The Multiple Benefits of Restored Wetlands for the Sustainability of New Orleans

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Climate Change Adaptation and Restoration in New Orleans

- Mississippi Delta and New Orleans
- Hurricane Katrina Lessons Learned
- Importance of wetlands
- Multiple lines of defense strategy
- Wastewater infrastructure design using wetland assimilation
Over the last 5,000 years, switching of the Mississippi River channel formed the present day delta.
Mississippi River Delta Land Losses Today
NEW ORLEANS AT RISK!
In the presence of extraordinary actuality, consciousness takes the place of imagination

Wallace Stevens
Facing the Future

- Multi-Billion Dollar Deficits
- Significantly Decreased Staff
- Higher Operation Costs
- 45% Less Revenue
- Largest Emitter in the City
- Nutrient Limits
- FEMA Policies Designed to Restore Infrastructure to Pre-Katrina Conditions
Driving Factors of Recovery

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

- **Resilience** the capacity to absorb the shocks of extreme events without disrupting the economy, natural resources, and social systems of a community
  - A measure of the vulnerability and adaptive capacity of a community
  - Depends on physical infrastructure, social infrastructure, and the natural environment
- Adaptation of vulnerable human and ecological systems
  - Integrate human society with natural environment
- Need to adapt to an already-changing climate
  - Hurricane protection
  - Off-set relative sea level rise (RSLR)
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.

WITHOUT WETLANDS, LEVEES ARE PUMMELED

Large sections of the MR-GO levee that had little or no wetlands separating them from Lake Borgne disintegrated.

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.

KATRINA’S WESTERN EYE WALL

KATRINA’S PATH

STAFF GRAPHIC BY DAN SWENSON

Sources: LSU, NASA, staff research
PEARL RIVER – (EYE OF KATRINA)

INTACT CYPRESS

FALLEN OAKS
Multiple Lines of Defense Strategy

• A planning methodology that integrates manmade and natural defenses which directly impede storm surge or reduce storm damage.

• Targeted coastal restoration for flood protection
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: ISDR
The Multiple Lines of Defense Strategy

- A healthy, storm-buffering coast will support an economy sufficient to justify future investments.
  - Avoid entrenched poverty

- Underlying support for this economy is a culturally rich, blue-collar workforce and a reliance on natural capital (i.e., goods and services provided by ecosystems).

- Green Jobs and Ecosystem Services
  - Modest restoration investments
Key adaptation technique is restoration of coastal wetlands

Wetland Assimilation
Effluent discharged into wetlands:

- Increases accretion to offset RSLR
- Carbon sequestration mitigates climate change
- Hurricane surge protection and floodwater retention increases resiliency of the built environment
- Freshwater in effluent protects against drought and buffers saltwater intrusion
- Numerous social and economic benefits
Enhanced Accretion

(Rybczyk et al. 2002)
Multi-Benefit Adaptation

- Increased resiliency of the built environment
  - Surge protection
  - Floodwater retention

- Increased resilience of the economy
  - Enhanced natural capital
  - Carbon sequestration

- Increase wetlands’ adaptive capacity
  - Freshwater - drought and saltwater intrusion
  - Increased vegetative productivity
  - Accretion rates to off-set RSLR
Thank you

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