



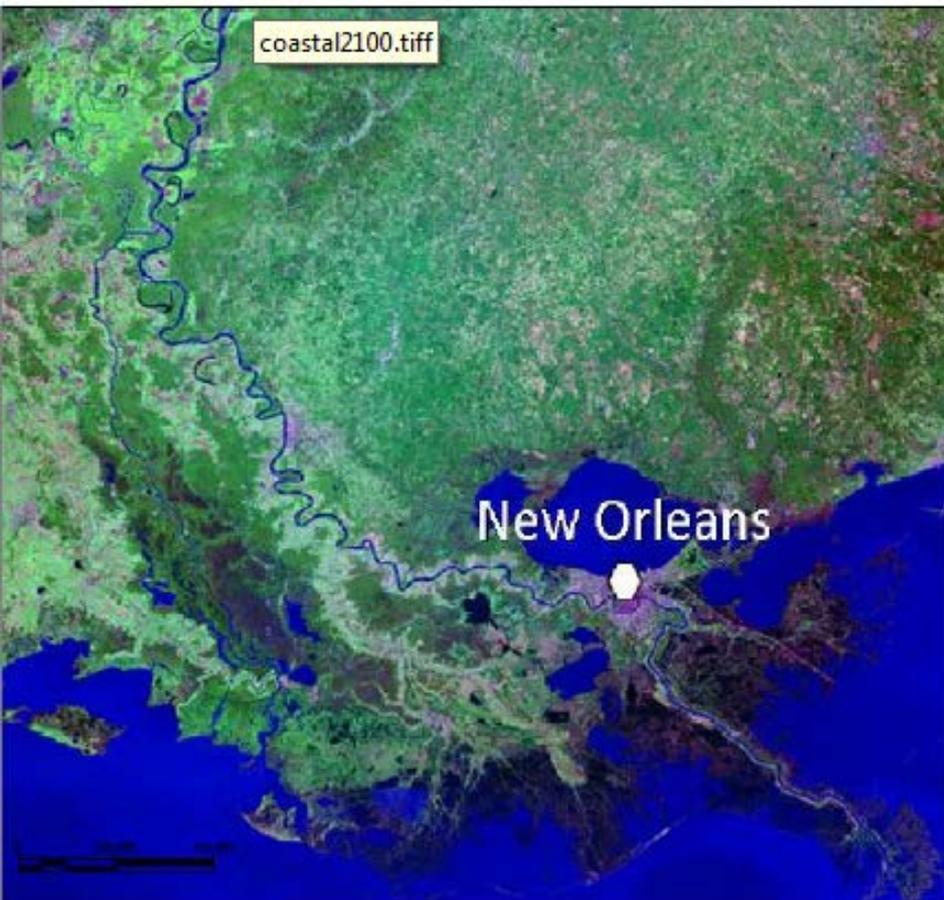
Henri Boulet, Executive Director  
LA 1 Coalition

Securing Louisiana Highway 1  
during  
Accelerated Coastal Change

# Subsidence & SLR are challenging Louisiana's coastal infrastructure

Year - 2009

Year - 2100



Map: Blum, M.D., and H.H. Roberts (2009), Drowning of the Mississippi delta due to insufficient sediment supply and global sea-level rise, *Nat. Geosci.*, 2, 488-491.

Using the GPS Surveying Equipment and the C4G Real Time Network, we know LA 1 lost over 1 foot of elevation in just 20 years.



# LA 1 is the nation's Poster-Child for Critical, At-Risk Infrastructure.



# LA 1 during Hurricane Isaac, looking South for 19 miles to Fouchon.



# Road Closures over the last 10 years have increased

Hurricane Lilly - September 21, 2002

Hurricane Isidore - September 26, 2002

Tropical Storm Bill - June 30, 2003

Hurricane Ivan - September 15, 2004

Tropical Storm Matthew - October 10, 2004

Hurricane Cindy - July 5, 2005

Hurricane Dennis - July 13, 2005

Hurricane Katrina - August 29, 2005 (4 day closure)

Hurricane Rita - September 26, 2005 (5 day closure)

Hurricane Gustav - August 31, 2008 (5 day closure)

Hurricane Ike - September 11, 2008 (6 day closure)

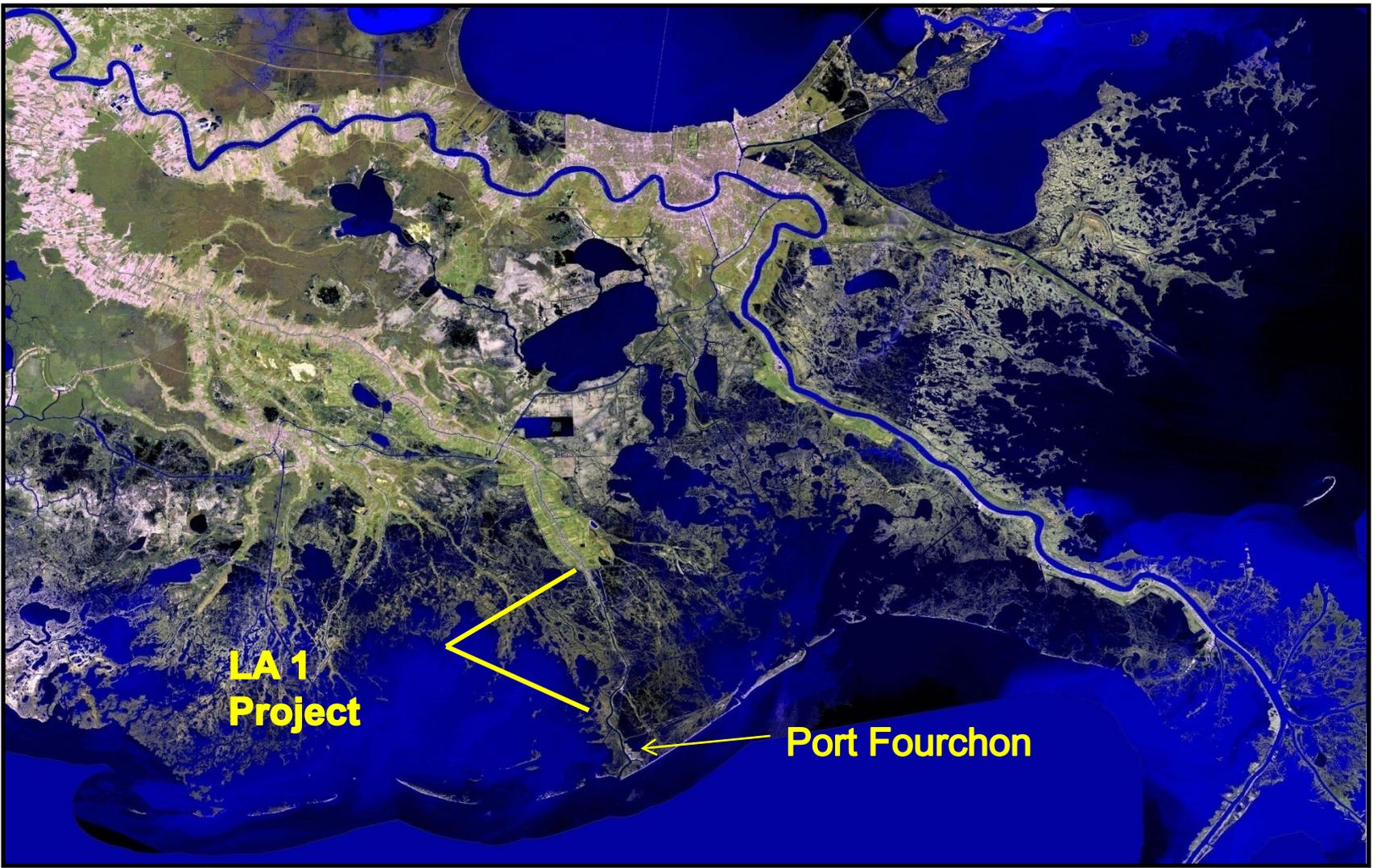
Tropical Storm Lee - Friday, September 16, 2011 (3 day closure)

Hurricane Issac - Tuesday, August 28, 2012 (4 day closure)

# Category 1 Hurricane Isaac brought unprecedented damage to LA 1.



# LA 1 Project - 19 mile Elevated Highway from Levee southward to Port Fourchon.



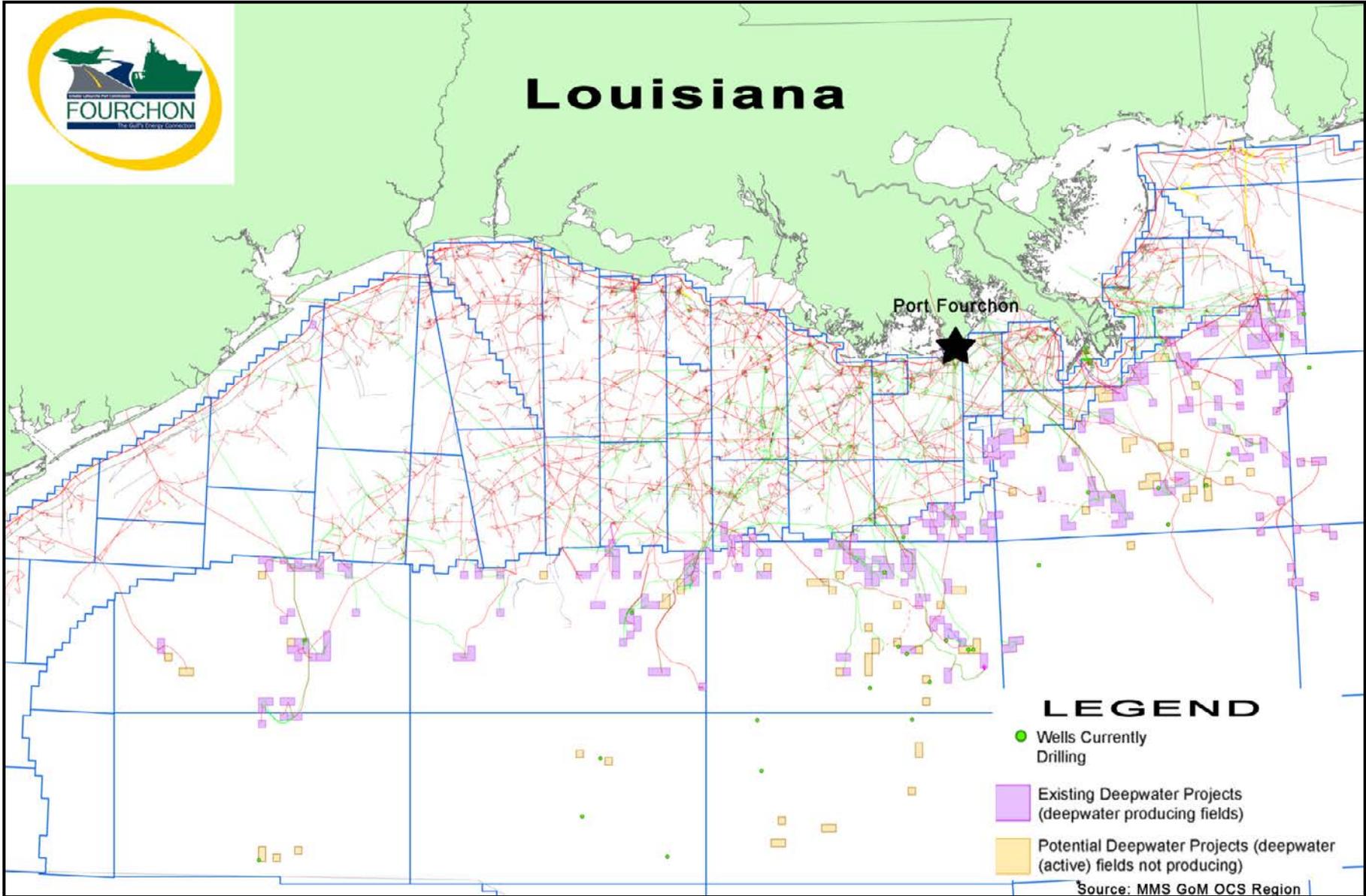
Port Fourchon relies on LA 1 as its sole highway access for supplies.



# Reopening Fourchon immediately after storms calms national energy markets



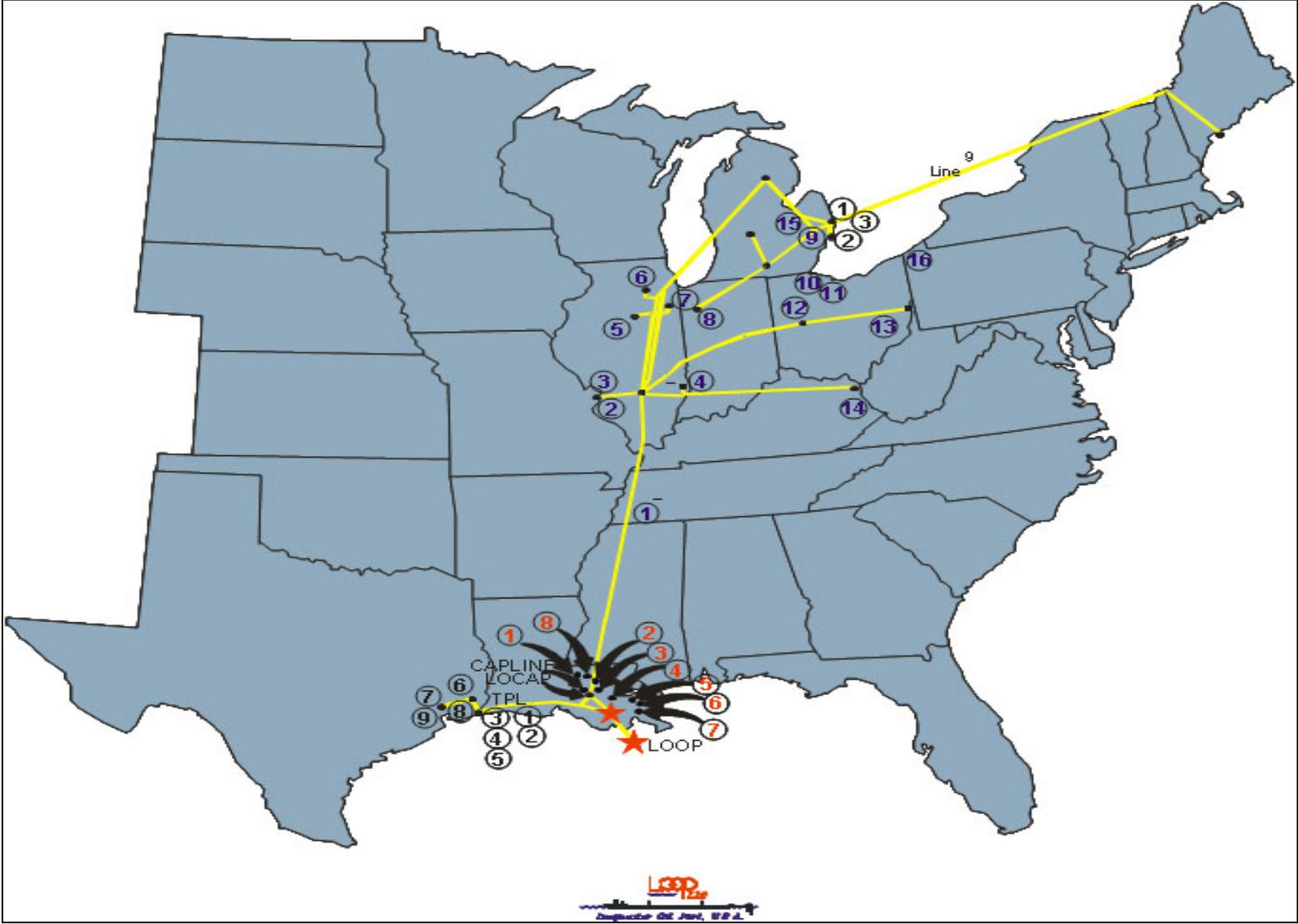
# Fourchon serves 90% of Deepwater



# LOOP – The Nation's Only Dewater Oil Port



# LOOP is Connected to 50% of the Nation's Refineries



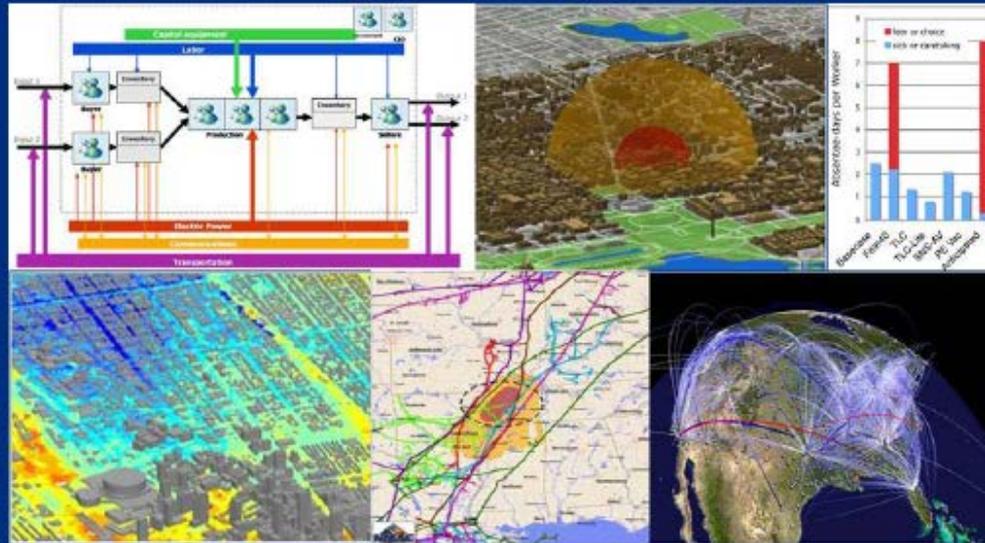
# Louisiana's only inhabited barrier island, Grand Isle, also relies on LA 1.



  
Louisiana Department of Transportation  
TRANSPORTATION  
CONSTRUCTION  
SAFETY  
PLANNING  
OPERATIONS

  
IDM  
Infrastructure Development  
Management  
2000 - 1-800-368-3688

U.S.D.H.S.  
performed an  
Assessment of  
Consequences  
of Disruptions  
to LA 1 in 2011.  
\$7.8 billion of  
loss GDP is at  
risk



National Infrastructure Simulation and Analysis Center  
Risk Development and Modeling Branch  
Homeland Infrastructure Threat and Risk Analysis Center  
Office of Infrastructure Protection

*In Collaboration with*

The National Incident Management Systems  
and Advanced Technologies Institute at  
The University of Louisiana at Lafayette

*Louisiana Highway 1/Port Fourchon Study*

*July 15, 2011*



Homeland  
Security



## ***USDHS Assessment Findings:***

- Estimates up to \$7.8 Billion in Loss GDP with a 90 day outage of LA 1
- Estimates reduction in 160 millions of barrels of oil and 320 billions of cubic feet of natural gas over 10 yr. with an outage of LA 1 which coincides with OCS damage from a major hurricane.
- Estimates 25% capability of substitution port facilities fulfilling national need

**The elevation of LA-1 will become increasingly inundated even if the present day relative sea level rise (RSLR) remains constant in the future.**

**Estimated Effects of RSLR on Frequency and Duration of Inundation for Leeville, LA using observations 1987-1990 and then projecting this 4-year time period forward using present rate of sea level rise**

**Using “5%” LA-1 elevation of 0.78m NAVD88 (1993)**

<b>4-yr Time Period</b>	<b>RSLR rate mm/yr)</b>	<b>Occurrences of Inundation (over 4-years) (# of tides)</b>	<b>Duration of Inundation (over 4- years) (hours (percent of total time))</b>	<b>Elevation Rise Above 1990 MSL (meters)</b>
1987- 1990	9.24	0	0 (0%)	-
<b>2027-2030</b>	9.24	124	<b>960(6%)</b>	0.3
<b>2047- 2050</b>	9.24	1127	<b>19163(55%)</b>	0.6
2097- 2100	9.24	1334	33699(96%)	1.0



# Vulnerability Documentation by Federal Agencies helps educate policy makers

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GAO

United States Government Accountability Office

Report to Congressional Requesters

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April 2013

CLIMATE CHANGE

Future Federal  
Adaptation Efforts  
Could Better Support  
Local Infrastructure  
Decision Makers



# Citings in studies also support needs.

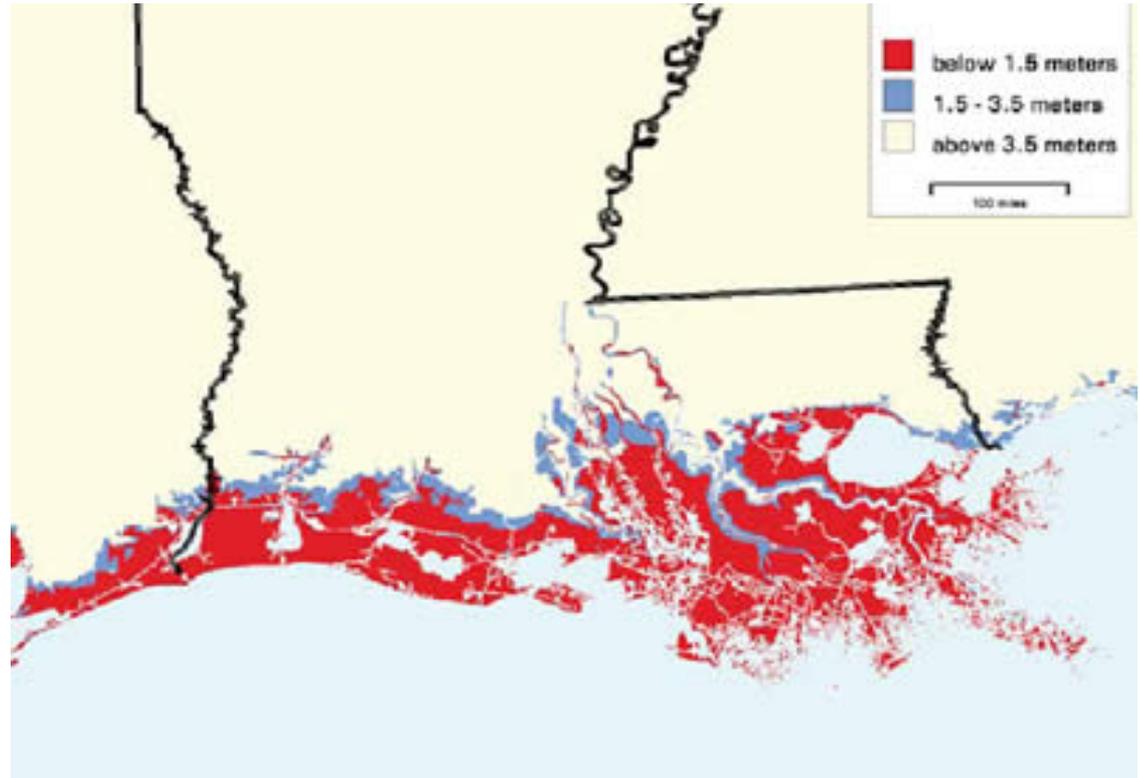


[Download the report](#)

# Industry studies amplify concerns:

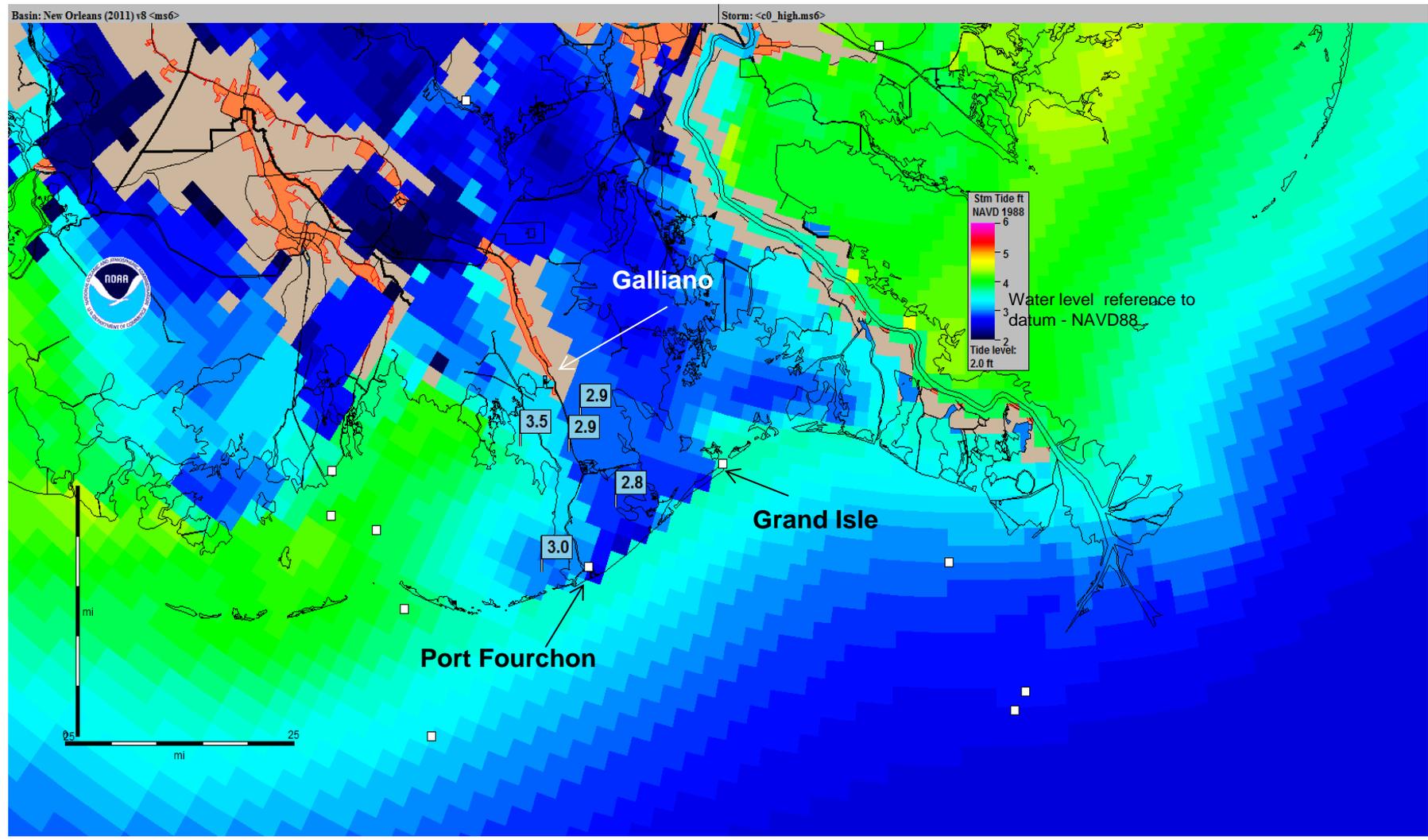


- Rise in sea level of 1.0 m by 2100;
- Rise in sea surface temperature 3°C;
- Intensified storms and storm surge
- Subsidence 1.0 m by 2100



**Source: Entergy Gulf Coast Adaptation Study, October 2010**

# Weak Tropical Storms at Port Fourchon will Inundate LA 1 to the point of closure.



# Good News: Of 19 miles of needed bridge, 1/2 built.



# \$165 million Leeville Bridge opened in 2009



[www.gulfcoastairphoto.com](http://www.gulfcoastairphoto.com)  
Slidell, LA 985.788.3458  
"Ready when you are."

# **\$153 million Port Fourchon-Leeville Elevated Highway opened in 2011.**



The elevated highway (background)  
replaced the existing at-grade highway.





# LA 1 Toll Road Source of Funds

<b>Project Funding Summary</b>	
<b>SOURCE OF FUNDS</b>	<b>Expended as of 3/20/2011*</b>
<b>Bonds / TIFIA Loan</b>	\$ 140,489,780
<b>Federal Earmarks</b>	\$ 59,042,453
<b>Federal Formula Funds</b>	\$ 62,470,440
<b>State TTF</b>	\$ 6,749,106
<b>State General Fund Surplus</b>	\$ 63,706,255
<b>State GO Bonds</b>	\$ 60,000
<b>CIAP / Local/ NOAA Funds</b>	\$ <u>36,165,432</u>
<b>TOTAL</b>	\$ 368,683,466

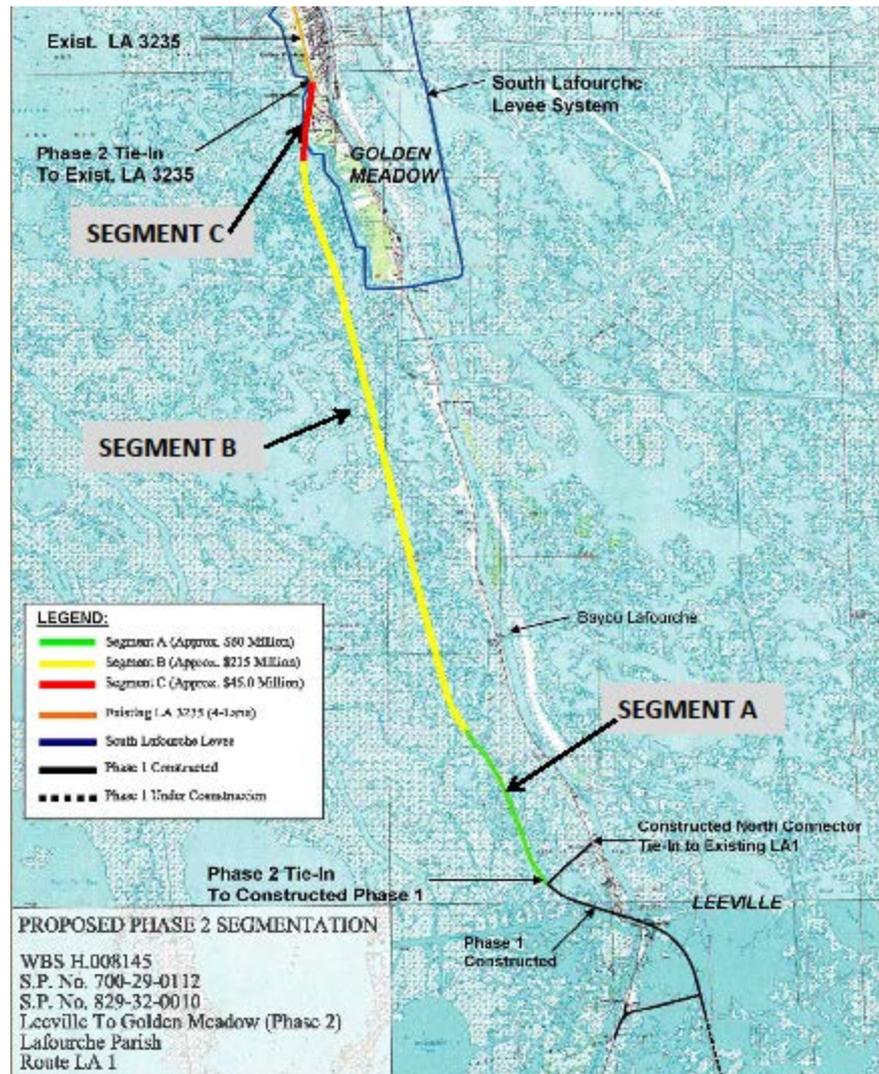
Port Fourchon contributed \$3.5 million for dredging and mitigation (not included in total)

**Local community is tolling themselves for 35 years which funded initial construction.**





# Segmenting Phase into 3 Projects for \$60million, \$215 million, & \$46 million.



# The project will be built with an Environmentally-Friendly method.



# Funding Sources being pursued:

- State Funds
- Corporate Contributions
- Restore Act funds
- U.S.D.O.T. Grant Funds
- OCS Royalty Sharing funds