Adaptation Decision Making in New Orleans: Wetland Assimilation Feasibility Planning

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Cypress Restoration of Bayou Bienvenue Central Wetland Unit
Multi-Disciplinary Decision Model

**Goal:** Determine trade-offs and priorities of stakeholders while holistically evaluating wetland restoration project.

- ecological and engineering design
- sustainable development
- urban planning
- public health
- disaster management

**Stakeholders:**
- Appointed and elected officials
- Science and technical experts
- Citizen stakeholders
- Environmental advocates
- Government regulatory groups
- Business or industry stakeholders
Stakeholder Group Trade-Offs

- **Technical**: Priority on community design for climate change adaptation
- **Regulatory**: Highest priority on direct public health impacts
- **Environmental**: Community design should focus on natural environment
- **Industry**: Highest priority on *Disaster Resilience*
- **Citizens**: Priority on protecting their community
- **Appointed**: Need to educate appointed and elected officials to think holistically
Consensus of All Stakeholders

Integrated all values into a decision set of structured consensus trade-offs

- Priority on community design for climate change adaptation
  *Disturbance Regulation, Climate Change, Land Use, and Property Damage*

- Environmental parameters for design
  *Ecosystem Integrity, Habitat Enhancement, Water Quality, Compatibility*

- System will be disaster resilient
  *Disturbance Regulation, Resiliency, Reliability*

- Citizens priority on *Energy Dependence* is included

- *Implementation Factors* address institutional barriers

- *Risk Assessment* addresses direct public health impacts
The Reality: consequences of poor policy

- Lack of technical and financial capacity
  - Devastated infrastructure
  - Billions of dollars of deficits
  - Limited tax base
  - Overwhelmed staff

- Biggest obstacles
  - *Ability to Finance*
  - *Site Acquisition*
  - *Equity*
Questions?
Cypress Restoration of Bayou Bienvenue Central Wetland Unit
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 impacts
Technical Stakeholder Group

Engineers, Ecologists, Environmental Scientists, Operations, Management

- Priority on community design for climate change adaptation
  - *Disturbance Regulation-1, Climate Change-2,*
  - *Land Use,* and *Property Damage and Value*

- Understanding of institutional barriers
  - *Ability to Finance* and *Implementation Factors*

- No priority on sub objectives linked to public health
  - *Risk Management and Hazardous Sources*

- Least amount of priority on *Disaster Resilience*
Regulatory Stakeholder Group

Louisiana Department of Environmental Quality (LDEQ)
Louisiana Department of Natural Resources (LDNR) CIAP

- Highest priority on direct public health impacts
  - Risk Assessment, Risk Management
  - Regulatory*

- Prioritized relationship
  - Property Damage and Value and Land Use

- No priority on Climate Change < 1%

- Aware of shortfalls in funding
  - Ability to Finance
Environmental Stakeholder Group

Sierra Club, Tulane Environmental Law Clinic, Lake Pontchartrain Basin

- Highest Agreement – Focused Agenda

- No priority on *Economics*

- Priority on public health
  - *Risk Assessment-3, Hazardous Sources-10*

- Community design should focus on natural environment
  - *Land Use-2* but not *Property Damage and Value*

- Prioritized *Ecosystem Services*
  - Only group familiar with this policy concept
Industry Stakeholder Group

Banking and Finance, Fishing, Tourism, Oil Refineries, Small Business

- Low level of agreement
  - Lack of technical knowledge on the project

- No priority on *Built Environment*
  - All six sub objectives in ten least important variables

- Highest priority on *Disaster Resilience*
  - Resiliency-1 and Flexibility/Adaptability*

- Highest priority on *Economics* of any stakeholder group
  - *Operation and Maintenance*, *Site Acquisition*
  - Hidden costs
Citizen Stakeholder Group

St. Bernard Citizen Recovery, Holy Cross Neighborhood Association,

- No priority on *Economics* or *Technical*

- Priority on protecting their community
  - *Resiliency, Disturbance Regulation, Reliability, Property Damage*

- *Hazardous Sources* a priority
  - Murphy Oil Spill
  - Environmental justice issues

- Only Stakeholder group to prioritize *Equity*

- Only stakeholder group to prioritize *Energy Dependence*
  - Rates increase as costs increase
Appointed Stakeholder Group
St. Bernard Parish, Orleans Parish, Southeast LA Flood Protection Authority

- 50% of importance in 4 attributes
  - Ecosystem Integrity, Disturbance Regulation, Habitat Enhancement, Water Quality

- What do simplified values mean towards funding?
  - 4 of 6 Economic sub objectives in 10 least important variables!
  - Less likely to advocate for funding.

- Need to educate appointed and elected officials to think holistically.

- Property Damage and Value, and Land Use together 4% of priority.
  - Community design and vulnerability?

- Highest priority on Disaster Resilience of any stakeholder group.
  - Centralization/Decentralization
Technical Major Objective

- **Implementation Factors**
  - Institutional barriers, proven treatment technology, regulatory and legal complexity, and siting.
  - Citizen and Appointed stakeholders in 10 least important variables.

- **Direct and indirect public health aspects not valued.**
  - Priority of Regulatory and Environmental stakeholders
  - Require health impact assessments
  - Optimize direct and indirect health impacts of urban environments
Economics Major Objective

- **Ability to Finance**
  - Technical and Regulatory stakeholders aware.
  - Appointed, Citizen, Industry, and Environmental stakeholders unaware:
    - Financial and technical capacity needs
    - Greater transparency

- **Operation and Maintenance & Site Acquisition**
  - Industry stakeholders brought to light hidden costs
  - Are Regulatory and Technical stakeholders providing all the information to decision-makers?
Environment Major Objective

- **Climate Change**
  - Technical-2\(^{nd}\) and Citizens-7\(^{th}\).
  - Appointed-17\(^{th}\) and Environmental 15\(^{th}\).
  - Industry and Regulatory in 10 least important variables.
    - Technical and Citizens have little influence.
    - Business as usual decision-making leaves us where?

- **Ecosystem Services**
  - Benefits to human societies by natural ecosystems-not a priority.
  - *Disturbance Regulation* valued by all groups.
  - Quantify locally important ecosystem services
  - Educate – Appointed and Regulatory
Built Environment Major Objective

- **Land Use Planning**
  - Well designed community favors health and quality of life.
  - Characteristics of Built Environment on Vulnerability
    - Flooded areas converted to green space or hazard mitigated.
  - Climate change and disturbance regulation on land use and property damage.
    - Appointed <4%.
    - Have Regulatory and Technical stakeholders tried to persuade appointed officials?
    - Citizens- *Property Damage and Value*-6<sup>th</sup> but *Land Use* less.
    - ECONOMICS!
  - Assist decision-makers to make hard decisions
    - Hazard Mitigation Grant Program (HMGP)
    - Refine policies
Built Environment Major Objective

- Energy Dependence
  - Will the region be prepared for an energy crisis?
    - NO!
      - Only a priority of citizens

- Equity
  - Listed in the 10 least important variables for all stakeholder groups but citizens
  - Indicative of the region
  - Essential for implementation
Disaster Resilience Major Objective

- Most valued for improving physical, mental, and social well-being of the public
- *Disturbance Regulation*
  - Ecosystems valued for adaptive capacity
- *Hazardous Source*
  - Potential to release hazardous products
  - Respond to a spill
- *Resilience*
  - Resistance to storm surge
  - Time required to restore operation