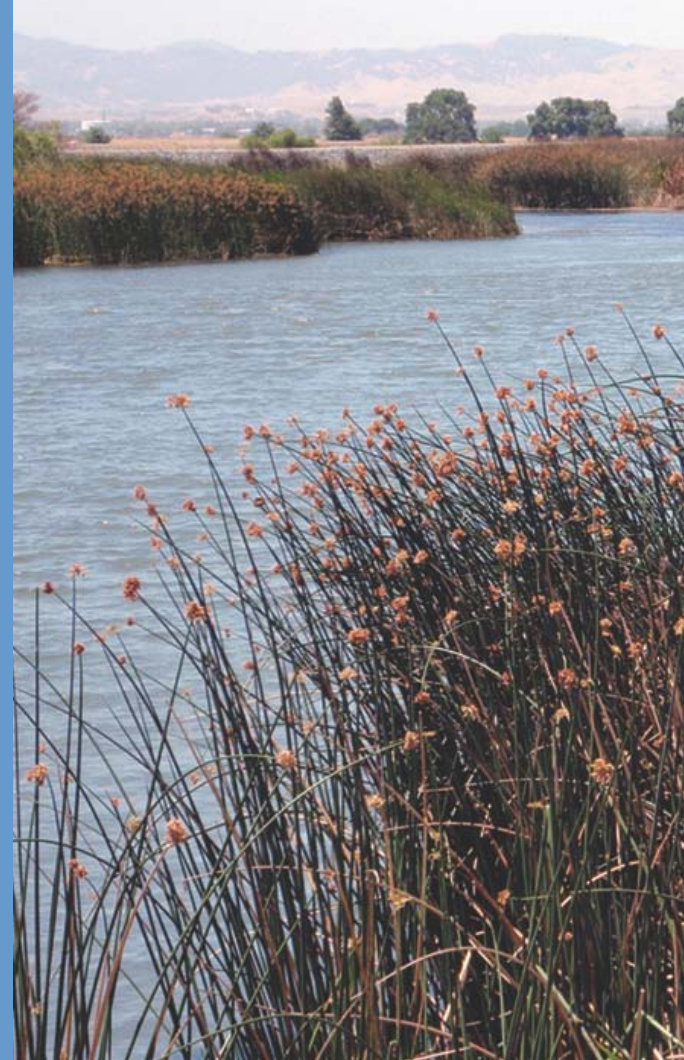


Addressing the Science and Policy Gaps to Support a National Protocol for Tidal Wetland Projects

Steve Crooks and Jette Findsen

November 15, 2010

5th National Conference on Coastal and Estuarine Habitat
Restoration



Protocol Development Process

- **Climate Action Reserve – Tidal Wetlands Issues Paper**
 - Need for science, economics and policy coordination
- **Team to lead this process**
 - Restore America's Estuaries and partners
 - Blue Ribbon Panel – action plan and guidance
- **Next Steps**
 - Working groups – gap filling
 - Advisory and Resources Group – implementation
 - Science Community Network – capacity and coordination
 - Demonstration Projects – proof of concept
 - Protocol Development
 - Registries

- Philip Williams and Associates
- Science Applications International Corporation
- California Coastal Conservancy
- Louisiana Office of Coastal Protection and Restoration
- AECOM
- California Ocean Protection Council
- California Ocean Science Trust
- Center for Collaborative Policy
- CH2M HILL
- Climate Action Reserve
- Conservation Capital, LLC
- Environmental Defense Fund
- KBR
- The Nature Conservancy
- The San Francisco Foundation
- USDA Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Geological Survey

Blue Ribbon Panel

- **Stephen Crooks**, Philip Williams and Associates, Panel Chair
- **Tim Dillingham**, American Littoral Society
- **Abe Doherty**, California Coastal Conservancy and Ocean Protection Council
- **Jette Findsen**, Science Applications International Corporation
- **Kathryn Goldman**, Climate Action Reserve
- **Patrick Megonigal**, Smithsonian Environmental Research Center
- **Ken Newcombe**, C-Quest Capital
- **Lydia Olander**, Nicholas Institute for Environmental Policy Solutions, Duke University
- **Brad Raffle**, Conservation Capital, LLC
- **Debbie Reed**, DRD Associates
- **Diane Ross-Leech**, Pacific Gas and Electric Company
- **Eric T. Sundquist**, U.S. Geological Survey
- **Robert Twilley**, Louisiana Office of Coastal Protection and Restoration, and Louisiana State University
- **Michael Wara**, Stanford Law School

Blue Ribbon Panel Workshop

Outcomes – Panel Workshop

1. Develop common understanding of scientific info. and policy issues
2. Identify key areas of certainty and uncertainty
3. Recommend high priority elements to be included in a protocol
4. Recommend follow up work groups

Outcomes – Public Stakeholder Workshop

- Inform and engage stakeholders

BRP Workshop Highlights

- “Significant Opportunities, Significant Challenges”
- Need to quantify national GHG reduction potential
- Science is achievable
- Exclude projects required by law or regulation
- Allow for public sector involvement
- Projects must be ecologically appropriate
- Identified key issues and work groups

Key Protocol Development Issues

Real	Demonstrate that reductions have actually occurred
Additional	Ensure reductions result from activities that would not happen in the absence of a GHG market
Permanent	Mitigate risk of reversals Verify reductions ex-post
Verified	Provide for independent verification that emission reports are free of material misstatements
Owned unambiguously	Ownership of GHG reductions must be clear
Not harmful	Avoid negative externalities
Practicality	Minimize project implementation barriers

Key Protocol Development Issues

- US markets favor a standardized approach to crediting offsets
 - Eligibility and additionality
 - GHG quantification and monitoring
 - Applicable to multiple projects within sector
- The standardized criteria are developed by the registry
 - High initial resource investment to establish methodology

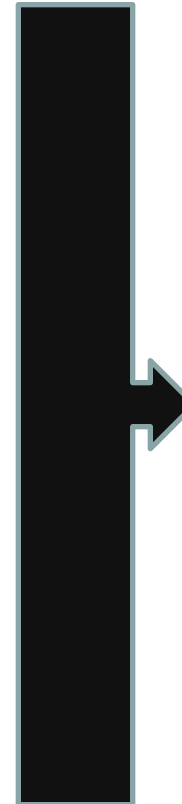
Blue Ribbon Panel Recommendations

Foundational Issues (4)

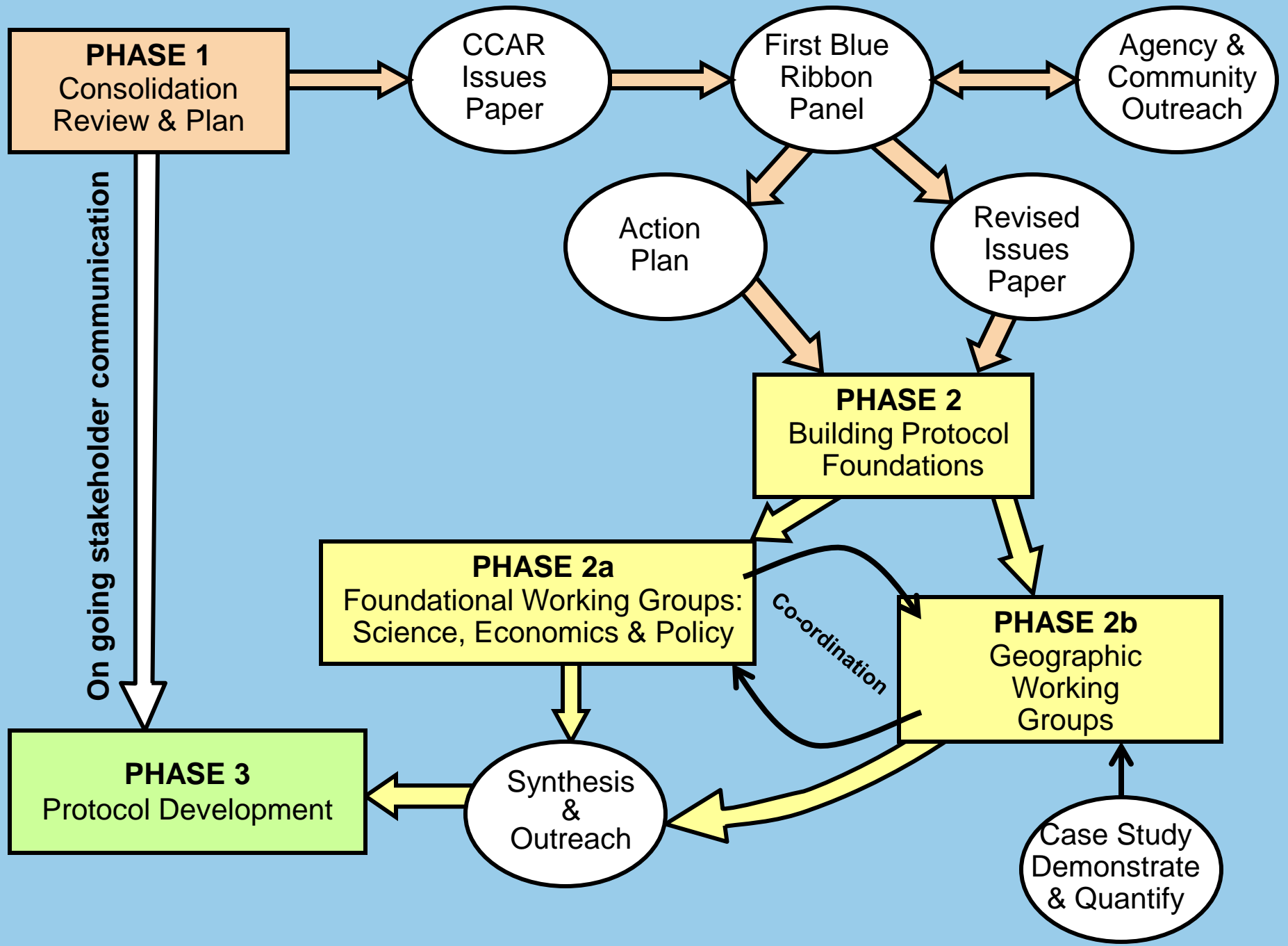
- Defining Project Types
- Eligibility
- Quantifying GHG Reductions
- Permanence

Regional Case Studies (3)

- Managed (Tidal) Freshwater Marsh
- Salt Marsh
- Mississippi Delta



Action Plan



Foundational Issues – Project Definitions

- Yet to be fully defined:
 - Avoided loss,
 - Restoration,
 - Management,
 - Creation
- Defining project boundaries

Foundational Issues - Eligibility

- Regulatory framework for wetlands projects
- Data on business as usual (BAU) practices
- Options for standardized test to screen out BAU projects
- Projects on public lands
- Mixed public/private funding of projects
- Economic feasibility of project types
- Environmental benefits/criteria

Foundational Issues – Quantifying GHG Reductions

- Soil Carbon, Methane (CH_4), Nitrous Oxide (N_2O), Carbon Dioxide (CO_2)
 - NCEAS Working Group on model development
- Baseline scenarios
 - Existing land use
- Monitoring
 - Characterize site variability
 - Decision tree
- Secondary effects

Foundational Issues - Permanence

- Risk of project reversals
 - Economic and regulatory
 - Engineering
 - Sea level rise
- Integration with climate change adaptation
- Resilience and disturbance dynamics

Geographic Cases Studies

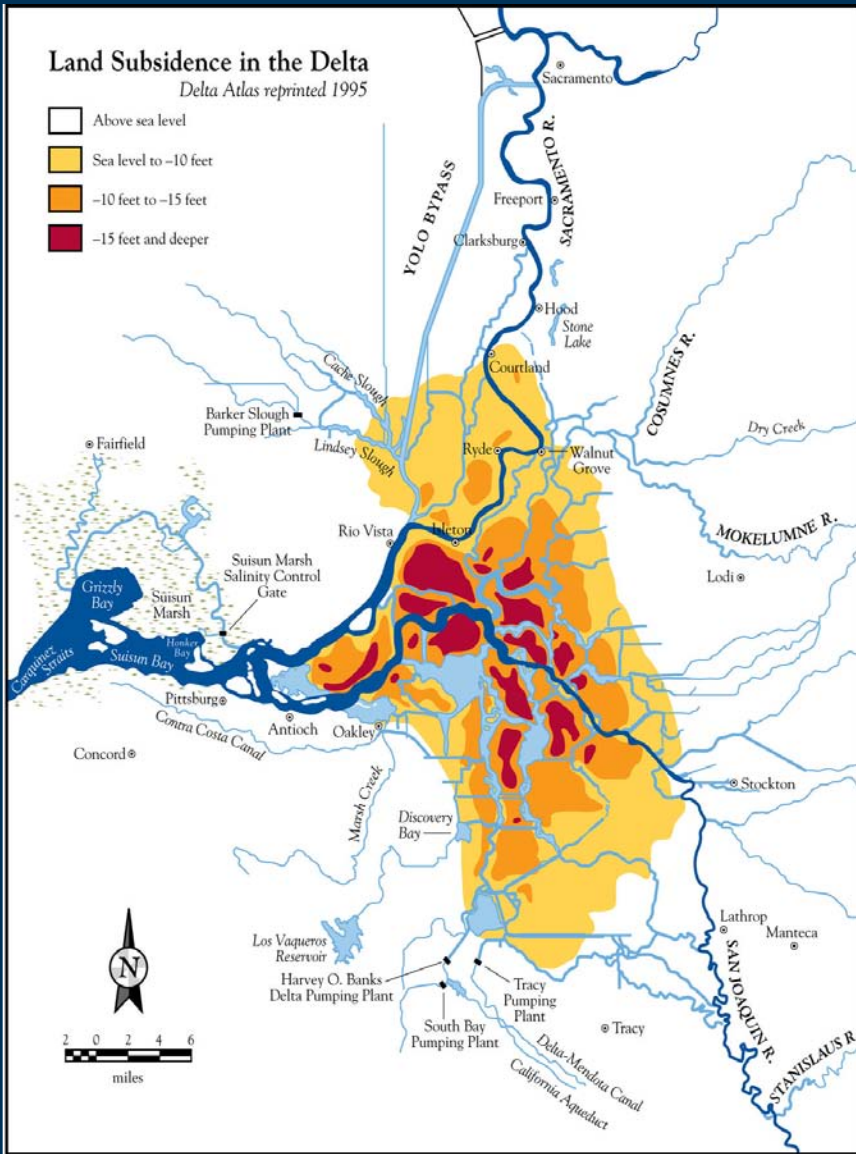
- **Managed (tidal) freshwater marshes**
 - Sacramento - San Joaquin Delta
 - High net CO₂e sequestration
- **Coastal salt marsh**
 - Good CO₂e sequestration potential (low methane)
 - Mitigation/ adaptation planning integration
- **Mississippi Delta**
 - Large avoided loss and sequestration potential
 - complex
- **(Global)**
 - Mangroves
 - Seagrass

Sacramento San Joaquin Delta

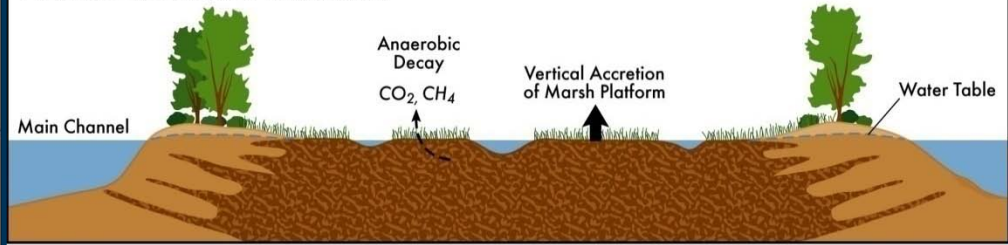
Land Subsidence in the Delta

Delta Atlas reprinted 1995

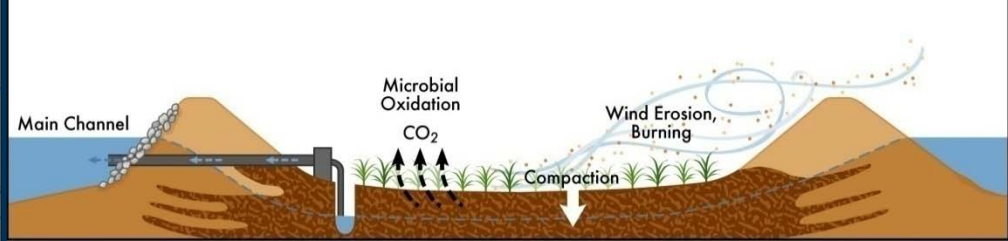
- Above sea level
- Sea level to -10 feet
- 10 feet to -15 feet
- 15 feet and deeper



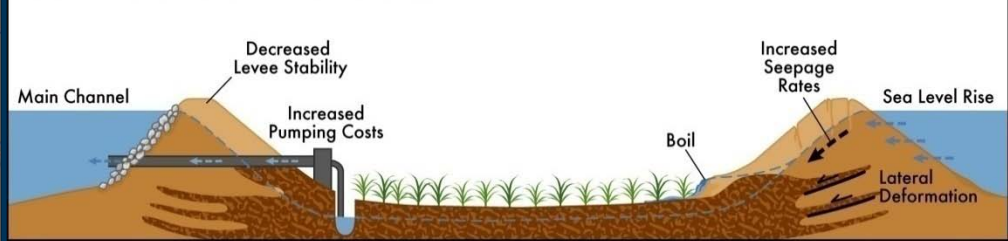
Pre-1880: Freshwater Tidal Marsh



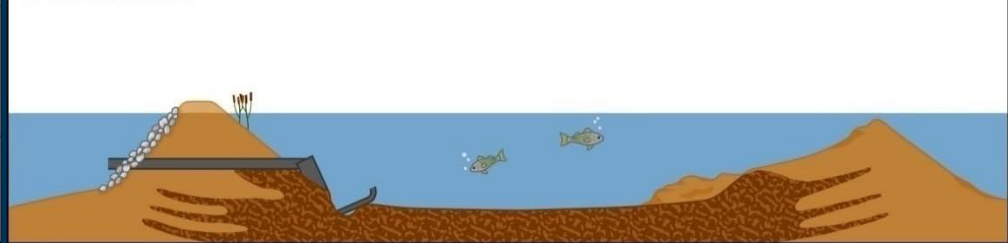
1900's: Elevation Loss



2000's: Increased Levee Maintenance



or Levee Failure



Salt Marshes

Mix organic and mineral sediments

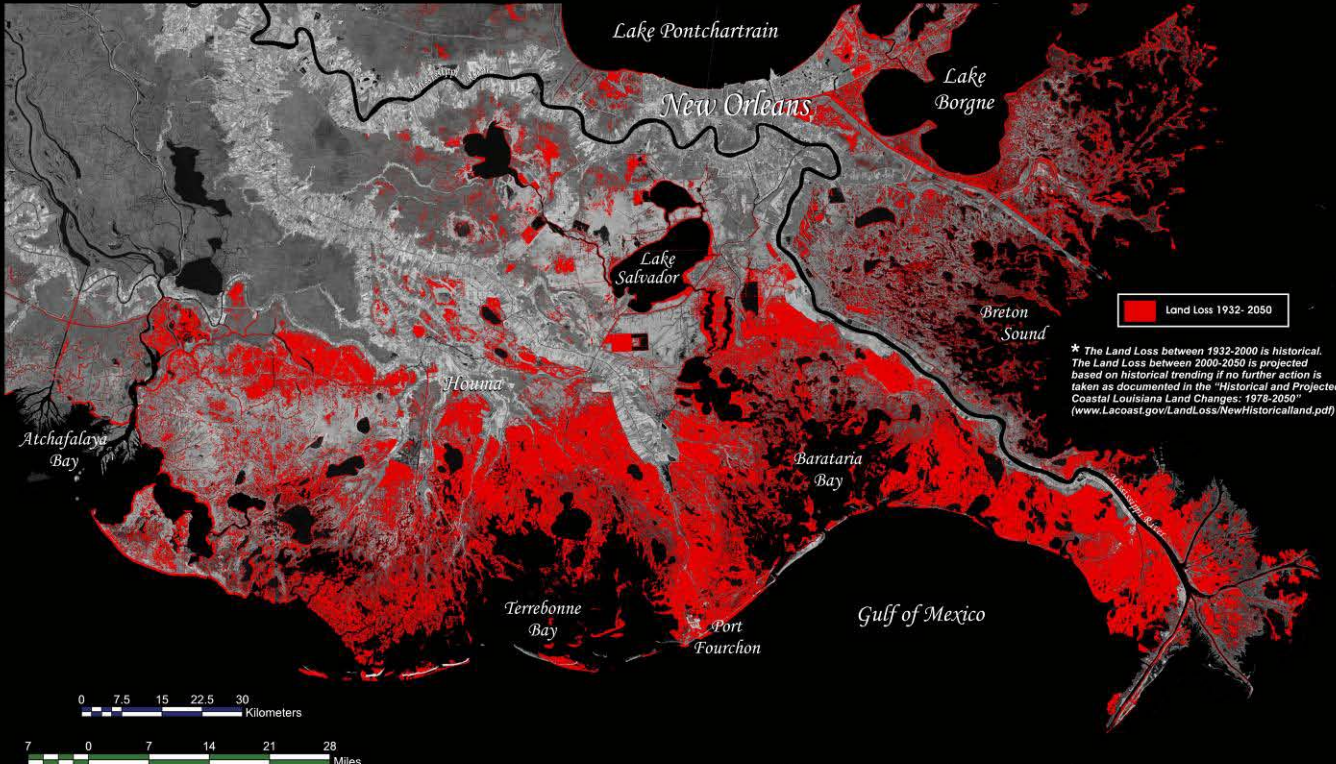


Large-scale Avoided Loss

Projected loss 50
years
450,000 acres

Southeast Louisiana Land Loss

**Historical and Projected Land Loss in the Deltaic Plain*



** The Land Loss between 1932-2000 is historical. The Land Loss between 2000-2050 is projected based on historical trending if no further action is taken as documented in the "Historical and Projected Coastal Louisiana Land Changes: 1978-2050" (www.LaCoast.gov/LandLoss/NewHistoricalLand.pdf)*

Coastal Louisiana has lost an average of 34 square miles of land, primarily marsh, per year for the last 50 years. From 1932 to 2000, coastal Louisiana lost 1,900 square miles of land, roughly an area the size of the state of Delaware. If nothing more is done to stop this land loss, Louisiana could potentially lose approximately 700 additional square miles of land, or an area about equal to the size of the greater Washington D.C.- Baltimore area, in the next 50 years.



For more information about the land loss analysis or to see an animated time series of wetland change, visit www.LaCoast.gov/LandLoss

Data Sources:
1932-1996 Land Change Analysis
U.S. Army Corps of Engineers, New Orleans

1956-1990 Land Change Analysis
1978-2050 Land Change Analysis
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Lafayette, LA

Prepared by:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Lafayette, LA

Map ID: USGS-NWRC 2005-16-0001
Map Date: December 6, 2004



Thank you!

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