



CERP System-wide Performance Measures

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Working Group— July 23, 20

Purpose of Today's Presentation



- Inform WG of RECOVER's technical report availability for review
- Describe report & answer questions
- Solicit comments to improve report

Process to Complete CERP System-wide Performance Measures Report

- Initial draft for RECOVER to review - May 2003
- June 18, 2004 draft distributed for external review – comments due July 23, 2004
- Incorporate comments to improve report - July/August 2004
- Completed report will be provided to USACE and SFWMD for consideration – September/October 2004

A Definition of Performance Measures

(from the Yellow Book)

Performance measures are the **quantitative indicators** of conditions in natural and human systems that have been selected as **targets** for restoration. Collectively, a well-selected set of performance targets provides a system-wide **characterization of restoration**.

Two Kinds of Performance Measures

- Identify system-wide hydrological, ecological and water quality indicators expected to respond to CERP implementation.
- **Evaluation** – predictors of systemwide performance used for plan formulation
- **Assessment** – measure real responses in the natural and human systems as CERP components are implemented



Development Process

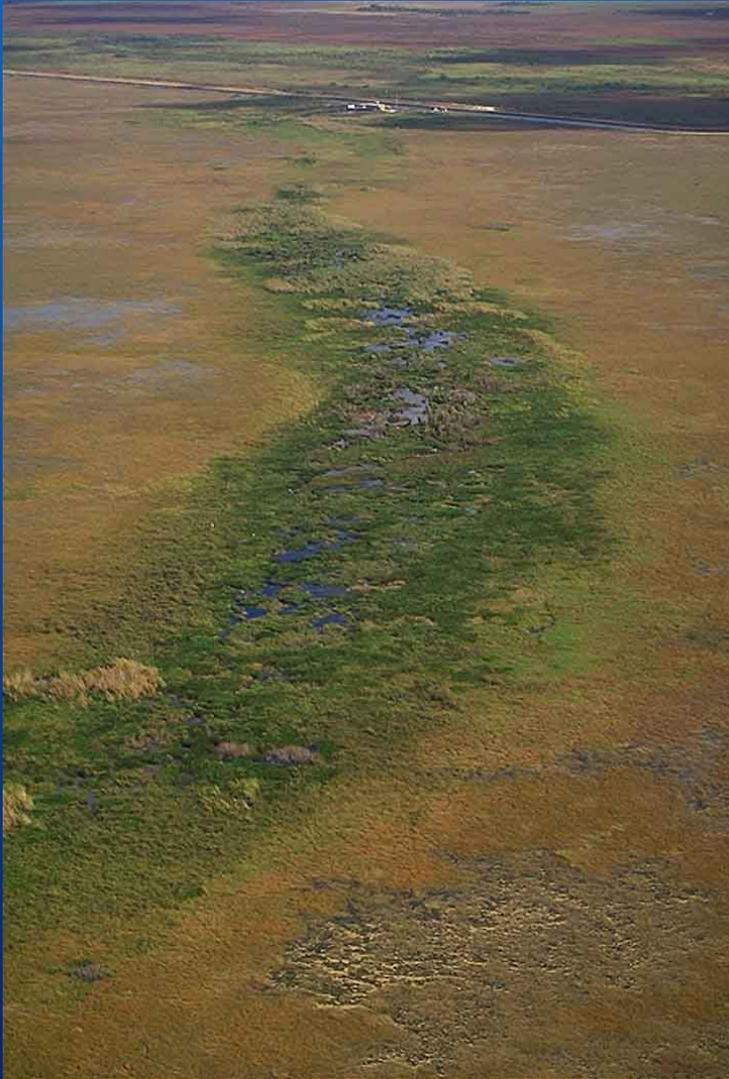
- RECOVER technical teams – RET, WQT and AAT
- Multi-year iterative process
- Sources
 - Simplified Conceptual Ecological Models
 - Federal and state laws and policy (water supply and flood protection)
- Starting Point:
 - Restudy - Evaluation Performance Measures
 - CERP Monitoring and Assessment Plan - Assessment Performance Measures

Evaluation Performance Measures

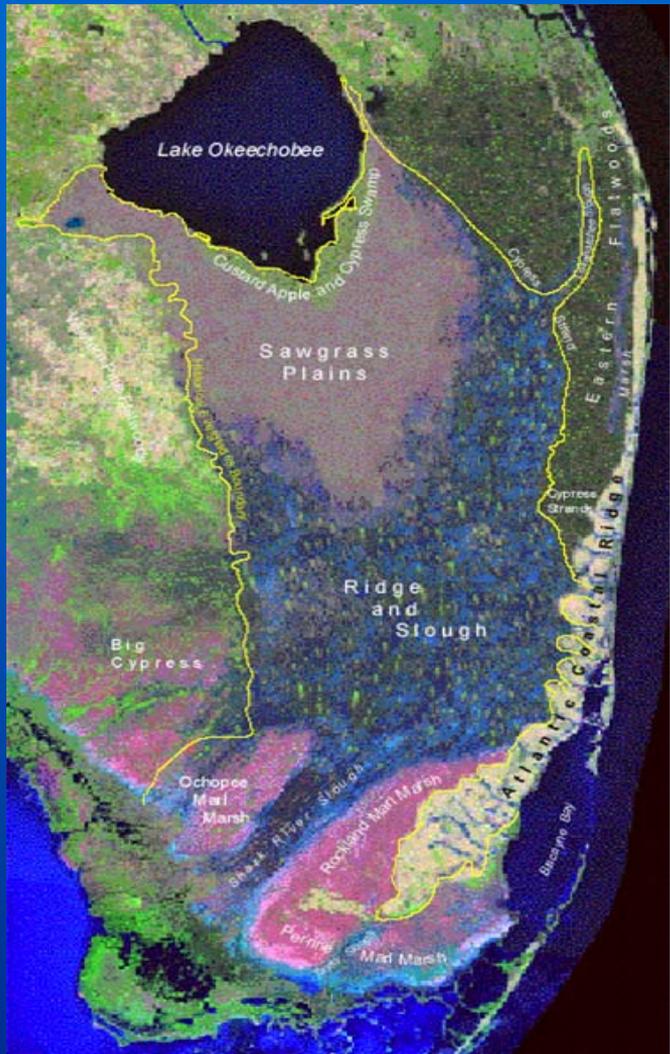
- Lake Okeechobee
 - High & low stage events
 - TP concentration, TP:TN
 - Diatom:Cyanobacteria ratio, algal bloom frequency
- Estuaries
 - Salinity envelopes
- Water Supply
 - Frequency of restrictions to agriculture & urban users
 - Severity & duration of restrictions to agriculture & urban users
 - Prevent saltwater intrusion of Biscayne Aquifer
- Flood Protection
 - Agriculture



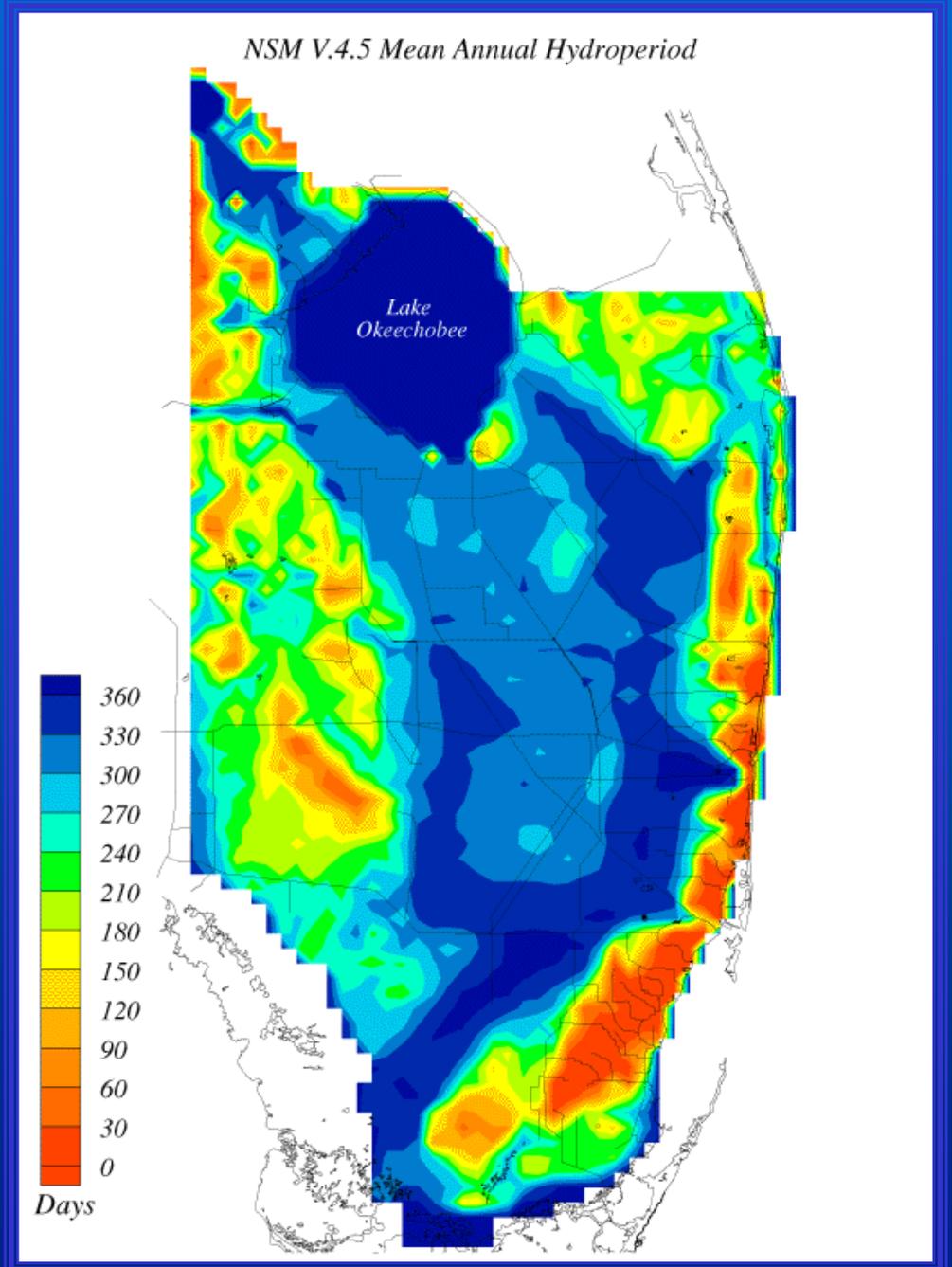
Evaluation Performance Measures



- **Greater Everglades**
 - Inundation patterns
 - Number & duration of dry events in Shark River Slough
 - Extreme high & low stages
 - Interannual variability
 - TP loading and concentration
 - STA bypass flows
 - Apple snails and Snail kite foraging habitat
 - Habitat suitability indices
 - ATLSS Spatially Explicit Suitability Indices
 - Revised indicator regions



Estimated Pre-drainage System Landscape (circa 1850)





Plan Implementation

Total System

- Everglade Snail Kite
Habitat and Nesting
Success
- Mercury Bioaccumulation



Lake Okeechobee

Assessment Performance Measures

- Vegetation mosaic
- Fish & other aquatic fauna
- Apple snails and snail kite population
- Alligators
- Shoreline organic berm
- TP concentrations & loads and TN:TP ratio
- Diatom:cyanobacteria ratio
- Algal blooms
- Water clarity
- Class I water quality standards



Northern Estuaries

Assessment Performance Measures



- Salinity envelopes
- Oysters
- Macroinvertebrates
- Fish communities
- Submerged aquatic vegetation
- Nutrient load and concentrations (TP & TN)
- Algal bloom frequency
- Contaminants
- Water clarity

Greater Everglades Assessment Performance Measures

- Hydropattern
- Coastal salinity gradients
- Crocodiles
- Roseate spoonbill nesting
- Nutrient loads and concentrations (TP & TN)
- Sulfates
- Wetland landscape patterns
 - Vegetation mosaics
 - Ridge and slough community
 - Tidal creek
 - Cape Sable sparrow habitat
- Wetland trophic relationships
 - Wading birds foraging and nesting patterns
 - American alligator
 - Periphyton mats
 - Fishes, crayfish, grass shrimp, & amphibians
 - Mangrove forest production/soil accretion



Southern Estuaries

Assessment Performance Measures



Photo by John LeClair

- Surface water discharges to Biscayne Bay
- Salinity patterns
- Submerged aquatic vegetation
- Juvenile shrimp
- Shoreline fish community
- Juvenile spotted sea trout
- Nutrient load and concentrations
- Algal bloom
- Contaminants
- Water clarity

Water Supply and Flood Protection Assessment Performance Measures

Water Supply

- Frequency of restrictions to agriculture & urban users
- Saltwater intrusion of Biscayne aquifer

Flood Protection

- Agriculture



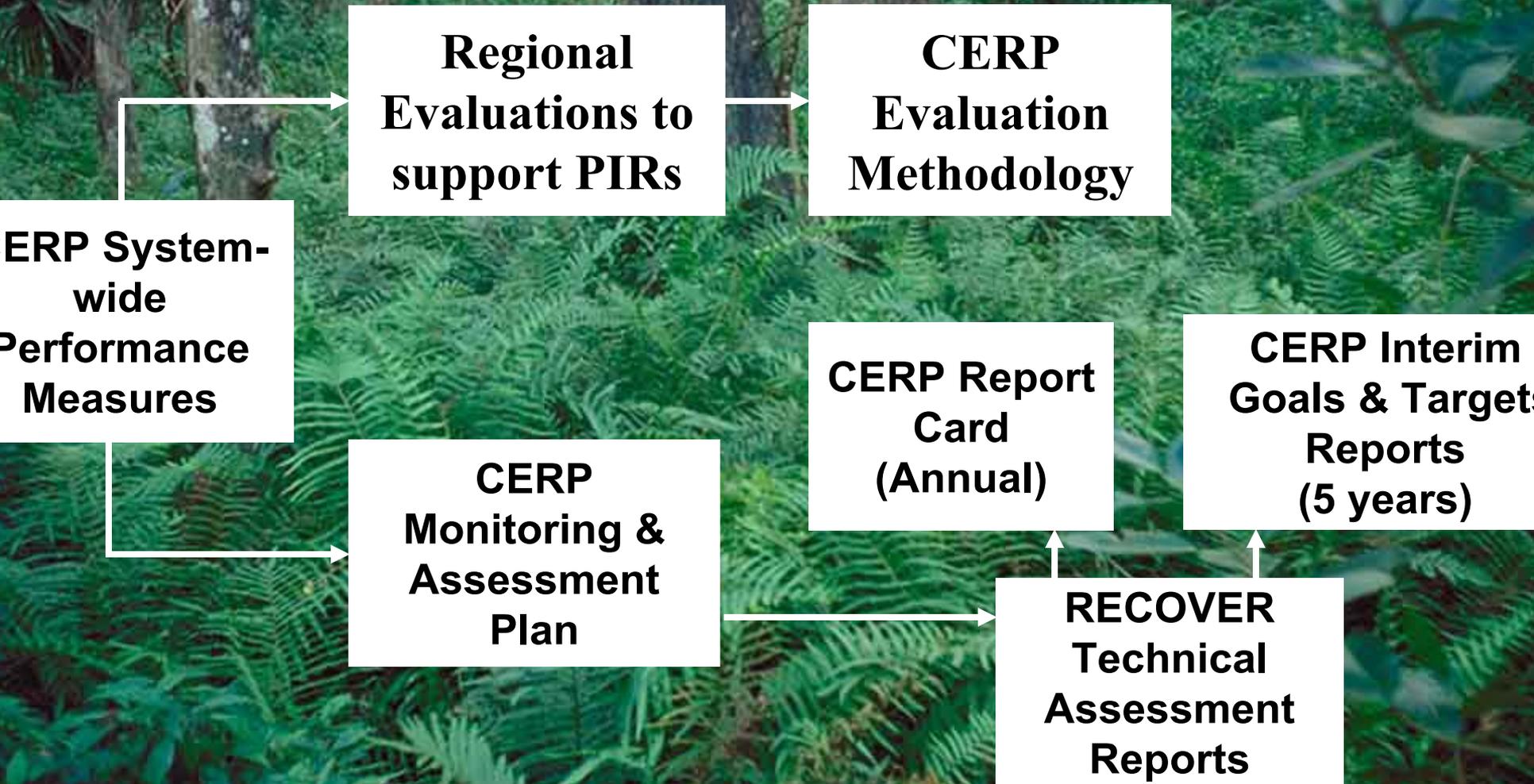
Future Development of Performance Measures

RECOVER technical teams responsible to

- Revise existing or develop new performance measures based on improvements to and development of new simulation tools (evaluation)
- New scientific information that improves the target (evaluation and assessment)
- Revisions to the RECOVER monitoring network (assessment)

Periodically revise CERP Performance Measures report to reflect changes

Application of System-wide Performance Measures



Organization of CERP System-wide Performance Measures report

- Background
- Legal Basis
- Scientific Basis for Performance Measures
- Development of Performance Measures
- Application of Performance Measures
- Evaluation Performance Measures
- Assessment Performance Measures

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Thank you

Questions?

