Chapter 7: RECOVER Activities

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SUMMARY

RECOVER (Restoration Coordination and Verification) is an interagency, interdisciplinary team sponsored by the United States Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD or District). The role of RECOVER is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of the Comprehensive Everglades Restoration Plan (CERP) and to ensure that CERP's systemwide goals and purposes are achieved.

RECOVER applies science and the tools of science to three broad mission areas. RECOVER's three mission areas are as follows:

- **Evaluation:** Work with the Project Delivery Teams (PDTs) to evaluate (through predictive modeling) and to maximize the contribution made by each project to the systemwide performance of CERP
- **Assessment:** Measure (through monitoring) and interpret responses in natural and human systems as CERP projects are brought online
- **Planning and Integration:** Identify potential improvements in the design and operation of CERP, consistent with plan objectives, and strive for consensus regarding scientific and technical aspects of the plan

RECOVER's three mission areas are the primary means of improving CERP systemwide performance as implementation of the individual CERP projects proceeds. The evaluation process (1) incorporates the Comprehensive Plan approved by the Water Resources Development Act of 2000 (WRDA 2000) and conceptual ecological models into a set of systemwide evaluation performance measures, (2) uses this set of performance measures to evaluate (or predict) the systemwide performance of CERP and to support individual CERP projects in the development of Project Management Plans (PMPs) and Project Implementation Reports (PIRs), and (3) assists in the refinement of project designs and operations. The assessment process (1) develops systemwide assessment performance measures based on conceptual ecological models, (2) develops a monitoring and assessment plan based on these models and performance measures, (3) uses the results of monitoring and supporting research described in the plan to assess the success of CERP implementation through the issuance of performance assessment reports, and (4) assists in refining CERP design and operation. The planning and integration process (1) refines models and performance measures, (2) performs CERP update modeling and contingency planning, and (3) provides options for management approval to refine CERP projects or operation.

These missions provide RECOVER with the organizational framework for meeting its overall objectives of predicting and measuring CERP performance, refining and improving CERP during

the implementation period, and ensuring that a systemwide perspective is maintained throughout the restoration program.

Evaluation, assessment, and planning and integration activities will encompass all CERP projects, pilot projects, and critical projects, as appropriate. RECOVER may also evaluate other non-CERP projects that can potentially affect CERP's ability to achieve its goals and purposes. RECOVER will function throughout the entire duration of the CERP process, continuously seeking ways to improve the plan. Evaluation and assessment activities, as well as data from cause-effect research and from new technologies, will shape planning and integration efforts toward this goal.

RECOVER is developing an adaptive management program for CERP that will better prepare the CERP to anticipate and respond to future uncertainties. The adaptive management program will provide a feedback mechanism for assessing whether the responses by the systems being restored are matching the restoration objectives. Expected responses will bolster the strength of planning hypotheses. These assessments will also be used to determine when and how implementation of the plan could be improved where the objectives are not being met. The ultimate role of adaptive management in CERP is to have an ongoing, scientifically based process for substantially increasing the probability that the plan will succeed. Key principles of adaptive management being incorporated in the CERP program are (1) anticipation, (2) learning, (3) communication, and (4) adjustment.

A total system conceptual ecological model has been created as a planning tool for selecting the most appropriate set of total system performance measures for the CERP. The Total System Model is designed to show the key ecosystem stressors working at multi-landscape scales in South Florida, and the best biological indicators of these stressors.

Several of the projects currently being undertaken by RECOVER will allow tracking of CERP performance. The development of the Monitoring and Assessment Plan has continued, and the second draft of this effort was distributed in March 2003 (RECOVER 2003a)[1]. This plan establishes the framework for measuring systemwide responses and for assessing how well CERP is meeting its goals and objectives. As part of this process, assessment performance measures and a process for establishing interim goals and interim targets have been developed.

The Initial CERP Update remains under way in response to environmental changes and new information gained since the release of the Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (USACE and SFWMD, 1999). The Initial CERP Update will result in an improved prediction of plan performance, a revised description of existing conditions and of the future-without-project condition. Moreover, this information will be provided to the individual CERP PDTs as they begin project-level formulation and evaluation.

More detailed information regarding the RECOVER program of CERP is contained in the Management Plan for Restoration Coordination and Verification (RECOVER)[2] (USACE and

[1] The draft Monitoring and Assessment Plan (March 2003) is available on the South Florida Water Management District's Website at http://www.org/pm/recover/recover_map.cfm.

[2] The final Management Plan (May 2001) is available on the South Florida Water Management District's Website at http://www.evergladesplan.org/pm/recover/recover_mgmt_plan.cfm.

SFWMD, 2001) and in the 2002 and 2003 Everglades Consolidated Reports (SFWMD, 2002 and 2003). This chapter focuses on RECOVER activities, organized by its mission areas for the period of September 2002 to July 2003.

RECOVER ACTIVITIES

The following sections provide an update on RECOVER activities since the publication of the *2003 Everglades Consolidated Report*. They are broken down into four categories as follows: RECOVER-wide, Evaluation, Assessment, and Planning and Integration. The activities listed under the RECOVER-wide section fall under two or more mission areas.

RECOVER-WIDE

Conceptual Ecological Models

Conceptual ecological models that represent South Florida's major wetland physiographic regions have been revised. These models were published in Appendix A of the March 2003 draft Monitoring and Assessment Plan (RECOVER 2003a). The models have served as the basis for the development of natural system performance measures used in RECOVER's evaluation and assessment missions. As the models are revised or new models are developed, the sets of evaluation and assessment systemwide performance measures will be revised and expanded.

New conceptual ecological models are currently being prepared for the Lake Worth Lagoon and the Loxahatchee Watershed River and Estuary. These draft models will be published in the final Monitoring and Assessment Plan, scheduled for completion in fall 2003. A conceptual ecological model addressing the total South Florida system has also been prepared. The Total System Model looks at the bigger picture, picking up where the regional models leave off and integrating the major, systemwide working hypotheses common to several or all of the regional conceptual ecological models. It identifies the working hypotheses that explain the major ecological changes that have occurred at the larger scale of the South Florida ecosystem. It also addresses major stressors and ecological effects that, because they are operating at such a large scale, have not been adequately characterized by the regional models. The model looks at the interactions among the regional models and at the upstream and downstream effects.

The regional conceptual ecological models published in Appendix A of the March 2003 draft Monitoring and Assessment Plan (RECOVER, 2003a) and the Total System Model are being prepared for publication in a peer-reviewed journal. It is currently anticipated that these documents will be submitted in December 2003. The Lake Worth Lagoon and Loxahatchee Watershed River and Estuary Conceptual Ecological Models may not be ready for submission at that time.

Performance Measure Documentation Report

Performance measures are the quantitative and qualitative indicators that are used to determine the degree to which (1) alternative plans are likely to meet restoration objectives or (2) implemented plans have met restoration objectives. CERP performance measures identify the systemwide hydrological, biological, and water quality indicators that are expected to be responsive to the implementation of CERP. These measures have been developed by both Central and Southern Florida Comprehensive Review Study (Restudy) and RECOVER teams. Many

performance measures were developed through the conceptual ecological model process. The currently approved set of measures that RECOVER is using to evaluate the predicted performance and assess the actual performance of CERP will be presented in the draft Performance Measure Documentation Report, which is presently scheduled to be published for agency and public review in December 2003.

RECOVER utilizes two categories of systemwide performance measures consisting of evaluation measures and assessment measures. Currently, 40 evaluation and 73 assessment systemwide performance measures have been developed by RECOVER. A summary of these performance measures is presented in Appendix 7-1.

Evaluation performance measures are used to predict systemwide performance as determined through simulation modeling of the plan. Each evaluation measure can be used to predict how well a component or combination of components will meet one or more CERP goals. Selection of the evaluation measures is constrained in large part by the modeling tools that are available to the evaluation teams. An intensive effort has been undertaken by RECOVER's regional evaluation and water quality teams to standardize the development and acceptance of performance measures.

The assessment performance measures serve as the basis to monitor and assess responses in the natural and human systems, as components of the plan are implemented. Each assessment measure identifies one or more elements to be monitored and is designed to assist in determining whether program objectives are being attained. These assessment measures are being used to assist in the design of the monitoring plan presented in the March 2003 draft Monitoring and Assessment Plan (RECOVER, 2003a) and represent an important tool in developing a performance assessment report as part of the CERP Adaptive Management Program.

In addition to the RECOVER systemwide performance measures, each individual project team is developing performance measures at the project level. These measures will be used to predict the performance and impacts of alternative plans and to monitor the local performance of CERP components after construction.

Adaptive Management Program

RECOVER has the responsibility to coordinate the development and implementation of a systemwide Adaptive Management Program in support of CERP. The purpose of the Adaptive Management Program is to create a set of measurable restoration objectives for CERP that are consistent with CERP goals and to assess how well CERP meets these objectives during and following its implementation. The program also aims to identify opportunities to improve CERP's design and operation, based on uncertainty analyses, assessments of its performance and on new information acquired through cause-effect research and monitoring.

The overall Adaptive Management Program includes a set of interconnected tasks and products that collectively provide RECOVER and the project teams with the ability to apply the principle of adaptive management to CERP, both at the systemwide and project levels. These tasks and products include the development of conceptual ecological models of South Florida's natural systems, a set of peer-reviewed and approved systemwide performance measures and restoration objectives, a systemwide monitoring plan, an adaptive management framework and strategy, a data management and quality control strategy, and a data assessment protocol. **Figure 7-1** shows the links in the development of the CERP Adaptive Management Program.

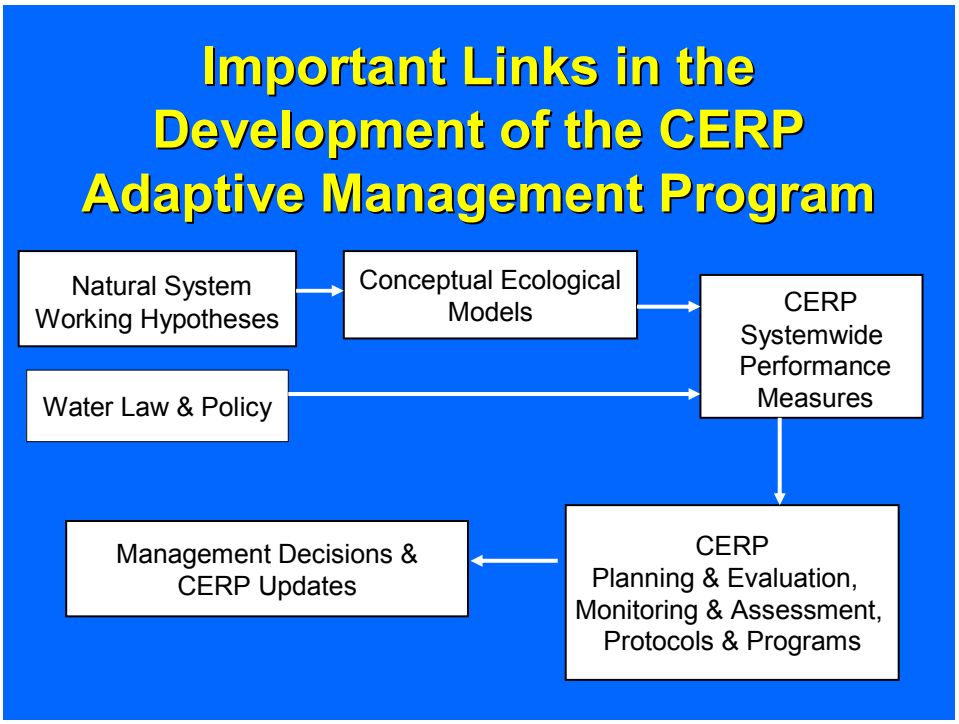

Figure 7-1. Important links in the development of the CERP Adaptive Management Program.

The draft CERP Performance Assessment Protocol Paper was published in Appendix 7-3 of the *2003 Everglades Consolidated Report* (SFWMD, 2003). The process described in this document is currently being revised. RECOVER members are in the process of developing and then implementing the CERP adaptive management principles and process, which will allow for science-based management adjustments to the implementation of CERP programs and projects. Team members are actively working on the performance assessment process, including the use of historical data, current Monitoring and Assessment Plan data, supplemental research, and modeling tools. The new design selected for the development of the CERP Adaptive Management Program consists of planning and facilitating a series of three workshops with the objectives of:

1. Developing a collaborative approach that would establish a set of CERP Adaptive Management principles
2. Enhancing scientific inquiry and understanding for CERP, allowing for adjustments to be made during the course of implementation
3. Establishing links between science and management that improve management's understanding and utilization of ecosystem responses to the design and operation of CERP projects

The first of the three Adaptive Management Program workshops was held on June 18 and 19, 2003. The second and third workshops are currently scheduled to take place in October 2003 and in winter 2003, respectively. Following these workshops, the performance assessment protocol will be revised and published in an assessment guidance memorandum, as required by the programmatic regulations (Department of Defense, 2002) in accordance with WRDA 2000. The guidance memorandum will identify the process that will be used to carry out performance assessments based on data acquired through the Monitoring and Assessment Plan. The Adaptive

Management Framework (in prep) identifies the components of the CERP Adaptive Management Program and how these components fit together in order to create a comprehensive Adaptive Management Program. **Figure 7-2** depicts a draft overview of the CERP Adaptive Management Framework.

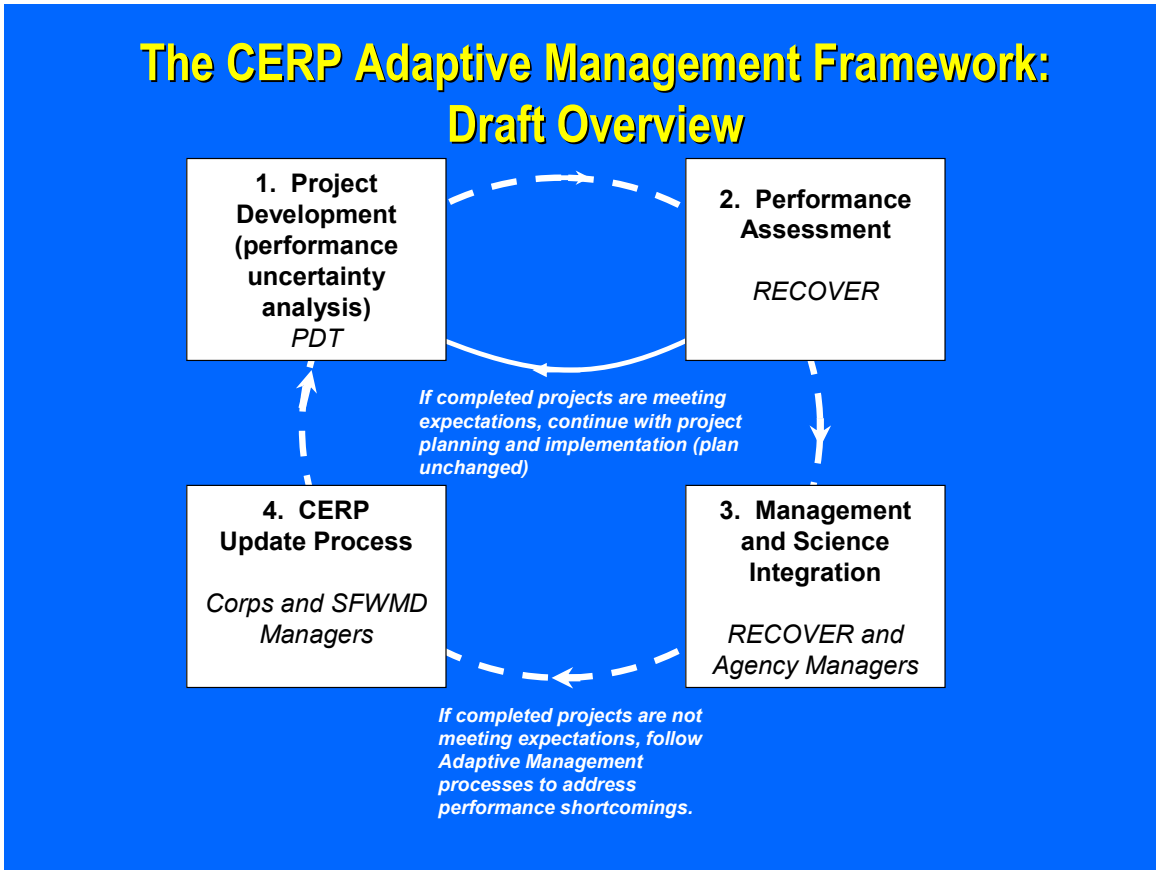

Figure 7-2. Draft overview of the CERP Adaptive Management Framework.

Interim Goals and Interim Targets

WRDA 2000 (Section 601 (h)(C)(i)(III)) directs that the programmatic regulations (Department of Defense, 2002) establish a process "to ensure the protection of the natural system consistent with the goals and purposes of the Plan…." The programmatic regulations further require that progress toward providing for "other water-related needs" also be evaluated. The vehicle for these assurances is the establishment of quantitative interim goals and interim targets through which the plan's success may be evaluated incrementally as CERP implementation proceeds. A RECOVER subteam has developed proposed indicators for interim goals and interim targets for CERP. These indicators were published in a final draft Proposed Indicators for Interim Goals and Interim Targets for the Comprehensive Everglades Restoration Plan, dated February 1, 2003 (RECOVER, 2003b)[3]. This document presents the lists of proposed indicators that will be

[3] The final draft Proposed Indicators for Interim Goals and Interim Targets for the Comprehensive Everglades Restoration Plan (dated February 21, 2003) is available on the South Florida Water Management District's Website at http://www.evergladesplan.org/pm/recover/rlg.cfm.

used to define the interim goals for restoration of the natural system and the interim targets for other water-related needs in support of CERP. These interim goals and targets, once determined, will be used for tracking the progress of CERP throughout its implementation toward meeting its goals and objectives. The indicators will be assessed using either measurable parameters with quantitative targets, or as trends, i.e., directions of change.

The proposed indicators are grouped into three general categories as follows: hydrologic, water quality, and biological. Some of the indicators are applicable systemwide, while others are applicable to a specific region or regions. The proposed list of indicators for interim goals is presented in **Table 7-1**.

Table 7-1. Proposed list of indicators for interim goals.

Title	Type	Applicable Region
Volume	Hydrology (Quantity and Distribution)	Systemwide
Sheetflow	Hydrology (Distribution)	Greater Everglades Wetlands
Hydroperiod	Hydrology (Timing and Distribution)	Greater Everglades Wetlands
Hydropattern	Hydrology (Distribution)	Greater Everglades Wetlands
Freshwater Inflows to Estuaries	Hydrology (Quantity and Timing)	Estuaries
Water Stages in Lake Okeechobee	Hydrology (Quantity)	Lake Okeechobee
Total Phosphorus	Water Quality	Systemwide
Lake Okeechobee Phosphorus	Water Quality	Lake Okeechobee
Recovery of Threatened and Endangered Species and Supporting Habitats (American crocodile)	Biological	Southern Estuaries and Southwest Florida
Wading Bird Nesting Patterns	Biological	Systemwide
American Alligator Distribution and Abundance	Biological	Systemwide
Periphyton Mat Cover, Structure, and Composition	Biological	Greater Everglades Wetlands
Aquatic Fauna Regional Populations	Biological	Greater Everglades Wetlands
Ridge and Slough	Biological (Landscape)	Greater Everglades Wetlands
Everglades Tree Islands	Biological (Vegetation)	Greater Everglades Wetlands
Spatial Extent of Habitat Type	Biological (Landscape)	Greater Everglades Wetlands
Submerged Aquatic Vegetation in Estuaries	Biological (Vegetation)	Estuaries
American Oysters in Estuaries	Biological	Estuaries
Lake Okeechobee Ecological Communities	Biological	Lake Okeechobee
Lake Okeechobee Algal Blooms	Biological	Lake Okeechobee
Juvenile Pink Shrimp Density in Florida and Biscayne Bays	Biological	Southern Estuaries

Interim targets for other water-related needs represent predictions of progress toward providing for other water-related needs of the region, such as water supply and flood protection. The list of proposed interim targets for other water-related needs is presented in **Table 7-2**.

Table 7-2. Proposed list of interim targets for other water-related needs.

Title
Volume
Ability to Meet Water Supply Needs in the Lower East Coast Service Area
Ability to Meet Water Supply Needs in the Lake Okeechobee Service Area
Ability to Prevent Saltwater Intrusion of the Biscayne Aquifer
Flood Protection

These two lists of proposed interim goals and interim targets were submitted for review by the agencies, tribal governments, stakeholders, and the public, and they were revised based on the review process. Currently, the interim goals and interim targets are being developed by technical subteams using the best available science and predictive tools, planning documents, and regulatory requirements. The subteams are made up of technical specialists for each of the proposed goals and targets. The first task for the subteams is to categorize each indicator to determine how that indicator will be predicted and reported at five-year increments during the implementation of CERP. These categories are as follows:

- Category 1 – Indicators that are developed into interim goals or interim targets with defined metrics predicted for five-year increments
- Category 2 – Indicators that are developed into projected trends, but without predictable five-year increments
- Category 3 – Indicators that, at present, cannot be developed into quantitative goals, but for which progress is reported to the U.S. Congress at five-year intervals and for which quantitative goals may eventually be possible
- Category 4 – Indicators for which progress is reported to the U.S. Congress at five-year intervals, but for which quantitative goals will likely not be possible due to conceptual limitations in developing predictions
- Category 5 – Indicators that are recommended by the development subteam to be deleted

After the indicators have been categorized, the subteams will determine the metrics that will be used to predict and measure the performance of the indicator for those that fall into Categories 1 and 2. The tools to be used in these predictions (modeling, professional opinion, etc.) will also be decided. Those indicators that fall into Categories 3, 4, and 5 will be documented as to how the subteam made this determination.

In many cases, the five-year predictions for the indicators are dependent on five-year incremental simulation modeling, using the South Florida Water Management Model (SFWMM) and the Natural System Model (NSM), and the current CERP Master Implementation Schedule. The process for actually developing the predictions of performance, report writing, and public and agency review is expected to take five to six months following the completion of the model simulations. The interim goals and interim targets report will be provided to the USACE and SFWMD for action.

EVALUATION

Performance Measure Development

RECOVER has continued the development and refinement of systemwide performance measures for evaluating alternative plans. These include water quality and biological evaluation performance measures. Although the evaluation performance measures are based upon stressors to the system, much thought has been given to the ecological consideration of these measures. The water quality measures may use the Lake Okeechobee Water Quality Model (LOWQM), the Dynamic Model for Stormwater Treatment Areas (DMSTA), the Everglades Landscape Model (ELM), or best professional judgment as evaluation tools. The biological performance measures may use the Across Trophic-Level System Simulation (ATLSS) Models or Habitat Suitability Indices (HSIs) derived from the South Florida Water Management Model (SFWMM). All accepted and proposed evaluation performance measures can be viewed at http://www.evergladesplan.org/pm/recover/ret_perf_measures.cfm. Also, all evaluation systemwide performance measures that will be published in the Performance Measure Documentation Report are summarized in Appendix 7-1.

Regional Evaluation and Report Process

RECOVER has developed a regional evaluation and report process for use during plan formulation and evaluation during Project Implementation Report (PIR) development. This process is presented in the draft document, RECOVER Regional Evaluation and Report Process dated May 27, 2003[4] (RECOVER, 2003c). RECOVER will coordinate with the PDTs and other restoration project teams during the plan formulation phase to ensure that each CERP project optimizes the level of systemwide performance. Systemwide evaluations will be performed by five subteams organized geographically consisting of (1) Southern Estuaries, (2) Northern Estuaries, (3) Greater Everglades, (4) Lake Okeechobee Service Area (LOSA) and Lower East Coast Service Area (LECSA), and (5) Lake Okeechobee. The subteams will initially produce a draft report and then generate a final report using the regional evaluation report format as provided for in the process document.

Simulation Models

Most evaluations will compare computer model simulations to the targets for systemwide evaluation performance measures, analyze the implications of any changes to the regional system, and estimate benefits and impacts of the changes. The computer models considered for systemwide evaluation include, but are not limited to, the SFWMM, NSM, ATLSS, ELM, DMSTA, and LOWQM. It is the responsibility of RECOVER to select the tools to be used for regional simulations. A newly established Interagency Modeling Center will provide technical assistance for model selection and will perform the simulations needed for the regional evaluations. The modeling center will also ensure consistency between the regional models used by RECOVER and the subregional models used by the PDTs.

[4] The RECOVER Regional Evaluation and Report Process document (dated May 27, 2003) is available on the South Florida Water Management District's Website at http://www.evergladesplan.org/pm/recover/recover_docs/ret/060203_ret_systemwide_evals.pdf.

Southern Golden Gates Evaluation

One of the missions of RECOVER is to work with the PDTs to evaluate and maximize the contribution made by each project to the systemwide performance of CERP. An evaluation was carried out by RECOVER in early 2003 for the final three proposed project alternatives for the Southern Golden Gate Estates (SGGE) Hydrologic Restoration Project. The purpose of this regional evaluation was to (1) inform the PDT of the compatibility of proposed project alternatives with regional CERP restoration goals and performance expectations, (2) identify improvements for project performance that would improve its regional performance, and (3) provide decision makers with the required information regarding regional performance expectations of the SGGE project. It should be noted that this regional evaluation is unusual because, due to an expedited schedule for project completion, it was conducted after selection of the preferred plan and therefore was not taken into consideration when selecting this plan. However, the RECOVER evaluators concluded that the three alternatives evaluated will meet or exceed the hydrologic and water quality improvements to coastal estuaries performance expectations of CERP.

ASSESSMENT

Performance Measure Development

The systemwide assessment performance measures published in the March 2001 Monitoring and Assessment Plan were revised and will be published in the Performance Measure Documentation Report. New assessment systemwide performance measures have been developed for water quality. Also, water supply and flood protection assessment measures have been developed based on evaluation performance measures. A summary of all the assessment systemwide performance measures is presented in Appendix 7-1.

Monitoring and Assessment Plan

The purpose of the Monitoring and Assessment Plan is to establish the monitoring framework for measuring systemwide responses and for assessing how well CERP is meeting its goals and objectives. The second draft of the Monitoring and Assessment Plan (RECOVER, 2003a) was released in March 2003 for public and agency review. This draft focused on monitoring. The performance assessment process is currently being developed by a subteam of the Adaptive Assessment Team. A draft of the performance assessment process is currently scheduled for publication in spring 2004. This publication will be incorporated into the next version of the Monitoring and Assessment Plan. As new information becomes available, periodic reviews and revisions of the plan will be conducted. It is anticipated that formal reviews will occur no less than every three years.

Implementation of the Monitoring and Assessment Plan will consist of three major tasks as follows: implementing and operating the monitoring and assessment program; managing RECOVER data in collaboration with the CERP Data Management Program; and assessing, synthesizing, and reporting the monitoring data.

The initial sequencing of implementation entails four main goals:

1. By 2005, establish all stations/projects necessary to measure the physical and chemical stressors (hydrological and water quality) identified in the plan
2. By 2005, close the gaps in high-priority existing biological monitoring programs that are relevant to the plan
3. By 2005, initiate high-priority baseline monitoring for the plan
4. By 2005, initiate high-priority research to address uncertainties in system responses

Ten projects recommended in the March 2003 draft Monitoring and Assessment Plan have been selected for fast track implementation during Fiscal Year 2003 (FY2003). Twenty-six projects are being proposed in the Fiscal Year 2004 (FY2004) budget. The fast track items for FY2003 are listed in **Table 7-3**, and the proposed items for FY2004 are listed in **Table 7-4**.

Table 7-3. Fast track (Fiscal Year 2003) Monitoring and Assessment Plan items.

Project Title
Greater Everglades Stratified Random Sampling Design
Greater Everglades Transect and Sentinel Sampling Design
Greater Everglades Restoration Hydrologic, Water Quality, and Topographic Data Collection
Greater Everglades Tidal Creek Geomorphic Survey in Southwest Everglades
Greater Everglades Regional Aquatic Fauna Populations Baseline Characterization
Greater Everglades Crayfish Population Dynamics and Hydrological Influences
Florida Bay Aerial Photography of Submerged Aquatic Vegetation
Southern Estuaries Salinity Monitoring Network
Southern Estuaries Biological Availability of Organic Nitrogen in Florida Bay, Phase I
Regional Hydrology Monitoring Network Optimization Study

Table 7-4. Proposed Monitoring and Assessment Plan items for Fiscal Year 2004.

Project Title
Greater Everglades Transect Sulfate/Porewater
Everglades Soil Mapping (Regional Distribution of Soil Nutrients)
Coastal Gradients of Flow, Salinity, and Nutrients
Greater Everglades Landscape Pattern - Vegetation Mapping Services
Greater Everglades Landscape Pattern - Ridge, Slough, and Tree Island Elevations
Tidal Creek Bathymetric Survey in Southwest Everglades
Greater Everglades Periphyton Mat Cover Structure and Composition
Aquatic Fauna Regional Populations
Greater Everglades Aquatic Fauna Seasonal Concentration
Loxahatchee Impoundment Landscape Assessment
Greater Everglades Crayfish Population Dynamics - Hydrological Influences
Wading Bird Distribution Surveys Synthesis, 1985–2001
Northeast Florida Bay Water Quality Trends
South Florida Fish Habitat Assessment Network
Southern Estuaries Large-Scale Remote Sensed Submerged Aquatic Vegetation Monitoring Program
Southern Estuaries Dissolved Organic Matter Fate and Effect
Submerged Aquatic Mapping from Aerial Photography (Caloosahatchee Estuary)
Indian River Lagoon Seagrass Photography/Geographic Information Systems (GIS)
Northern Estuaries Oyster Monitoring Network
St. Lucie Estuary Oyster Bed Restoration
Charlotte Harbor Research
Lake Okeechobee Taxonomic Support Services for Phytoplankton and Zooplankton
Lake Okeechobee Submerged Aquatic Vegetation Sediment, Periphyton, and Plants
Regional Hydrology Monitoring Network Water Conservation Area 1 Elevations
Regional Hydrology Monitoring Network Optimization
Evapotranspiration Remote Sensing

CERP Annual Report Card

The 2001 draft baseline CERP Annual Report Card was presented in Appendix 7B-2 of the *2003 Everglades Consolidated Report* (SFWMD, 2003). This document represents the first proposed annual report card for the initial elements of CERP. Now in the earliest stages of implementation, CERP is not yet expected to show any indication as to the health of the Everglades basin. Thus, the grades reported in the report card are indicative of baseline, or pre-CERP, conditions rather than any improvements brought about by CERP implementation. The publication of a final baseline CERP Annual Report Card has been delayed to ensure that it reflects the information that will be presented in the Performance Measure Documentation Report and in the interim goals and interim targets that will be completed later this year.

The CERP Annual Report Card is intended for a large audience, and as such, it will not contain the detail necessary to inform decision makers on the progress toward restoration. The

more detailed Performance Assessment Reports, the *2004 Everglades Consolidated Report*, and five-year reports to the U.S. Congress will fulfill this requirement.

PLANNING AND INTEGRATION

CERP implementation will take place over an estimated 30-year period. The magnitude of CERP, as well as direction from the U.S. Congress and the Florida legislature, necessitate that a process to incorporate changing conditions, new information, and other factors that may affect CERP performance be put into practice. As more detail becomes available from the CERP feasibility studies and PIRs, as well as non-CERP projects that may have an influence on CERP planning, the integration function of RECOVER will incorporate this information into the overall prediction of CERP's progress. This planning and integration mission will, through time and scenario/sensitivity development, evaluate the effects of forces outside of CERP (population, land use, sea level rise, etc.) on the planning and implementation of CERP.

Initial CERP Update

In the *2003 Everglades Consolidated Report*, it was reported that an effort known as the "Initial CERP Update" would be a first step in assuring that new technical information is integrated into CERP's implementation. The Initial CERP Update is being undertaken by an interagency, interdisciplinary team of the RECOVER program in CERP. The update will incorporate new information gained in the past several years since the CERP feasibility study was released (USACE and SFWMD, 1999). The scope of this effort is to perform the following:

- Update planning conditions from the 1995 data used in the Restudy to 2000 data, such as land use, population, and water use
- Update structural, operational, and regulation schedule changes to the water management system
- Update forecasts of 2050 conditions based on new data obtained since the Restudy
- Evaluate the performance of CERP using the latest updated versions of the SFWMM and the NSM
- Document all findings in a technical report

Planning for water resources purposes in South Florida relies strongly on the SFWMM, which simulates the daily hydrology and operations of the water management system. The model requires input data, termed "assumptions," that govern the results, or outputs, of a given model simulation. Use of this modeling tool allows informed discussion as to what assumptions appear reasonable as input data. In addition to the use of new data, the SFWMM and NSM have undergone updating and improvements to increase accuracy of predictions. This effort has been ongoing throughout the year, but the milestones reported last year have been delayed due to the need to perform a quality review of the data for use in the SFWMM version 5.0.

MAJOR MILESTONES

The major milestones for the Initial CERP Update are presented in **Table 7-5.** These milestones represent the currently anticipated schedule for accomplishing the Initial CERP Update.

Table 7-5. Initial CERP Update milestones.

Task	Date
Data gathering and assimilation	
1. Define assumptions for CERP existing and future-without-project conditions	July 2003
2. Update 2000 and 2050 land use/land cover	June 2003
3. Update population projections	July 2003
Upgrade simulation models	
1. Extend climatic period of record from 31 to 36 years	June 2002
2. Incorporate latest topography (SFWMM v5.0 and NSM v5.0)	June 2002
3. Calibrate and verify (SFWMM v5.0)	June 2003
4. Technical review of SFWMM v5.0 and NSM v5.0	July 2003
5. Compare NSM v3.5 and NSM v5.0	July 2003
Evaluate CERP	
1. Simulate CERP planning conditions and compare to Restudy 1995 and 2050	September 2003
2. Simulate the Comprehensive Plan with SFWMM v5.0; compare to Restudy	November 2003
Sea level rise sensitivity analysis	
1. Simulate the Comprehensive Plan with an 0.8 ft rise in sea level (2050)	January 2004
Technical documentation	
1. Finalize technical report	February 2004

RELATED EFFORTS

Three efforts are linked to the Initial CERP Update as follows: (1) incremental modeling of the CERP Master Implementation Schedule, (2) Aquifer Storage and Recovery (ASR) contingency planning, and (3) development of the pre-CERP baseline. All of these activities will rely heavily on the use of the computer simulation modeling performed for the Initial CERP Update. These efforts will follow the update.

RECOVER Liaisons to Project Delivery Teams

RECOVER has assigned a liaison for each project in CERP. Their goals are to substantially improve communication and coordination between RECOVER and the PDTs and to ensure consistency and a smooth working relationship throughout the planning process. The liaisons will serve as the initial points of contact for questions on RECOVER responsibilities, work products, and protocols while coordinating with the SFWMD's Office of RECOVER chief scientist and staff and the USACE's RECOVER Branch Chief and staff, as needed, to ensure effective communication. RECOVER teams and the liaisons have developed a draft interaction strategy to improve coordination and communication with the PDTs. This strategy will be revised as necessary and provided to the PDTs for input and review.

LITERATURE CITED

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