



DEERING ESTATE AT CUTLER

*Cultural & Ecological
Field Station*

Community Update

FACEBOOK:

[www.facebook.com/deeringestate
atcutler](http://www.facebook.com/deeringestateatcutler)

TWITTER: @DEERINGESTATE

WWW.DEERINGESTATE.ORG

Miami-Dade County Parks,
Recreation and Open Spaces
Department



AGENDA - DISCUSSION

- Visit Weeks-Wulf Property (May 26)
- What is a Field Station?
- Cultural & Ecological Resources at the Deering Estate
- Why a Cultural & Ecological Field Station (CEFS) at Deering?
- The Institute for Conservation Research and Learning
- CEFS Updates
 - Partnership with FIU
 - SFWMD Results to Date
- CEFS Workplan

MISSION OF THE DEERING ESTATE



Dedicated to **preserve and protect** the natural, archaeological, architectural and historic legacy of the Estate by using wise stewardship in the management and utilization of its sensitive resources, while **educating and enhancing** the public appreciation of the unique characteristics of the site through compatible uses.



Placemaking
& Historic
Preservation



Conservation
& Awareness



Resource
Based
Recreation &
Wellness



Sustainability
&
Community
Engagement

PERFORMANCE EXCELLENCE

WHAT IS A FIELD STATION?

...Field Stations provide living laboratories and outdoor laboratories for students, researchers, and the general public interested in the environment and conservation.

They vary greatly in form and purposes, and include both marine laboratories whose focus is offshore, as well as terrestrial reserves dedicated to protecting key ecosystems. Field stations may vary in size from a few urban acres to thousands of acres spread across a remote landscape. Stations facilities might range from trail networks to state of the art laboratories.

Whatever form individual field stations may take, they all share a commitment to advancing our understanding of the earth by supporting

research, teaching conservation management best practices, and public education and community engagement.



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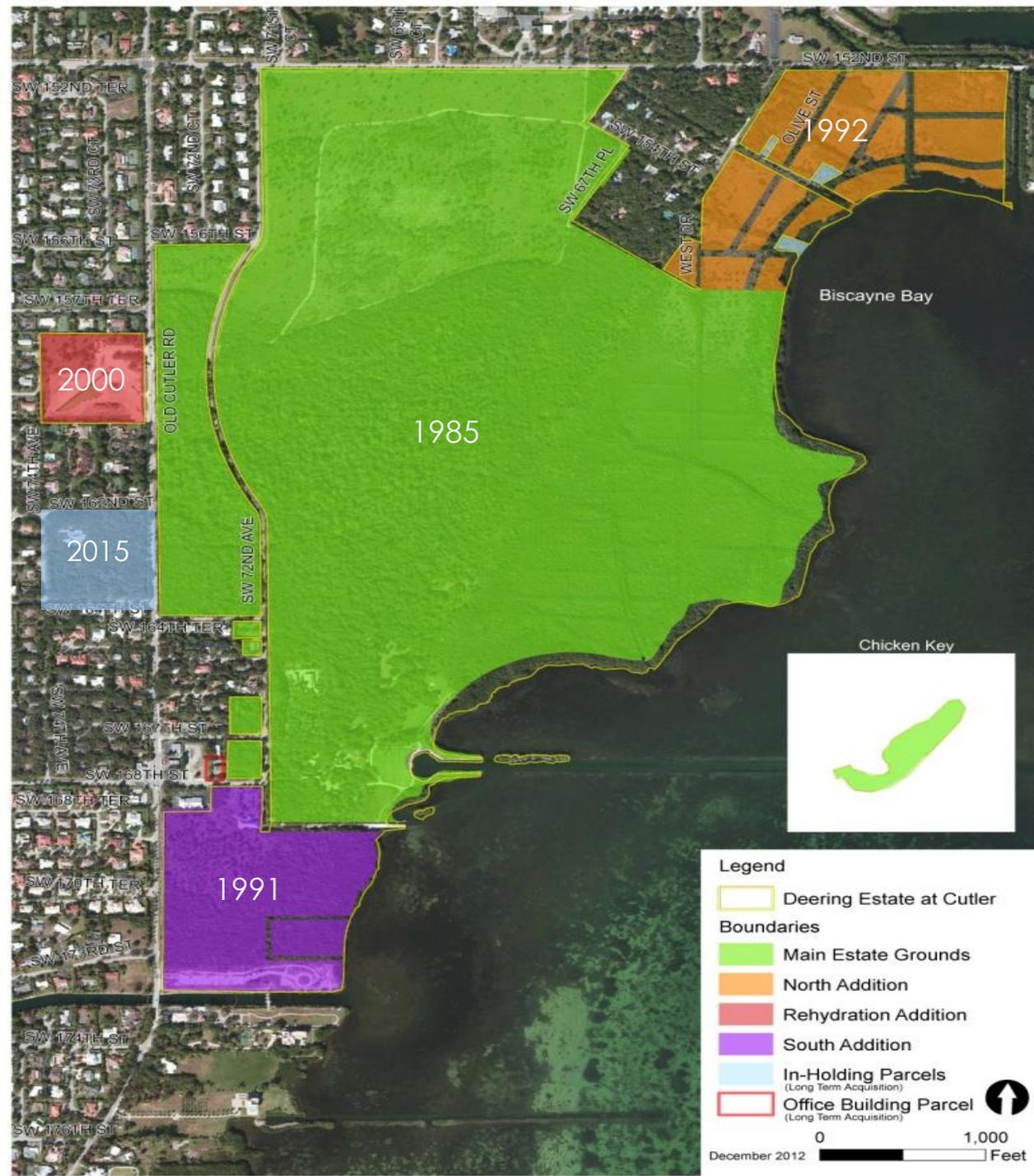
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A LOOK TO THE FUTURE



The Cutler Slough Rehydration Project provides a relevant and exciting opportunity to study environmental feedback from the effects of urbanization and management decisions regarding hydrology in South Florida.

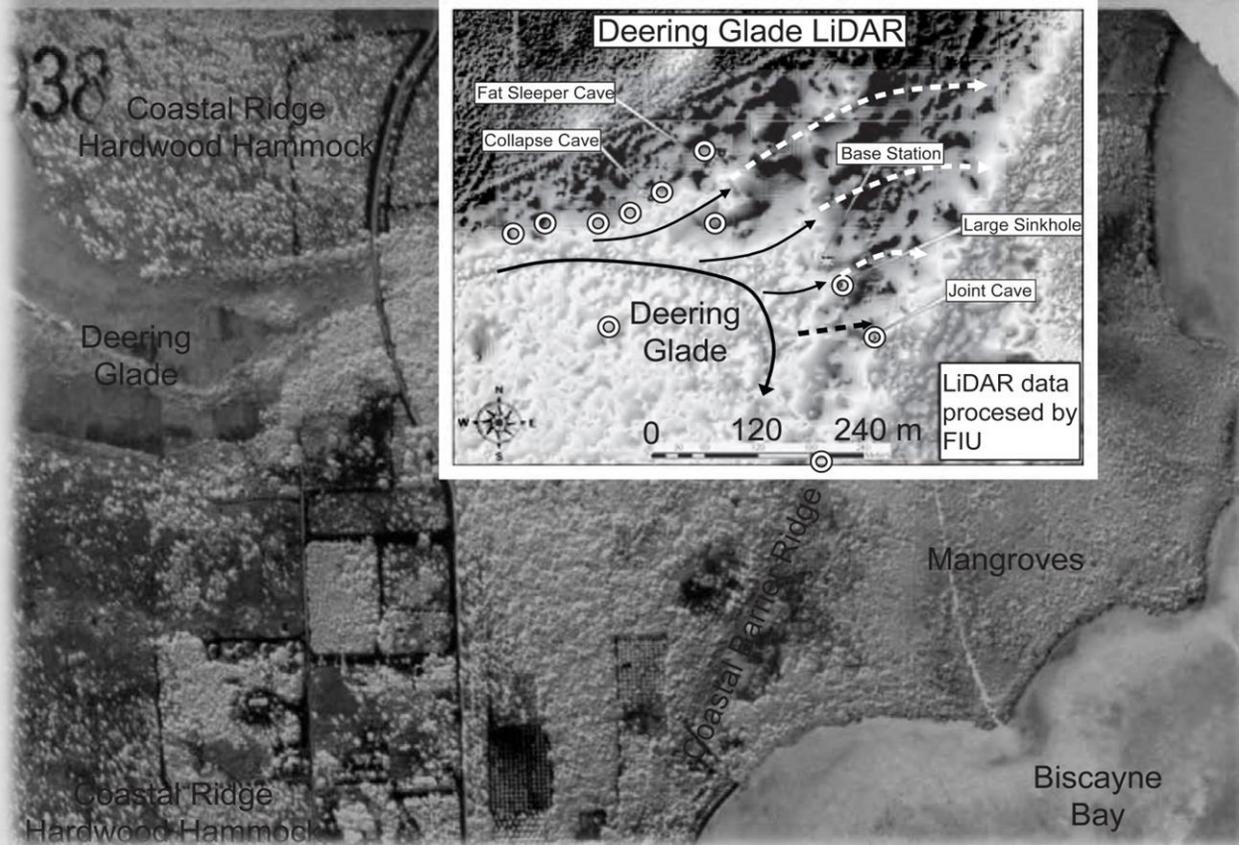
Photo Credit: South Florida Water Management District



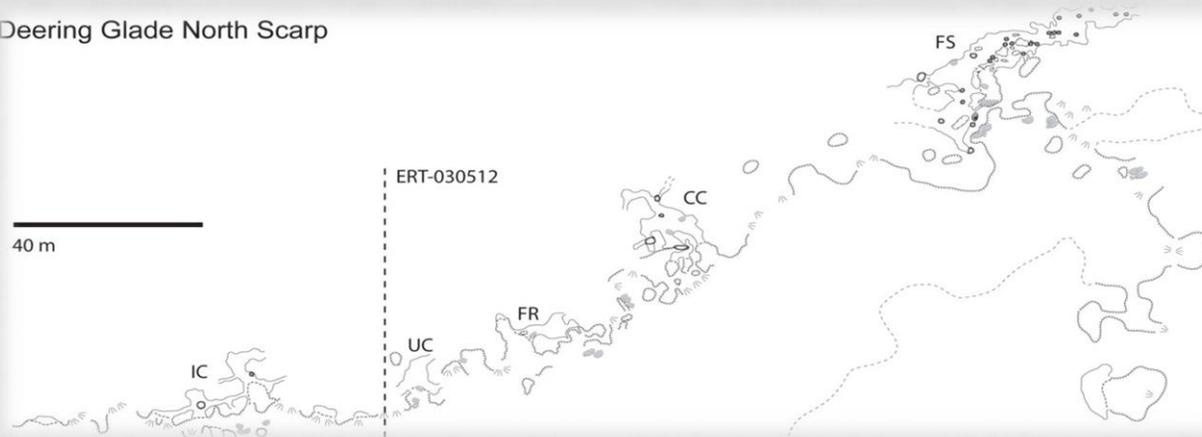
Cultural & Ecological Resources



Geologic Resources



Deering Glade North Scarp

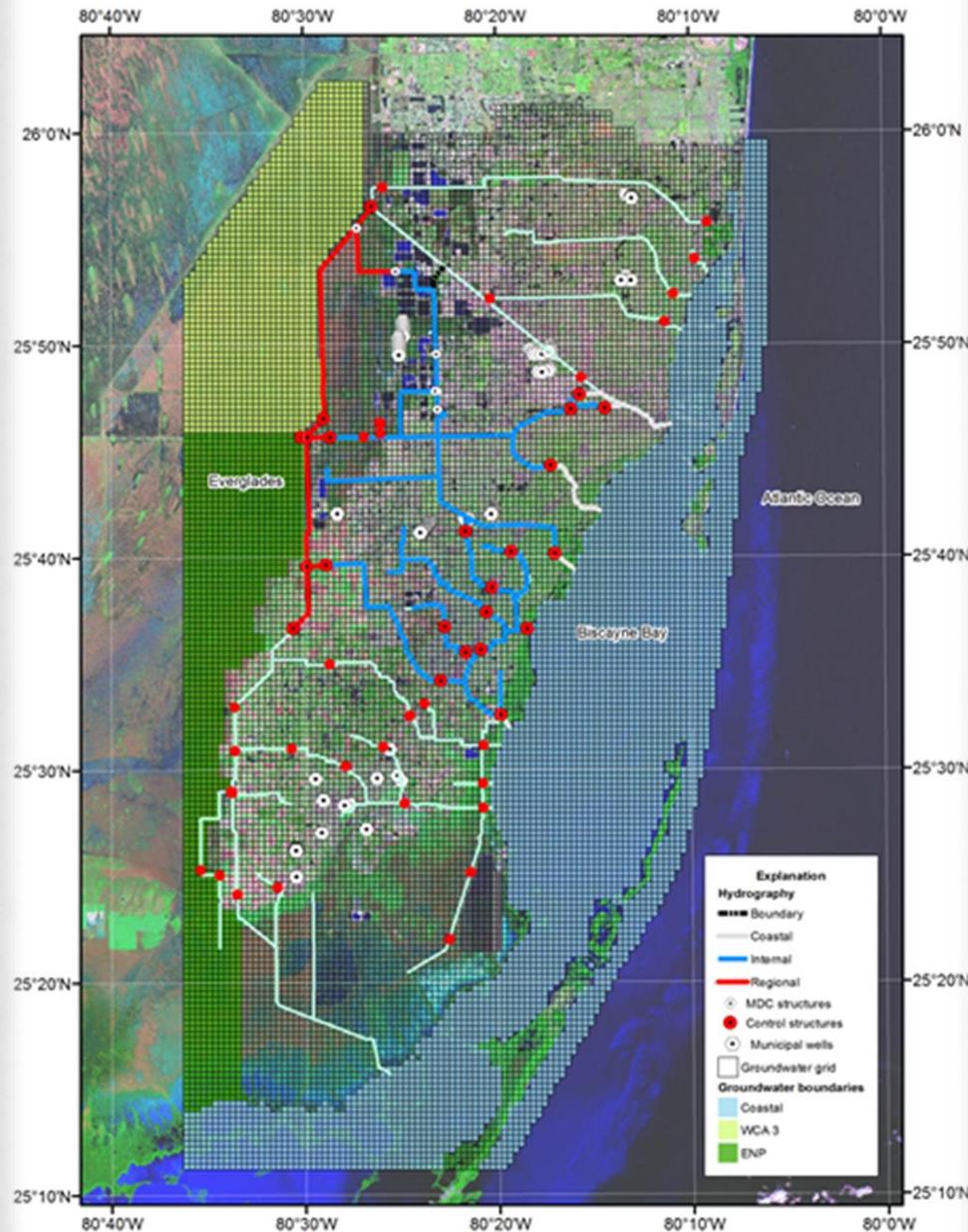


- Florida experienced cycles of sediments deposition and erosion in response to sea-level changes
- As sea levels fluctuated, the corals maintained footholds; reefs grew upward when sea level rose and retreated to lower depths when sea levels fell, accumulating 75 to 100 feet of limestone.
- The last drop in sea level exposed the ancient reefs which are the present Florida Keys. Living coral reefs continue to grow in the shallow waters seaward of the Keys
- Carbonate sediments formed due to biological activity and are mostly made up of whole or broken fossils including foraminifera, bryozoa, mollusks, corals and other forms of marine life

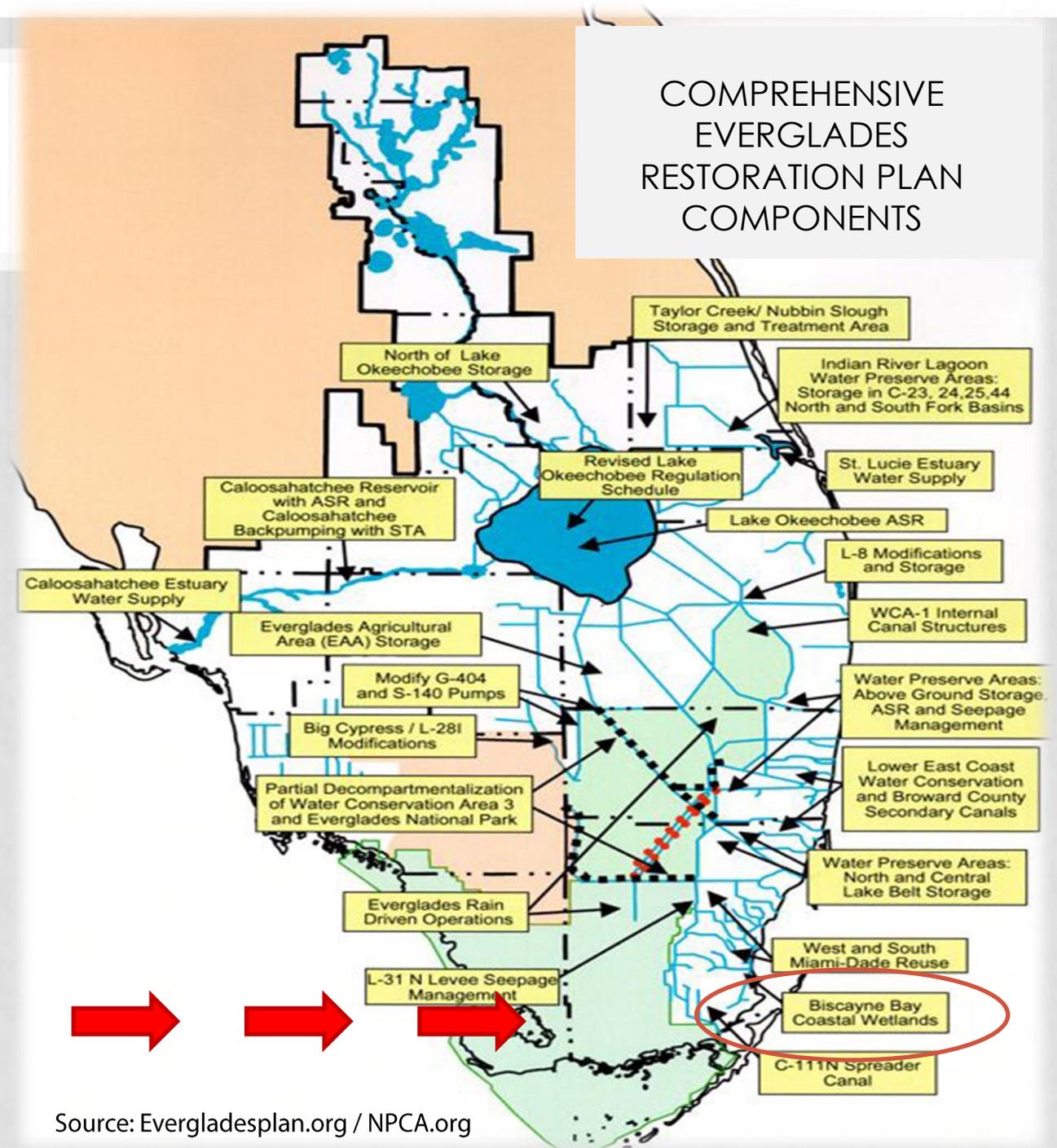
Through a Public Park Lens

How do the services provided by evolving urban ecosystems affect human outcomes and behavior, and how does human action (responses) alter patterns of ecosystem structure and function, and ultimately, urban sustainability, in a dynamic environment?

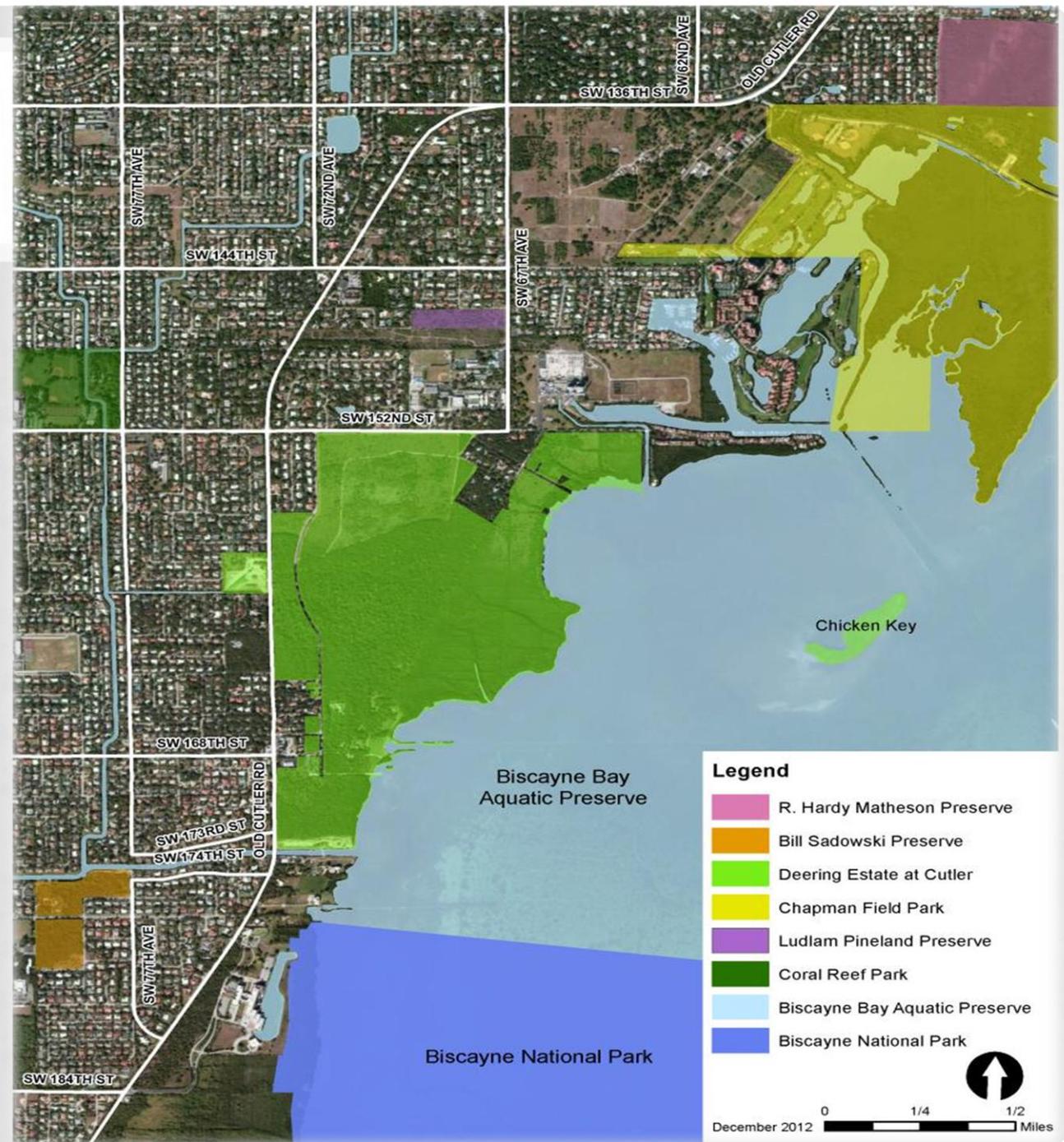
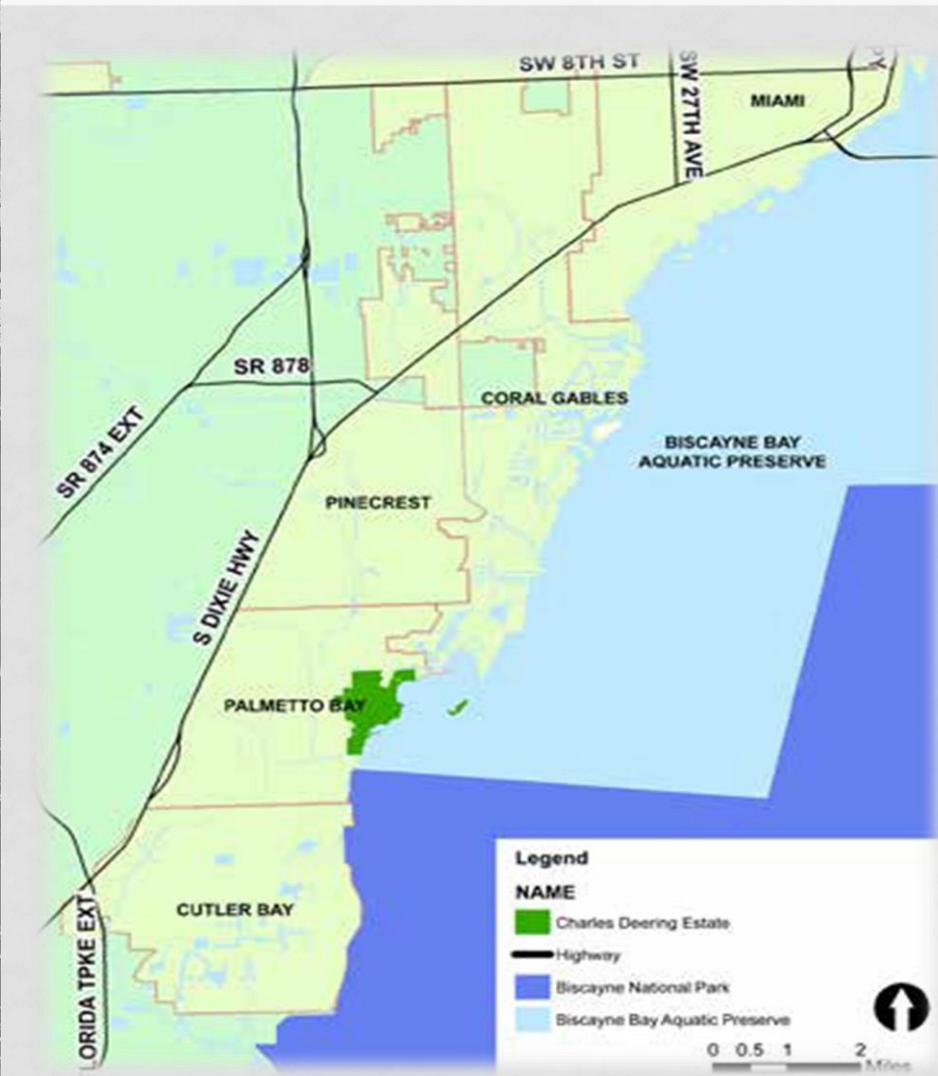
- Urban ecosystem services: How does urbanization change the structure and function of ecosystems and thereby alter the services provided by those ecosystems?
- Human outcomes and actions/responses: How do people perceive and respond to ecosystem services, how are the services' effects distributed spatially and with reference to characteristics of the population, and how do individual and collective behaviors further change ecosystem structure and function?
- Urbanization in a dynamic world: How does the larger context of biophysical drivers (e.g., climate change) and societal drivers (e.g., immigration or regional urbanization) influence the interaction and feedbacks between ecosystems and society as mediated through ecosystem services, and thereby influence the future of the urban ecosystem?



ACCESSIBLE TO THE PUBLIC



Proximity To Regional Parks & Preserves

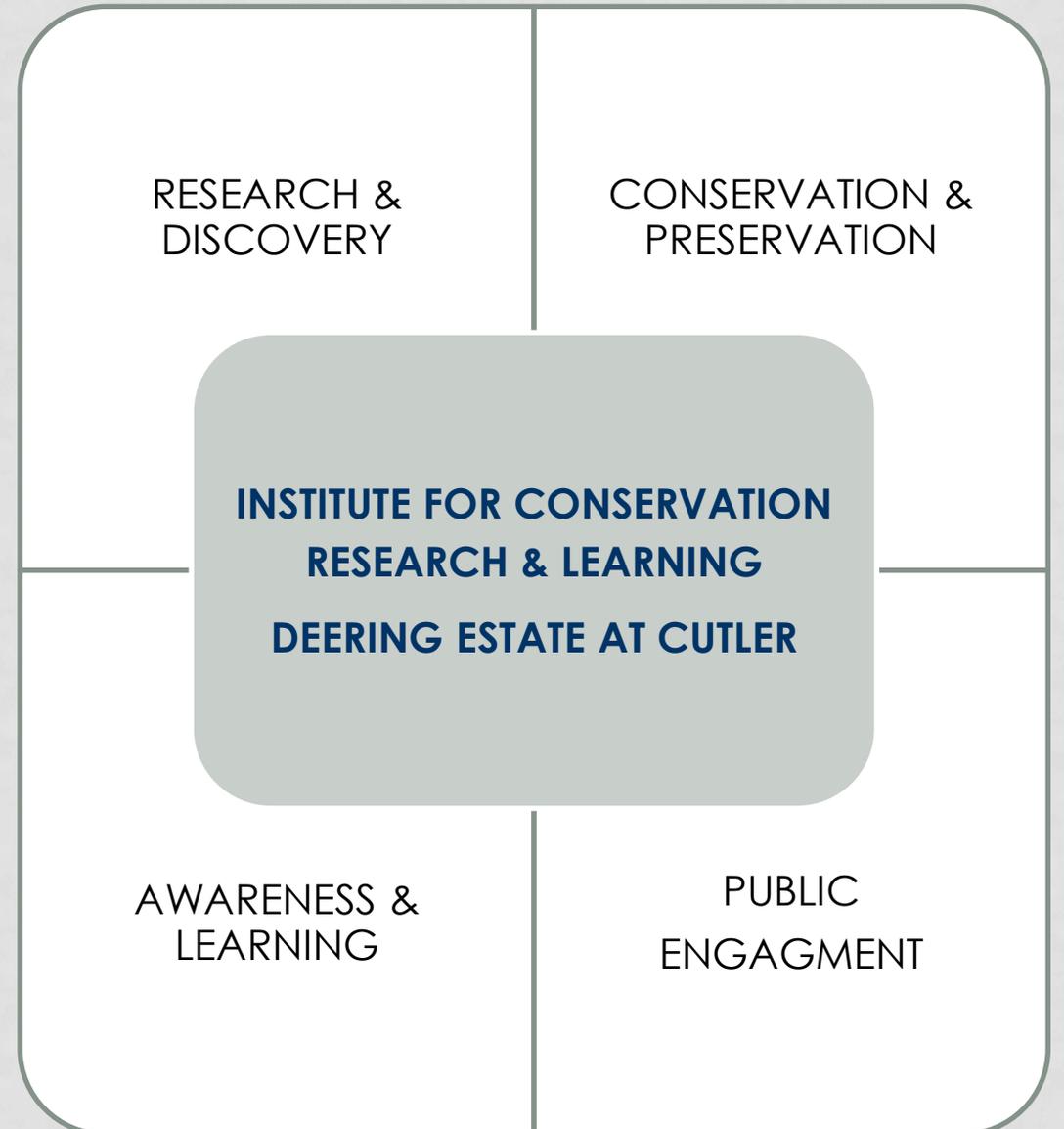




The Institute for Conservation Research and Learning

- Donation from Marta Weeks-Wulf on behalf of the Weeks family
- 8.75 acre, west edge of Old Cutler Road, adjacent to the Deering Estate.
- 7+ acres of tropical hardwood hammock, maintained under an Environmentally Endangered Lands (EEL) covenant;
- 10,500 square foot energy efficient, custom home built in 1982
- Research Access Point & Contemplative Study
- Welcome visiting academics, scientists, researchers, students, and educators ready to engage in interdisciplinary, ground-breaking research.

OUTCOMES





Cultural and Ecological Field Station

- Provide living laboratories for students, researchers, and the general public interested in the environment and conservation.
- Provides opportunities for conservationists and preservationists regionally and worldwide to explore innovative ways to preserve the rich cultural and natural resources, part of our local communities.



OUTCOMES

RESEARCH &
DISCOVERY

CONSERVATION &
PRESERVATION

**CULTURAL & ECOLOGICAL
FIELD STATION**

DEERING ESTATE AT CUTLER

AWARENESS &
LEARNING

PUBLIC
ENGAGEMENT



COMMUNITY ENGAGEMENT

Key Partners

Multi-Level Government Agencies

Non-Governmental Conservation, Academic, and Informal Education Organizations

Tribal Leaders

General Public

Education professionals (formal and informal)

Parents Educators

Individuals

Corporations/Local Business Leaders

Future Generations



CEFS UPDATES

- Memorandum of Understanding (MOU) between Deering Estate at Cutler and Florida International University School of Environment Arts
- Highlight of Ecological Outcomes Against Goals and Objectives from South Florida Water Management District (abbrv from G.E.E.R.)



Outcomes of the MOU:

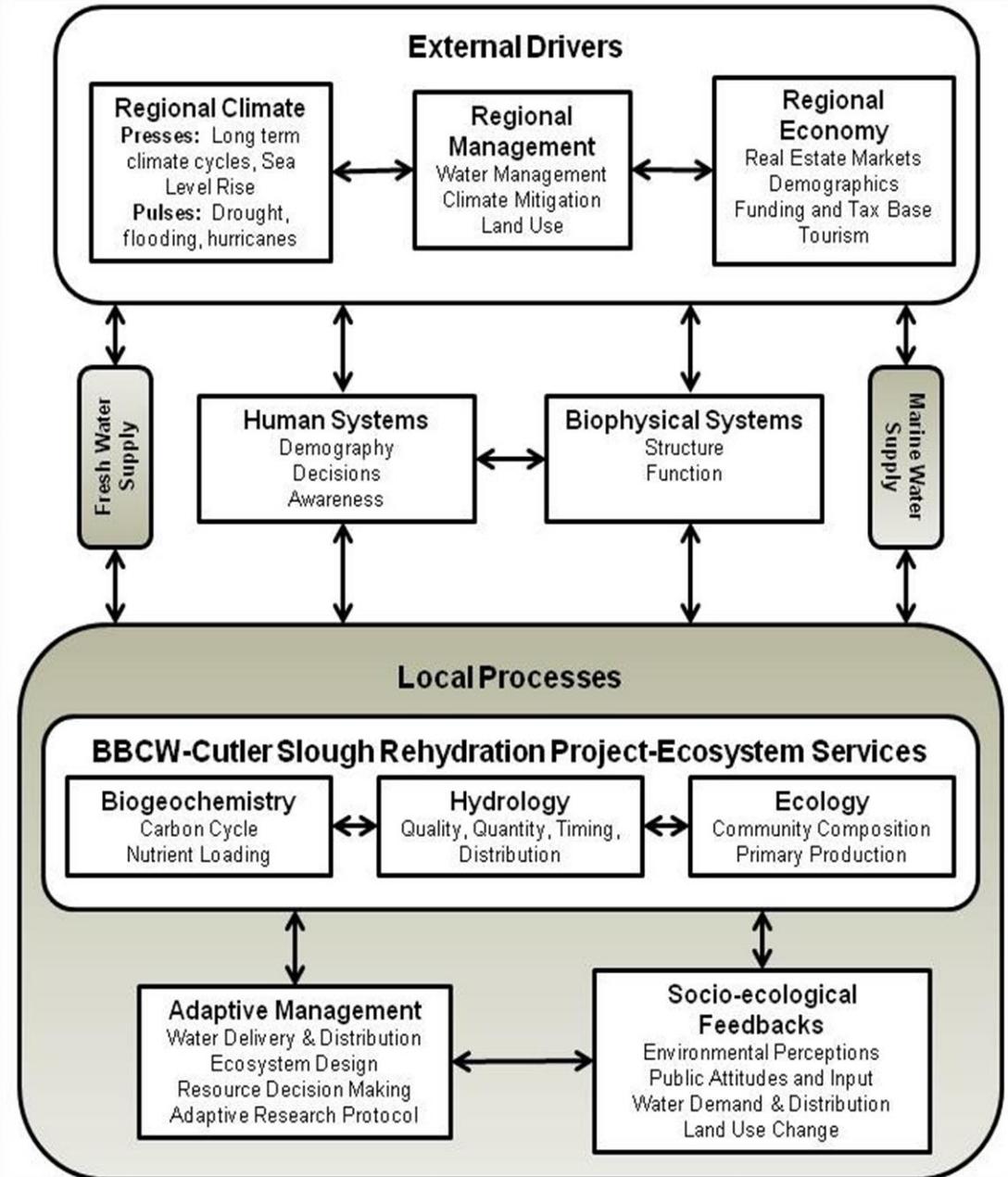


- **Best Conservation Management Practices**
- **Collaborative Science, Education, and Social Engagement Research** – collaboration will strive to identify core thematic areas of *research* and to develop strategies for enhancing K-12, undergraduate and graduate opportunities for *field research* and *formal/informal experiential* learning.
- **Funding for Collaborative Research and Informal Science Education Projects**
- **Cultural and Natural Resource Awareness**
- **Professional Development**

RESEARCH FRAMEWORK

How does human behavior and decision making interact with biophysical processes (past and present) to drive change and outcomes?

Urban Ecology & Natural Resource Management
Cultural Resource Management
Integration into Local Economies & Neighborhoods



Research & Discovery Themes

Conservation Biology

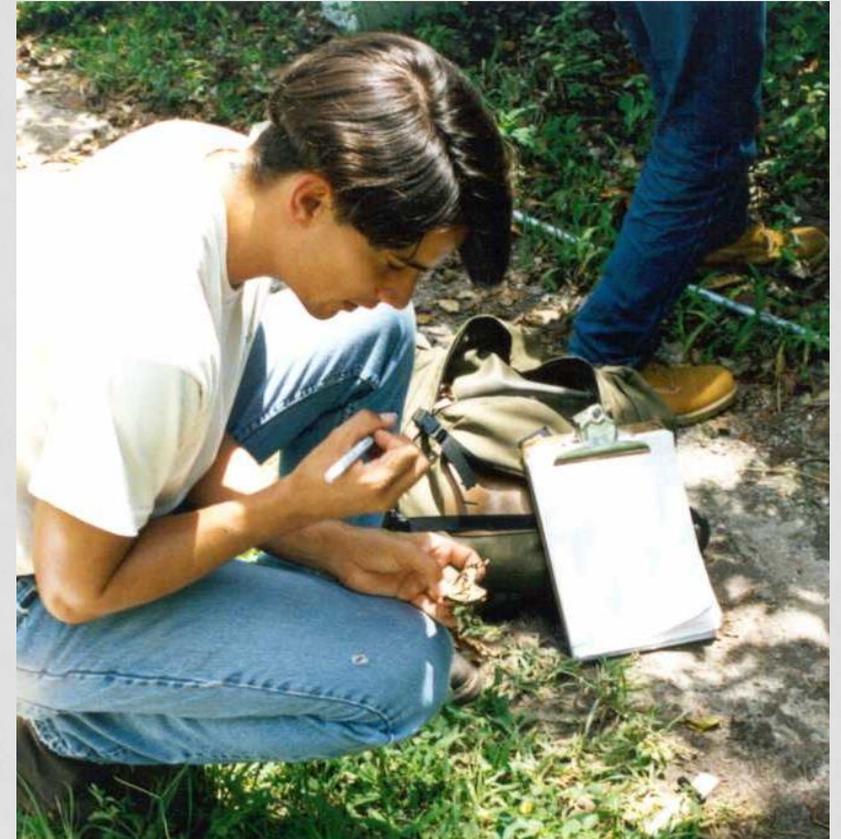
Restoration Ecology

Coastal Wetland Ecology

Geology, Geophysics, and
Paleoclimatology

Activity Theory in Formal and Informal
Science Education

Socio-Cultural Studies



Enhanced Opportunities for Research & Discovery

Access by faculty and students to diverse marine, freshwater and terrestrial habitats, archeological sites, geologic record, cultural collections, and active natural and cultural resource management.

- CEFS/FIU/DEF MOU - potential placement of FIU faculty at the Deering Estate at Cutler, on a short-term or permanent basis to develop research.
- Establishment of new and innovative programs for K-12, undergraduate and graduate students, with potential for additional revenue generation.
- Establishment of a competitive graduate fellowship program, supported by funding from Deering Estate Foundation, to support graduate student research at the Deering Estate.
- Joint approaches to the interpretation and broader dissemination of research.



Best Conservation Management Practices:

- Using ecological and cultural resource assessment data, site management will develop and enhance their own best management practices.
- Prioritizing site specific strategies for natural and cultural resource adaptation planning - preservation, rehabilitation, restoration, and/or reconstruction.
- How activities better integrated into existing regulatory planning processes.
- Internship opportunities will be provided for college students to engage in real-world conservation projects, cultural and natural resource management, and public engagement processes for environmental and cultural resource decision making.



Awareness & Learning

- Identify and analyze the process of public engagement, decision-making, and representation.
- The promotion of Miami as a world hub for converging social and empirical science disciplines, creating a multi-disciplinary approach to understanding public attitudes and norms about science and changes to the environment.
- Engagement of other units at FIU relevant to the mission of the Deering Estate at Cutler and the Cultural and Ecological Field Station.
- The hosting of joint research and educational events and activities.
- Professional advancement for Deering Estate and partner organization staff.



Learning Outcomes

Living Classroom, environmental education, programs for grades K-22 will integrate these resources into cutting-edge informal STEM learning experiences and complement research conducted onsite, building broader audiences and educating future generations about the importance of preserving biodiversity.

Outcomes for Research Experiences for Undergraduates and Graduates...

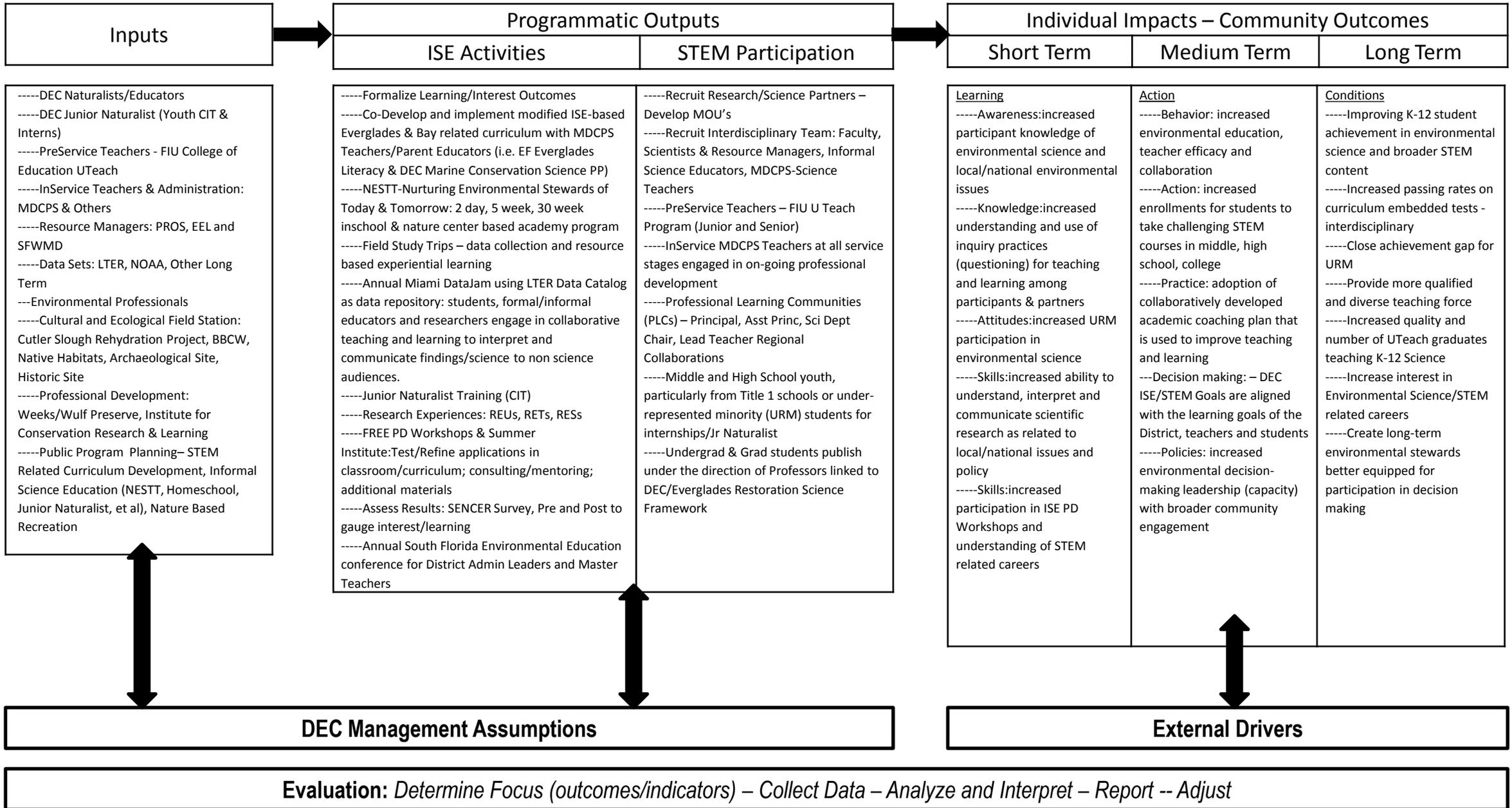
- Revenue Opportunities Undergraduate, Graduate, PhD Classes and Graduate
- Certificate Programs...

Learning Outcomes for K-12 students, teachers, and parent educators...

- K-12 Living Classroom Programs...
- What makes a teacher effective?
- Summer Institute...
- Teacher Education Workshops...



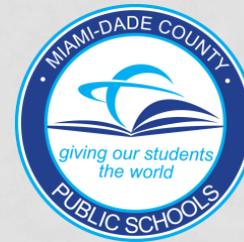
2015 Deering Estate at Cutler ISE Community Engagement Logic Model



Informal Science Education

Onsite: EcoAcademy for Parent Educators and Youth (Homeschool Program); Field Study Trips; Scout; Science Discovery Camps; Teacher Work Day Camps, Special Events

*Marine Conservation Science and Policy
Wildlife Conservation Program
Everglades Literacy Project – NEW
Miami DataJam - NEW
Junior Naturalist Program*



Outreach: NESTT Program; Global Studies Integration – NEW

Citizen Science: Soil & Water Testing for Enhanced Stewardship, Other Opportunities - NABA Butterfly Surveys, Christmas Bird Count, Boa GPS Tracking, Marine Mammal Observation Logs, Oyster and Sea Grass Monitoring, Coastal Clean Ups, Trail Monitoring

Nature Based Recreation: Canoe Tours, Archaeology Day, Deering Goes to the Birds, Speaking Sustainably Film & Lecture Series, Nite Hikes, Bike Tours, Special Field Study Trips, Service Learning, amongst others



Enhanced Opportunities for Teaching & Learning

Focus outcomes on improvements to education (informal and formal), contributions to professional development and pedagogy, and the feedback these groups provide to resource managers, scientists, and educators in communicating complex and multi-dimensional issues facing society.

- **Enhanced Certificate in Conservation Biology** offered at FIU with field experiences and coursework taking place at the Deering Estate.
- Create **weekend or extended semester field experiences** as part of new or existing course offerings for local students.
- Enhanced **field intensive research** for local graduate students.
- Leadership training to graduate students through participation in **near peer mentoring** of undergraduate and K-12 students.
- Provide opportunities for graduate students to train and conduct research with scientists and students from other collaborating and visiting universities.
- Create national and world-wide **academic exchange field study** programs.
- Establish **service learning projects** that link K-12 students, teachers with researchers and scientists.
- Link local **Research Experience for Undergraduates (REU)** site experience to students nationally.
- Enhance **Professional Educator Development Workshops** for K-12 pre-service, inservice and school administrators.



Offer a model site for professional development that integrates experiential learning in STEM technologies in interdisciplinary subjects that include a focus on science and culture.

Funding for Collaborative Research and Informal Science Education Projects

CEFS will foster collaborations with other university scientists and students, as well as federal, state, and local agency, municipal and private partners.

- University scientists will work with colleagues in the U.S. and abroad to pursue extramural funding and explore comparative frameworks for compelling research.
- Collaboratively generate and benefit from funds generated for socio-ecological science and training in field biology.
- Discussions regarding infrastructure support and future capital projects for field stations and marine labs.



Goals of the Biscayne Bay Coastal Wetlands Project:

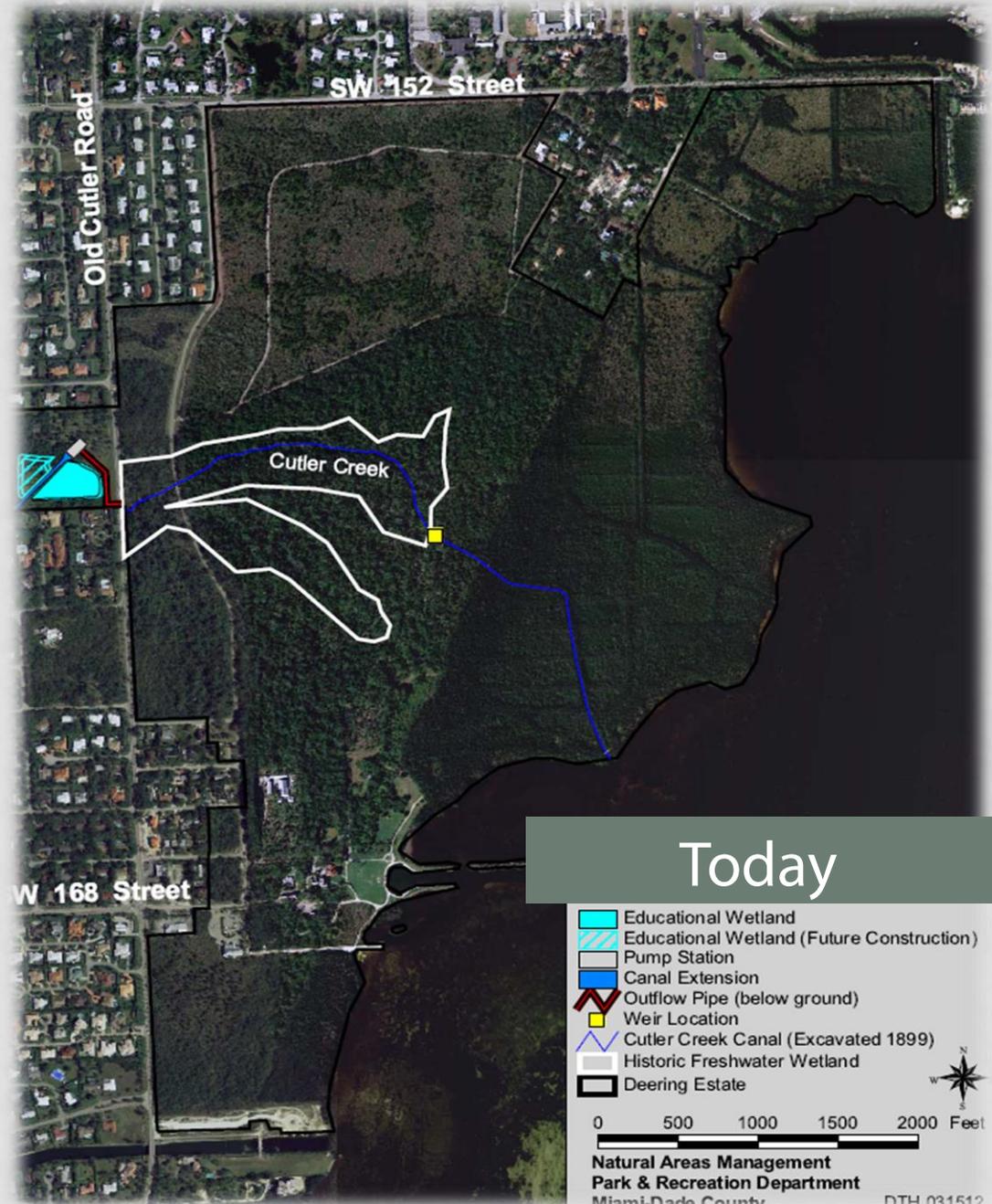


- Re-establish productive nursery habitat
- Improve quantity, quality, timing and distribution of fresh water to Biscayne Bay
- Redistribute freshwater flow and minimize point source discharges
- Preserve and restore natural coastal glades habitat
- Re-establish connectivity between the coastal and adjacent wetlands
- Improve near-shore and saltwater wetland salinity regimes

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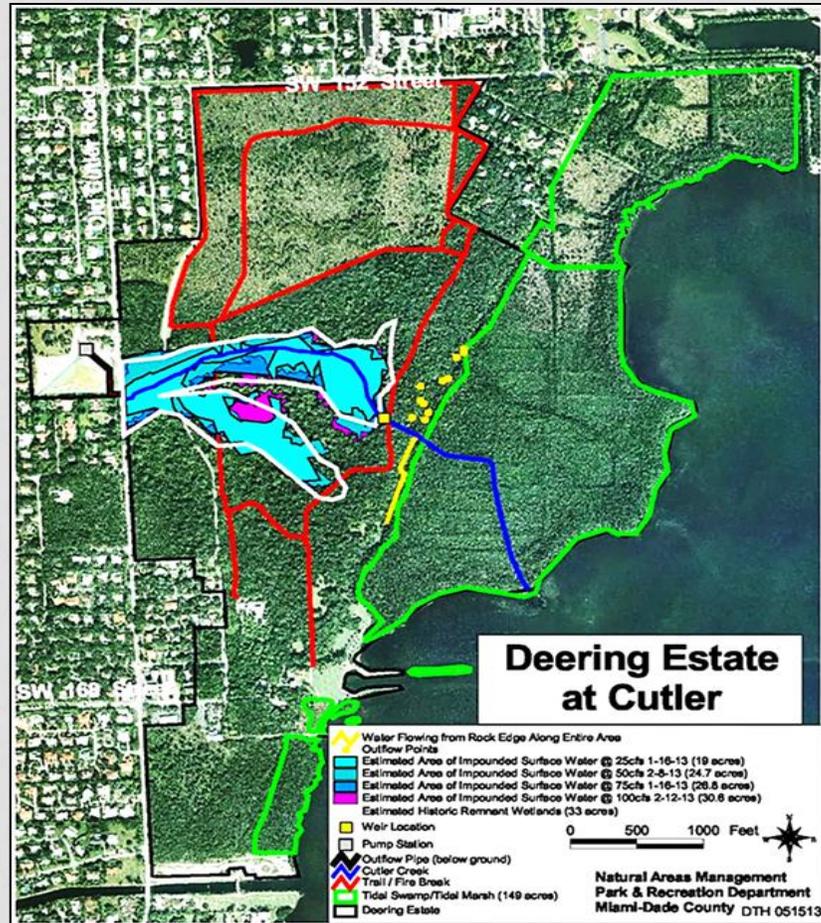
Source: MDC – Deering Estate at Cutler



BBBCW Restoration Benefits (Deering Flow-way)



BBCW Restoration Benefits (Deering Flow-way)



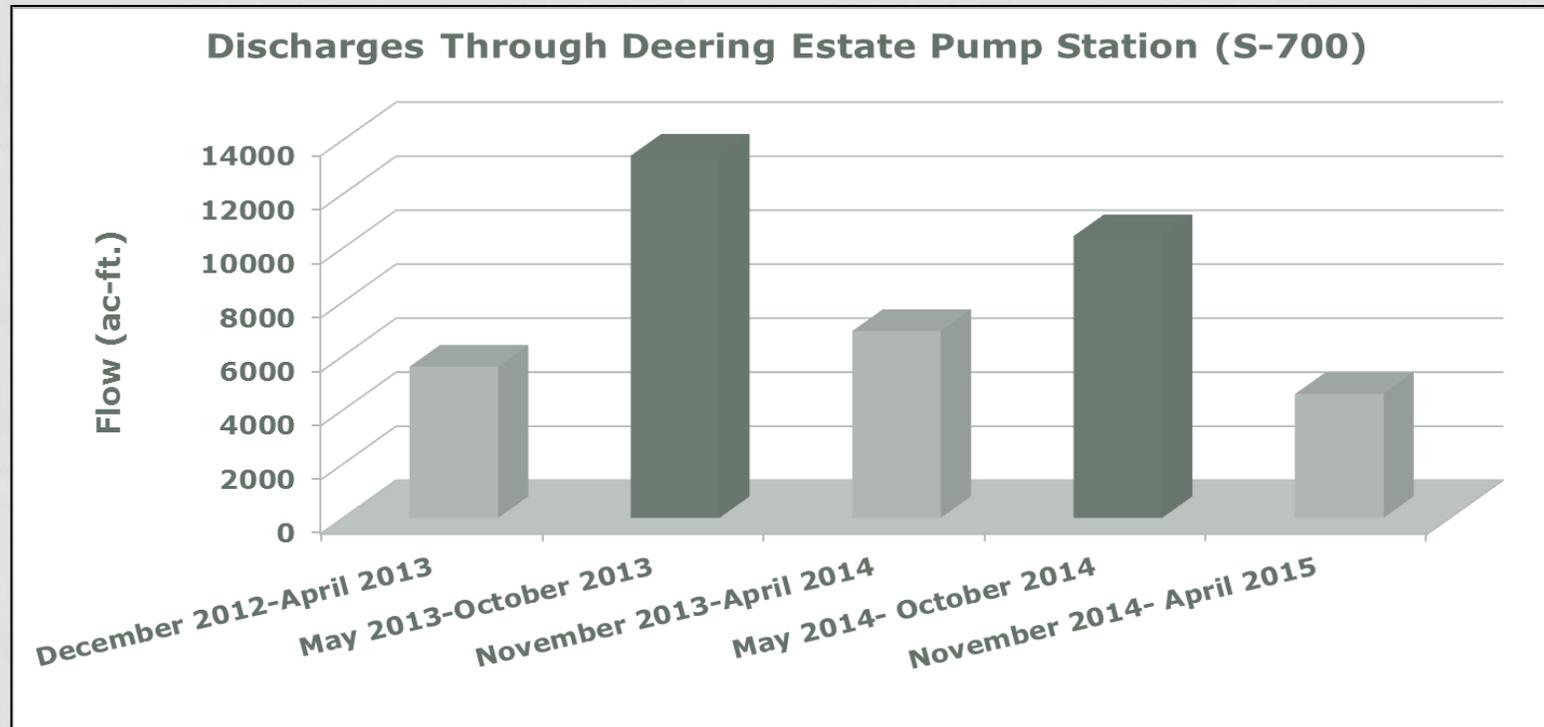
Delineation of the Historical Freshwater Wetland Slough in Deering Estate and Areas of Inundation at Different Pump Rates

Estimated Acreage of Impounded Surface Water Under Different Pumping/Flow Rates within Deering Estate.

Pumping Rate(cfs)	Duration of Testing (hours)	Estimated Acres of Impounded Surface Water	Percentage of Inundate Historic Remnant Wetlands within Cutler Creek
0	5	0	0%
25	5	19	58%
50	5	25	76%
75	5	27	82%
100	5	31	94%

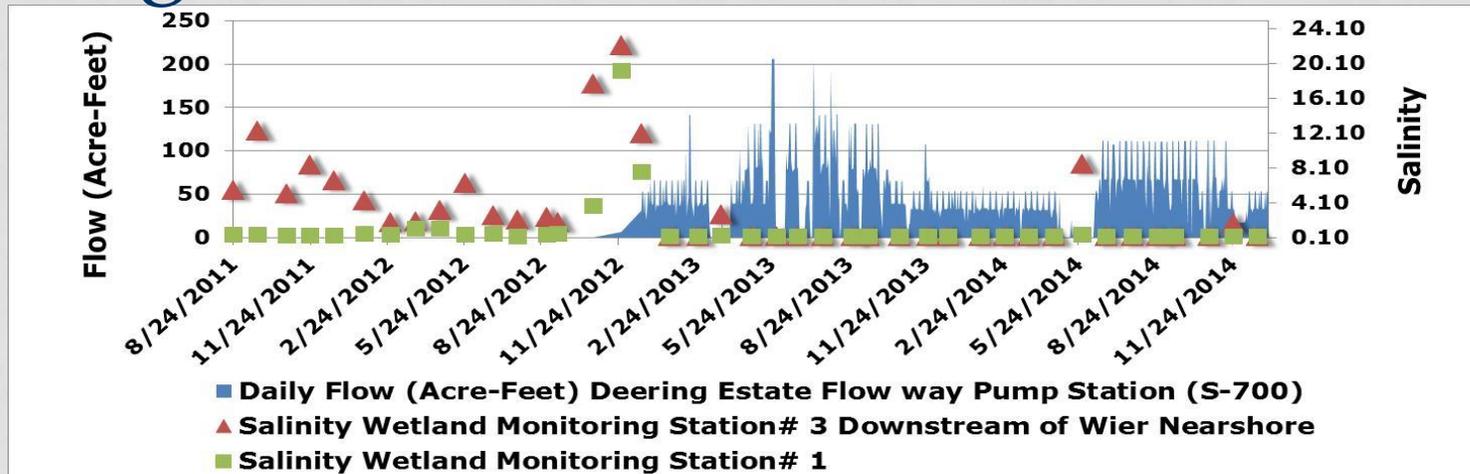
Determined extent of inundation under various pumping rates

BBCW Restoration Benefits (Deering Flow-way)

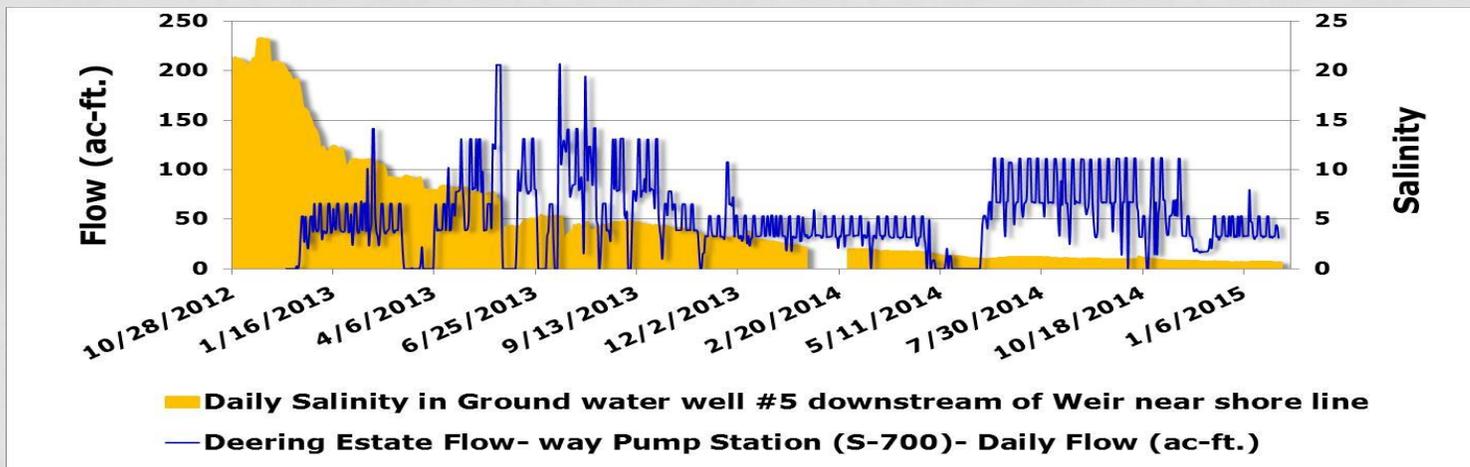


- Approximately 40,970 ac-ft. of fresh water redirected to historic remnant wetlands
- Timing of flows to the wetlands at Deering Estate has been improved

Ecological Monitoring Stations - Reduced salinity in groundwater and surface water



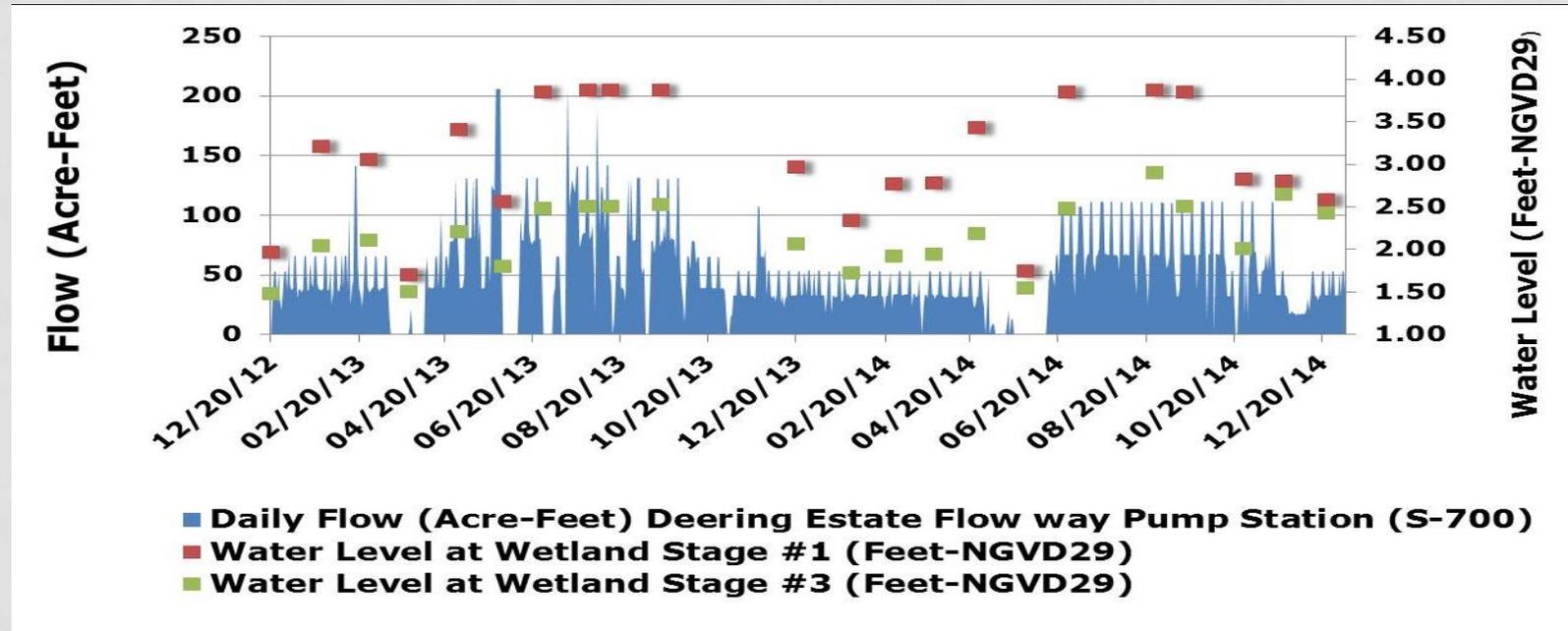
Comparison of Surface Water Salinity at Deering Estate Wetland staff Gauges 1 and 3 Versus S-700 Daily Flow



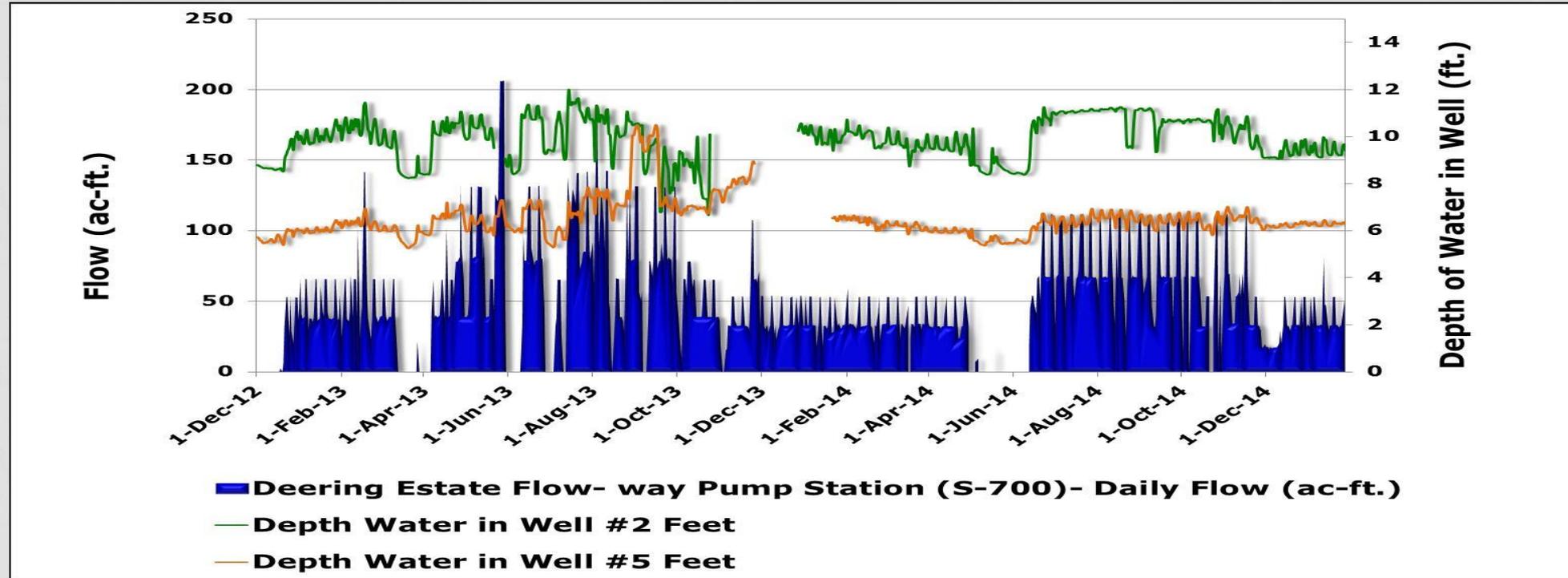
Comparison of Salinity Concentrations in Groundwater Well #5 Near the Historic Remnant Wetlands of Deering Estate Versus S-700 Daily Flow



Water Levels at Deering Estate Staff Gauges 1 and 3 Versus S-700 Daily Flow



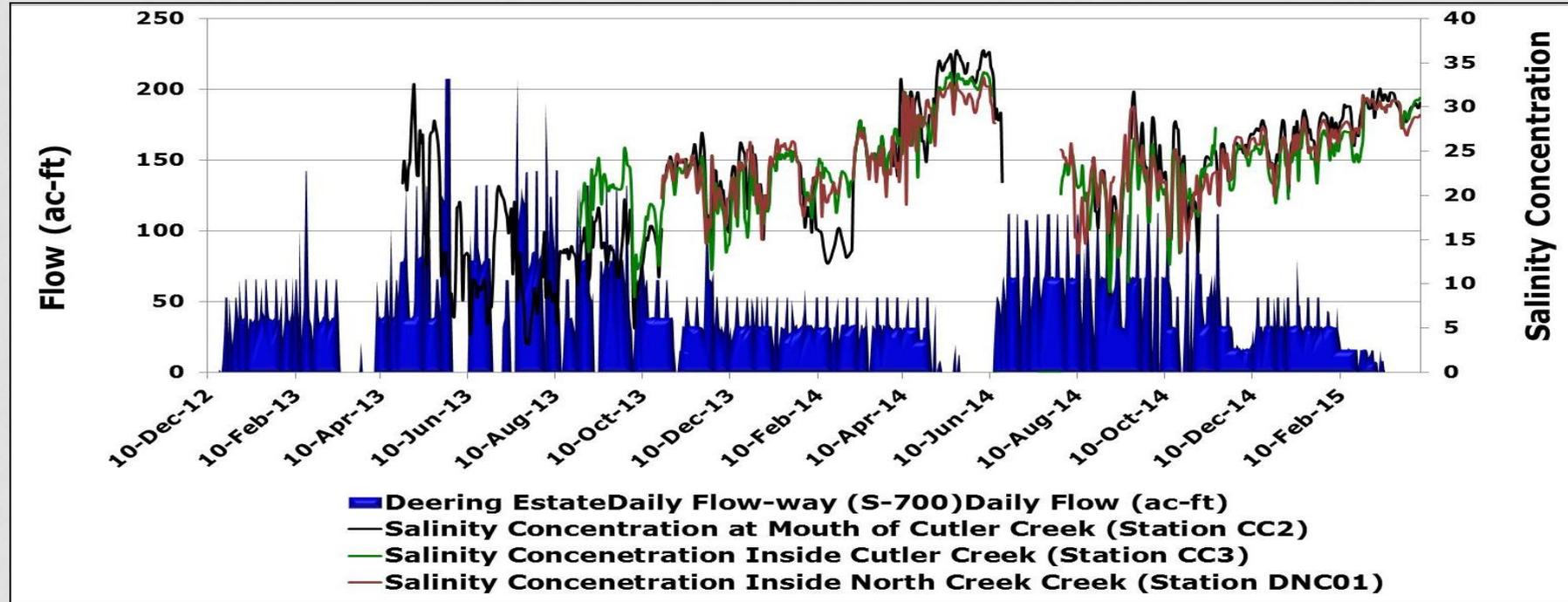
Comparison of Water Levels at Deering Estate Staff Gauges 1 and 3 within Vicinity of Historic Remnant Wetlands of Deering Estate Versus S-700 Daily Flow



Groundwater stage rose noticeably at monitoring stations 2 and 5, and water levels varied according to pump operations

Adapted from GEER – SFWMD April 2015 – Charkhian, Bahram

Comparison of Surface water Salinity at Deering Estate Nearshore Salinity Monitoring Stations (Mouth of Cutler Creek, Inside North Creek, and Inside Cutler Creek) Versus S-700 Daily Flow



Groundwater stage rose noticeably at monitoring stations 2 and 5, and water levels varied according to pump operations

BBCW Restoration Benefits (Deering Flow-way)

- Improve Near-shore Salinity Regimes
- Reduced salinity in Cutler Creek, North Creek and nearshore at Mouth of Cutler Creek



Adapted from GEER – SFWMD April 2015 – Charkhian, Bahram

Five (5) Year Work Plan:

DEERING ESTATE AT CUTLER



The Deering Estate Foundation, Inc.
Partners in Preservation, Education & Recreation

- Develop the Science Framework & Discovery Themes
- Implement Science Advisory Team
- Improvements to Property
- Write Grants, Implement Capital and Program Funding Plan

FIVE (5) YEAR WORK PLAN 2014-2019
Cultural & Ecological Field Station
Institute of Conservation Research & Learning

OUTCOME: *Our long-term vision is to be an internationally recognized cultural and ecological field station, contributing to science, resource management, and society through fine art, history, sustainable eco-tourism, and awareness*

<p>DESCRIPTION: <i>The Cultural and Ecological Field Station</i> at the Deering Estate at Cutler provides opportunities for conservationists and preservationists regionally and worldwide to explore innovative ways to preserve the rich cultural and natural resources, part of our local communities.</p> <p><i>Conservation, research/discovery, awareness/learning, public engagement.</i></p> <p>Field stations provide living laboratories for students, researchers, and the general public interested in the environment and conservation.</p> <p>Because they lack traditional university departmental boundaries, researchers at field stations have the opportunity to converge their science disciplines with other social and empirical scientists and researchers in ways that can change careers and entire fields.</p>	Develop Vision, Concept, Goals and Objectives for the Cultural and Ecological Field Station (Discovery, Research, Education, Resource Monitoring):					
	Key Dates	Planning/Action Steps Completed	Status	Done		
		Develop Working Draft & FAQs for Cultural & Ecological Field Station	100%	YES		
		Join/Become Member OBFS (Organization of Biological Field Stations)	100%	YES		
		Develop Scientific Research Framework	80%			
		Develop Science Advisory Board/Working Group – Linked to Deering Estate Foundation BOD – Recruit Members				
		Conduct VIP/Ambassador Site Visits - Enhance cooperation through co-sponsorship of scientific meetings and workshops, offer tours to local leaders, NGO, partners				
		Develop Site/GOB Development Plan – Perimeter access control, main entrance visitor feature, additional parking, observation & discovery center (Powers Property).				
		Sign MOU with FIU – SEAS – pursue collaborations with universities, researchers, and conservation organizations to improve research and data collection.	25%			
		Facilitate communication across and amongst agencies by regular information exchanges and participation in OBFS.				
		Link conservation, research, education and engagement programs and activities to DEC GMP, DEC Comprehensive Interpretive Plan aligned with MDPROS Conservation Plan and departmental goals.				
	Key Dates:	Planning/Action Steps Completed	Status	Done		
	Develop a Proposed Schedule of Year Round Activities, enhancements to DEC activities and programs.					
	Provide for support of PROS departmental environmental education/conservation initiatives.					

Note: In general, we measure the success of our programs through number of programs offered, increased participation/enrollment and participant satisfaction based on surveys.

DESCRIPTION: *The Institute for Conservation Research and Learning*, made possible by a generous donation from Marta Weeks-Wulf on behalf of the Weeks family, includes an 8.75 acre property located on the west edge of Old Cutler Road, adjacent to the Deering Estate. More than 7 acres of pristine native tropical hardwood hammock have been managed and maintained under an Environmentally Endangered Lands covenant; the property also boasts a 10,500 square foot energy efficient home custom built in 1982 to: **welcome visiting academics, scientists, researchers, students, and educators ready to engage in interdisciplinary, ground-breaking research.**

Research repository and professional development

Living Classroom, environmental education and professional development, programs for grades K-22 integrate these resources into cutting-edge informal STEM learning experiences and complement research conducted onsite, building broader audiences and educating future generations about the importance of preserving biodiversity.

Develop Vision, Concept, Goals and Objectives for the Institute for Conservation Research and Learning			
Key Dates:	Planning/Action Steps Completed	Status	Done
	Develop Table of Organization: Conservation Director, Biologists, Research Coordinator and hire	25%	
	Establish a research access point – site files, local literature, archaeological reports, permits, compliance reviews, and institutional memory.		
	Develop accession registry, onsite library, and lending procedures	25%	
	Establish Research Agreement/Permit, Researcher in Residence, and Permit to Do Business Forms.	40%	
	Develop Summer Institute, RESSs, REUs, Field Course in partnership with FIU	25%	
	Develop shared revenue agreements for local & national researchers and associations to have limited access to space and site.		
	Publish or perish.		
Develop Funding Priorities & Potential Sources			
Key Dates:	Planning/Action Steps Completed	Status	Done
	Develop Public Relations Plan - Website, Social Media, Press releases		
	Funding Priorities (Naming Opportunities): Institute for Conservation Research & Learning Weeks- Wulf Reserve TBD Academic Program – i.e. Southeast Cultural and Ecological Field Studies Endowed Conservation Chair or Director Funding Priorities (Capital Improvements & Programming): Long Term Ecological Research and Discovery Center (w FIU, Powers Property) Living Classroom Summer Institute & Professional Development Opportunities NESTT Program Individual Research – i.e. Archaeological Survey & Assessment Sense of Place Pillars		
	Funding Opportunities (Grants): NSF (DRK- Discovery & Research) NSF (Biological Field Station) NSF (Informal Science Education) EPA (Environmental Education Grant - \$192,000) Everglades Foundation – Everglades Literacy Program - \$25,000	100% 100%	Funded

Note: In general, we measure the success of our programs through number of programs offered, increased participation/enrollment and participant satisfaction based on surveys.