Cypress Restoration of the Bayou Bienvenue Central Wetland Unit

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Wetlands, Wastewater Infrastructure, and the Recovery

- Long Term Planning and Recovery of Critical Infrastructure

- Wastewater Infrastructure Design Using Wetland Assimilation
  - Multiple Benefit / Multiple Stakeholder Approach
  - Enhance 28,000 Acres of Cypress Wetlands
  - Protect Orleans and St. Bernard Parishes
In the presence of extraordinary actuality, consciousness takes the place of imagination

Wallace Stevens
East Bank Sewage Treatment Plant

- Urgent Need for Restoration
- FEMA - Pre-Katrina Conditions
- 2 Year Time Frame for Restoration
- Estimated $70 Million for Restoration
Facing the Future

- Population?
- Solids
- Nutrients
- Mitigation
- 50% Less Revenue
Driving Factors of Recovery

- Public Safety
- Economic Recovery
- Multi-Objective Management
  - Hazard Mitigation Objectives Coincide with Stakeholder Objectives
  - Multiple Benefit
Sustainability

- Disaster - The ability to survive future disasters with minimum loss of life and property
  - Hazard Mitigation

- Environment - Meet the needs of the present without compromising the ability of future generations to meet their own needs
  - Global Climate Change
  - Energy
Global Climate Change

- Adaptation of vulnerable human systems.
- Need to adapt to an already-changing climate
  - Relative Sea Level Rise (RSLR)
  - Increased Tropical Storms
HUBBERT’S PEAK

![Graph showing Hubbert's Peak phenomenon]
Peak Oil – The Growing Gap

Discovery

Consumption

Billions of Barrels/Year


Projected Discoveries
Sewerage & Water Board of New Orleans

BETSY
CAMILLE
ANDREW
KATRINA
AUDREY
CAT 5 LEVEES
MARSH CREATION USING PIPELINES
Adaptation Measures & the Poor

- Enhanced natural resource measures benefit the poor more than large scale structural measures!
- Poor are the most dependent on natural resources.
- Poor tend to live in more vulnerable locations.

Source: IDNDR
NATURE’S SURGE BUSTER

Scientists with the LSU Hurricane Center say Hurricane Katrina provided graphic proof of how marshes and wooded wetlands provide natural armor that can save levees during storms.

WETLANDS TAKE THE BRUNT OF THE STORM

The 20-Arpent Canal levee remained standing. The difference was the buffer of marsh and wooded wetlands, researchers said.

WITHOUT WETLANDS, LEVEES ARE PUMMELED

Large sections of the MR-Go levee that had little or no wetlands separating them from Lake Borgne disintegrated.
Environment Is Our Best Asset

- Wetlands most productive ecosystems.
- Will contribute proportionally more to the human economy in the future.
- Offset impacts of global climate change
  - Relative Sea Level Rise
  - Increased Tropical Storms
- As fossil fuels become scarce, natural energies will become more important.
Sewerage & Water Board of New Orleans

10 M SPOT Satellite Image: 2 Sept 2005

Lake Borgne
Miss River Gulf Outlet

Treatment Plant
Destroyed Wetlands
Potential Restoration Area

French Quarter

DeWitt Braud and Rob Cunningham
WETLAND ASSIMILATION

Secondary Treatment-Disinfected
Fertilizer
Freshwater
Cheaper-Natural Energies
Restored Wetlands
Storm Protection
Wetland Assimilation

- **Waste Assimilative Capacity**
- Natural systems have the ability to “clean” waste up to a certain amount.
- Determined in feasibility
Tertiary Treatment

- TMDL Limits in 2010
- New Infrastructure
- Operation and Maintenance
- Avoid New Spending
Thibodaux Wetland Enhancement

1992

2000

2003

Sewerage & Water Board of New Orleans
Cypress Restoration of Bayou Bienvenue Central Wetland Unit
St. Bernard Parish
ST BERNARD PARISH. CYPRESS SWAMP AT OUTFALL OF THE GORE PUMPING STATION
Process

- Funding
- Task Force
- Feasibility
- Design
- Implementation
Funding

- **Delta Regional Authority**
  - $400,000
  - Feasibility and Preliminary Design

- **Coastal Impact Assistance Program (CIAP)**
  - $10 Million
  - Phase I Implementation

- **Implementation Funding Gap**
  - $30 Million
The Nation benefits from the Louisiana seafood, oil & gas, and the port, at the expense of our environment!

Junior Rodriguez
St. Bernard Parish President
Carbon Sequestration

- Green plants remove (sequester) carbon from the atmosphere through photosynthesis to make biomass in the form of roots, stems, and foliage.
Carbon Sequestration

- **Biosequestration** - above ground biomass in wood $1\text{ kg/m}^2$ per year

- **Carbon Burial and Sequestration Through Wetland Assimilation** - $4.6 \text{ kg/m}^2$ per year

- **Central Wetland Unit Assimilation/ Year**
  (15,000 acres)

- **300,000 Tons Carbon Sequestration /Yr**

- **Equivalent to 200,000 Automobiles /Yr**

Source: Day et. al & EPA
Cypress Restoration of Bayou Bienvenue Central Wetland Unit
Louisiana Wetland Loss

- 80% of the Nation's Wetland Loss is in Louisiana
- 34 Square Miles of Marsh Loss / Year
- 88,000 Tons of Carbon Sequestration
  Equivalent to Adding 60,000 Automobiles This Year
- 700 Square Miles of Marsh Loss in 50 Years
- 1.8 Million Tons of Carbon Sequestration
  1.2 Million Automobiles-Year


Sewerage & Water Board of New Orleans
Greenhouse Gas Regulation

- Under development by the State of California
- Congress is debating the design of a Federal program
- Develop policy that benefits Louisiana in the greenhouse gas offset market!
- Regional Greenhouse Gas Initiative
Multiple Benefits

- Restore Critical Infrastructure
- Restore 10,000-28,000 Acres of Wetlands
- Improve Water Quality
- Protect Orleans and St. Bernard Parish
- Protect Public Health
- Sequester Carbon
- Contribute to the Economy
- Financial and Energy Savings
- Protect the Culture

Sewerage & Water Board of New Orleans
World Model

- Size
- Recovery
- Policy
- Port Cities
  - River-Transportation
  - Sea Level Rise
  - Increased Tropical Storms
Recovery Recognition
S&W

- Innovative
- Environmental
- Economic
Waste is a Resource
Out of Place
References

- [www.epa.gov/otaq/420f05004.htm](http://www.epa.gov/otaq/420f05004.htm)