

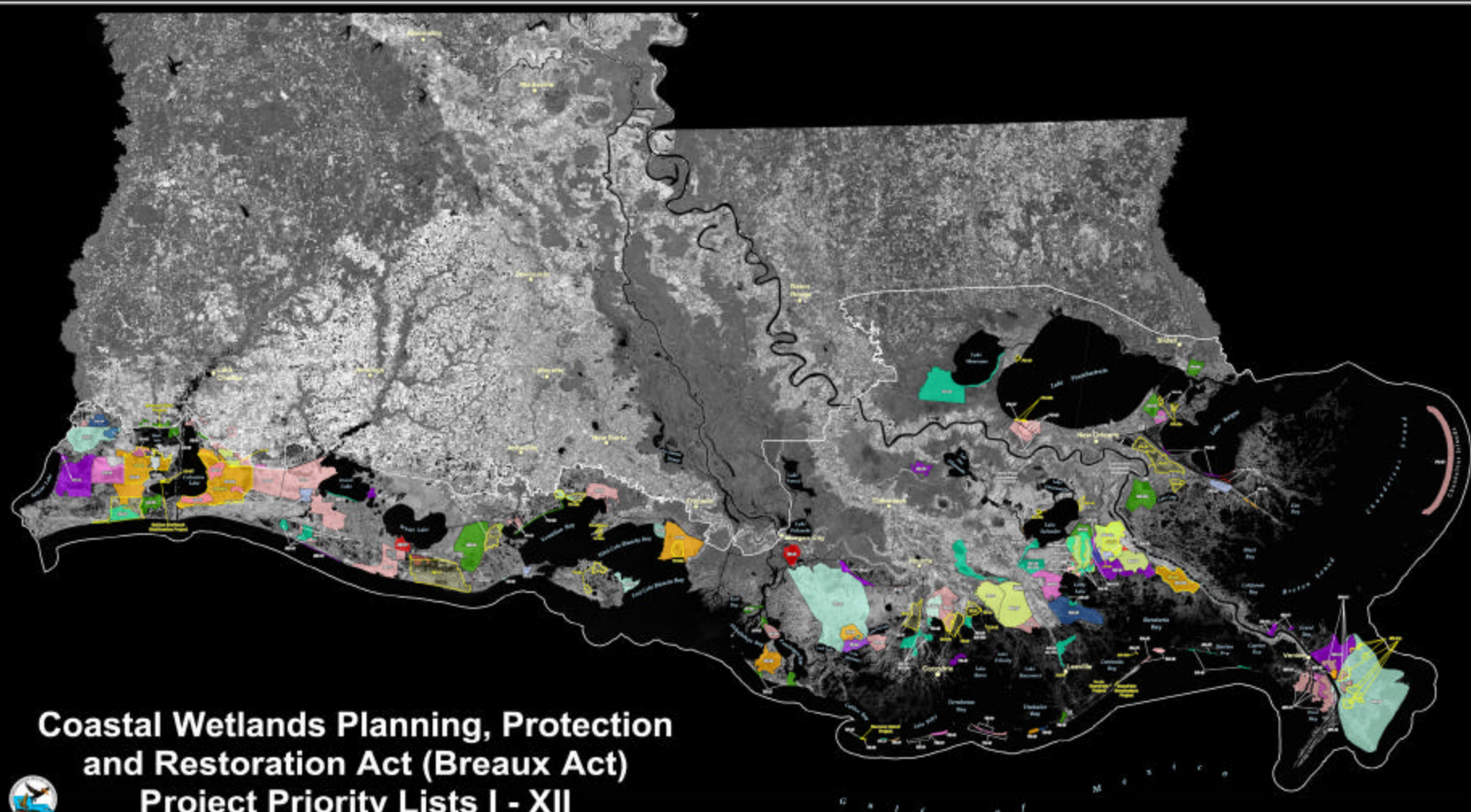
US EPA ARCHIVE DOCUMENT

Value-Added Monitoring Beyond Project Evaluation



**LOUISIANA DEPARTMENT OF NATURAL RESOURCES
COASTAL RESTORATION DIVISION**

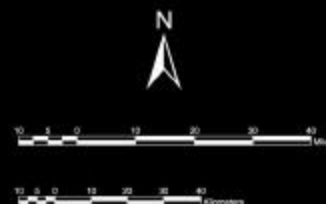
Rick Raynie, Biological Monitoring Section Manager



Coastal Wetlands Planning, Protection and Restoration Act (Breau Act) Project Priority Lists I - XII and Louisiana Coastal Restoration Projects



- | | | | | | |
|--|------|--|------|--|------|
| | 1991 | | 1995 | | 1999 |
| | 1992 | | 1996 | | 2000 |
| | 1993 | | 1997 | | 2001 |
| | 1994 | | 1998 | | 2002 |
- Louisiana Coastal Restoration Projects
- Coastal Zone Boundary
- Freshwater Diversion



Data Source:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Wetlands Field Station
Baton Rouge, LA

and
Louisiana Department of Natural Resources
Coastal Restoration Division and G&B Lab
Baton Rouge, LA

Image Source:
2000 Thematic Mapper imagery

Map Date: June 18, 2002
Map ID: 12004-0000C 2002 1-1-20

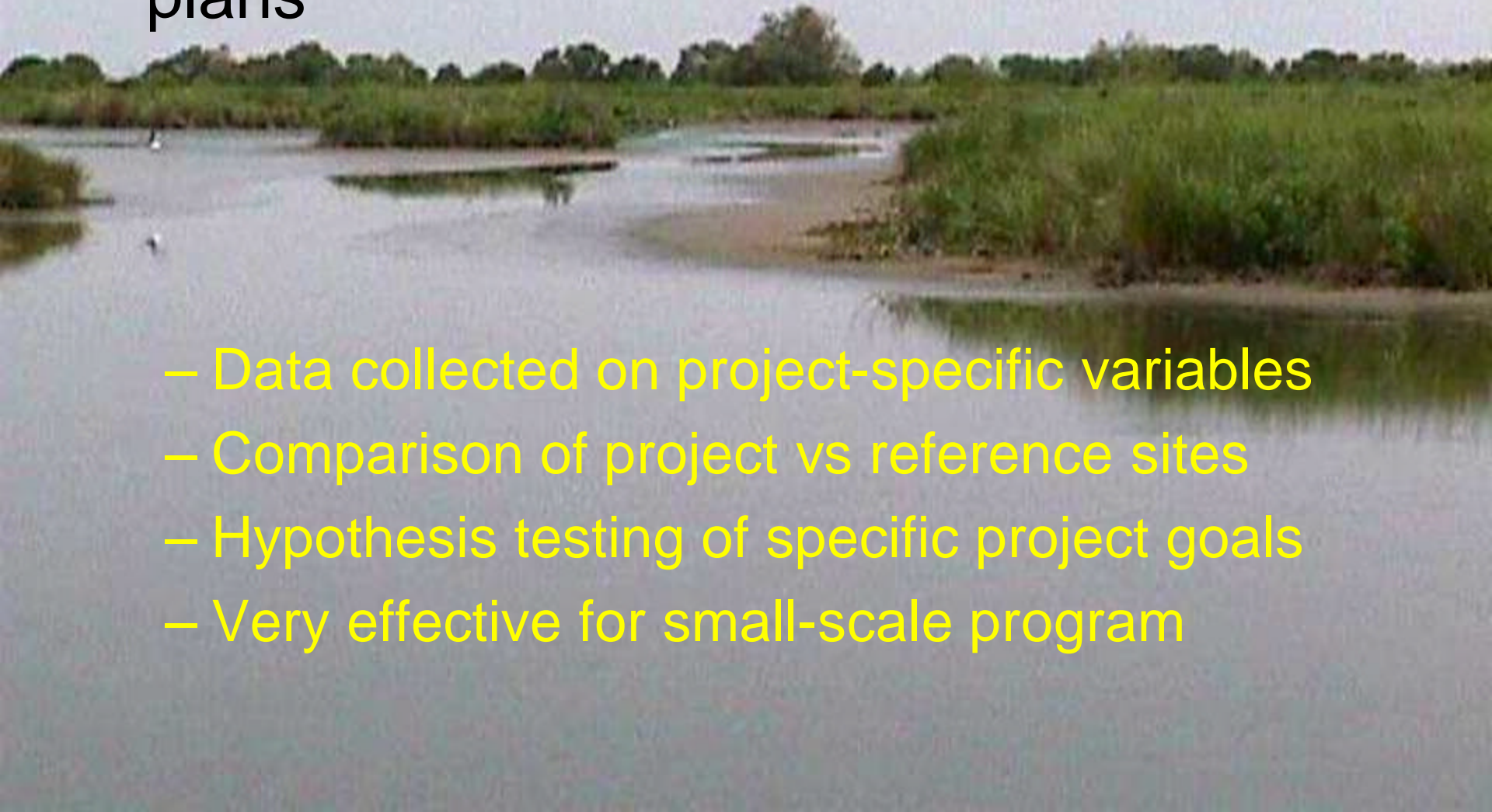
Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA)

- CWPPRA legislation has two monitoring mandates:
 - To evaluate the effectiveness of individual restoration projects.
 - To scientifically evaluate the effectiveness of all projects in creating, restoring, protecting and enhancing Louisiana coastal wetlands.
- CWPPRA Task Force in 1992 focused on addressing the first mandate (individual restoration projects).

Project-Specific Monitoring

- 72 projects have completed monitoring plans

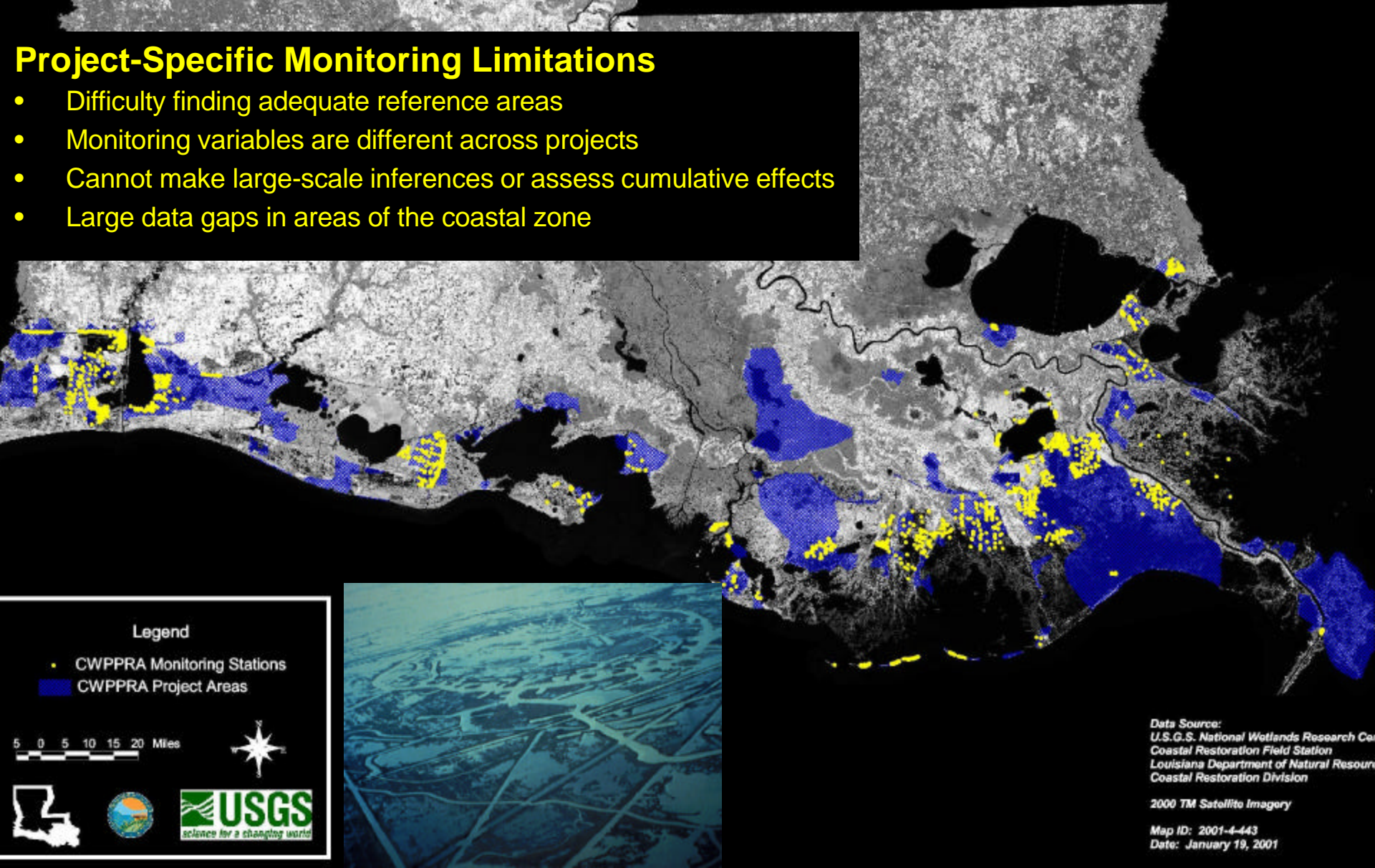
- Data collected on project-specific variables
- Comparison of project vs reference sites
- Hypothesis testing of specific project goals
- Very effective for small-scale program



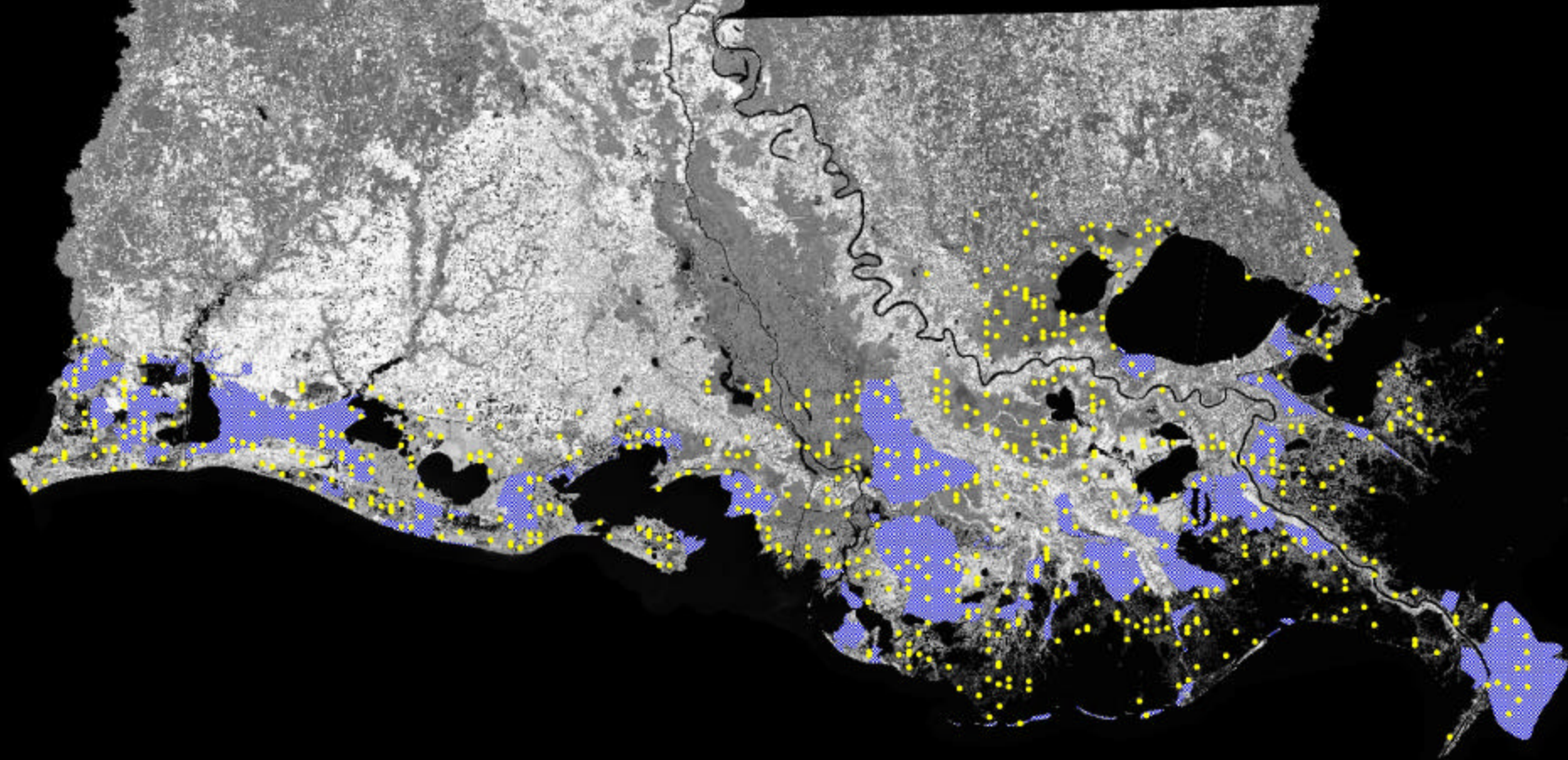
CWPPRA Project Areas and Monitoring Stations

Project-Specific Monitoring Limitations

- Difficulty finding adequate reference areas
- Monitoring variables are different across projects
- Cannot make large-scale inferences or assess cumulative effects
- Large data gaps in areas of the coastal zone



CWPPRA Project Areas and Coastwide Reference Monitoring Stations



Legend

- Coastwide Reference Monitoring Stations
- CWPPRA Project Areas

0 20 Miles



The Distribution of Stations and Environmental Variables Measured will allow us to more effectively evaluate:

**The effectiveness of individual projects, and
The effectiveness of the restoration program**

Data Source:
U.S.G.S. National Wetlands Research Center
Coastal Restoration Field Station
Louisiana Department of Natural Resources
Coastal Restoration Division

2000 TM Satellite Imagery

Map ID: 20014440
Date: January 19, 2001

Proposed CRMS Design Sampling Stations

VEGETATION DATA

- DELTAIC MIXTURE
- DELTAIC ROSEAU CANE
- FRESH BULLTONGUE
- FRESH MAIDENCANE
- FRESH SPIKERUSH
- MESOHALINE MIXTURE
- MESOHALINE WIREGRASS
- OLIGOHALINE BULLTONGUE
- OLIGOHALINE MIXTURE
- OLIGOHALINE SPIKERUSH
- OLIGOHALINE WIREGRASS
- POLYHALINE OYSTERGRASS
- ▲ SWAMP
- BOTTOMLAND HARDWOOD

□ HYDROLOGIC BASIN

20 0 20 40 Miles



Please note the following classifications were determined using 1980 NM1 Habitat Data by the U.S. Geological Survey. Bottomland hardwoods, Swamps, and some Polyhaline Oystergrass locations. All other classes were determined by Louisiana State University, Visser, et. al

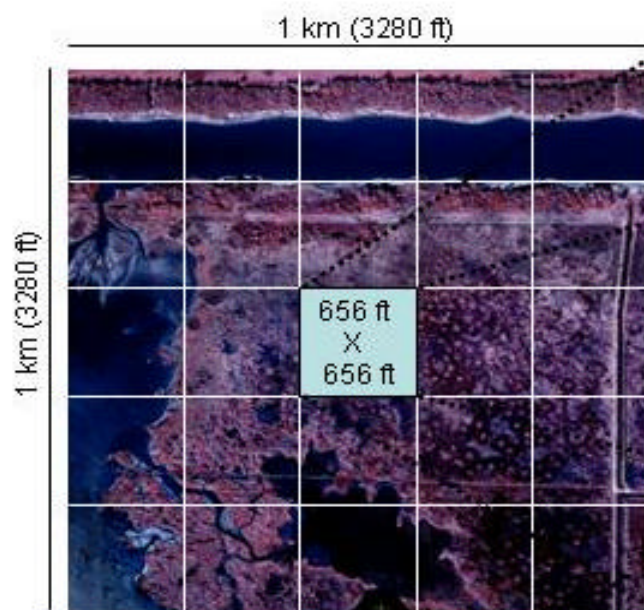
Map by: 10/20/2007
Revised: 10, 2008
Map by: 10/20/2007
Dr. Robert C. Visser
Department of Forestry, Wildlife, and Fisheries
Louisiana State University
Dr. Craig L. Visser
Louisiana Department of Wildlife and Fisheries
DATA ANALYSIS
Dr. Jennifer M. Visser and Dr. Charles E. Visser
Louisiana Department of Forestry, Wildlife, and Fisheries
Louisiana State University
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
MAP PRODUCTION
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Louisiana Department of Forestry, Wildlife, and Fisheries
Louisiana State University
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Louisiana Department of Forestry, Wildlife, and Fisheries
Louisiana State University

Improvements with CRMS-Wetlands

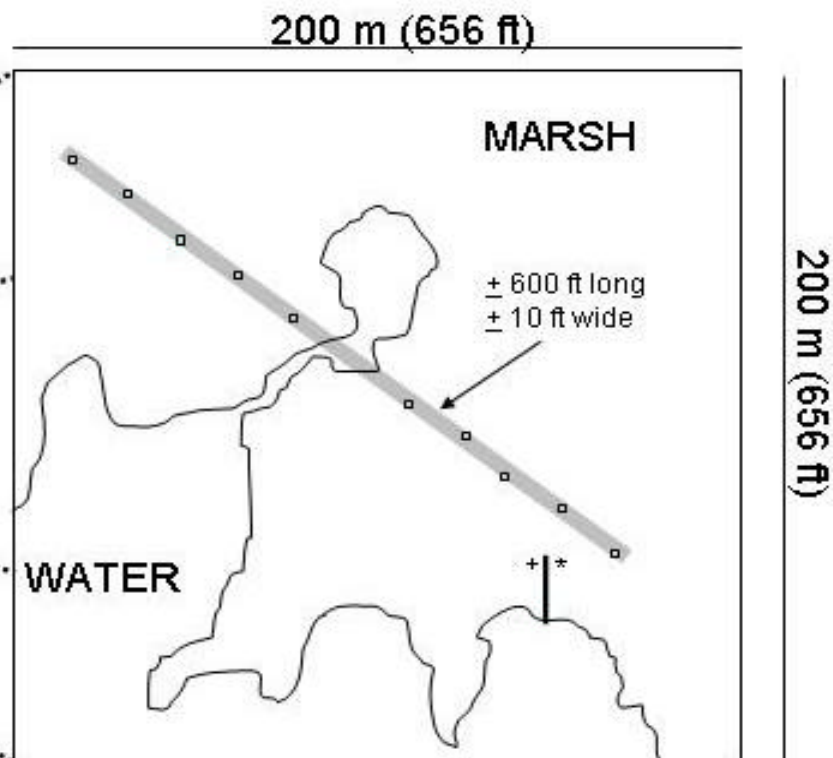
- **Data from the same comprehensive suite of variables will be collected at every station**
- **Stations will be located in every basin and major plant community type across the coast**
- **Allows for integration among programs**
 - **CWPPRA WRDA (Davis Pond & Caernarvon)**
 - **LCA**

TYPICAL CRMS-Wetlands SITE SAMPLING & DATA COLLECTION AREAS

*CRMS Sampling Area:
1 km² aerial photo area*



*CRMS Sampling Area:
200m X 200m data collection area*



- ▣ 2m X 2m vegetation station for collecting % cover and species abundance (within 10 ft X 600 ft area)
- * Sediment Elevation Table (SET) for collecting elevation data
- + Data Sonde collecting water level and salinity
- Boardwalk

WATER-LEVEL and SALINITY RECORDER



A photograph showing two researchers in a marshy field. One researcher, wearing a yellow shirt and dark waders, stands in the background holding a long pole. The other researcher, wearing a dark shirt and brown waders, is bent over in the foreground, adjusting a horizontal metal rod of the R-SET instrument. The instrument is mounted on a wooden frame. The background consists of tall, dry grass and a flat horizon under a bright sky.

R-SET Measurements of
marsh surface elevation



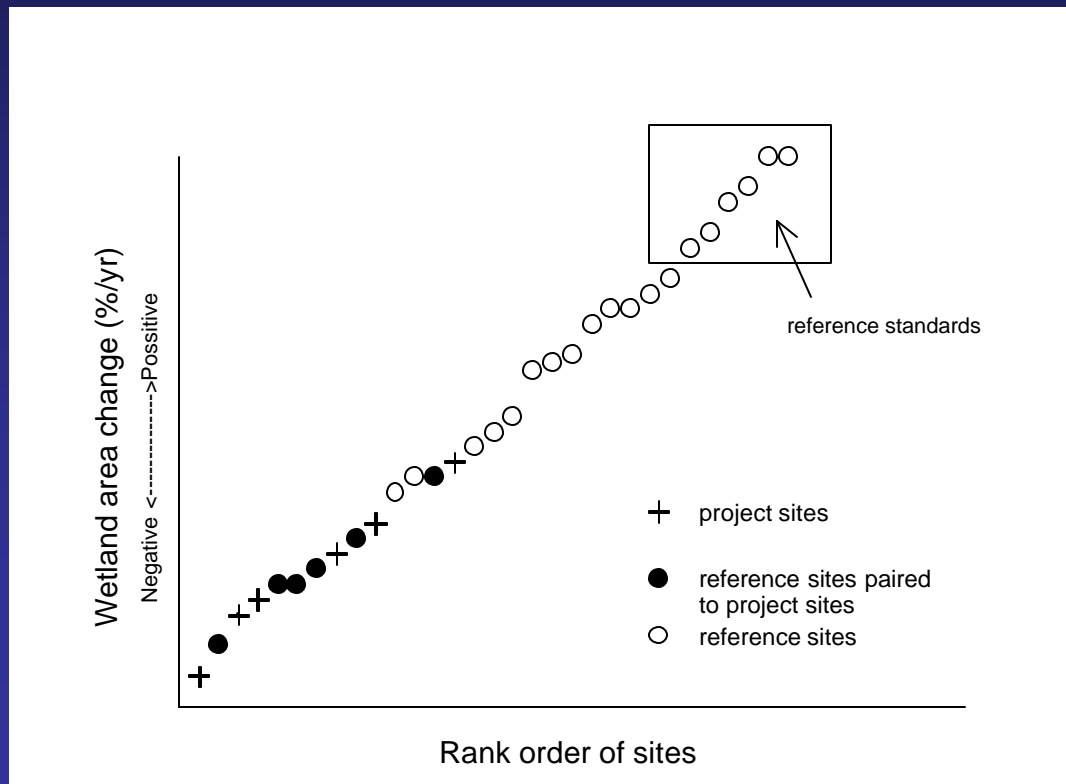
FELDSPAR PLOT FOR MEASURING
ACCRETION RATES

VEGETATION PLOT (2m x 2m)



CRMS-Wetlands Approach

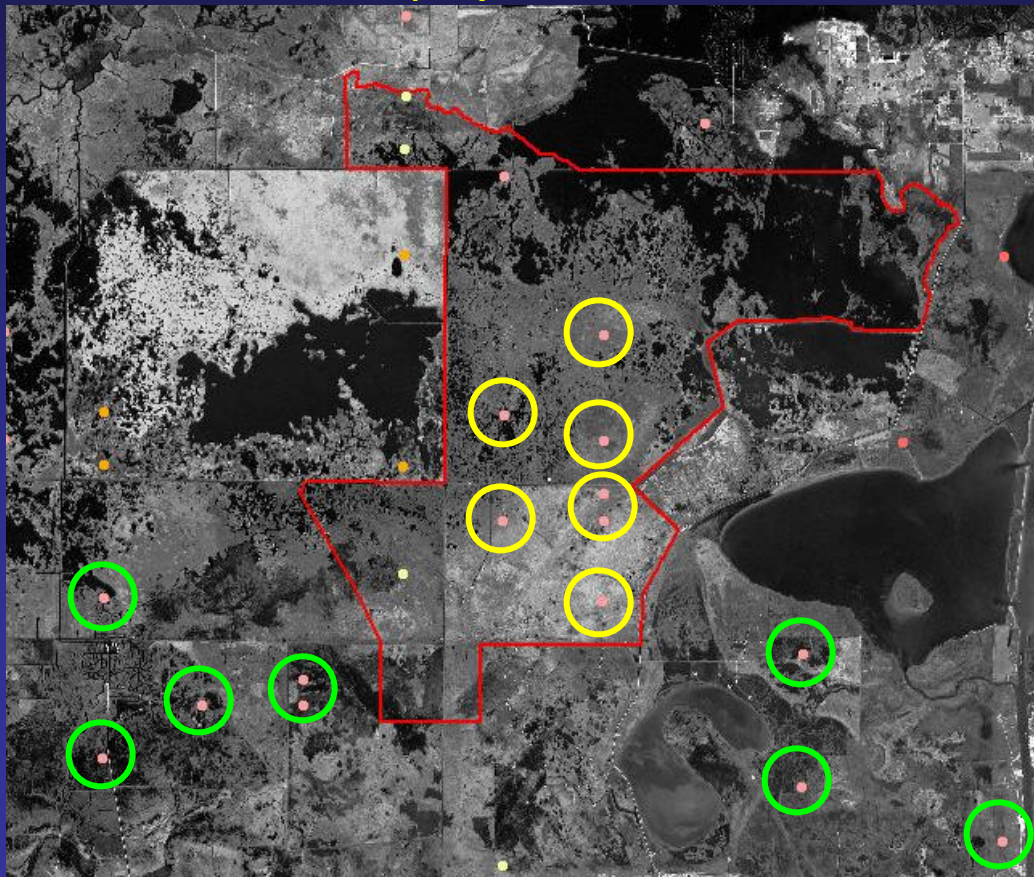
- Classify coastal wetlands into discrete basins, and into vegetation types within each basin.
- Reference sites will represent the range of functional variation for ecological, biological, and water quality variables of interest



CRMS-Wetlands Data Analyses

CRMS-Wetlands will facilitate the investigation of:

- Individual project effects



CRMS Stations

- DELTAIC MIXTURE
- DELTAIC ROSEAU CANE
- FRESH BULLTONGUE
- FRESH MAIDENCANE
- FRESH SPIKERUSH
- MESOHALINE MIXTURE
- MESOHALINE WIREGRASS
- OLIGOHALINE BULLTONGUE
- OLIGOHALINE MIXTURE
- OLIGOHALINE SPIKERUSH
- OLIGOHALINE WIREGRASS
- POLYHALINE OYSTERGRASS
- SWAMP
- CWPPRA Polygons

○ Project Oligohaline Wiregrass

○ Reference Oligohaline Wiregrass

CRMS-Wetlands Data Analyses

CRMS-Wetlands will facilitate the investigation of:

- Comparison of all projects within a basin vs non-project stations within a basin



CRMS Stations

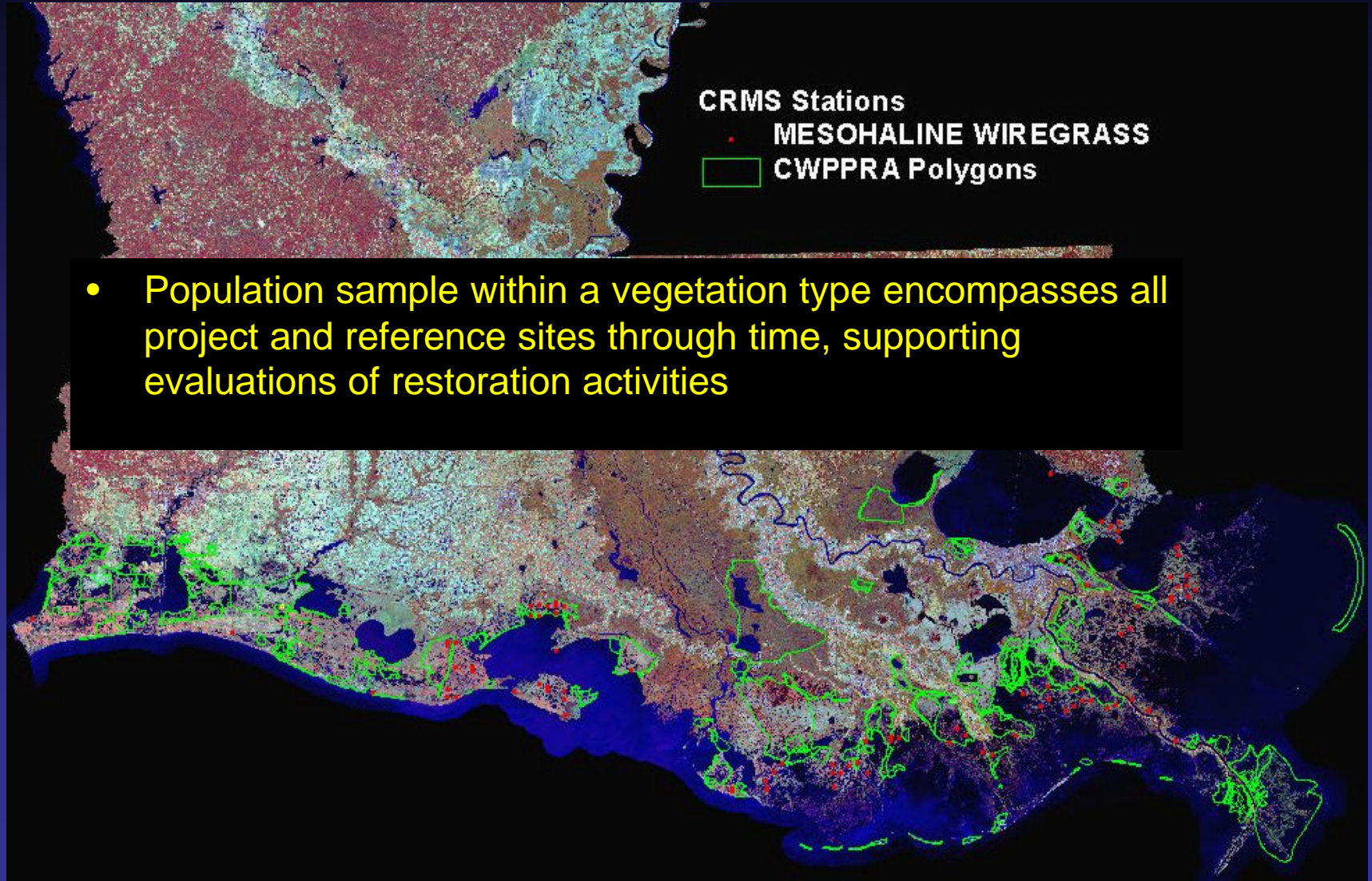
- DELTAIC MIXTURE
- DELTAIC ROSEAU CANE
- FRESH BULLTONGUE
- FRESH MAIDENCANE
- FRESH SPIKERUSH
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- MESOHALINE WIREGRASS
- OLIGOHALINE BULLTONGUE
- OLIGOHALINE MIXTURE
- OLIGOHALINE SPIKERUSH
- OLIGOHALINE WIREGRASS
- POLYHALINE OYSTERGRASS
- SWAMP

□ CWPRA Polygons

○ Project Oligohaline Wiregrass

○ Reference Oligohaline Wiregrass

Value-Added : Project Planning and Operations



**Ecosystem
Management**

Formulate & Implement Mgt
Plans

Set Mgt Goals

**Ecosystem
Assessment**

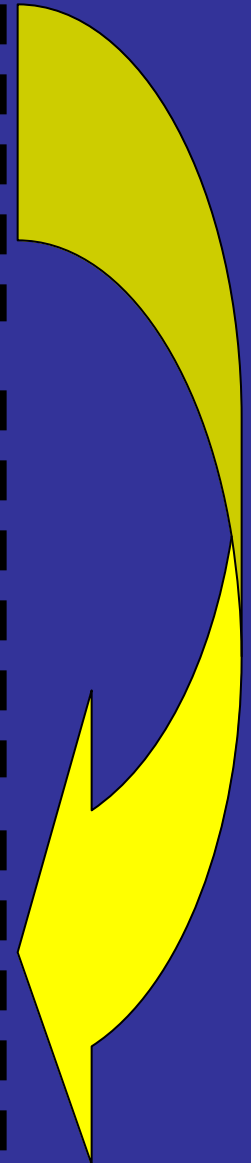
Review Ecological Models

Est. Ecological State & Trends

**Ecosystem
Monitoring**

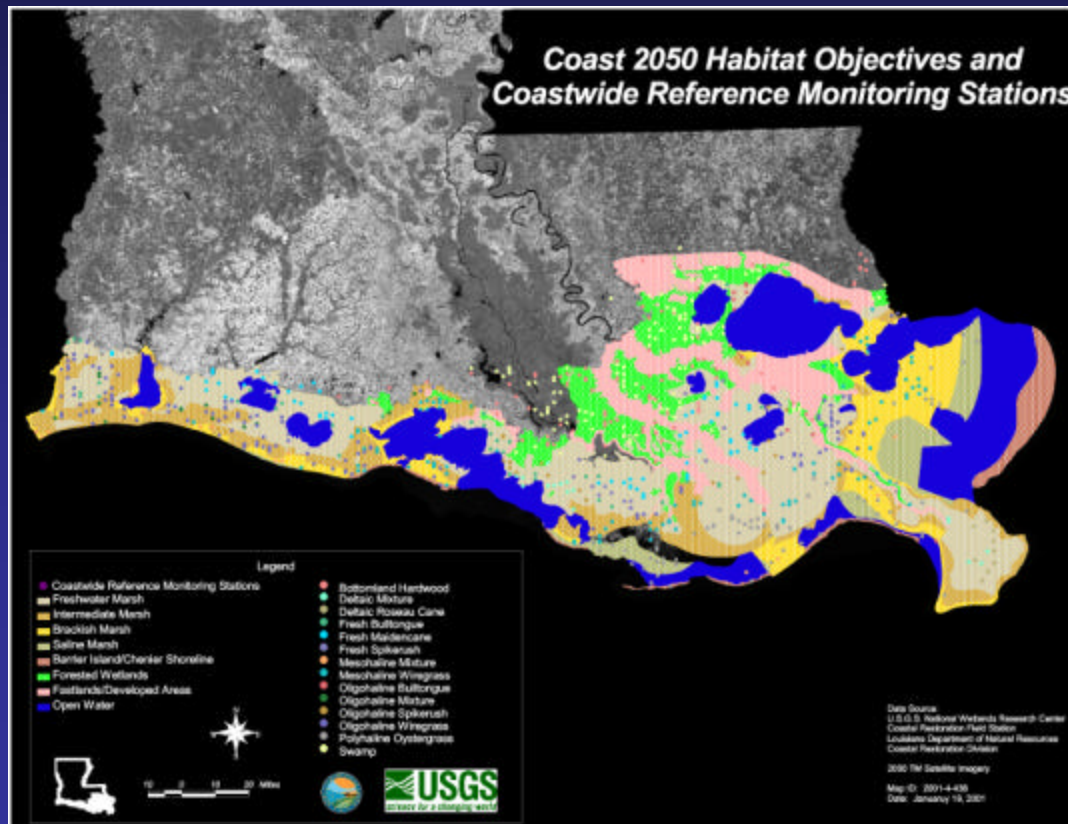
Implement Monitoring

Design Monitoring Program



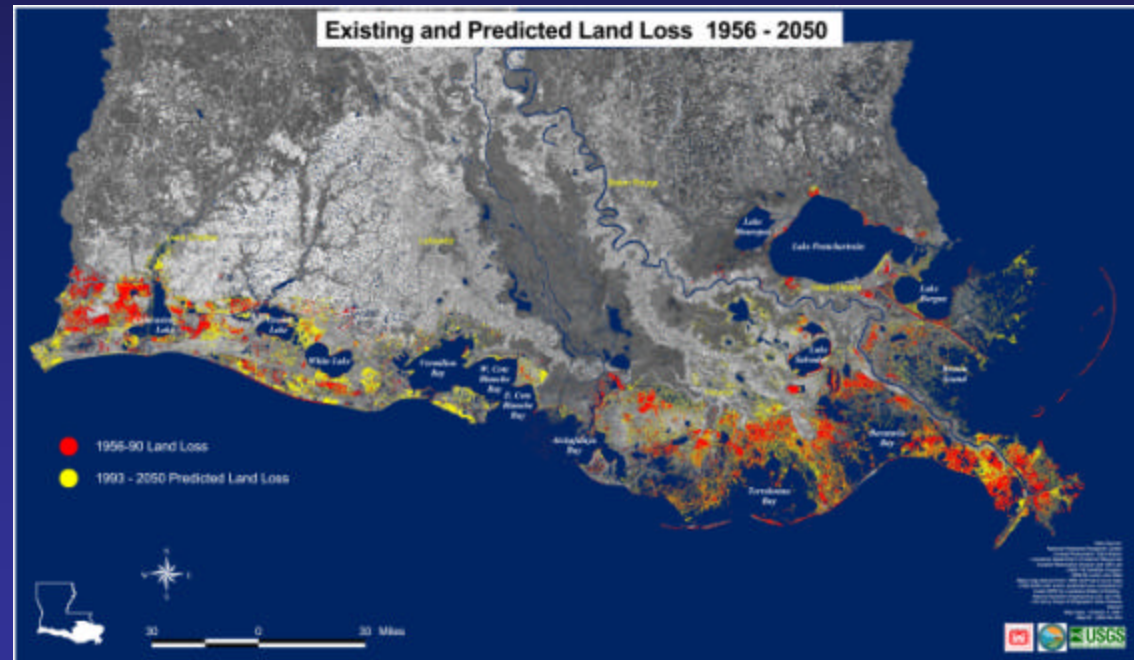
Value Added: Multiple Applications

- Improved capability to evaluate Coast 2050 Habitat Objectives



LCA System-wide Assessment and Monitoring Plan (SWAMP)

- A component of the LCA Science Plan
 - Includes:
 - CRMS-Wetlands
 - CRMS-Waters
 - Near Coastal Waters (hypoxia)
 - Barrier Islands



Value Added: Unexpected Events

- Provide more useful information to evaluate impacts and mitigation for adverse climatic conditions, such as the Brown Marsh phenomenon, severe drought and tropical storms and hurricanes.



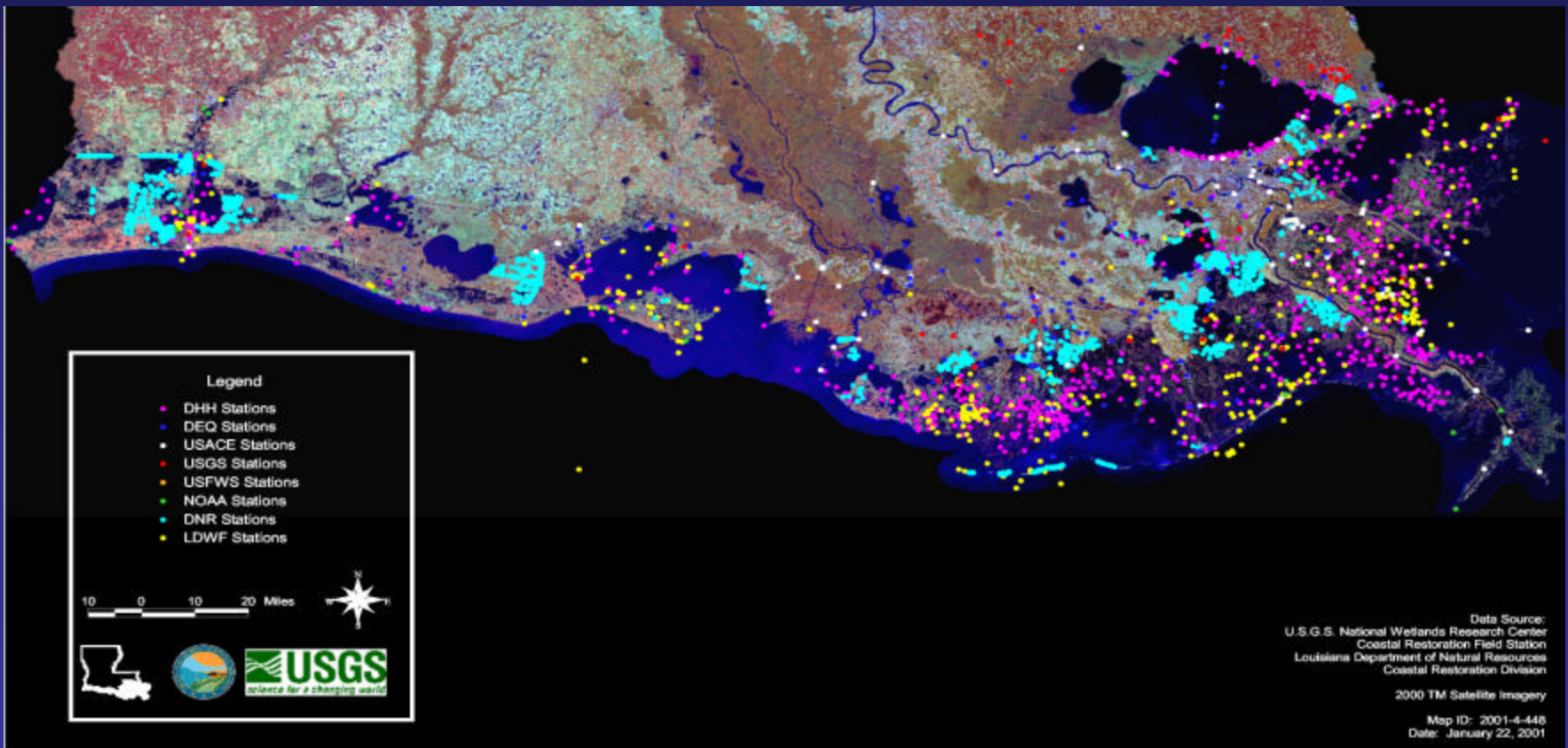
Drought effects at Mud Lake



Brown Marsh in coastal Louisiana

Value Added: Design Infrastructure

- Classify coastal wetlands into discrete basins, and into vegetation types within each basin.
- Provides a framework for state-wide Comprehensive Coast-wide Monitoring System to unify monitoring of state agencies in Louisiana.



Value Added: Information exchange

CRMS-Wetlands will provide:

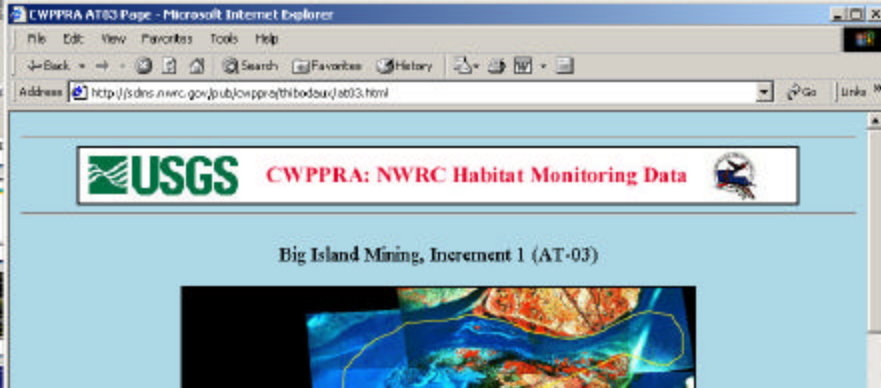
- CRMS-Wetlands data from each site will be available to project managers, landowners, academia, planners, LCA modelers, etc. on the internet at www.saveLAwetlands.org.

The screenshot displays a web browser window showing the Louisiana Department of Natural Resources website. The website features the state seal, the text "Louisiana Department of Natural Resources", "Office of Coastal Restoration and Management", "Coastal Restoration Division", and "James 'Randy' Hanchey, Asst. Secretary". It also includes a search bar, a "Related Sites" section, and a "Join us in the fight to turn back the tide and save this American treasure." message. Below this, it states "The Coastal Restoration Division develops, implements, and monitors coastal vegetated wetland restoration, creation and conservation measures. It performs engineering, planning, and monitoring functions essential to successful development and implementation of wetland conservation and restoration plans and projects as directed by the Coastal Wetlands Conservation and Restoration Plan." At the bottom, there are links for "CRD Projects & Monitoring Data", "Press Releases", "Coast 2050 Initiative", and "Career Opportunities".

Overlaid on the website is a Microsoft Excel spreadsheet titled "Microsoft Excel - cr20data.xls". The spreadsheet contains data for various wetland sites, with columns for Day, Year, Time, Depth, Staff Gauge, Bottom Temp, Surface Temp, Bottom SP, Surface SP, Bottom Salinity, and Surface Salinity. The data is organized into rows for different sites and dates.

Below the Excel spreadsheet, another web browser window is visible, showing a document titled "THREE-YEAR COMPREHENSIVE MONITORING REPORT" for the "BAYOU LABRANCHE WETLAND RESTORATION PROJECT PO-17". The document includes a "First Priority List Beneficial Use of Designated Natural Project of the Coastal Wetlands Planning, Protection, and Restoration Act (Public Law 101-646)" and a "Data Transition" section.

Value Added: Information exchange



Data

	Data Available for Project AT-03			
	Year	File	File Size	Metadata
Mosaic Photography	1994	at03_94p.jpg	3.50MB	
	1997	at03_97p.jpg	6.33MB	
Land/Water Analysis	1994	Not Planned	0MB	
	1997	Not Planned	0MB	
Habitat	1994	h94p.e00	1.74MB	
	1997	h97p.e00	4.57MB	
	1997	h97r.e00	4.57MB	
	1998	at03_98ph.e00	4.57MB	
	1998	at03_98ch.e00	4.57MB	
	reference			

For further information about data, email william.jones@usgs.gov

Maps available for Project AT-03

To download,
For Netscape browsers, click on the left mouse button and
For Explorer browsers, click on the right mouse button

CWPPRA AT03 Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://sdms.nwrc.gov/pub/cwppra/thibodaux/at03.html>

[Big Island Mining \(AT-03\) Habitat Analysis: 1994 \(8.5 x 11\)](#)

[Big Island Mining \(AT-03\) Habitat Analysis: 1997 \(8.5 x 11\)](#)

[Big Island Mining \(AT-03\) Habitat Analysis: 1998 \(8.5 x 11\)](#)

[Big Island Mining \(AT-03\) 1994 Photomosaic \(8.5 x 11\)](#)

[Big Island Mining \(AT-03\) 1997 Photomosaic \(8.5 x 11\)](#)

[Big Island Mining \(AT-03\) 1998 Photomosaic \(8.5 x 11\)](#)

Monitoring Plan

To download the monitoring plan for this project, click on [Monitoring Plan](#). To view, use [Adobe Acrobat Reader](#)

[Return to Thibodaux Office Page](#)

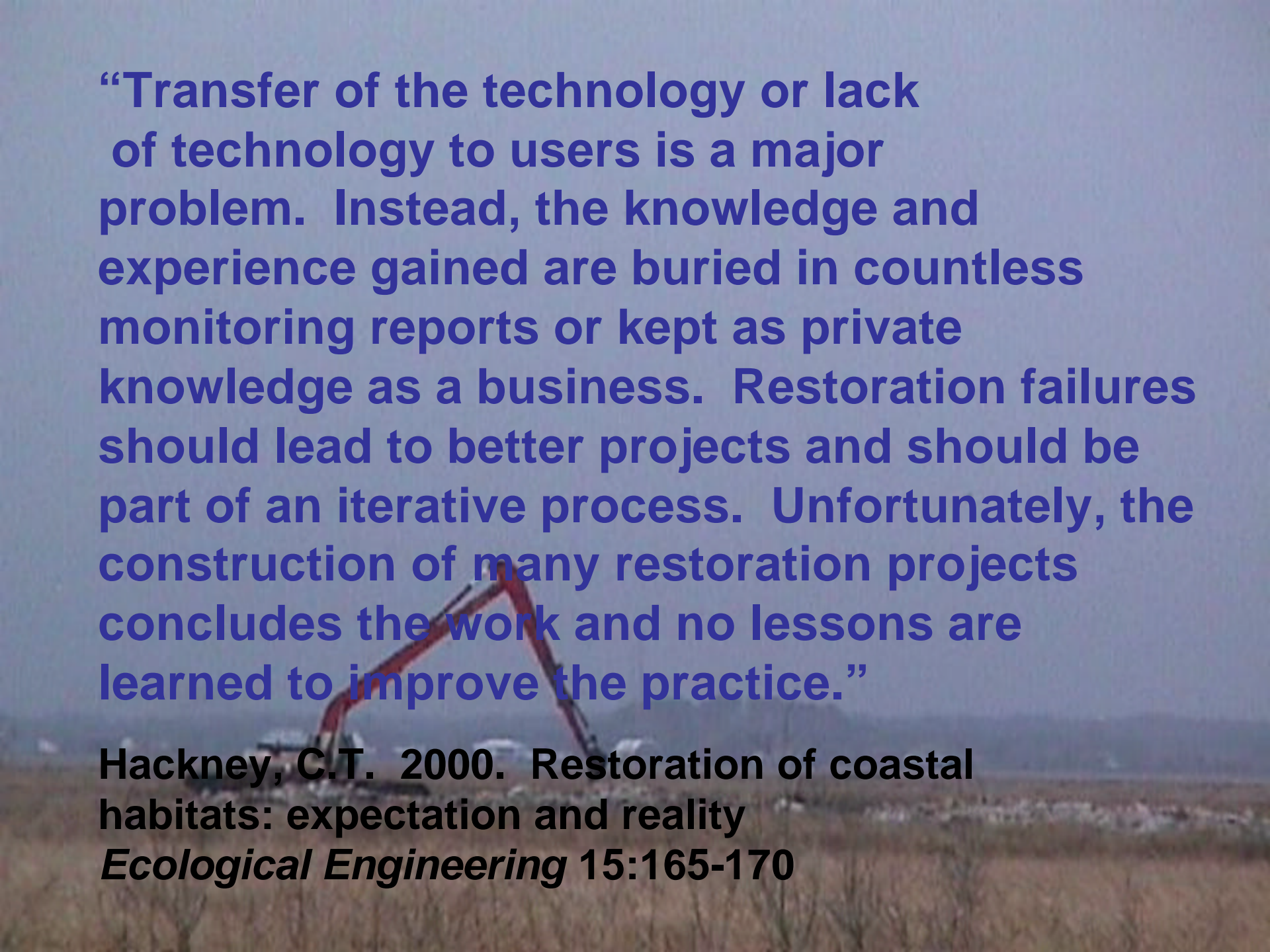
sdms.nwrc.gov/pub/cwppra/cwppra2.html

Reporting Changes for 2004 Operation, Maintenance, and Monitoring Reports



Value-Added Monitoring

- **Project Planning**
- **Engineering and Design**
- **Operations and Maintenance**
- **Adaptive Management**
- **Hydrologic and ecosystem modeling**
- **LCA Science and Technology Plan (SWAMP)**
- **Design structure for adding cost-sharing partners and collaborative wetland studies and research**
- **Anomalous events**
- **Make data and information available**

A red excavator is visible in the background, working in a field. The excavator's arm is extended, and it appears to be digging or moving earth. The field is covered with dry, brownish vegetation. In the distance, there are hills or mountains under a clear sky.

“Transfer of the technology or lack of technology to users is a major problem. Instead, the knowledge and experience gained are buried in countless monitoring reports or kept as private knowledge as a business. Restoration failures should lead to better projects and should be part of an iterative process. Unfortunately, the construction of many restoration projects concludes the work and no lessons are learned to improve the practice.”

**Hackney, C.T. 2000. Restoration of coastal habitats: expectation and reality
Ecological Engineering 15:165-170**



FOR MORE INFORMATION:

www.saveLAwetlands.org

www.LACoast.gov

www.AmericasWetland.com

LDNR Coastal Restoration Division

CWPPRA

America's Wetland campaign

Restoration Project Types



TS Isidore and H Lili: TV-04 Cote Blanche

