Overview of System-wide Science Efforts

Gretchen Ehlinge, Bob Doren, Matt Harwell, Eliza Hines, Jennifer Stiner

GEER 2010
Themes in System-wide Science

1. Making scientific assessments management relevant
2. Communicating scientific/technical information to managers/decision-makers
System-wide Science Reporting

System Status Reports

Knowledge

SCG New Science

Stoplights

Other Reports
- Technical Report
- Assessment Report
- Options Report
- IGs
- AM Integration Guide
- SFER
- R-EMAP
- SERES
- MARES
- Others
System-wide Science Reporting

Knowledge

System Status Reports

Gained

SCG New Science

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System-wide Science Reporting

Knowledge Gained

Public review through August 26, 2010
www.evergladesplan.org

Public workshop – SE FL
August 4, 2010

www.sfrestore.org/new_science.html
What is RECOVER?

- **RE**storation **CO**rdination and **VER**ification
- A multi-agency, multi-disciplinary team of scientists, modelers, planners & resource specialists
- Role – To organize, analyze and apply scientific and technical information in support of the **system-wide goals** of CERP
- Authorized in CERP Programmatic Regulations
System Status Report

- Formal assessment of data generated from the Monitoring and Assessment Plan (MAP)
- Status, condition, and trends of hydrological, water quality, and biological data
- Biennial assessment to establish pre-CERP reference conditions and determine whether the goals and objectives of CERP are being met
- Address the overall status of the ecosystem relative to system level hypotheses, PMs, and restoration goals
The SSR Provides

- A synthesis of findings across MAP modules and across years to provide a holistic description of the status of the Everglades ecosystem
- An evaluation of the results in relation to system-level hypotheses and Interim Goals
- Identification of major unanticipated findings
- Information to feed the CERP Adaptive Management (AM) Program
SSR Management Relevance

- Scientific information reported in the SSR is fed into the decision-making process, allowing managers and decision-makers to use the best available science during CERP implementation.
SSR Management Relevance

- The SSR functions as the interface between the science and communication of the restoration by providing information for:
  - Adaptive Management
  - Reports to the National Research Council
  - Interim Goals and Targets (IG/IT) Report
  - CERP Report Card
  - Report to Congress
Evolution of the 2009 SSR

- Paper document (600+ pages) – 2006 & 2007 SSRs
- Interactive Webpage
- Key Findings
- Three Separate Parts – 2009 SSR
  1. Web Application – will be posted to [www.evergladesplan.org](http://www.evergladesplan.org)
  2. Key Findings
  3. Hard Copy
2009 SSR Interactive Webpage

RECOVER:
2009 System Status Report
Northern Estuaries (east and west)

Historically, natural freshwater discharges into these water bodies sustained an appropriate range of salinity conditions, which supported healthy plant and animal communities. The development of Florida's coast has increased demands for water and flood control. This has led to frequent high and low salinity extremes within these water bodies negatively affecting the plant and animal communities that live within and depend on these water bodies.

Restoration and management efforts are focusing on controlling 1) water levels for flood management 2) frequency and duration of water releases and consequent rapid salinity shifts, and 3) introduction of point and non-point source pollutants.

Implementation of projects to reach these goals will require a comprehensive approach of both CERP and non-CERP constructed storage and water quality.
2009 SSR

- Reaffirm key CERP hypotheses and associated functional relationships
- Integration of MAP and non-MAP data (SCS module)
- Provide the foundation for evaluating Interim Goals
- Link to, and compare with, Stoplight Indicators (when possible)
- Utilize the status/trends of ecosystem components to provide management-relevant information
- Communicate areas of high priority/concern to decision-makers and managers
2009 SSR

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Task Force Directive – SCG to develop small set of System-wide Indicators for Restoration

SCG developed a process to identify indicators using criteria established in the literature

Provide for Independent Scientific Review (ISR) of System-wide Indicators

Report and ISR: www.sfrestore.org
<table>
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**Summary Finding:** Fish density was lower than expected—based on rainfall—throughout Shark and Taylor Sloughs since 2000, coinciding with the onset of the IOP water management program. Several drydowns have occurred that were not predicted from rainfall patterns and appear to have resulted from operation schedules. Starting with each drying event, fish populations decline and remain lower than expected for two or more years. Fish density in WCA-3A and 3B was less affected by IOP than in Everglades National Park. There was a slight increase in fish density consistent with a movement of fish into the area of WCA-3A which held water while the surrounding marshes did not.

**KEY FINDINGS - FISH**

1. Taylor Slough had the largest decrease in fish density overall.
2. Shark Slough also had statistically significant decreases in fish density at most monitoring sites.
3. The Pre-IOP versus Post-IOP conditions show that fish densities have decreased significantly in much of the southern Everglades because of drydowns that would not have occurred prior to IOP, as predicted by rainfall.
4. Fish density in Water Conservation Area 3A and 3B were less affected by IOP, though they are inconsistent with expectations from NSM conditions because of ponding in 3A and drainage of 3B. Fish are more sensitive to drying frequency than water depth, which explains why the high-water conditions of 3A during IOP had little impact.
5. Overall fish densities (and crustaceans) were lower than expected for the month of the 6 year post-IOP period as compared to the Pre-IOP period.

**KEY RECOMMENDATIONS:**

1. Water management operations in regions that showed significant decreases in fish densities from the expected should be evaluated by managers and hydrologists to determine hydrological operations that would improve fish densities toward target (predicted) levels.
2. Additional water is needed for Taylor Slough; the aquatic fauna there is dramatically changed since implementation of IOP.
3. Implementation of DECOMP should lead to greater densities of small fish in WCA-3A and 3B, and will probably also shift large-fish populations from WCA-3A to 3B.

**Stoplight Indicator Report**

**Stoplights - Fish**

<table>
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<tr>
<th>PERFORMANCE MEASURE</th>
<th>LAST STATUS²</th>
<th>CURRENT STATUS</th>
<th>PROGNOSIS¹</th>
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<tr>
<td>TOTAL FISH DENSITY TAYLOR SLOUGH</td>
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Legend: Standardized difference between Observed Density and Predicted Density. Plus sign = too many fish; minus sign = too few fish. Green is the target range.

- RED (+) (greater than -0.4)
- YELLOW (0.2 to 0.4)
- GREEN (-0.2 to -0.4)
- RED -- (less than -0.4)
Application of Indicators

- Stoplights used in the SSR, the SFER and the Task Force Biennial report
- Reports being integrated
- Working toward using many of the same reporting formats
Integrating RECOVER & SCG Efforts

- Using the same data and information provided to RECOVER (SSR)
- Using other existing reports (Annual Wading Bird Report)
- Stoplight Indicator Report addresses the status or the “what” questions
  - SSR addresses “status, trends and differences” or the “what” and “why” questions
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* Stoplight indicator used in 2009 SSR
Future System-wide Reporting

- 2012 System Status Report
  - Web Interface
  - Integrate non-MAP and project-level monitoring & assessment
  - Integration with Stoplight Report

- Indicator Report – 2010 report under development
  - Updating the indicators

- Integration of reports
Questions?

www.evergladesplan.org