year	Amount of State Funding Per Unit to Generate Credits	Notes
Clay County Utility Authority (3 Facilities)	3176 Old Jennings Road, Middleburg, FL 32068	Marine Section Lower St. Johns River	2213H & 2213G	Total Nitrogen	84,058	2,850	0.12 (WBID H-transferor), 0.52 (WBID I-transferee), 0.62 (WBID J-transferee), Trade with Fresh at 5.4:1	1	Treatment improvement	Measured	3/27/2009	3/27/2009	4/30/24	DEP	5/25/2017	Clay County	5 Esplande Ave, Green Cove Springs, FL 32043	Marine Section Lower St. Johns River	2213H, 2213J, 2213I, 2213G	409	\$ -	\$ -	This trade of 409 kg/yr was added to the 2008 trade of 19,686 kg/yr for a total of 20,096 kg/yr.
Clay County Utility Authority (3 Facilities)	3176 Old Jennings Road, Middleburg, FL 32068	Marine Section Lower St. Johns River	2213H & 2213G	Total Phosphorus	0	7,973	0.12 (WBID H-transferor), 0.52 (WBID I-transferee), 0.62 (WBID J-transferee), Trade with Fresh at 5.4:1	1	Treatment improvement	Measured	3/27/2009	3/27/2009	4/30/24	DEP	5/25/2017	Clay County	5 Esplande Ave, Green Cove Springs, FL 32043	Marine Section Lower St. Johns River	2213H, 2213J, 2213I, 2213G	1,476	\$ -	\$ -	This was the first TP trade between these two entities. Credits of 1,476 kg/yr TP split into two credit entries towards separate Clay County allocations (CC-03 for 1,328 kg/yr TP and CC-06 for 148 kg/yr TP).
JEA (13 Treatment facilities)	21 West Church Street, Jacksonville, FL 32202	Marine Section Lower St. Johns River	2213A - 2213H	Total Nitrogen	650,136	30,340		1	Treatment improvement and reuse	Measured	3/11/2009	7/10/2015	3/10/2024	DEP	3/22/2017	City of Jacksonville	Public Works Department, 214 North Hogan Street Jacksonville, FL 32202	Marine Section, Lower St. Johns River	2213A - 2213H	30,340	\$ 10.83	\$ -	Cost per kg/yr are based on the 2015 and 2016 payments divided over the 2015-2023 timeframe (period of initial and the new agreement).
Florida Department of Transportation	District Maintenance Engineer 1109 S. Marion Ave. MS 2010 Lake City, FL 32025	Marine Section Lower St. Johns River	2213A - 2213H	Total Nitrogen	9,602	10,570		1	Stormwater treatment improvements (BMAP projects COJ-54 to COJ-116)	Estimated	5/6/2015	5/6/2015	Not specified	DEP	N/A	City of Jacksonville	City Engineer 214 N. Hogan Street 10th Floor Jacksonville, FL 32202	Marine Section, Lower St. Johns River	2213A - 2213H	10,570	\$ -	\$ -	Trade from MS4 permit to MS4 permit; trade not processed by the NED.

Issues: Florida's Nutrient Credit Trading Statute

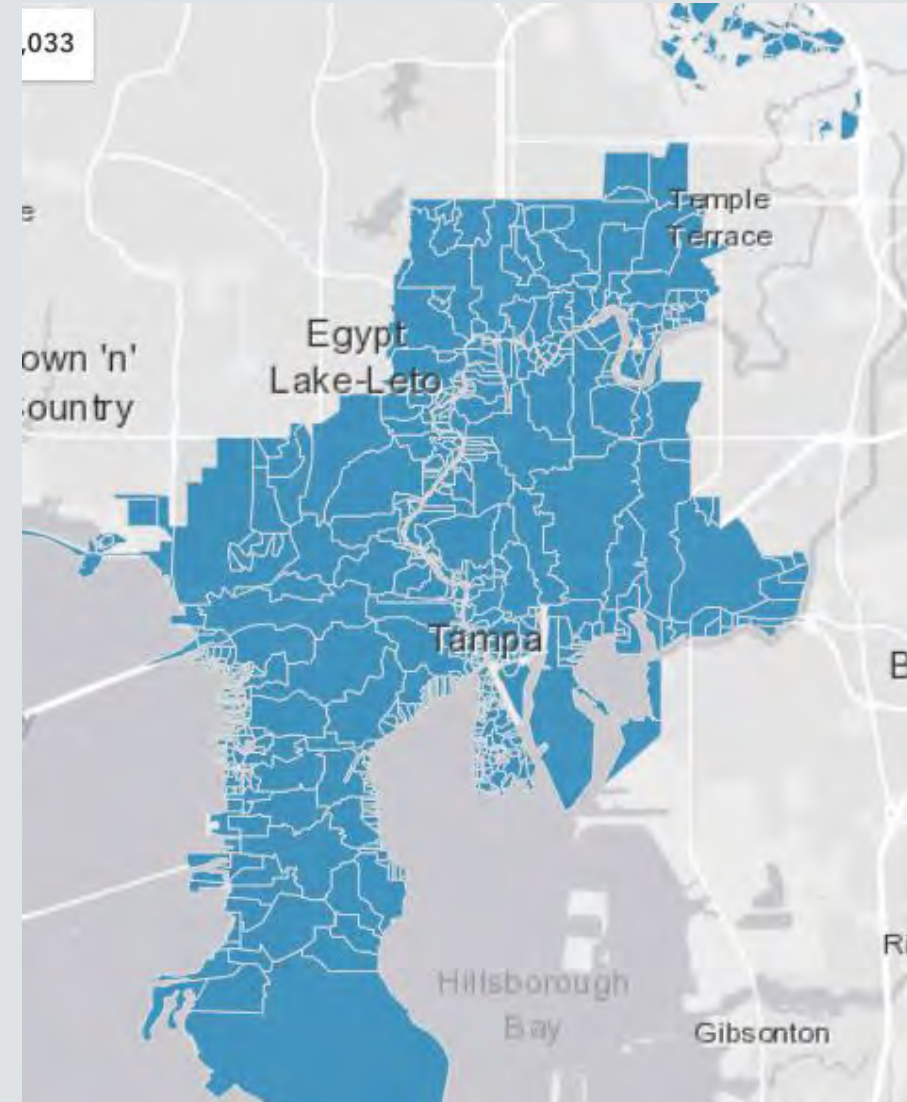
- The Florida Water Quality Trading Program statute and rules may work for bivalve aquaculture, but it wasn't designed with this sort of project in mind
- Requirements that trades occur within the same (or a hydrologically connected) impaired waterbody with an approved BMAP is a constraining factor
- Location and Uncertainty Factors loom large in the calculation of credits and will likely result in risk ratios of 2:1, if not more.
 - *After all, what can go wrong?*
- Monitoring and reporting requirements are considerable and may be burdensome

Forms of Payments: Fees and Taxes

- Fees and taxes distinguished
- Fees
 - *Stormwater utility fees*
 - *User fees (fertilizer fee, boat licenses; ramp fees, etc.)*
 - *Fertilizer fees*
 - *Special purposes districts*
 - E.g. water & sewer districts
- Taxes
 - *Pollution taxes*
 - *Example: Everglades agricultural tax*
 - Constitutionally created
 - *Special purposes districts*
 - E.g. water & sewer districts
 - Tax increment financing (CRA's)
 - *Local sales tax initiatives*
 - Indian River Lagoon example

Stormwater Utility Fees

- Assessed on residential and commercial properties to cover the cost of stormwater infrastructure and management, including nutrient management
- Typically associated with urban areas
- Appears legally viable for bivalve aquaculture
- But location may be problematic



City of Tampa Stormwater Basins

Fertilizer fees

- Several fees are assessed on fertilizer
 - F.S. 576.21(1) - Distribution license fee (\$100 annually)
 - F.S. 576.021(2)(a) - Specialty fertilizer license fee (\$100 annually for each specialty fertilizer type)
 - F.S. 576.041 - Fertilizer inspection fee (\$1 per ton sold)
 - F.S. 576.045 - Nitrogen & Phosphorus Fees (\$100 for each distribution license, and \$100 for each specialty license)
 - 50 cents per ton for all fertilizer containing N & P.
 - F.S. 482.1562 - Limited Urban Fertilization Certification Fee (\$25 - \$75)(default is \$25, can be raised up to \$75 by rule).

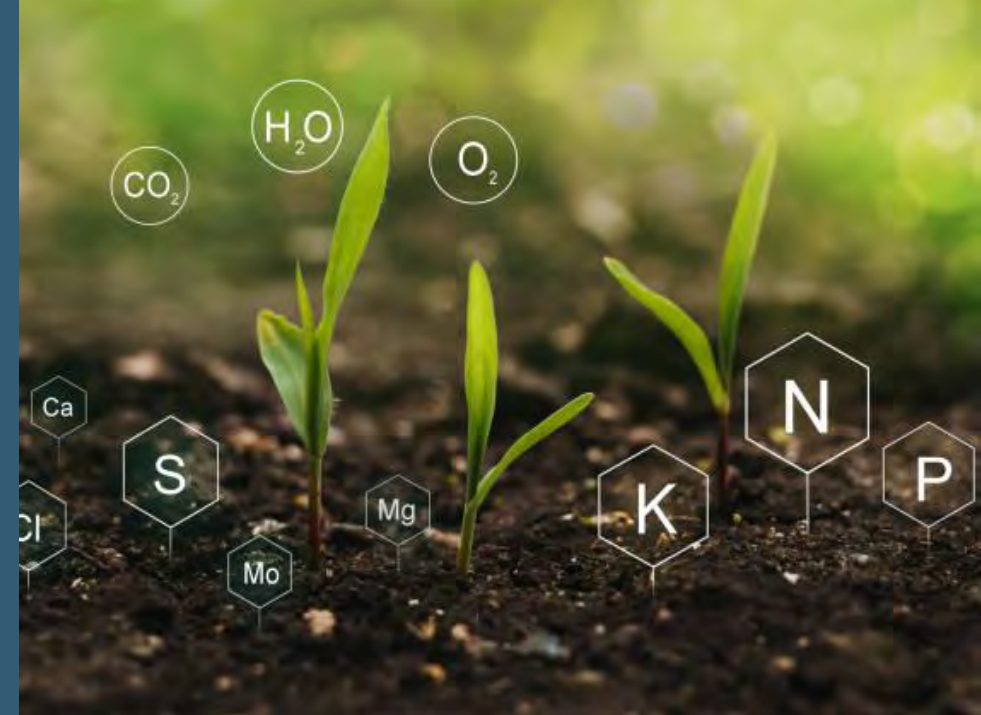
**Tonnage distributed in Florida based on public information of State Inspection Fees as reported to the Florida
Department of Agriculture and Consumer Services**

FISCAL YEAR: 2022-2023

Total of All Plants	228,093.65	357,077.00	495,230.01	443,367.42	1,523,768.08
----------------------------	------------	------------	------------	------------	--------------

Fertilizer Fees: Nitrogen & Phosphorus

- Fees are deposited in the “General Inspection Trust Fund.” (F.S. 576.045(2)(a))
- Annually appropriated pursuant to a (F.S. 576.045(2)(c)) memorandum of understanding between FDACS and FDEP.
- Use of Funds: Funds must be used for R & D, demonstration projects, implementation measures, BMP’s & other measures to achieve state water quality standards for N & P. (F.S. 576.045(3)(d))



Forms of Payments: Local Tax Initiatives

- Counties may impose a discretionary infrastructure sales surtax on purchases in its jurisdiction of either one half cent or one cent on the dollar. (F.S. 215.055(2))
- Requires a local referendum
 - *Key term here is infrastructure*
 - An ongoing PES Program would likely not qualify
 - However, costs associated with the introduction of clams into the environment for the purpose of nitrogen removal might qualify
- Example: Save our Indian River Lagoon Project Plan
 - *Funds 60k pilot project to subsidize clam farmers to offset license, lease and/or material costs*
 - *Unclear if funds came from infrastructure sales tax or other source (FSG?)*

Save Our Indian River Lagoon Project Plan 2023 Update for Brevard County, Florida



Table 4-40: Projects for Clam Restoration

Year Added	Project Number	Project Name	Responsible Entity	Sub-lagoon	Total Nitrogen Reduction (pounds per year)	Cost per Pound per Year of Total Nitrogen Reduction	Total Phosphorus Reduction (pounds per year)	Cost per Pound per Year of Total Phosphorus Reduction	Plan Funding
2021	194	Aquaculture Stimulus Project+	Brevard County	All	1,000	\$60	Not applicable	Not applicable	\$60,000
-	-	Total	-	-	1,000	\$60	Not applicable	Not applicable	\$60,000

Note: The projects highlighted in tan and marked with a plus sign were added to the plan as part of an annual update.

Prepared by:
Tetra Tech, Inc.



Prepared for:
Brevard County, Natural Resources Management Department



February 7, 2023

Forms of Payments: Loans, Grants, and Subsidies

- Grants and subsidies distinguished
 - *The terms “subsidy” and “grant” are often used interchangeably but can be distinguished.*
 - *Subsidies are current payments aiming to influence levels of production or prices*
 - *grants are direct financial contributions for specific activities that support policy objectives*
- Revolving funds
 - *Florida Clean Water State Revolving Fund*
 - *Example: Virginia Resiliency Revolving Fund*
- Other
 - *Legislative appropriations*
 - *Restore Act*
 - *Foundations, etc.*

Florida Clean Water State Revolving Fund

- Federally capitalized with State matching – “The revolving nature of the CWSRFs mean that funds will be available for the foreseeable future”
- Typically based on low interest loans but some grants types are eligible
 - “additional subsidization”
- Relevant Project types
 - *Non-point source*
 - *National Estuary Program program projects*
 - *Decentralized systems*
 - *Watershed pilot projects*
 - *Technical assistance*
- “Green Project Reserve” – environmentally innovative activities

Clean Water State Revolving Fund

Intended Use Plan

Base
&

Bipartisan Infrastructure Law Capitalization Grant

Federal Fiscal Year 2023

Submitted to the



U.S. Environmental Protection Agency

Region IV

By the



Florida Department of Environmental Protection

July 2023
Revised 7/28/2023

Conclusions & Recommendations

CONCLUSIONS

- Bivalve-based nutrient trading credit markets have not caught on as a form of payments for ecosystem services in Florida or elsewhere
- Florida Water Quality Trading Program appears to work for bivalves, but...
 - *Locational and uncertainty factors loom large*
 - *Monitoring and reporting may be burdensome relative to revenue gained*
 - *Rule reform to clarify some requirements might be warranted*
- Stormwater utility fee payments appear to be a legally viable source of PES for urban areas
- Fertilizer fees appear to be a potential source for PES statewide
- Local option sales tax initiatives are not a likely source of PES, but could potentially fund construction of restoration aquaculture projects
- Long term subsidies and continuing grant programs such as the Clean Water Revolving Fund are a potential source for PES

RECOMMENDATIONS

- Always consider including aquaculture as a BMP in applicable Basin Management Action Plans
- Consider a pilot project within the state water quality trading program to test its regulatory potential
- Consider alternative Fee-based PES funding strategies (stormwater utility, fertilizer fees, special purpose districts)
- Consider long term subsidy & grant-based PED funding strategies (new legislation; state revolving fund).