

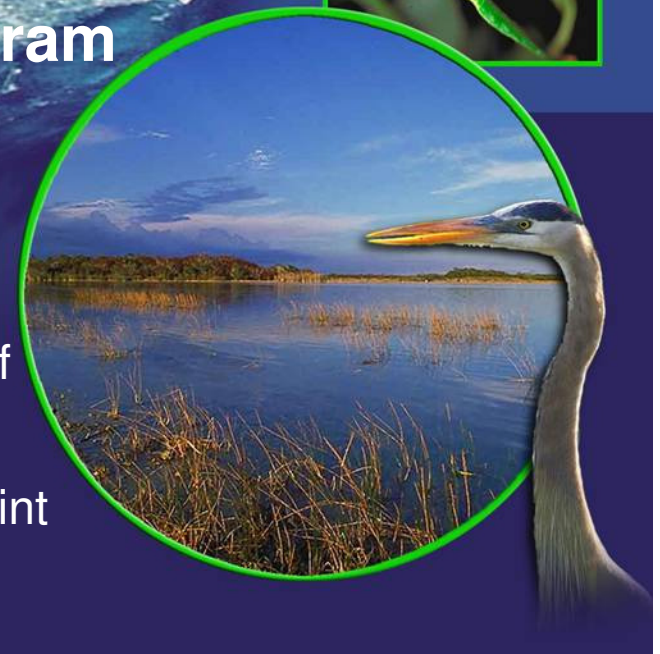


# Comprehensive Everglades Restoration Plan

## Adaptive Management Program

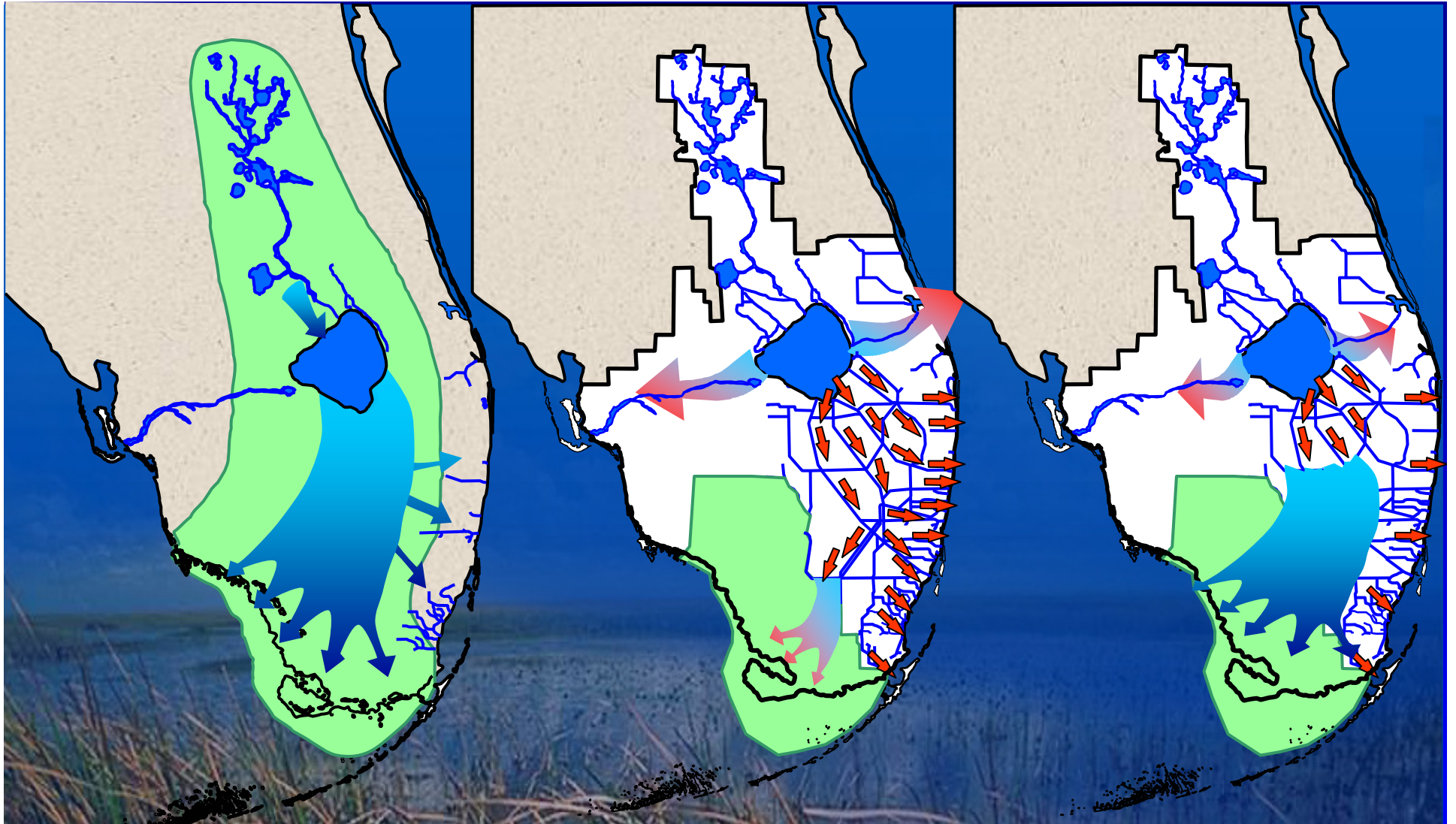
Elmar Kurzbach, U.S. Army Corps of  
Engineers

Tom St. Clair, Everglades Partners Joint  
Venture



# CERP Adaptive Management Program

- CERP Background
- Adaptive Management (AM) Background
- AM Definition
- AM Strategy (Framework)
- Monitoring and Assessment Program
- AM Guidance Manual
- Incremental Adaptive Restoration (IAR)
- AM Program Next Steps



Historic  
Flow

Current  
Flow

Future  
Flow

**Background: CERP Goal**

# CERP AM Background

- 1992-1999 Foundation for CERP AM
- 2003 CERP Programmatic Regulations (33 CFR 385.31) require development of AM program
- 2004 CERP Monitoring and Assessment Plan
- 2006 CERP AM Strategy published
- 2007 Draft CERP AM Guidance Manual available

# CERP AM Definition

**“Adaptive management is a science- and performance-based approach to ecosystem management in situations where predicted outcomes have a high level of uncertainty. Under such conditions, management anticipates actions to be taken as testable explanations, or propositions so the best course of action can be discerned through rigorous monitoring, integrative assessment, and synthesis. Adaptive management advances desired goals by reducing uncertainty, incorporating robustness into project design, and incorporating new information about ecosystem interactions and processes as our understanding of these relationships is augmented and refined. Overall system performance is enhanced as AM reconciles project-level actions within the context of ecosystem-level responses.”**

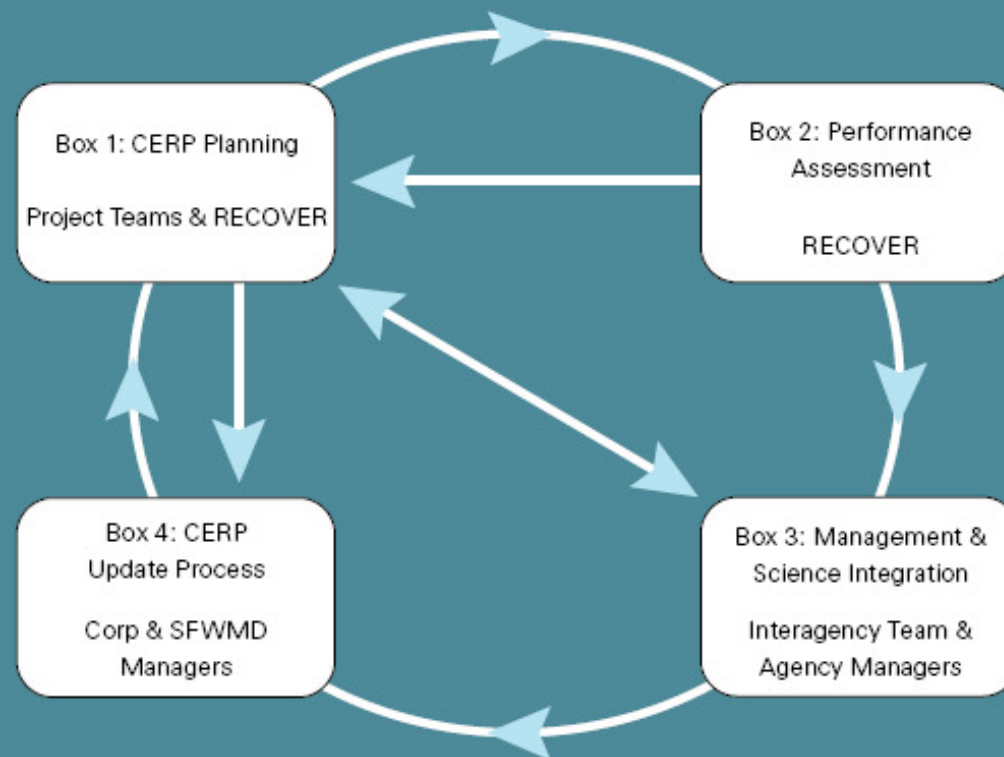
**- CERP AM Strategy, 2006**

## CERP AM Benefits

- AM reduces risk and increases the probability of CERP restoration success
- AM increases our ability to make educated decisions and move forward
- AM supports collaboration among agencies and stakeholders to avoid “surprises” and “stalemates”

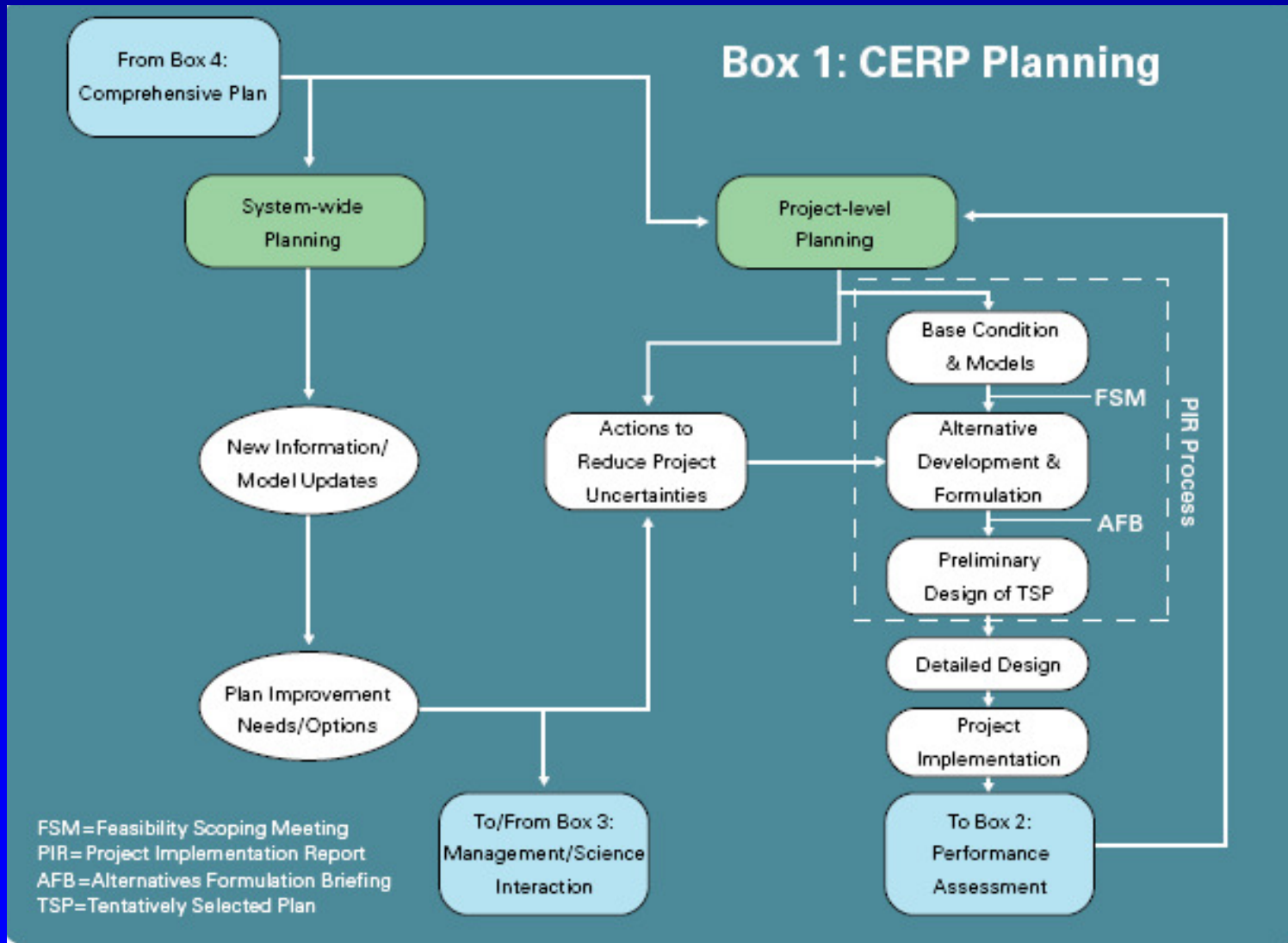
# CERP AM Strategy (Framework)

## The CERP Adaptive Management Framework: Overview

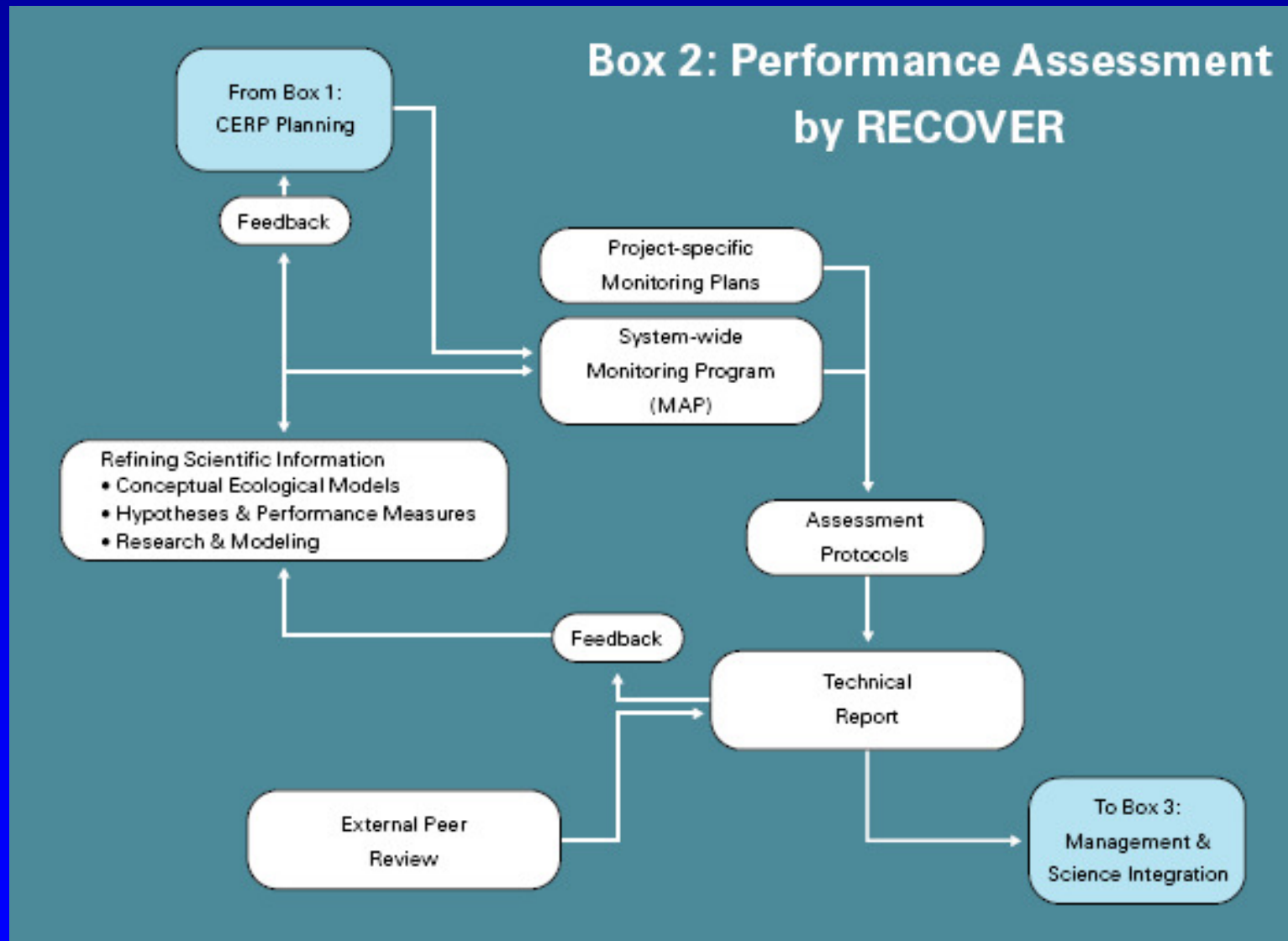


If completed projects are meeting expectations continue with project planning and implementation (plan unchanged). If completed projects are not meeting expectations, follow four phases of Adaptive Management to address performance shortcomings.

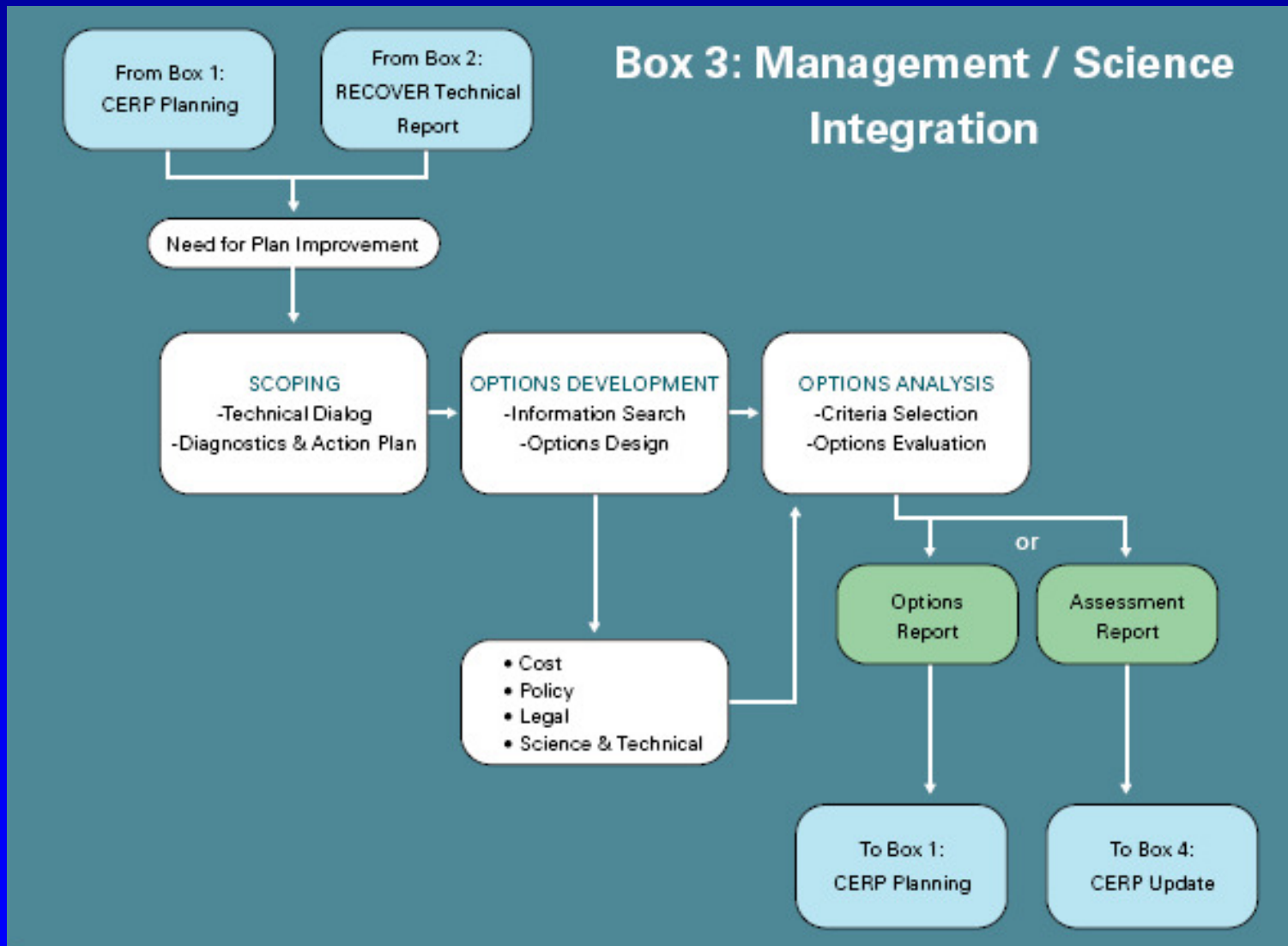
# CERP AM Framework Box 1



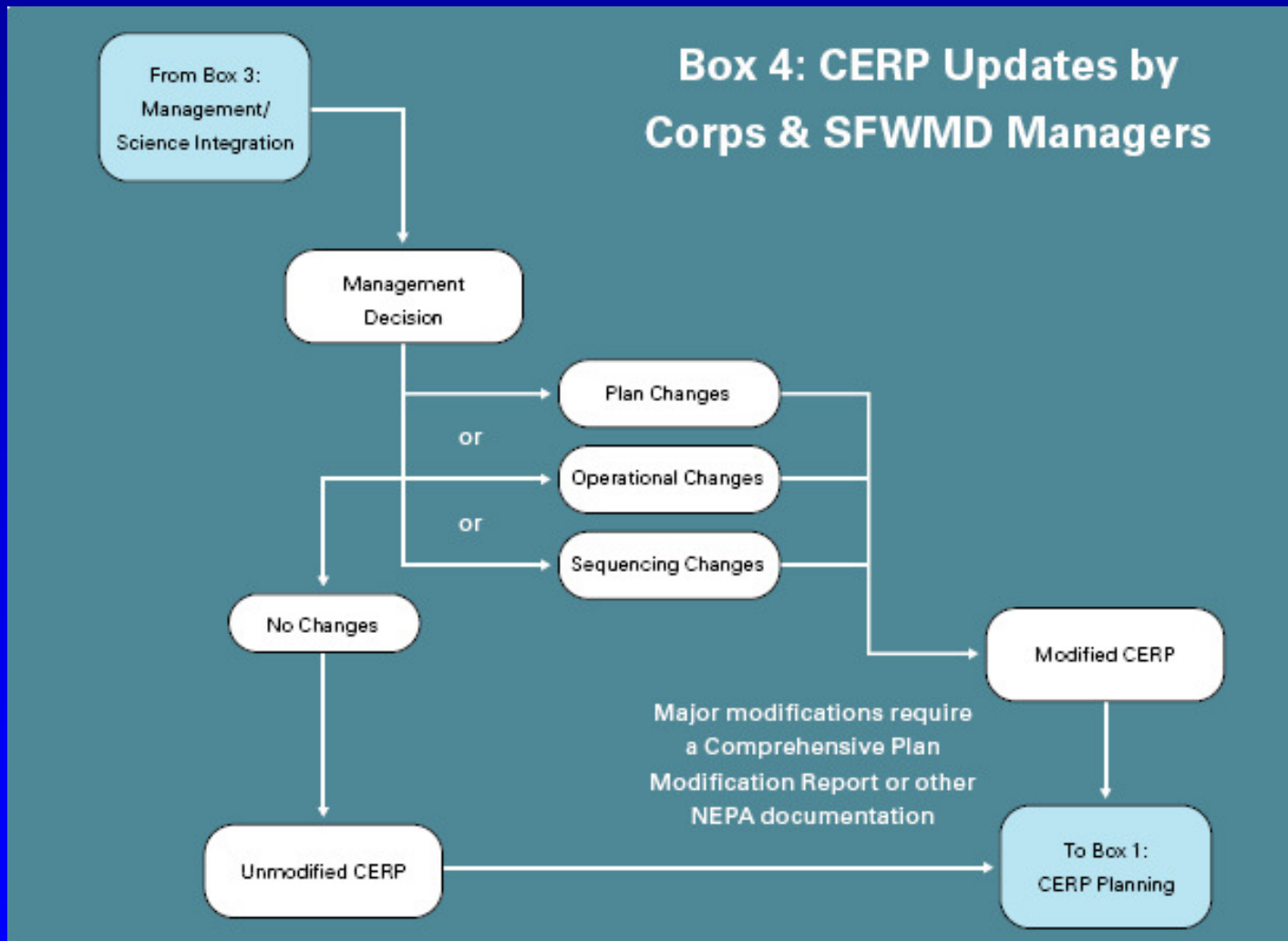
# CERP AM Framework Box 2



# CERP AM Framework Box 3



# CERP AM Framework Box 4



## CERP Monitoring and Assessment (Box 2)

- Focus on system-wide/regional trends rather than project performance
- Assess actual performance of CERP
- Evaluate CERP hypotheses and Performance Measures; revise Conceptual Ecological Models (CEMs) as appropriate
- Iterative process to make adjustments to CERP if required
- Assess and document progress-PM targets, interim and long-term goals
- Detect undesirable system responses-allows for early corrective actions and minimization of adverse effects
- Produce biennial system status report

# CERP Monitoring and Assessment Role

- Feedback loop integrating science and management
- Confirm/develop scientific information
  - Sound science to reduce risk and uncertainty
- Routine communication and information exchange
  - Informed decision-making
- System-wide monitoring is a key component of AM
- Using collaboration to reach consensus

# CERP AM Guidance Manual

- Current Version Focuses on Project-Level guidance
  - Introduction to AM
  - When AM should be applied
  - Stakeholder engagement guidance
  - Project-level AM guidance
  - CERP system-wide AM placeholder
  - Legal issues to address
  - Criteria to determine success in AM application
- CERP AM Guidance Manual Draft is Available at:
  - [ftp://ftp.saj.usace.army.mil/pub/Public\\_Dissemination/CERP\\_AM\\_Guidance\\_Manual/](ftp://ftp.saj.usace.army.mil/pub/Public_Dissemination/CERP_AM_Guidance_Manual/)

# 12-Step Process to Apply AM at the Project-Level

Plan Formulation

Design/Construction

Operations

## Step 1: *Stakeholder Engagement and Collaboration*

- Identify and involve stakeholders
- Establish interagency collaboration

## Step 2: *Verification of Project Goals and Objectives*

- Confirm and refine project goals and objectives
- Review vision statement for the project

## Step 3: *Identification of Unanswered Questions*

- Identify key unanswered questions
- Determine whether to use AM
- Obtain management buy-in

## Step 4: *Use of Conceptual Modeling, Hypotheses, and Performance Measures*

- Develop hypotheses to explain uncertainties
- Verify hypotheses are testable
- Develop performance measures
- Establish restoration targets
- Identify predictive tools

## Step 5: *Integration of AM in Project Planning*

- Use AM principles to guide plan formulation
- Recognize key uncertainties to develop AM Plan

## Step 6: *Monitoring at the Project-Level*

- Design a project-level monitoring plan
- Identify baseline conditions
- Monitor existing conditions and project performance
- Develop a decision framework to recognize triggers and link to management actions

## Step 7: *Incorporating Robustness*

- Incorporate robustness into project planning process
- Conduct multiple scenario analysis
- Incorporate robustness into project design

## Step 8: *Conduct Field Testing*

- Conduct field experiments
- Implement incremental approach

## Step 9: *Assessment at the Project-Level*

- Assess monitoring data
- Prepare project performance report

## Step 10: *Decision-Making*

- Apply decision framework
- Develop and Implement CERP management decision

## Step 11: *Operational Refinement*

- Continue monitoring and assessment
- Adjust project operations

## Step 12: *Iteration*

- Repeat AM Steps 3-10 if necessary
- Provide new knowledge



# **Incremental Adaptive Restoration (IAR)**

- **The National Research Council (NRC) Proposed IAR as a Framework to:**
  - **Accelerate natural system restoration**
  - **Address project sequencing constraints**
- **Increase Learning to Address Key Uncertainties**
- **Generate Restoration Benefits Sooner**
- **Accelerate Approval of CERP Projects at the Federal Level**
  - **(System formulation with measurable benefits)**
- **Increase Stakeholder Buy-in**

## IAR Status for CERP

- Develop IAR Process and Strategy
- Develop Proposal for Southern Everglades Projects
- Members of Quality Review Board Review and Determine Next Steps, January 29-30, 2008

# CERP AM Program Next Steps

- Brief CERP Agency Leadership to Gain Support for AM
- CERP AM Guidance Manual Version 2.0
- CERP AM Training
- Further Develop and Refine CERP AM Tools

# Questions?

## Thanks!

For more information, please go to:

<https://www.evergladesplan.org>

[http://www.evergladesplan.org/pm/program\\_docs/adaptive\\_mgmt.aspx](http://www.evergladesplan.org/pm/program_docs/adaptive_mgmt.aspx)