COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP)

FRAMEWORK TO RESTORE, PROTECT, AND PRESERVE AMERICA'S EVERGLADES

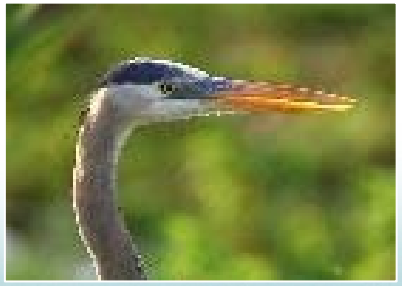
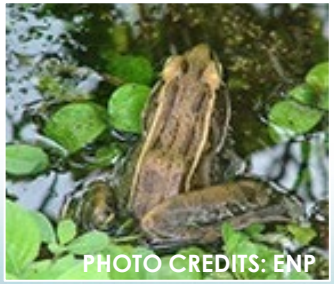



PHOTO CREDITS: ENP



Gina Paduano Ralph, Ph.D.
Jenna May
Jacksonville District
U.S. Army Corps of Engineers

April 16, 2024

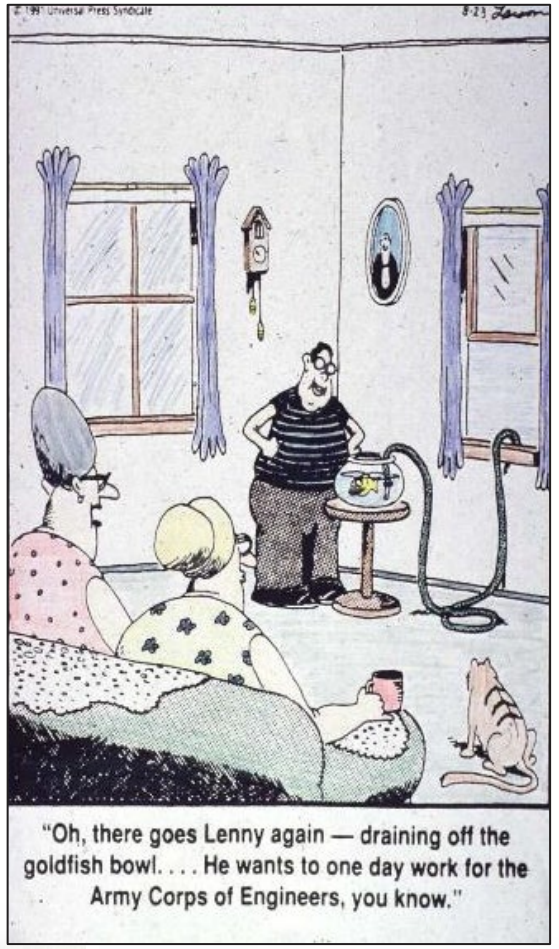
U.S. ARMY

US Army Corps of Engineers

COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP)

FRAMEWORK TO RESTORE, PROTECT, AND PRESERVE AMERICA'S EVERGLADES

- A Brief History
- Getting the Water Right
- How Science Informs Restoration
  - REstoration, COordination, and VERification (RECOVER)
  - Applied Science Strategy



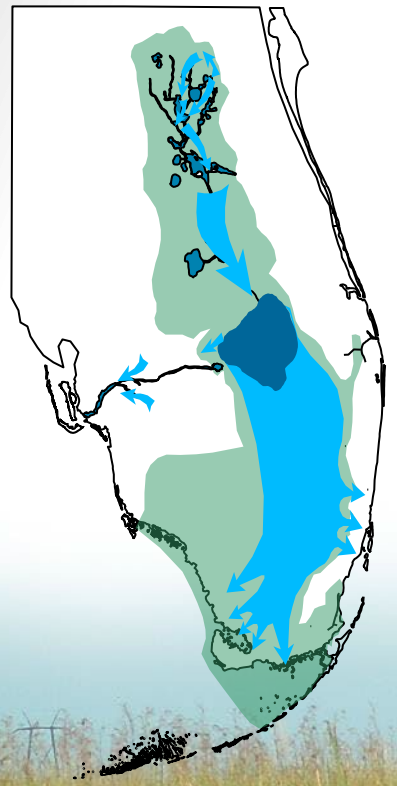
"THERE ARE NO OTHER EVERGLADES IN THE WORLD"

- Marjory Stoneman Douglas -





THE RIVER OF GRASS

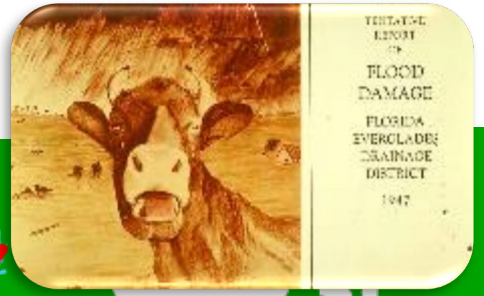


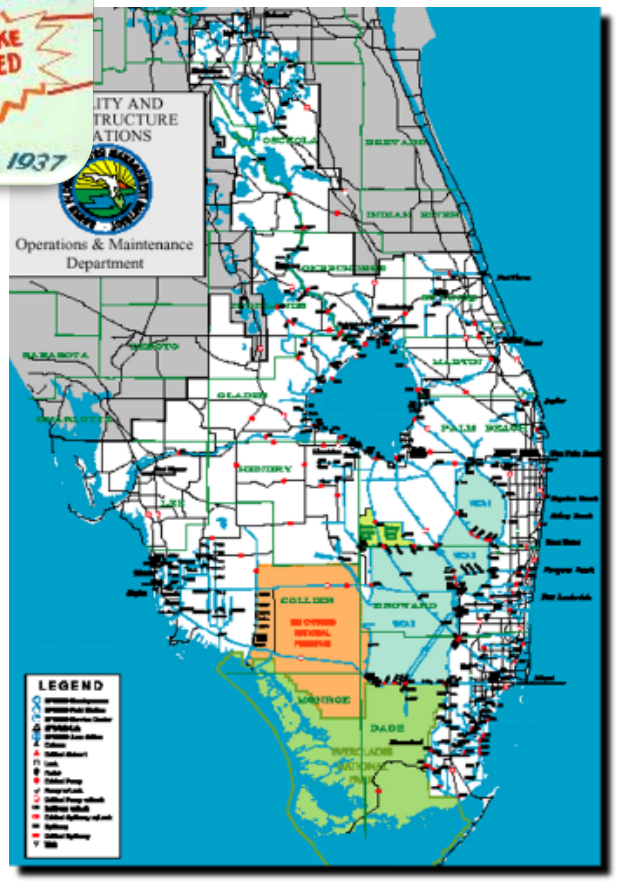
PRE-DRAINAGE FLOW

TYPICAL CROSS SECTION OF THE EVERGLADES
- RIDGE AND SLOUGH TOPOGRAPHY -

The Everglades have been designated a World Heritage Site, an International Biosphere Reserve, and a Wetland of International Significance

CERP: A BRIEF HISTORY





1881-1894

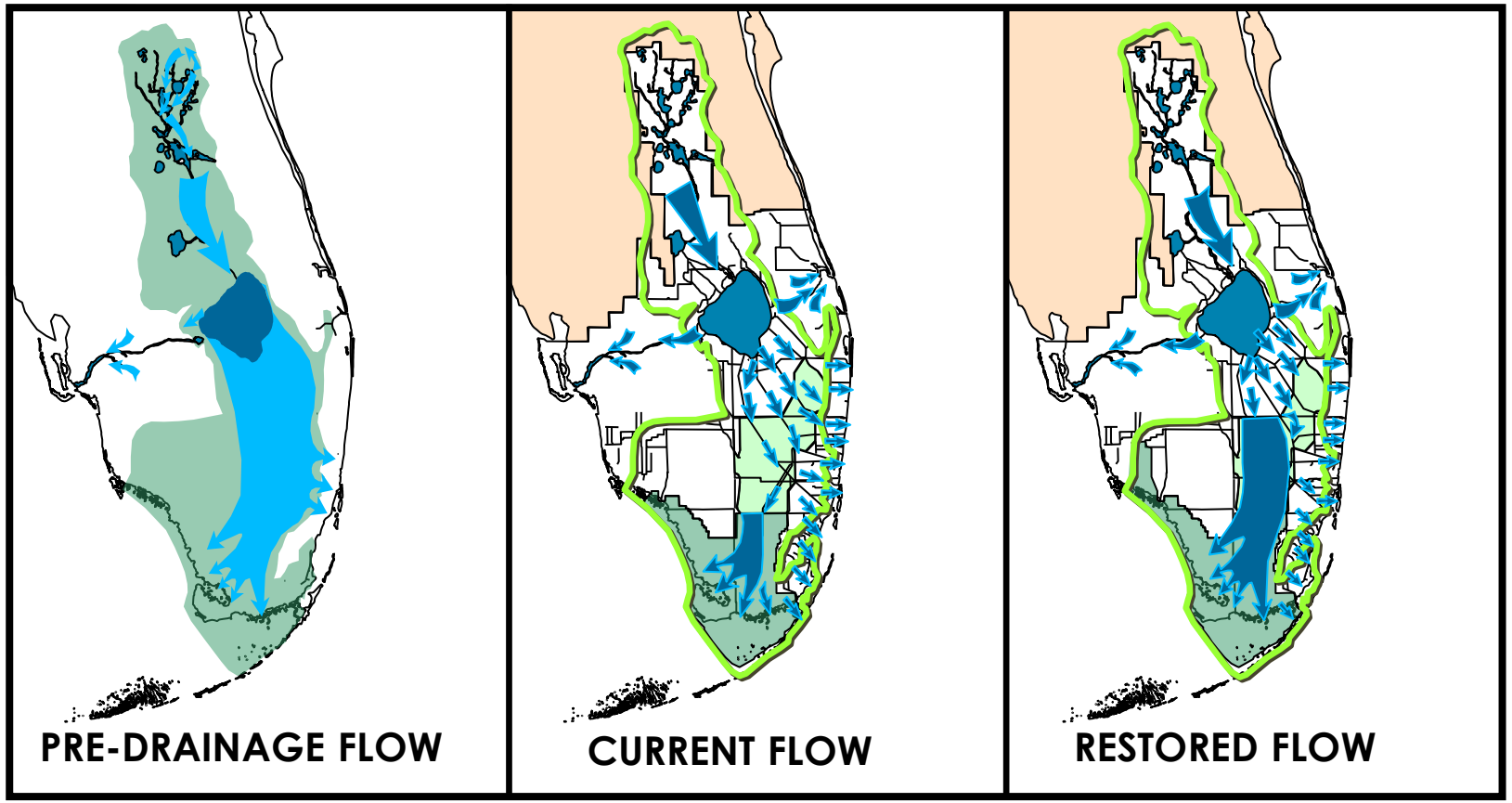
1905-1928

1948-Present

Central & Southern Florida Project (C&SF)

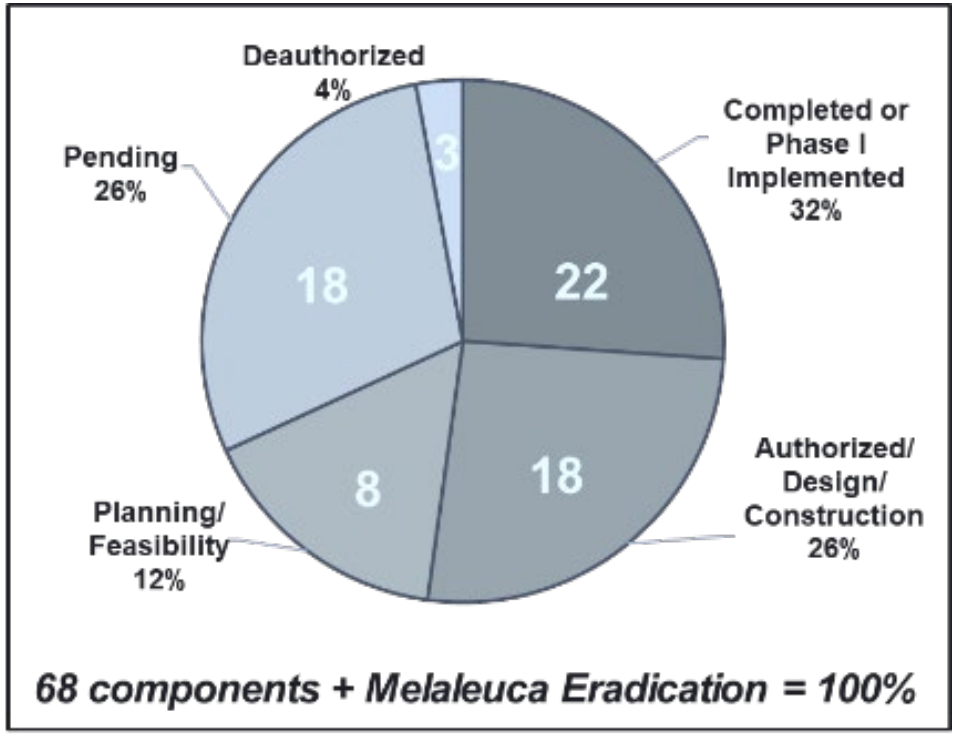
- 1,800 miles of canals and levees
- 160 major drainage basins
- Over 2,000 water control structures
- 200 major structures
- 36 pump stations

CERP: GETTING THE WATER RIGHT



OUTLINE OF ORIGINAL SOUTH FLORIDA ECOSYSTEM
COMPARED TO CURRENT AND RESTORED CONDITIONS

CERP: COMPONENTS

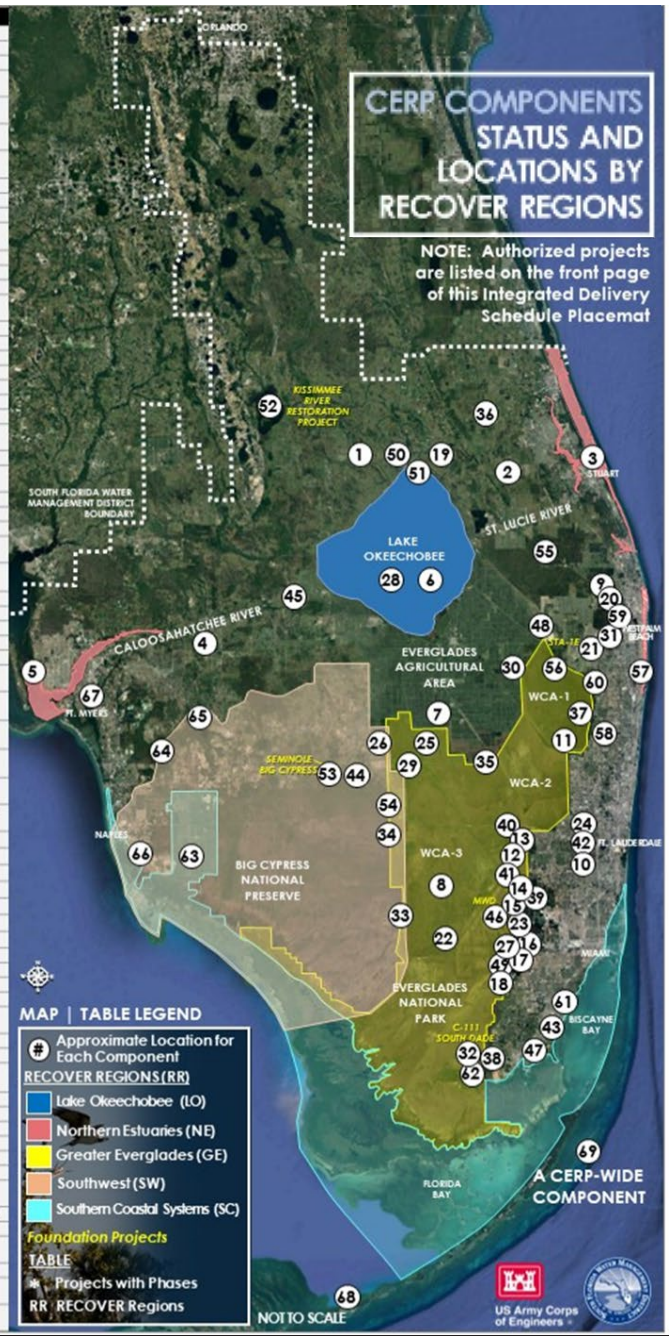


68 components + Melaleuca Eradication = 100%

Terminology Overview:

- **Completed or Phase I Implemented:** partially or completely constructed and operational
- **Authorized/Design/Construction:** project approved by WRDA. Start or continue implementation activities
- **Planning/Feasibility:** currently evaluated for future implementation
- **Deauthorized:** due to lack of funding and activity. May be considered in a future PIR
- **Pending:** to be considered in an upcoming study

	#	RR	YELLOW BOOK NAME AND CODE
COMPLETE OR PHASE 1 IMPLEMENTED	10	SC	Change Coastal Wellfield Operations (L)
	11	GE	Site 1 Impoundment with ASR* (M)
	16	GE	C-4 Structures (T)
	19	LO	Taylor Creek/Nubbin Slough Storage and Treatment Area* (W)
	25	GE	Modified Holy Land Wildlife Management Area Water Management Operations (DD)
	26	SW	Modified Rotenberger Wildlife Management Area Water Management Operations (EE)
	32	SC	Modification to SDCS in southern portion of L-31N and C-111* (OO)
	38	SC	C-111 Spreader Canal* (WW) – Phase 2 in Planning
	42	GE	Lower East Coast Water Conservation (AAA)
	45	GE	C-51* and Southern L-8 Reservoir (GGG)
	50	LO	Lake Okeechobee Watershed Water Quality Treatment Facilities* (OPE) – Phase 2 in Planning
	56	GE	Acme Basin B (OPE)
	57	NE	Lake Worth Lagoon Restoration* (OPE)
	58	GE	Winsberg Farms Wetlands Restoration (OPE)
	60	GE	Protect and Enhance Existing Wetlands Systems along Lox (Strazzulla Tract) (OPE)
	64	SW	Southern CREW Project Addition (OPE)
	65	SW	Lake Trafford Restoration (OPE)
	66	SW	Henderson Creek/Belle Meade Restoration (OPE)
	67	GE	Lake Park Restoration (OPE)
	68	SC	Florida Keys Tidal Restoration (OPE)
	69	ALL	Melaleuca Eradication and Other Exotic Plants (OPE)
AUTHORIZED / DESIGN / CONSTRUCTION	2	NE	St. Lucie/C-44 Basin Storage Reservoir (B)
	3	NE	Environmental Water Supply Deliveries to St. Lucie Estuary (C)
	4	NE	Caloosahatchee Basin Storage Reservoir with ASR* (D)
	5	NE	Environmental Water Supply Deliveries to Caloosahatchee Estuary (E)
	7	GE	EAA Storage Reservoir (G)
	8	GE	Everglades Rain-Driven Operations* (H)
	9	GE	L-8 Project (K)
	12	GE	Water Conservation Area 3A and 3B Levee Seepage Management (O)
	13	GE	Western C-11 Diversion Impoundment and Diversion Canal (Q)
	14	GE	C-9 Stormwater Treatment Area/Impoundment (R)
	18	GE	L-31N Improvements for Seepage Management (V)
	22	GE	Additional S-345 Structures* (AA)
	27	GE	Construction of S-356 A and B Structures* (FF)
	29	GE	Pump Station G-404 Modification (II)
	33	SW	Decompartmentalization of Water Conservation Area 3* (QQ)
	36	NE	C-23, C-24, C25 and Northfork and Southfork Basins Storage Reservoirs (UU)
	55	GE	Pal Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE)
	61	SC	Biscayne Bay Coastal Wetlands* (OPE) – Phase 2 in Planning
	63	SW	Southern Golden Gate Estates Hydrologic Restoration (OPE)
PLANNING/FEASIBILITY	1	LO	North of Lake Okeechobee Storage Reservoir (A) – Section 203 Study
	28	LO	Lake Okeechobee Aquifer Storage and Recovery* (GG)
	34	SW	Flow to Central Water Conservation Area 3A (RR)
	39	GE	North Lake Belt Storage Area (XX)
	43	GE	South Miami Dade County Reuse (BBB)
	44	SW	Big Cypress/L-28 Interceptor Modification (CCC)
	47	SC	Biscayne Bay Coastal Canals (FFF)
	49	SC	West Miami Dade Reuse (HHH)
PENDING	6	LO NE	Lake Okeechobee Regulation Schedule* (F)
	15	GE	Central Lakebelt Storage Area (S)
	17	GE	Bird Drive Recharge Basin (U)
	20	GE	C-17 Backpumping (X)
	21	GE	C-51 Backpumping to West Palm Beach Water Catchment Area (Y)
	23	GE	Dade Broward Levee/Pennsuco Wetlands (BB)
	24	GE	Broward County Secondary Canal System (CC)
	30	GE	Loxahatchee National Wildlife Refuge Internal Canal Structures (KK)
	31	GE	C-51 Regional Groundwater ASR (LL)
	37	GE	Palm Beach County Agricultural Reserve Reservoir (VV)
	40	GE	Divert WCA2 flows to Central Lake Belt Storage (YY)
	41	GE	Divert WCA3 flows to Central Lake Belt Storage Area (ZZ)
	45	NE	Caloosahatchee Backpumping with STA (DDD)
	46	GE	Flows to Eastern Water Conservation Area (EEE)
	51	LO	Lake Okeechobee Tributary Sediment Dredging/Phosphorus Removal (OPE)
	52	LO	Lake Istokpoga Regulation Schedule Modification (OPE)
	54	SW	Miccosukee Water Management Plan (OPE)
	62	SC	Restoration of Pineland & Hardwood Hammocks in C-111 Basin (OPE)
	35	SC	Re-route Miami-Dade Water Supply Deliveries (SS)
DE-AUTH	53	SW	Seminole Tribe Big Cypress Water Conservation Plan (East and West) (OPE)
	59	GE	Palm Beach County Wetlands-based Water Reclamation (OPE)

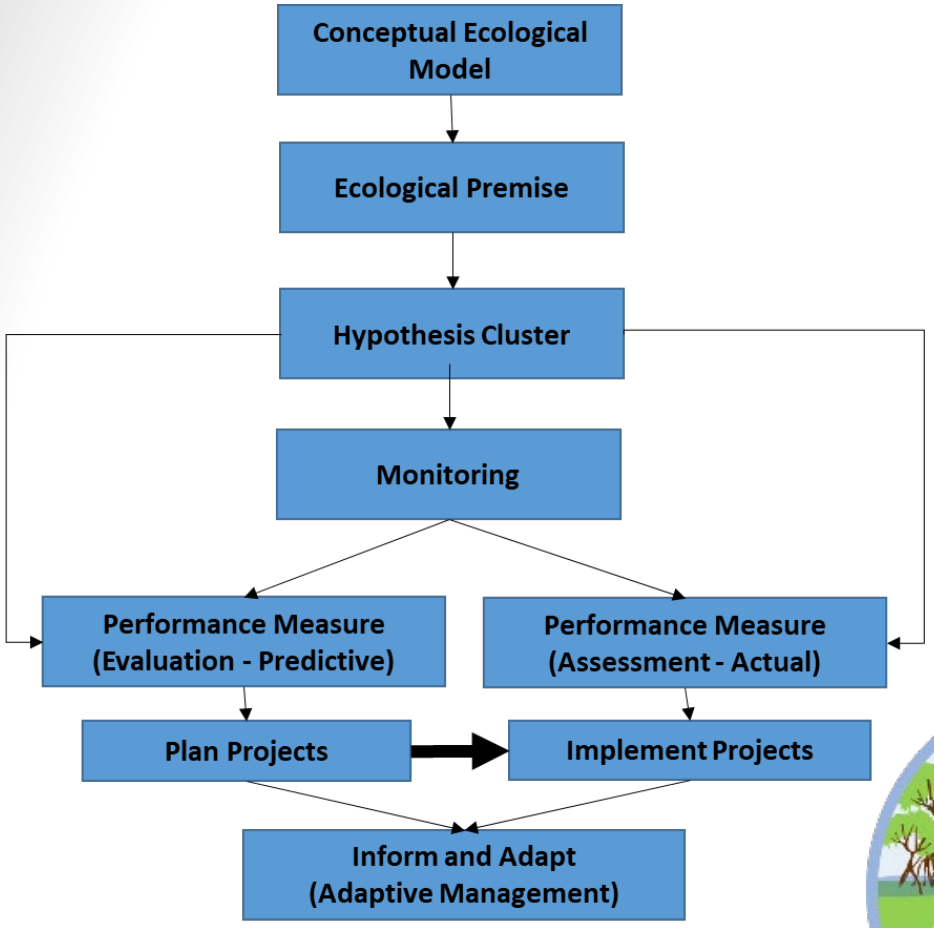


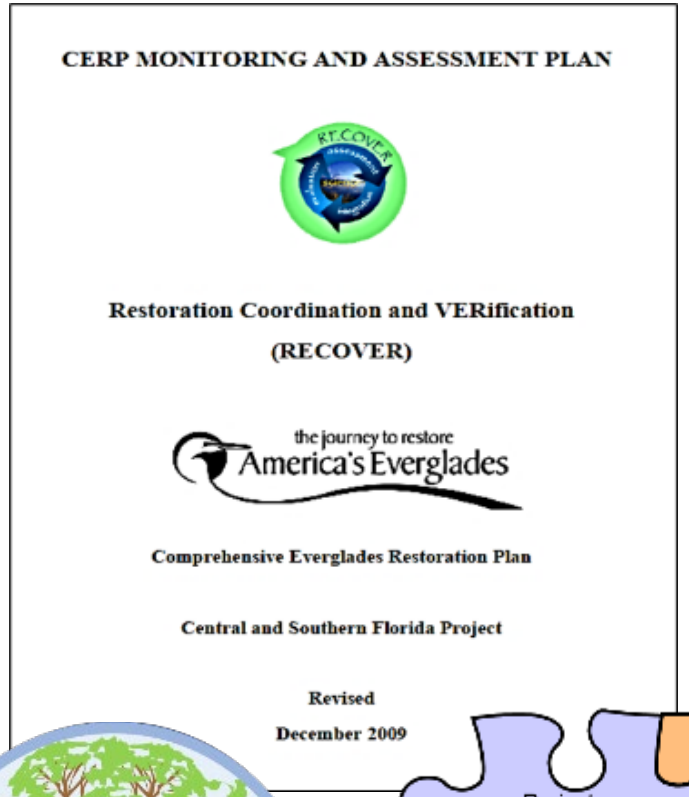
CERP: RECOVER

REstoration, COordination & VERification

- Ensures CERP implementation is guided by the best available science
- Three Major Missions:
  - **Assessment:** measuring performance of projects through research and monitoring
  - **Evaluation:** forecasting project performance through predictive modeling and performance measures
  - **Planning:** integrating RECOVER with planning and operation of the system

CERP: RECOVER
APPLIED SCIENCE STRATEGY




CERP MONITORING AND ASSESSMENT PLAN

Restoration Coordination and VERification

(RECOVER)

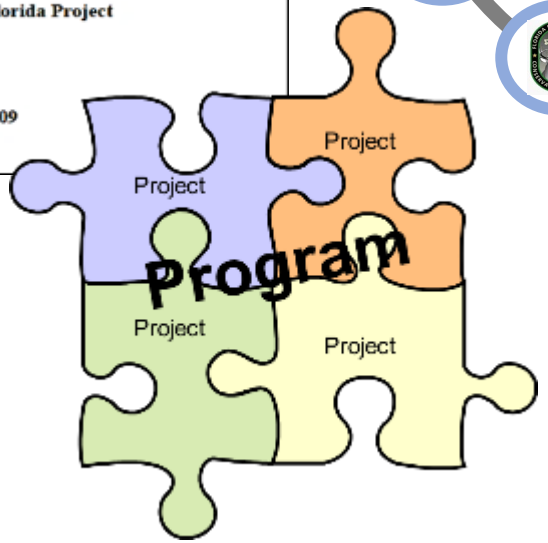
the journey to restore America's Everglades

Comprehensive Everglades Restoration Plan

Central and Southern Florida Project

Revised

December 2009



CERP: RECOVER
APPLIED SCIENCE STRATEGY

U.S. ARMY

Conceptual Ecological Model

Ecological Premise

Hypothesis Cluster

Monitoring

Performance Measure (Evaluation - Predictive)

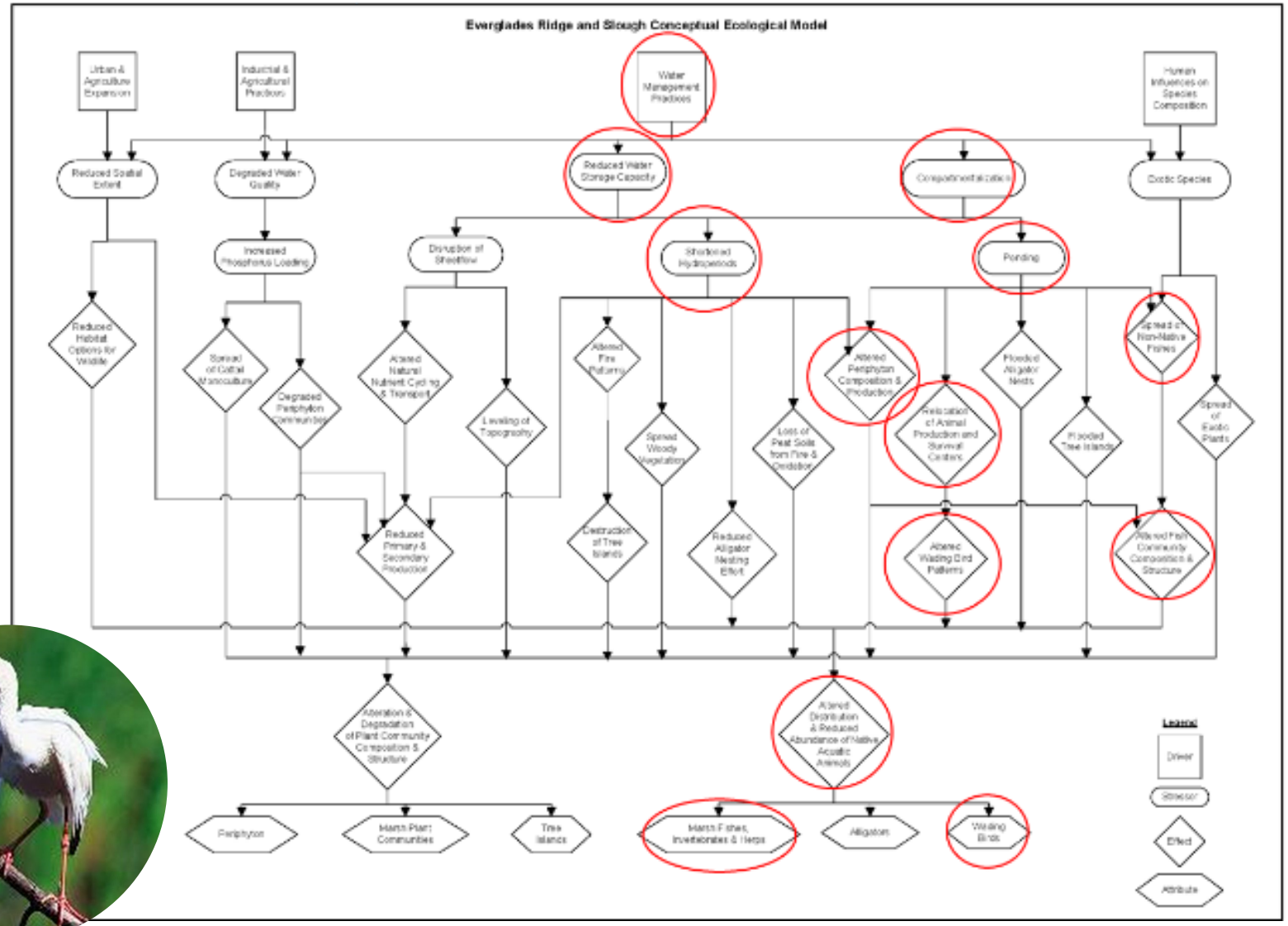
Performance Measure (Assessment - Actual)

Plan Projects

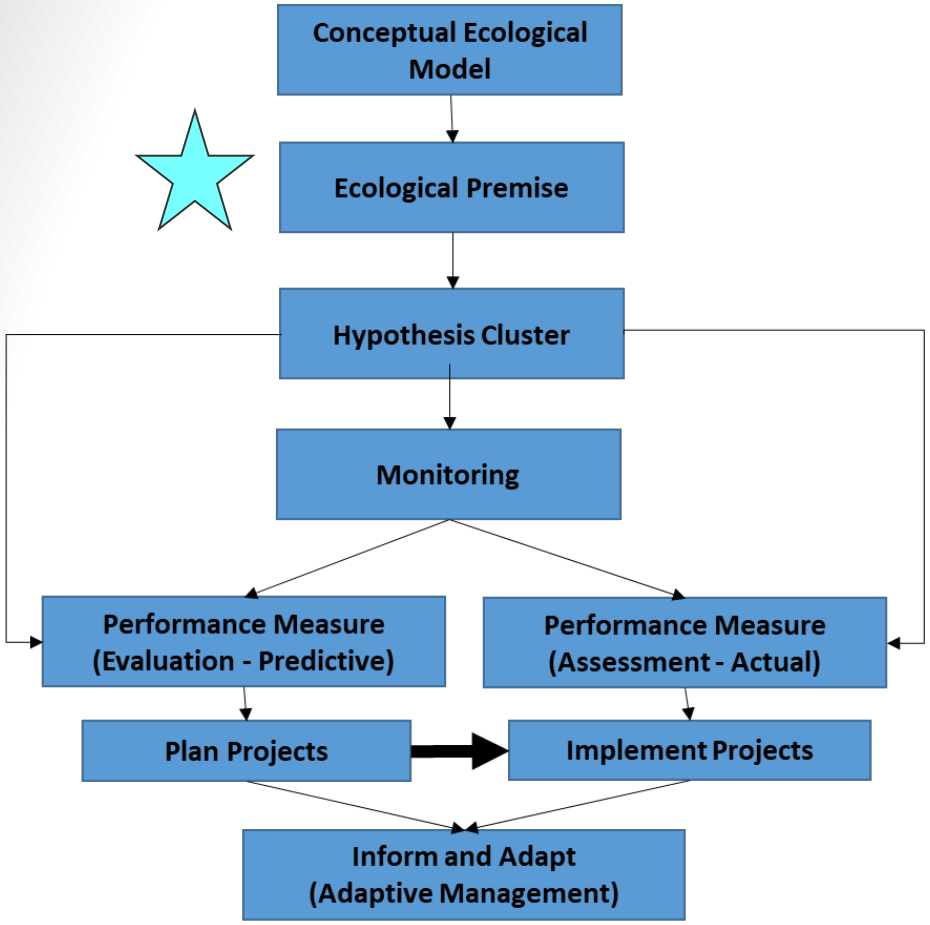
Implement Projects

Inform and Adapt (Adaptive Management)

EVERGLADES RIDGE AND SLOUGH CONCEPTUAL ECOLOGICAL MODEL



CERP: RECOVER
APPLIED SCIENCE STRATEGY



ELSEVIER

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ecolind

Aquatic fauna as indicators for Everglades restoration: Applying dynamic targets in assessments

Joel C. Trexler *, *Charles W. Goss*

Department of Biological Sciences, Florida International University, 11200 SW 8th Street, Miami, FL 33199, United States

ARTICLE INFO

Article history:
Received 8 April 2008
Received in revised form
24 October 2008
Accepted 3 November 2008

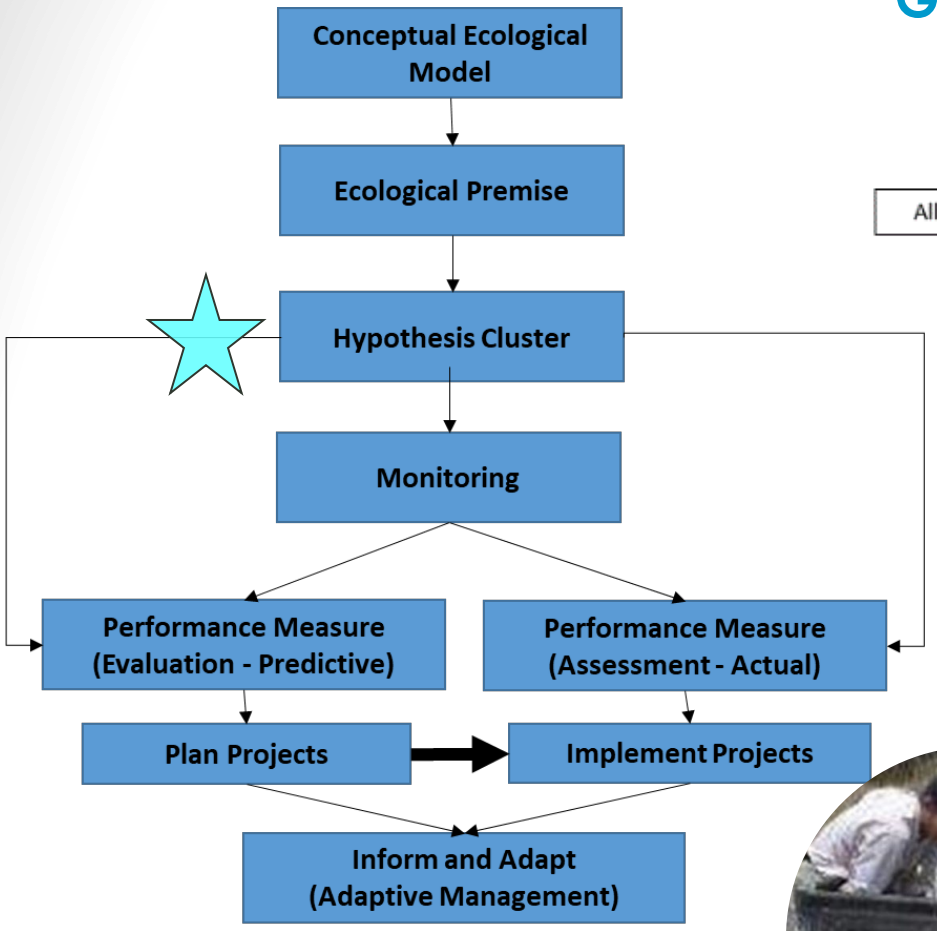
ABSTRACT

A major goal of the Comprehensive Everglades Restoration Plan (CERP) is to recover historical (pre-drainage) wading bird rookeries and reverse marked decreases in wading bird nesting success in Everglades National Park. To assess efforts to restore wading birds, a trophic hypothesis was developed that proposes seasonal concentrations of small-fish and crustaceans (i.e., wading bird prey) were a key factor to historical wading bird success. Drainage of the Everglades has diminished these seasonal concentrations, leading to a

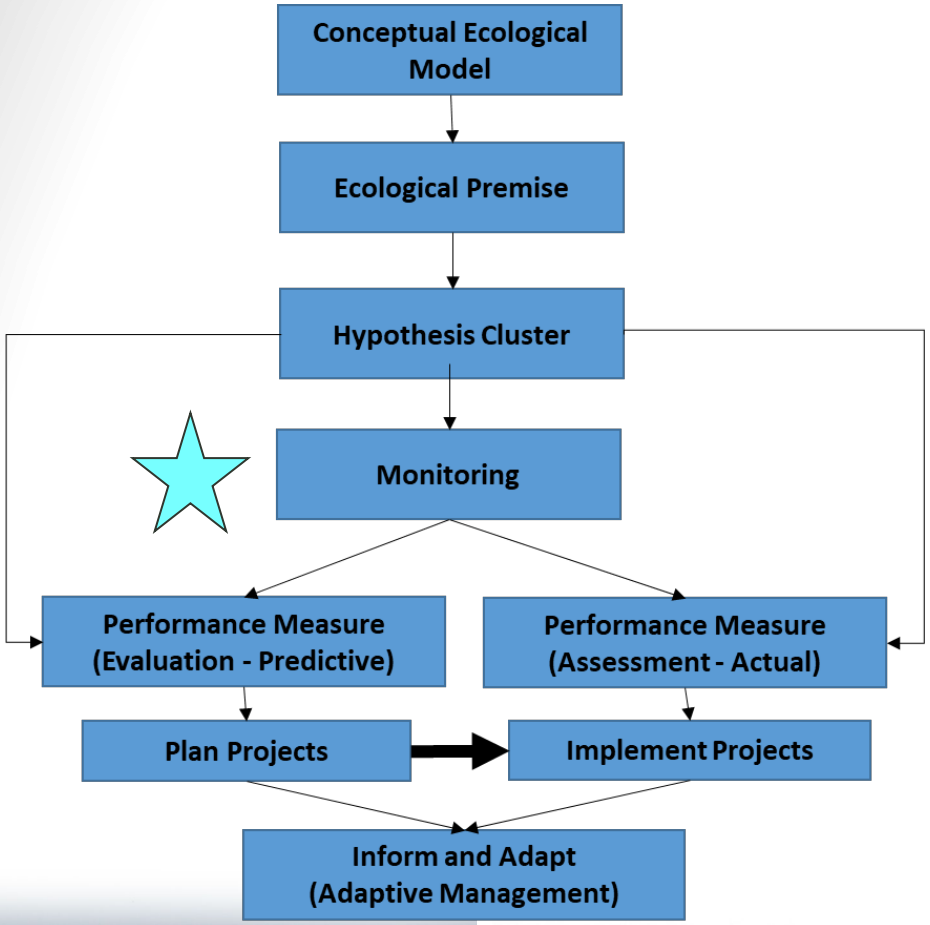
Photo Credit: NPS

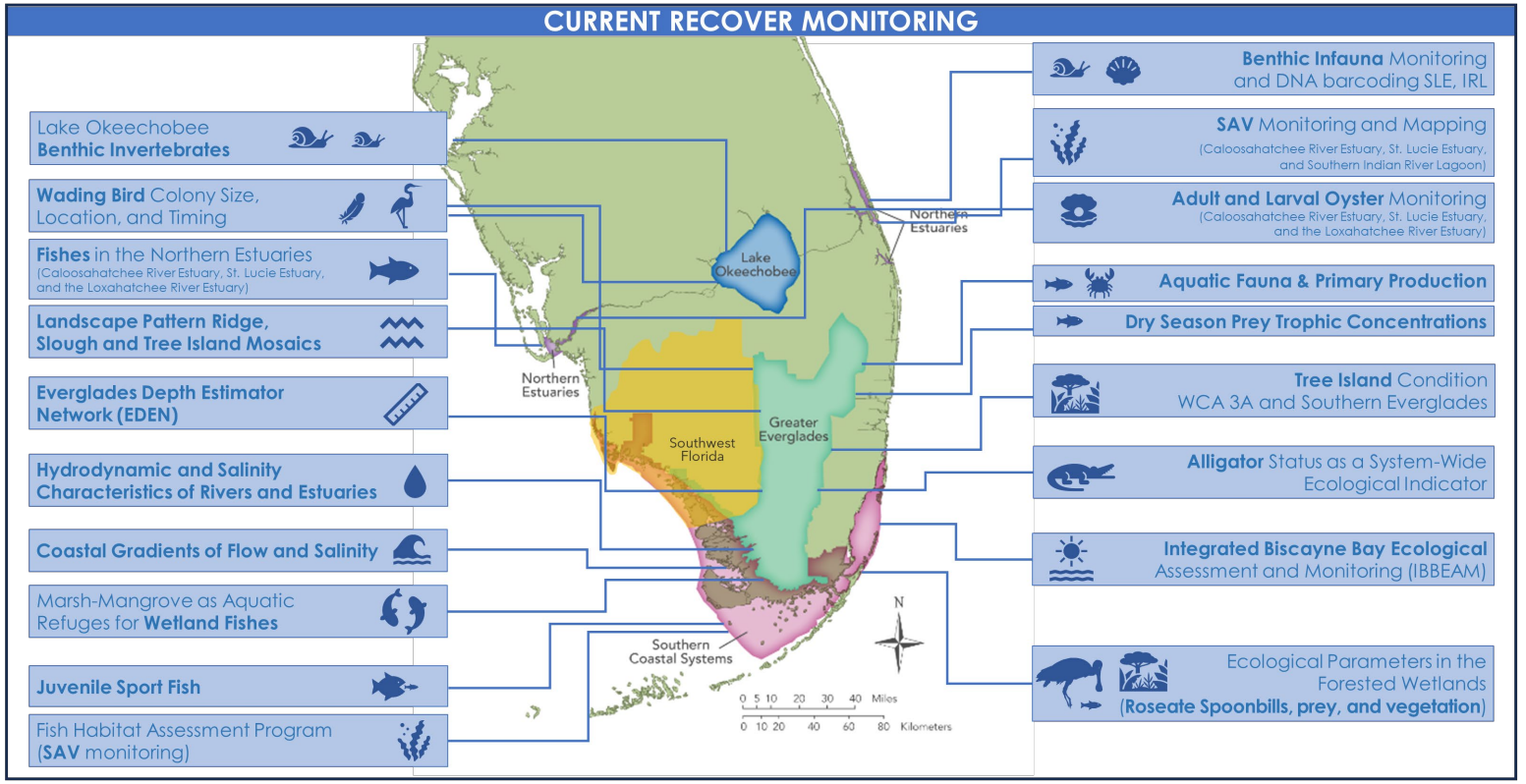
CERP: RECOVER
APPLIED SCIENCE STRATEGY

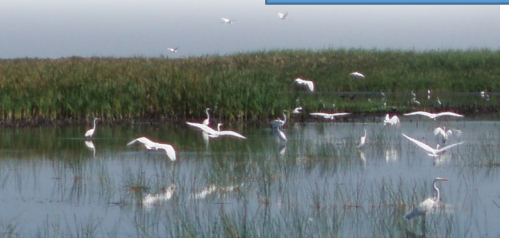
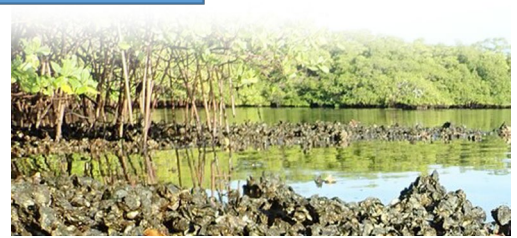
GREATER EVERGLADES TROPHIC HYPOTHESIS CLUSTER DIAGRAM



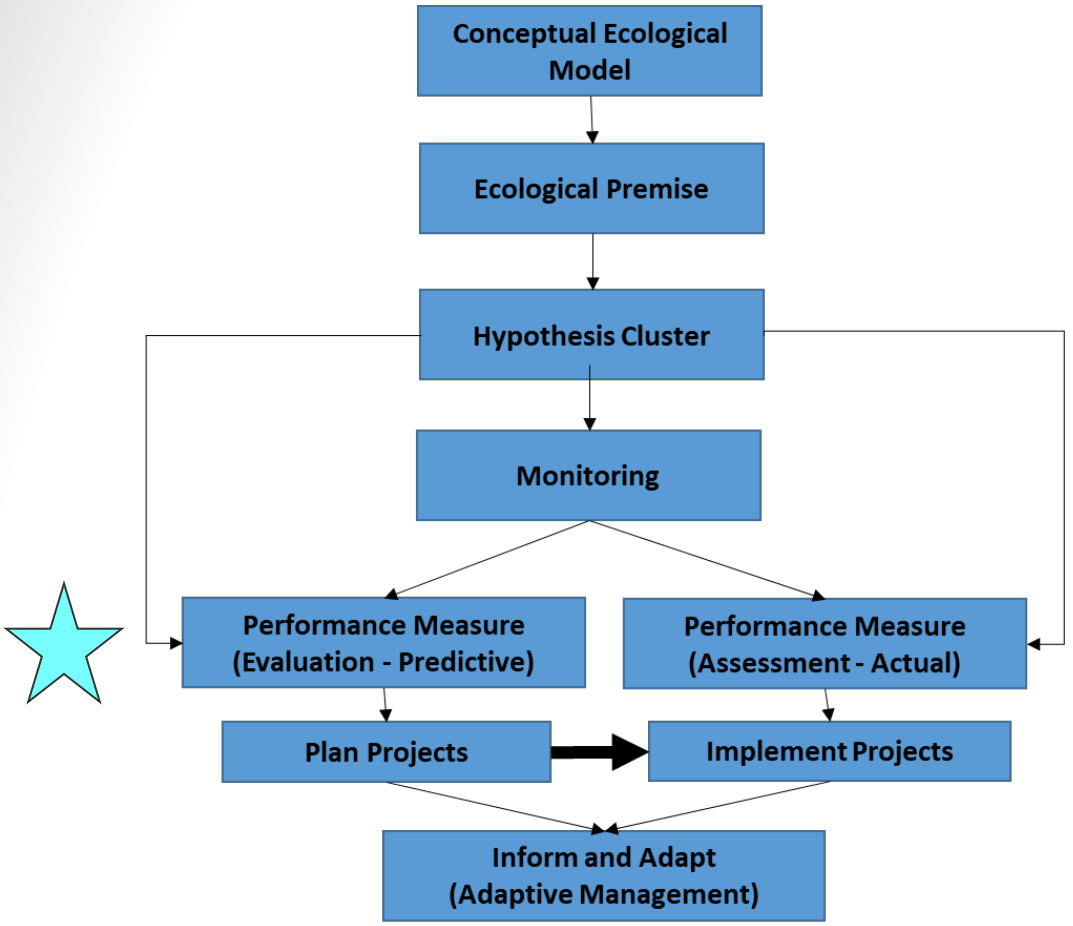
CERP: RECOVER
APPLIED SCIENCE STRATEGY



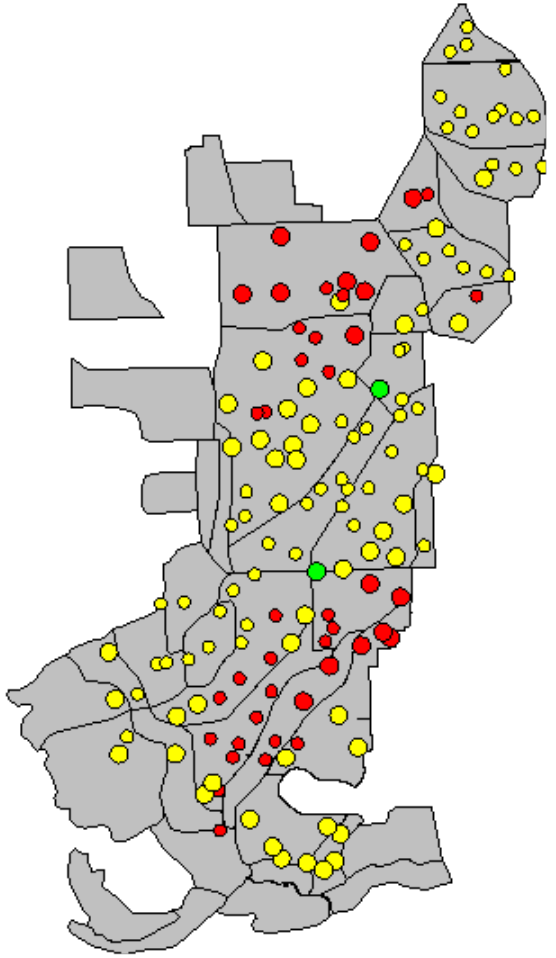


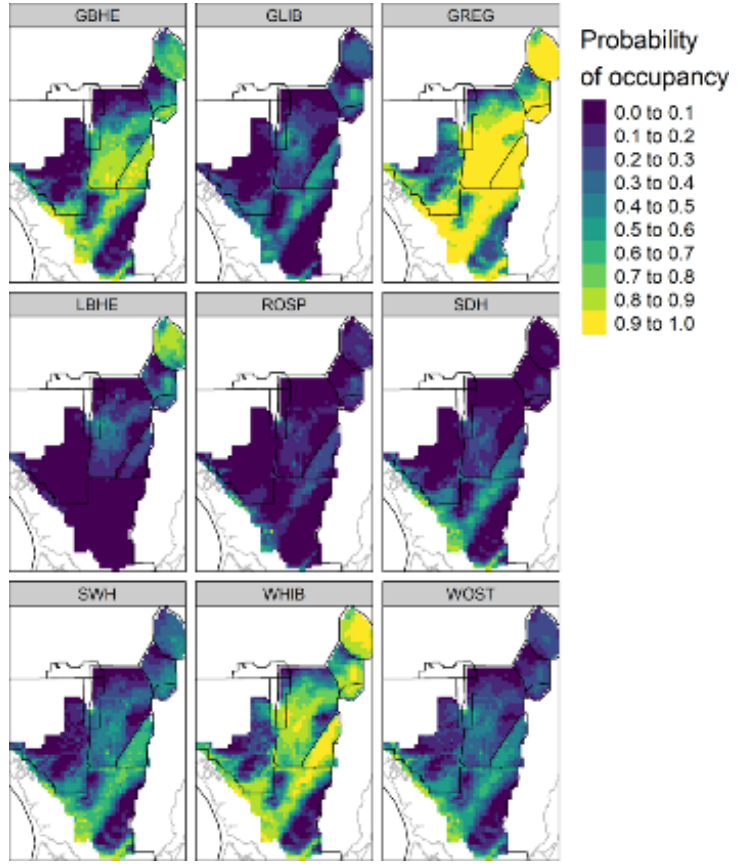

CERP: RECOVER
APPLIED SCIENCE STRATEGY



Greater Everglades Aquatic Trophic Levels
Small-Sized Freshwater Fish Density Performance Measure
RECOVER



Small Fish Density Model

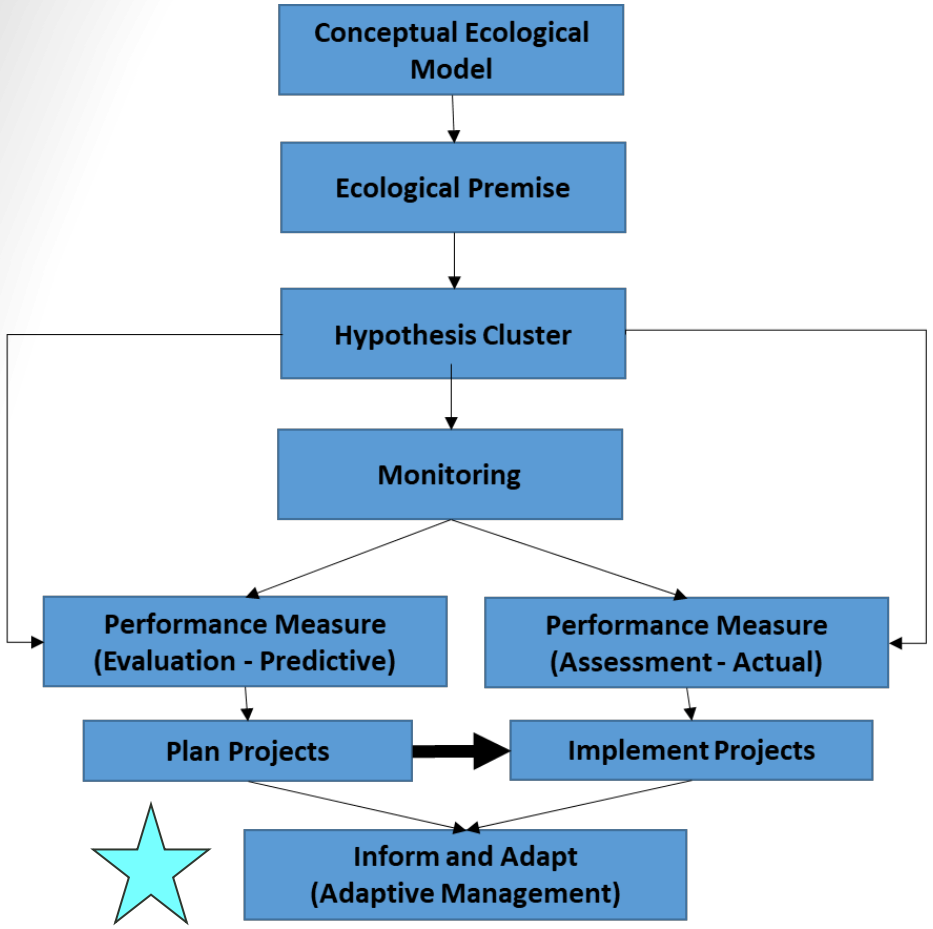


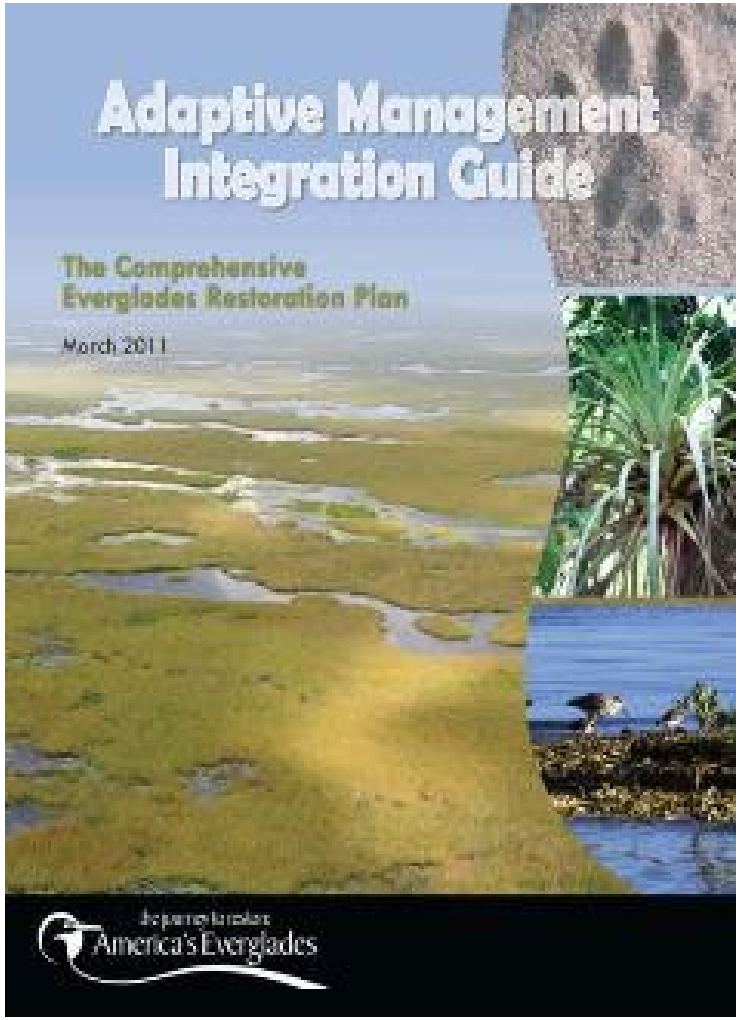
EverWaders (D'acunto et al. 2021)

Joint Ecosystems Modeling (USGS)
https://www.jem.gov/

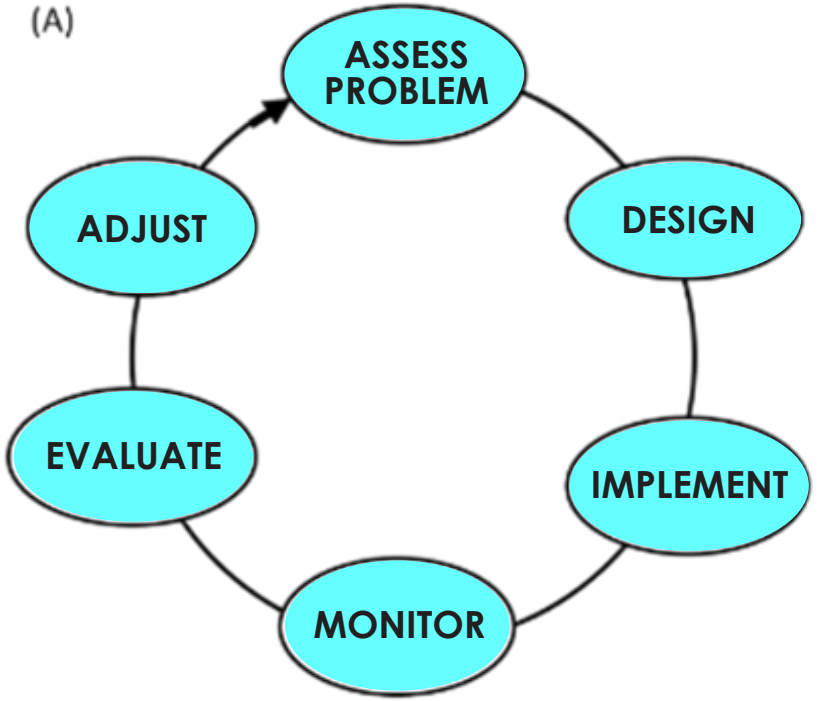
CERP: RECOVER

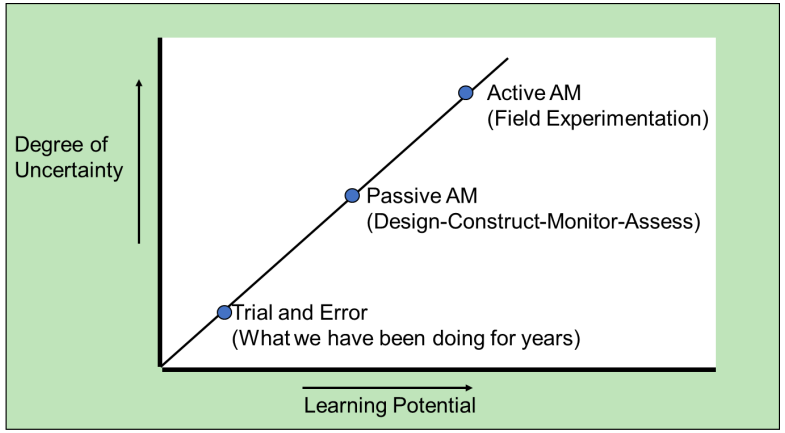
APPLIED SCIENCE STRATEGY





(A)





QUESTIONS?

"…restoring the Everglades is not rocket science or brain surgery. It's much more complicated than that."

- Don Boesch
National Academy of Sciences

WE ARE HIRING!
Join the Jacksonville District Team

Seeking to fill multiple positions:

Biologist, Physical Scientist, Program Analyst, Engineers, Geologist, Chemist, Landscape Architect and many more.

Scan the QR Code
Or visit
www.saj.usace.army.mil/NowHiring

U.S. ARMY

US Army Corps of Engineers