

Wetland Restoration and Recovery from the Deepwater Horizon Oil Spill

Irv Mendelssohn

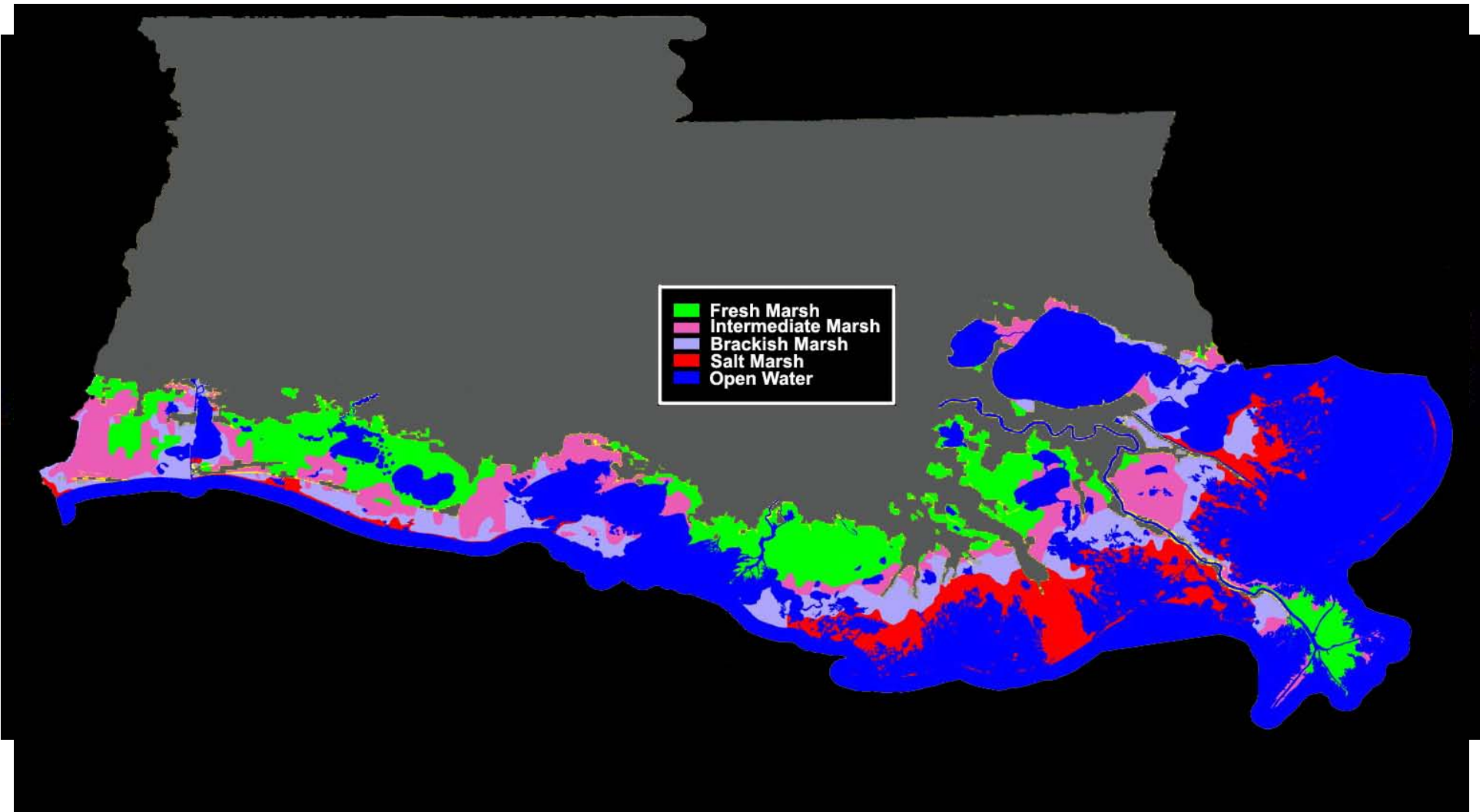
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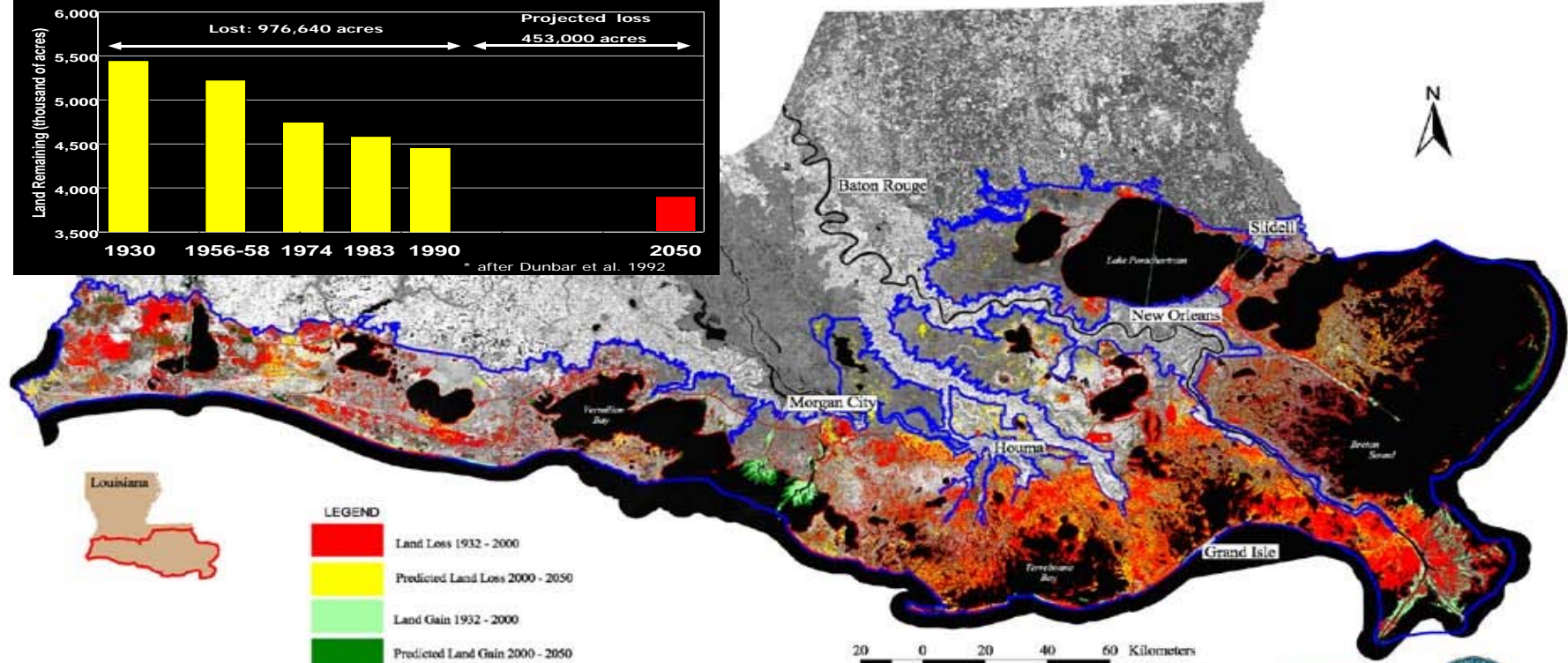
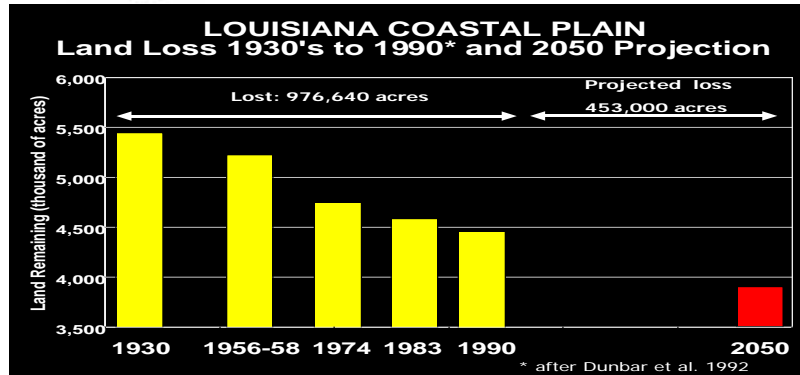
Mississippi River Delta Complex



Mississippi River Delta Complex

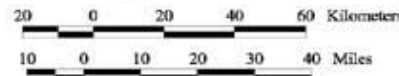


100+ Years of Land Change for Coastal Louisiana



- LEGEND**
- Land Loss 1932 - 2000
 - Predicted Land Loss 2000 - 2050
 - Land Gain 1932 - 2000
 - Predicted Land Gain 2000 - 2050
 - Louisiana Land Change Study Boundary

Background is 2000 Thematic Mapper panchromatic band.



LOUISIANA COASTAL LAND LOSS PROCESSES

NATURAL

- **Delta Cycle Process**
- **Subsidence**
- **Storm Impact**
- **Wave Erosion**
- **Eustacy**
- **Weather Extremes**

HUMAN-INDUCED

- **Flood Control**
- **Canal Dredging**
- **Altered Hydrology**
- **Impoundments**
- **Fluid Extraction-Induced Faulting**
- **Herbivory (Nutria)**

WETLAND FUNCTIONS AND SERVICES

A photograph of a wetland landscape. In the foreground, there is a body of water with a large flock of birds, possibly shorebirds, gathered in the shallow water. The water is surrounded by lush green vegetation, including tall grasses and reeds. In the background, the wetland extends to a flat horizon under a clear sky. The overall scene depicts a healthy, natural wetland environment.

FUNCTIONS

- Hydrological
- Biogeochemical
- Habitat
- Landscape

SERVICES

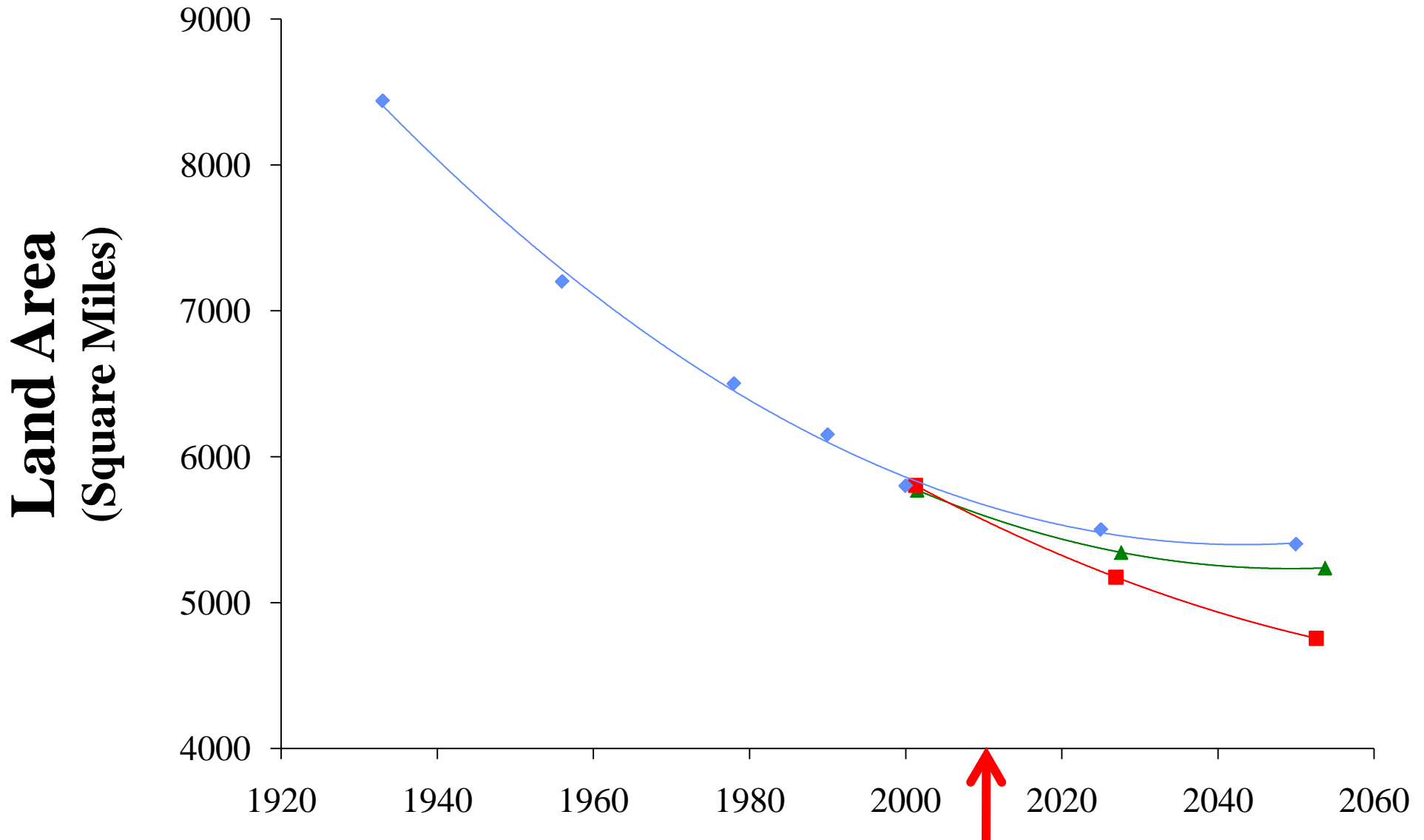
- Water Quality
- Carbon Sequestration
- Flood Reduction
- Fisheries Support
- Erosion Protection
- Recreation
- Aesthetics

The Spill Event



Photo Source: MSNBC

Historical and Projected Wetland Loss



Data Sources: US Army Corps & USGS

Cumulative SCAT Map

Habitat	Heavy	Moderate	Light	Very Light (<1%)	Trace	Total
Beach	48 ¹	21	44	27	6	147
Marsh	74	99	113	121	3	419
Other	10	9	5	3	1	28
Total	132	129	163	151	18	594

¹Miles of shoreline (Source: SCAT results, J. Michel et al.)

Image USDA Farm Service Agency
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

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135 km

Image © 2010 DigitalGlobe

lat 29.847507° lon -91.250063° elev 0 m

Eye alt 455.05 km

Oiled Shorelines around Bay Jimmy

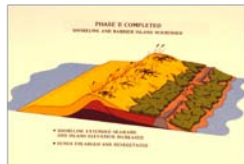
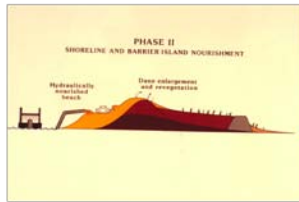


Factors Controlling Recovery of Wetland Vegetation



- Extent of Plant Mortality
 - Type of Oil
 - Concentration of Oil
 - Extent of Weathering
 - Degree of Plant Coverage
 - Oil Penetration into the Soil
 - Species of Plant Affected
- Hydro-geomorphic Setting
- Extent of Accelerated Erosion and Subsidence
- Cleanup Procedures

RESTORATION APPROACHES



- Marsh Creation (dedicated dredging)
- Shoreline Protection
- Freshwater Diversion
- Sediment Diversion
- Hydrologic Restoration
- Marsh Management
- Barrier Island/Shoreline Restoration
- Terracing
- Vegetative Plantings

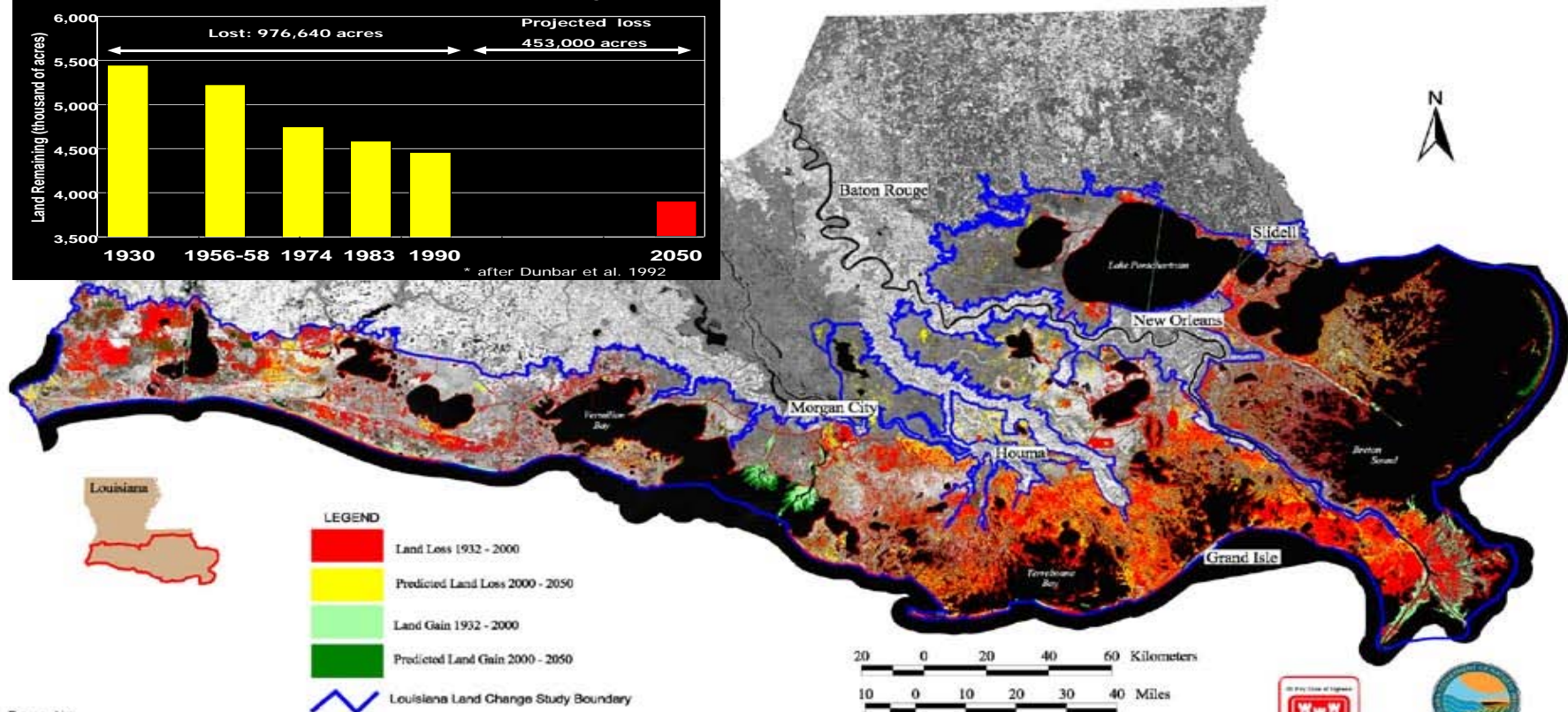
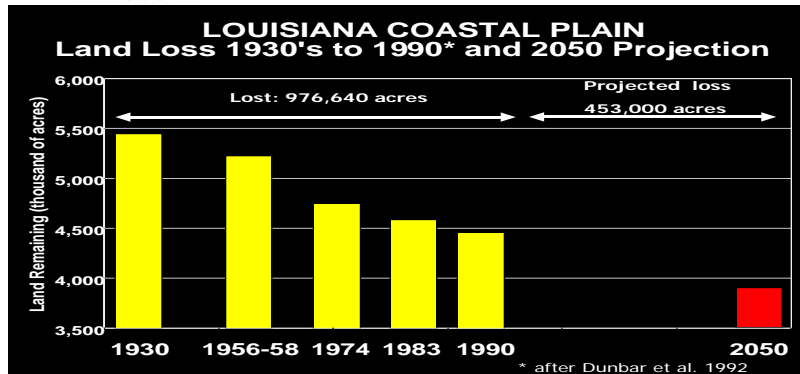
For General Information on Oil
Spill Impacts and Remediation:
see the YouTube video:

**Oil Spill Impacts on Coastal Wetlands of the
Mississippi River Delta**

Mississippi River Delta Complex



100+ Years of Land Change for Coastal Louisiana



Prepared by:
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National Wetlands Research Center
Lafayette, LA



Oil and Eroding Shorelines

