

Program Name: C&SF: CERP Adaptive Assessment and Monitoring Program (AA&M)
Project ID: 2308
Lead Agency: USACE / SFWMD
Authority: Design Agreement; WRDA 1996, WRDA 2000 (*Initially Authorized Project*)

Strategic Plan Goal(s) Addressed: supports 2-A.3

Measurable Output(s): System-wide/Regional Monitoring and Assessment Plan (MAP),
Biennial System Status Report

April 1999 (Restudy) Project/Program Synopsis: A rigorous Adaptive Assessment and Monitoring (AA&M) program was included as an essential feature of the Plan and implementation of the AA&M program will ensure the Plan's overall success. New information about the natural system, that is learned from monitoring and from measuring responses to implementation of Plan components, can be used to increase the ultimate level of success of the overall restoration program. Specifically, AA&M utilizes a focused, system-wide/regional monitoring and assessment plan (MAP) to measure how well each component of the Plan accomplishes its goals and objectives. Data from monitoring is assessed and reported biennially in system status reports (SSRs), providing a status on the Everglades and South Florida ecosystem and information critical to refinement of the Plan as well as its individual components through adaptive management. AA&M was authorized along with the ten Initially Authorized Projects under WRDA 2000.

The AA&M program is rooted in science and includes not only comprehensive monitoring and assessment but development of conceptual models, performance measures, and scientific peer review.

Current Project/Program Synopsis: The AA&M Program is designed to provide system-wide and regional monitoring and assessment that ensures CERP goals and objectives will be met throughout implementation of the Plan. AA&M-related activities include: (1) implementing a system-wide monitoring and assessment plan (MAP) (2) conducting annual assessments by synthesizing MAP and CERP project data; developing and refining the conceptual ecological models; (3) developing performance measures; (4) developing and refining the conceptual ecological models; (5) coordinating peer reviews; and (6) resolving scientific/technical issues. The goal of the AA&M program is to increase the probability of restoration success by recognizing that modifications will be made the Plan and its components in the future; based upon new information garnered from the AA&M program.

The CERP is also being planned, implemented, and refined using the principles of adaptive management (AM). AM was mandated by the Water Resources Development Act of 2000 and the CERP Programmatic Regulations (2003). AM is an iterative and deliberate process of applying principles of scientific investigation to both design and implementation in order to better understand the ecosystem and reduce key uncertainties; AM seeks to continuously refine program/project design and operation. To address uncertainties, and to improve the performance of CERP, AM addresses the challenges inherent in predicting and restoring large-scale complex ecosystems by replacing dependencies on numerical models and traditional planning guidelines with using a "learning-by-doing" approach to decision-making.

This approach takes that learning and applies it to: (1) reducing uncertainties and guiding management decision-making; (2) transferring lessons from one project to another or among project phases in order to refine alternatives and enhance restoration success; (3) using physical models/field testing to test hypotheses and the outcomes of management decisions; and (4) incorporating flexibility and versatility into project design and implementation. AM for CERP recognizes that the future will be influenced by unanticipated internal and external events and that the Plan must be implemented with flexibility in mind.

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Monitoring and Assessment Plan (MAP): The Monitoring and Assessment Plan (MAP) is the primary tool by which the RECOVER program will assess the performance of the Plan. Over a three-year period, a team of federal, state, tribal governments, local agencies and stakeholders, interest groups, and the public developed the MAP which was completed in 2004. The overarching goal for implementation of the MAP is to have a single, integrated, system-wide monitoring and assessment plan that will be used and supported by all participating agencies and tribal governments as the means of tracking and measuring the performance of the CERP. As the primary tool by which RECOVER assesses Plan performance, monitoring determines if ecosystem responses are desirable; if progress is being made toward Interim Goals and Interim Targets; and whether refinement of the Plan is needed.

System Status Report (SSR): The SSR, released in 2007, was the first comprehensive technical assessment of monitoring data developed by the RECOVER Assessment Team using data collected by the MAP. Because few CERP projects had been implemented at this time, the 2007 SSR provides estimates of pre-CERP conditions of ecosystem indicators monitored by the MAP, in conjunction with data from other sources. The SSR also identifies potential management actions that may be necessary to adjust CERP to achieve its goals and objectives. Data is assessed biennially to establish pre-CERP reference conditions and ultimately to determine whether the goals and objectives of the Plan are being met.

CERP AM Strategy and AM Integration Guide: An interagency team lead by RECOVER is defining CERP Adaptive Management (AM) including development of an overall strategy for integrating AM into CERP (CERP AM Strategy) and documentation about how and when AM should be used. Following release of the CERP AM Strategy in 2006, development of guidance was the next step in fully implementing the CERP AM program.

Current Status:

Monitoring and Assessment Plan (MAP): The 2012 RECOVER Monitoring and Assessment Plan (MAP) refined MAP 2004 (MAP, Part 1: Monitoring and Supporting Research); the MAP 2004 describes the monitoring components and supporting research of the MAP and briefly summarizes the assessment process.

The MAP 2012 utilizes the same conceptual ecological model approach and retains the MAP 2004 focus on long-term system-wide monitoring and assessment; it also incorporates adaptive management (AM) principles as well as flexibility to address project-level monitoring. The MAP 2012 provides a necessary update to the monitoring and assessment program in order to reflect refinements, including scientific information gathered over the past nine years. MAP 2012 incorporates lessons learned during development of the MAP, Part 2 (Assessment Strategy for the MAP) as well as the 2006 and 2007 System Status Reports (SSRs). These lessons learned include the organization of monitoring and assessment data via hypothesis clusters rather than single hypotheses, assessment across geographic module boundaries, and an emphasis on development of a comprehensive data management system in order to adequately assess and report on the results of system-wide MAP monitoring.

System Status Report (SSR): The 2012 SSR is a formal assessment of data generated from the MAP, Part 1 (Monitoring and Supporting Research). The focus of the 2009 SSR is two-fold: (1) provide an assessment of the pre-CERP status and trends of important ecosystem attributes; and (2) assess the validity of using a hypothesis-based approach to assess data at both the regional and system-wide scales. Because the variability in available data, estimates of the pre-CERP condition will vary among hypotheses and their associated performance measures and interim goals.

The 2009 SSR is formatted as an interactive web page accessible from www.evergladesplan.org. This web-based approach allows managers, stakeholders and scientists with many different interests and

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degrees of technical expertise to easily find the information they want and need. Information is presented in a hierarchical way – users can access very general information about each assessment (i.e., general trends in wading birds), slightly more detailed information (i.e., location and number of wading bird nests in Big Cypress) or very detailed information (i.e., specific wading bird survey techniques by location). Key findings provide a high-level synthesis of the assessment.

Detailed information about each geographic MAP Module (e.g., Lake Okeechobee, Northern Estuaries, Greater Everglades and Southern Coastal Systems) uses the most recent scientific data and includes the validity of the hypothesis cluster concept, metrics and functional relationships, status and trends of key ecological indicators, management issues that communicate high priority areas of concern to the decision makers and managers; and uses hypothesis-based assessments to provide the scientific foundation for evaluating interim goals and applying adaptive management (AM).

CERP AM Strategy and AM Integration Guide: The draft CERP AM Guidance Manual underwent agency and public review and comment from mid-September to mid-October 2008. The Guide identifies the activities and processes needed to implement CERP AM at the project and program levels and identifies how these activities are integrated with the USACE Six-Step Planning Process, through implementation of nine (9) specific AM activities. The Guide also provides the rationale for, and importance of, the CERP AM Program and is designed to assist managers/decision-makers, scientists, and CERP PDTs understand and integrate AM into CERP planning, design, construction, operations, and maintenance.

Est. Cost: \$ 167,112,000

Detailed Project Budget Information (rounded):

AA&M	Expenditures Thru FY 2011
USACE	\$45,415,000
SFWMD	\$41,071,000
Total	\$86,486,000

Hyperlinks: http://www.evergladesplan.org/pm/recover/assess_team_ssr_2007.aspx
http://www.evergladesplan.org/pm/program_docs/adaptive_mgmt.aspx

http://www.evergladesplan.org/pm/pm_docs/adaptive_mgmt/091208_am_guid_manual_v2-1.pdf

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Source: Original project description summarized from the *Central and Southern Florida Project Comprehensive Review Study (1999)* and WRDA 2000. Cost estimate information is updated to reflect current price levels in October 2011 dollars. Actual expenditures include all federal expenditures through FY09 (Sept, 2009) and sponsor verified and approved in kind credit through 4th quarter FY11. Additional information provided from the Monitoring and Assessment Plan (2011) and the RECOVER team.

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