

Everglades Restoration

Incremental Analysis and Justification of a Comprehensive Plan

- Analytical and Policy Issues
- Lessons Learned
- Recommendations

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Why this is important. . .

- Ecosystem restoration and protection
 - *Societal values*
 - *Abundant fish and wildlife; habitat*
 - *Clean water*
 - *Water supply and flood protection*
- \$, \$\$\$, \$\$\$, \$\$\$.00
- Authorization
- PIRs approved
 - *Incremental justification*

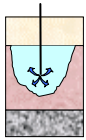
What we need. . .

- New paradigm for decision-making for watershed-scale restoration plans
 - *Investment of taxpayers' funds*
- Prioritization and funding of individual projects based on sequencing logic
 - *Availability of land*
 - *RE acquisition*
 - *Dependencies*
 - *Benefits to endangered species*
 - *Adaptive management*
 - *Scientific consensus*

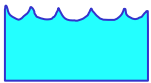
Comprehensive Everglades Restoration Plan

- 1999 Feasibility Report/Programmatic EIS
 - Conceptual level of detail
 - No cost effectiveness analysis of individual components (projects)
- 68 Components, combined into 56 projects
- Comprehensive plan approved by Congress as a “framework” via WRDA 2000
- WRDA 2000
 - Individual “Project Implementation Reports” required for project approval and authorization
 - Projects justified by environmental benefits to South Florida ecosystem
 - No further economic justification required, if project is cost-effective
 - *Programmatic Regulations to be developed*

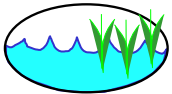
CERP Components



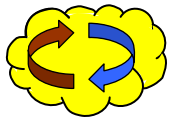
Aquifer Storage & Recovery



Surface Water Storage Reservoir



Stormwater Treatment Areas (STAs)



Reuse Wastewater



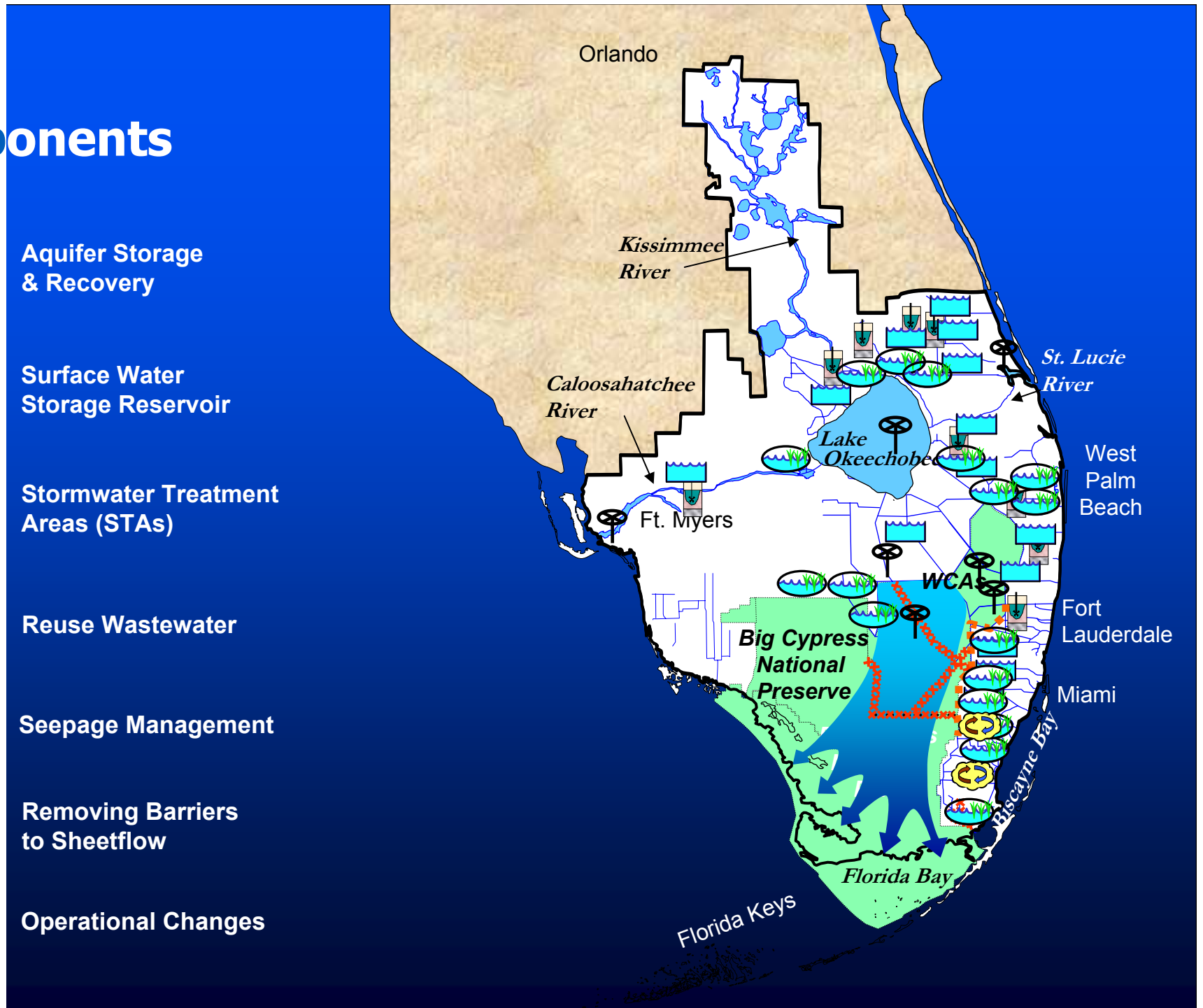
Seepage Management



Removing Barriers to Sheetflow



Operational Changes



Programmatic Regulations

- Final rule, November 2003
 - 6 detailed “Guidance Memoranda” to be developed
- Selected alternative plan must be “justified on a next-added increment basis”
- Next-added Increment defined:
 - *“Next project to be added to a system of projects that includes only those approved and likely to be implemented”*
 - New baseline condition

Additional Requirements (Guidance Memoranda)

- Pro Regs required six additional Guidance Memoranda
 1. Project Implementation Reports
 2. Formulation and Evaluation
 3. Savings Clause Requirements
 4. Identification of Water
 5. Operating Manuals
 6. Adaptive Management
- Initial Draft, February 2005; Final Draft July 2007
 - Concurrence required (not yet!)

GM 2: Plan Selection

“System Formulation”

**Future
Without
Condition**



**Future
With
Condition**

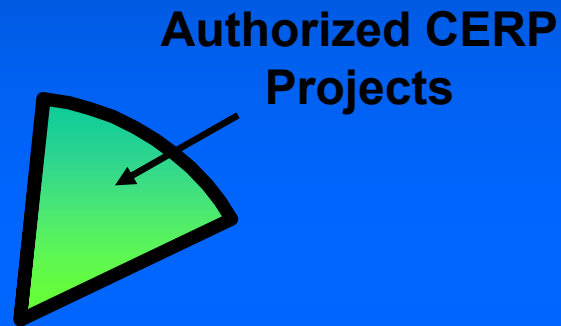


- Alternative plans evaluated together with rest of CERP compared to FWO
- Acreage-based “Ecosystem restoration benefits” is metric
- Cost-effectiveness Analysis and Incremental Cost Analysis
 - Benefits compared to costs

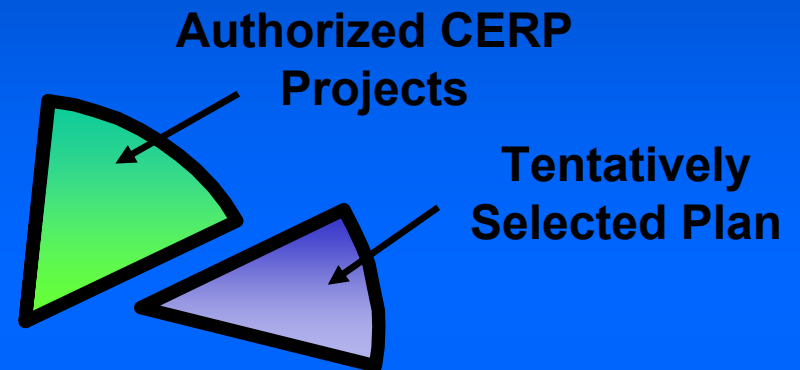
GM 2: Justification

“Next-Added Increment Analysis”

**Future Without Condition
(2050)**



Future With Condition



What benefits would we get if nothing else in CERP was ever built?

- Project justification
- Ecosystem restoration benefits of Tentatively Selected Plan only
- Compared to a future baseline (includes only authorized CERP and non-CERP projects; not a likely future baseline)

Next-Added Incremental Justification Challenges

- CERP is a system of related projects (components)
 - Not incrementally formulated
- NAI is an evaluation of individual project's effects over 16,000 sq. miles
- Comparison to a future baseline condition
 - Defined in Pro Regs and GMs
 - Better than current conditions
 - Unlikely (Exp Project, U.S. Sugar)
- Dependent on acceptable benefits quantification methodology
- Dependent on high-resolution modeling tools
- Results compared to costs to determine relative cost - effectiveness
 - Comparison between projects



Analytical Problems

- **Regional hydrologic modeling (“system” approach)**
 - Coarse grid size (averaging conditions within 4 sq. mile grid cells)
 - Modeling assumptions and operational rules
- **Performance measures**
 - Hydrologic outputs; not sophisticated enough to fully characterize ecological response
 - No acceptable performance measures for key indicators
- **Ecological significance of hydrologic change**
 - How meaningful is an average stage change of 0.05 ft.?
- **Understanding spatial extent of ecological effects in a large system**
 - Overlapping benefit areas
 - Attributes vary independently
- **Ecological response time**
 - Long time-scales for key ecosystem attributes
 - Average annual outputs; 50-year period of analysis

Justification Problems

- **Components of comprehensive plan not incrementally evaluated**
 - Restudy, 1997-1999: Base set of management measures optimized (Governor's Commission Plan)
- **Economic concept, not an ecosystem response concept**
- **Environmental benefits evaluation methodology**
 - Inconsistent; no basis for comparison between projects
 - No programmatic tracking of environmental benefits
- **No established threshold of acceptability**
 - How much = justified?
 - Analytical and policy “do-loop”
- **Comparing NAI benefits to system formulation benefits**
 - Problematic; different baselines
 - Model results complicated by synergies

If not justified, what next?

- **Consider combining the project with other CERP components or projects to identify a plan that can be justified; or**
- **Consider delaying implementation until other projects come on line that can improve the justification analysis**

Lessons Learned

- **Incremental analysis of individual components of a comprehensive plan does not work well**
 - **Implementation of other watershed-scale restoration plans affected**
- **Real estate acquisition drives implementation sequencing**

Recommendations

- **Revise CERP Programmatic Regulations**
 - 5-year review underway
- **New implementation paradigm needed now!**
 - Acquired/to be acquired land
 - Dependency logic
 - Incremental adaptive restoration principles
 - Benefits to endangered species!
 - Societal values
 - Adaptive management
- **Integrated Delivery Schedule**
 - Bigger than CERP
 - U. S. Sugar land acquisition
 - Update “Master Implementation Sequencing Plan”

Thank You!

