

# **The Comprehensive Everglades Restoration Plan**

## **Aquifer Storage and Recovery Program Status Update**

**Richard Harvey, P.E.**

**Director**

**United States Environmental Protection Agency, South Florida Office**

**November 2002**

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery (ASR) Program

## The Recommended Plan (Alternative D13R)

**Lake Okeechobee ASR**  
Approximately 200 Wells

**Located in Glades and Okeechobee Counties**

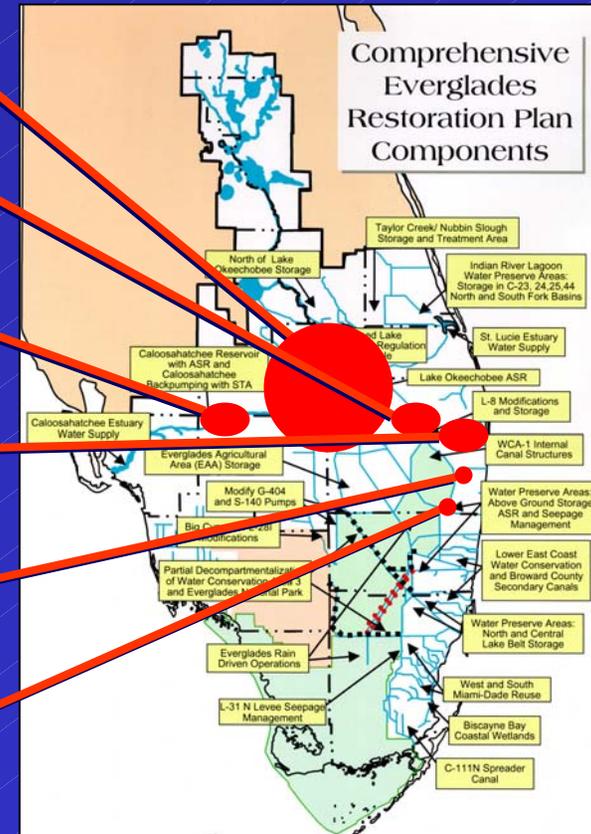
**L-8 Basin ASR**  
Approximately 10 Wells  
Located in Palm Beach County

**C-43 Basin ASR**  
Approximately 44 Wells  
Located in Hendry, Glades, and Lee Counties

**C-51 Basin ASR**  
Approximately 34 Wells  
Located in Palm Beach County

**Palm Beach Agricultural Reserve Reservoir ASR**  
Approximately 15 Wells  
Located in Palm Beach County

**Western Hillsboro Canal Basin ASR**  
Approximately 30 Wells  
Located in Palm Beach County



for a total of 333 wells... pending further study and pilot testing

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Program

MARCH 2001

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN



PROJECT MANAGEMENT PLAN

Lake Okeechobee  
Aquifer Storage and Recovery Pilot Project



U.S. Army Corps of Engineers  
Jacksonville District

South Florida  
Water Management

CEERP PROJECTS  
Monthly Progress Report

Report Month	Reporting Period	Submitted	Reviewed
March 2001	February 2001	3/1/01	3/1/01

Project Description: The CEERP is a multi-agency effort to restore and improve the water quality and quantity of the Lake Okeechobee and other water bodies in the South Florida Water Management District. The project involves the construction of a series of levees and canals to prevent salt water intrusion from the Atlantic Ocean and the Gulf of Mexico. The project also includes the construction of a series of canals to improve the water quality of the Lake Okeechobee and other water bodies in the South Florida Water Management District.

Project Objectives: The project objectives are to restore and improve the water quality and quantity of the Lake Okeechobee and other water bodies in the South Florida Water Management District. The project objectives are to restore and improve the water quality and quantity of the Lake Okeechobee and other water bodies in the South Florida Water Management District.

Project Status: The project is currently in the planning phase. The project is currently in the planning phase. The project is currently in the planning phase.

Item	Project Manager	Start Date	Actual Completion	Actual Length
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2.0				
3.0				
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8.0				
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MARCH 2001

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN



PROJECT MANAGEMENT PLAN

Western Hillsboro  
Aquifer Storage and Recovery Pilot Project



U.S. Army Corps of Engineers  
Jacksonville District

South Florida  
Water Management

CEERP PROJECTS  
Monthly Progress Report

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Preliminary Draft September 2001

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN



PROJECT MANAGEMENT PLAN

Caloosahatchee River  
Aquifer Storage and Recovery Pilot Project



U.S. Army Corps of Engineers  
Jacksonville District

South Florida  
Water Management

CEERP PROJECTS  
Monthly Progress Report

Report Month	Reporting Period	Submitted	Reviewed
September 2001	August 2001	9/1/01	9/1/01

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Monthly progressive reports for each of the pilot projects and Regional Study can be found at:

[http://www.evergladesplan.org/pm/proj\\_status\\_reports.cfm](http://www.evergladesplan.org/pm/proj_status_reports.cfm)

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Pilot Projects

## A quick refresher in permitting...

The permitting of ASR wells is administered by the Florida Department of Environmental Protection (FDEP), as approved by EPA pursuant to section 1422 of the SDWA. of Underground Injection “Control Program” and accompanying certifications, signed by General Counsel for the FDEP, January 14, 1982.

## A quick refresher in permitting terminology...

As defined in Chapter 62-528, F.A.C.,

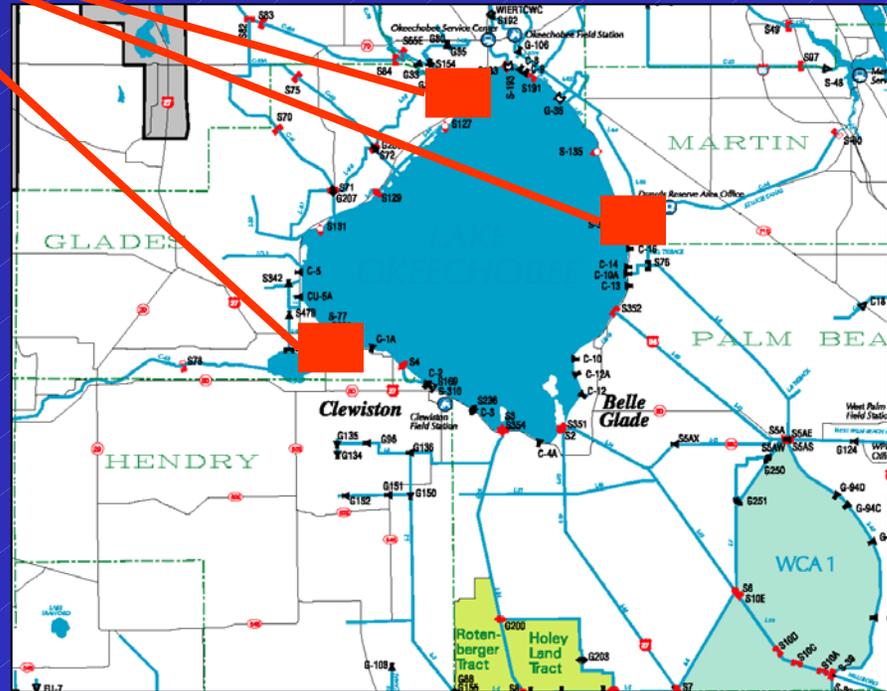
- "Test injection well" means the first injection well constructed in a well field, which is used for specific formation testing and to verify the feasibility of the injection well system. This well is designed and constructed to be used as an injection well, if injection is proven feasible and environmentally acceptable.
- "Exploratory well" means a cased well drilled in an area in which there is limited hydrologic and geologic data, to obtain sufficient data to determine the feasibility of using an injection well at the site.

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Pilot Projects

## Lake Okeechobee ASR Pilot

- Source water characterizations are ongoing (third quarter completed).
- One test injection well has been installed at each of the three locations.
- Applications for exploratory well construction permits have been filed for each location and are in various stages of the review/permitting process.
- Applications for NPDES permits (for discharges associated with hydraulic testing) have been filed and are in various stages of the review/permitting process.
- Water treatment technology tests (micro-filtration, ozone, UV) have been completed and data reports are pending.

## Pilot Project Status



Purpose: Construct and test five 5-MGD ASR wells

Budget: \$19 Million (WRDA 1999)

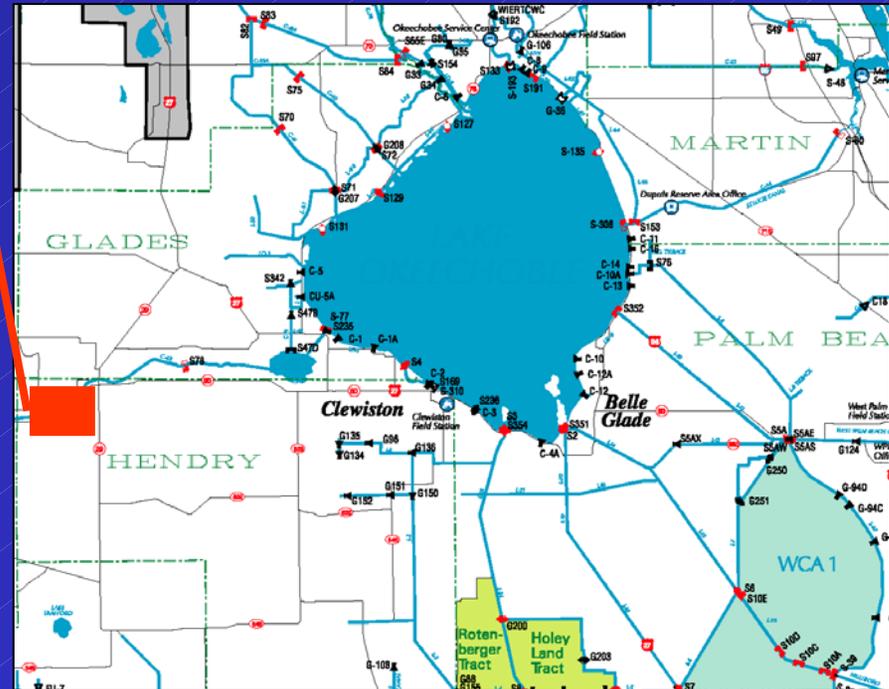
PMP: Approved March 2001

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Pilot Projects

## Caloosahatchee River ASR Pilot

- **Source water characterization has been initiated (first quarter completed).**
- **Site access agreement negotiations with Berry are ongoing.**
- **Application for exploratory well construction permit has been filed and is being reviewed.**
- **Application for NPDES permit (for discharges associated with hydraulic testing) has been filed and is being reviewed.**
- **Water treatment technology tests (micro-filtration, ozone, UV) have been completed and data reports are pending.**

## Pilot Project Status



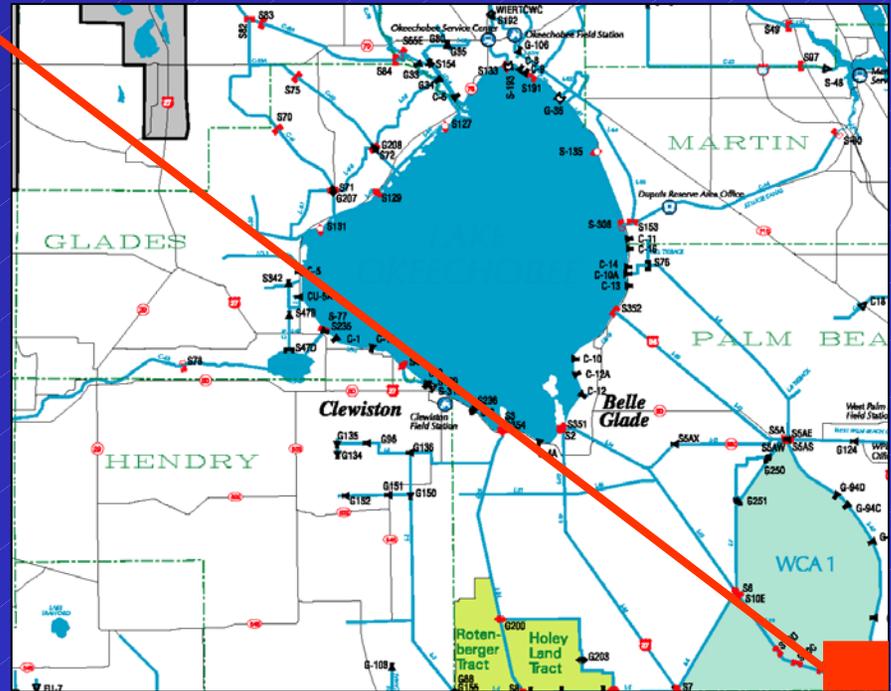
Purpose: Construct and test one 5-MGD ASR well  
Budget: \$6 Million (WRDA 2000)  
PMP: Approved February 2002

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Pilot Projects

## Hillsboro ASR Pilot

- Source water characterizations are ongoing (third quarter completed).
- One exploratory well has been constructed and hydraulic tests have been performed. Waiting on completion of source water characterization and treatment technology reports to proceed with pilot facility design.
- Water treatment technology tests (micro-filtration, ozone, UV) have been completed and data reports are pending.
- Design and construction of the pilot impoundment is on hold due to an acceleration of the full-scale Hillsboro impoundment schedule.

## Pilot Project Status



Purpose: Construct and test three 5-MGD ASR wells  
Budget: \$8 Million (WRDA 1999)  
PMP: Approved March 2001

# The Comprehensive Everglades Restoration Plan Aquifer Storage and Recovery Regional Study

- The ASR Regional Study was prepared by the SFWMD and USACE, with the assistance of a multi-agency team, to address regional water quality, ecosystem, and hydrologic issues raised by the ASR Issue Team and the Committee on Restoration of the Greater Everglades Ecosystem (CROGEE).
- Public and agency comments are being accepted on the Draft Project Management Plan through November 15, 2002.
- Comments and recommendations have been received from the CROGEE.
- The USACE and SFWMD with the assistance of the ASR Regional Study Project Delivery Team are in the process of summarizing and providing responses to the comments in a memorandum that will be provided to the ASR Issue Team for its review.

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## Regional Issues in Aquifer Storage and Recovery for Everglades Restoration:

A Review of the ASR Regional Study  
Project Management Plan of the  
Comprehensive Everglades Restoration Plan

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Prepublication Copy  
Subject to editorial changes.

*ADVANCE COPY*  
NOT FOR PUBLIC RELEASE BEFORE  
*Friday, October 4, 2002*  
*4:00p.m. EDT*

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PLEASE CITE AS A REPORT OF THE  
**NATIONAL RESEARCH COUNCIL**

NATIONAL RESEARCH COUNCIL  
OF THE NATIONAL ACADEMIES

# Aquifer Storage and Recovery Issue Team

## Recent Discussions

### Source Water Characterization

- Data quality problems were identified by the USACE and SFWMD. The ASR Issue Team has been advised by the USACE that those problems have been rectified.
- The contractor has had difficulty in fulfilling data quality requirement for rainfall-triggered monitoring activities due to shipping and laboratory difficulties. The USACE is working to resolve these issues.
- Few rainfall-triggered events have been sampled due to a combination of the infrequent occurrence of significant rainfall events in 2002, and the above-referenced contractor difficulties. In addition to working toward resolution of the above-referenced issues, the USACE and SFWMD are reevaluating the trigger criteria.

# Aquifer Storage and Recovery Issue Team

## Recent Discussions

### Well Construction Permits

- Input from agencies participating in the technical review of permit applications has been better than anticipated. Similarly, the SFWMD and USACE have been responsive to to much of the input.
- To provide the USACE and SFWMD with advance notice of issues that could be of concern during future permitting activities, FDEP has provided issues and recommendations of potential future concern to the USACE and SFWMD in a “response optional” format. This is being done to ensure that the USACE and SFWMD are made aware of issues that will or will likely be of concern during future permitting activities, allowing the USACE and SFWMD to consider the input during initial planning and well siting activities.

# Aquifer Storage and Recovery Program Projected Timelines

Pilot Projects	Lake		
	Okeechobee	Hillsboro	Caloosahatchee
Project Management Plan	Mar 2001	Mar 2001	Feb 2002
Pilot Project Design Report	Apr 2004	Mar 2004	Dec 2004
Project Cooperation Agreement	Oct 2004	Sept 2004	Mar 2005
Construction	Feb 2006	Dec 2005	Oct 2006
Testing	Feb 2008	Dec 2007	Oct 2008
Technical Data Report	Nov 2008	Feb 2009	Aug 2009
<b>Pilot Project Completion</b>	<b>Sept 2009</b>	<b>Jun 2009</b>	<b>Aug 2009</b>

## Regional Study

**Final Report Complete**

**First Quarter 2010**

# Public Workshops

will be held by the **SFWMD and USACE** to present information regarding **ASR technology**, its potential role in **Everglades Restoration**, the status of pilot projects and the regional study, and proposals for future studies. **Public comments will also be accepted.**

**The meeting dates and times are...**

## This Week

**Wednesday, November 6**

Florida Atlantic University Broward Community College Building

1515 West Commercial Boulevard, Room 3

**Fort Lauderdale, FL 33309**

6:30 p.m. - Open House / 7:30 p.m. - Public Workshop

**Thursday, November 7**

Okeechobee Service Center

South Florida Water Management District

205 North Parrott Avenue, Suite 201

(second floor of the Bank of America building)

**Okeechobee, FL 34972**

6:30 p.m. - Open House / 7:30 p.m. - Public Workshop

## Next Week

**Wednesday, November 13**

Fort Myers Service Center

South Florida Water Management District

2301 McGregor Boulevard

**Fort Myers, FL 33901**

6:30 p.m. - Open House / 7:30 p.m. - Public Workshop

**Thursday, November 14**

Lake Shore Middle School Cafeteria

425 West Canal Street

**Belle Glade, FL 33430**

6:30 p.m. - Open House / 7:30 p.m. - Public Workshop

# Discussion

