ROLE OF SYSTEM-WIDE ECOSYSTEM RESTORATION ASSESSMENTS IN THE EVERGLADES ADAPTIVE MANAGEMENT PROGRAM

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Introduction

- What is the Comprehensive Everglades Restoration Plan?
- Adaptive Assessment and Monitoring Program (Adaptive Management Overview)
- Three Large Ecosystem Assessment Methods/Approaches to Share
  - System-wide Assessments
  - Hypothesis Based
  - Multiple lines of evidence
- How to Better Link Science to Decision-Making?
Comprehensive Everglades Restoration Plan (CERP) Goal

Pre-drainage Flow

Current Flow

Restored Flow

www.evergladesplan.org

Legend:
- Natural Areas
- Water Flows
- Pre-drainage Boundary
Comprehensive Everglades Restoration Plan

68 components to be implemented over 35 years including the following features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Action</th>
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<tbody>
<tr>
<td>Surface Water Storage Reservoirs</td>
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<tr>
<td>Aquifer Storage &amp; Recovery</td>
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<td>Stormwater Treatment Areas</td>
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<td>Seepage Management</td>
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<td>Removing Barriers to Sheetflow</td>
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<td>Wastewater Reuse</td>
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<td>Operational Changes</td>
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Everglades Adaptive Management Program

- **Integration of Science** – Program and project plans and implementation
- **Evaluation** – Models, performance measures, interim goals and targets
- **Assessment** – Monitoring and reporting and ecosystem status
- **PEER Review** – National Research Council Supports Everglades AM

[Image: RECOVER logo with arrows indicating cycle of science, assessment, integration, evaluation]

[Image: Progress Toward Restoring the Everglades]
Monitoring and Assessment Program

- Monitoring of current ecosystem status
- Supports model development used in project planning
- Facilitates prediction and verification of actual project performance
- Informs adjustments to improve project implementation (adaptive management)
- Reports out to managers, the public, scientific community
REstoration COordination VERification

- Science behind the Plan (CERP)
- Collaboration across Everglades Stakeholders within Region Teams
System-Wide vs. Project

- System-wide –
  - large scale, multiple areas both “treated” by restoration projects and/or only natural climate variability
  - reference conditions or control sites for comparisons
- Project – area effected by project
System-Wide vs. project Simple Example: Crocodiles
Hypothesis Based Approach

• How ecosystem will respond to restoration actions
• Represent Complex stressor-response relationships between multiple ecosystem restoration indicators
• Monitoring designed to test hypotheses
Trophic Hypothesis Example
Multiple-Lines of Evidence

- Comparison of system-wide to project
- Hypothesis based
- Multiple indicators illustrate similar congruent trends
- Matching predictive values (thresholds/targets) with actual assessed monitoring data
Verifying Predictions with Actual Monitoring Data Example - Caloosahatchee

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Target</th>
<th>Current</th>
<th>Future Without</th>
<th>C-43</th>
<th>CEPP</th>
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- Oyster density 4.4% at Shell Point and 7.1% at Cape Coral
- Seagrass shoot density 5.3% at Shell Point
Challenge – Conflicting Lines of Evidence from Multiple Indicators

From Doren, et al., 2009 Ecological Indicators Journal
Example – C-111 South Dade Project

Hydrology Improved

Water Quality not as Certain
Communicate Science to Peers, Decision-Makers, and Public

Increasing level of detail and ability to drill down into further complexity:

- Fact Sheet/Executive Summary
- Key Findings
- Module summaries
- Principal investigator reports
- PDF of full report or individual sections can be downloaded and printed
Questions?

http://www.evergladesplan.org/pm/recover/recover.aspx