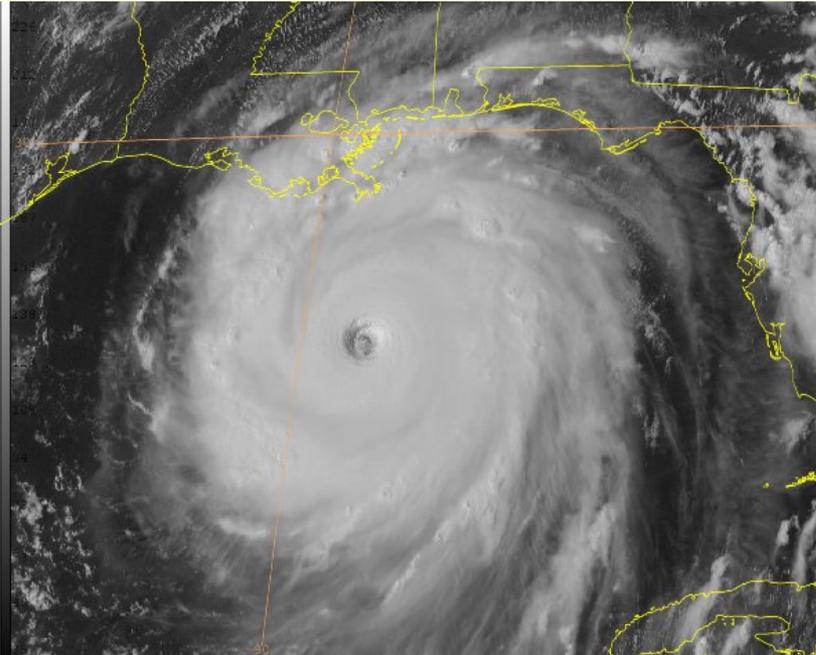


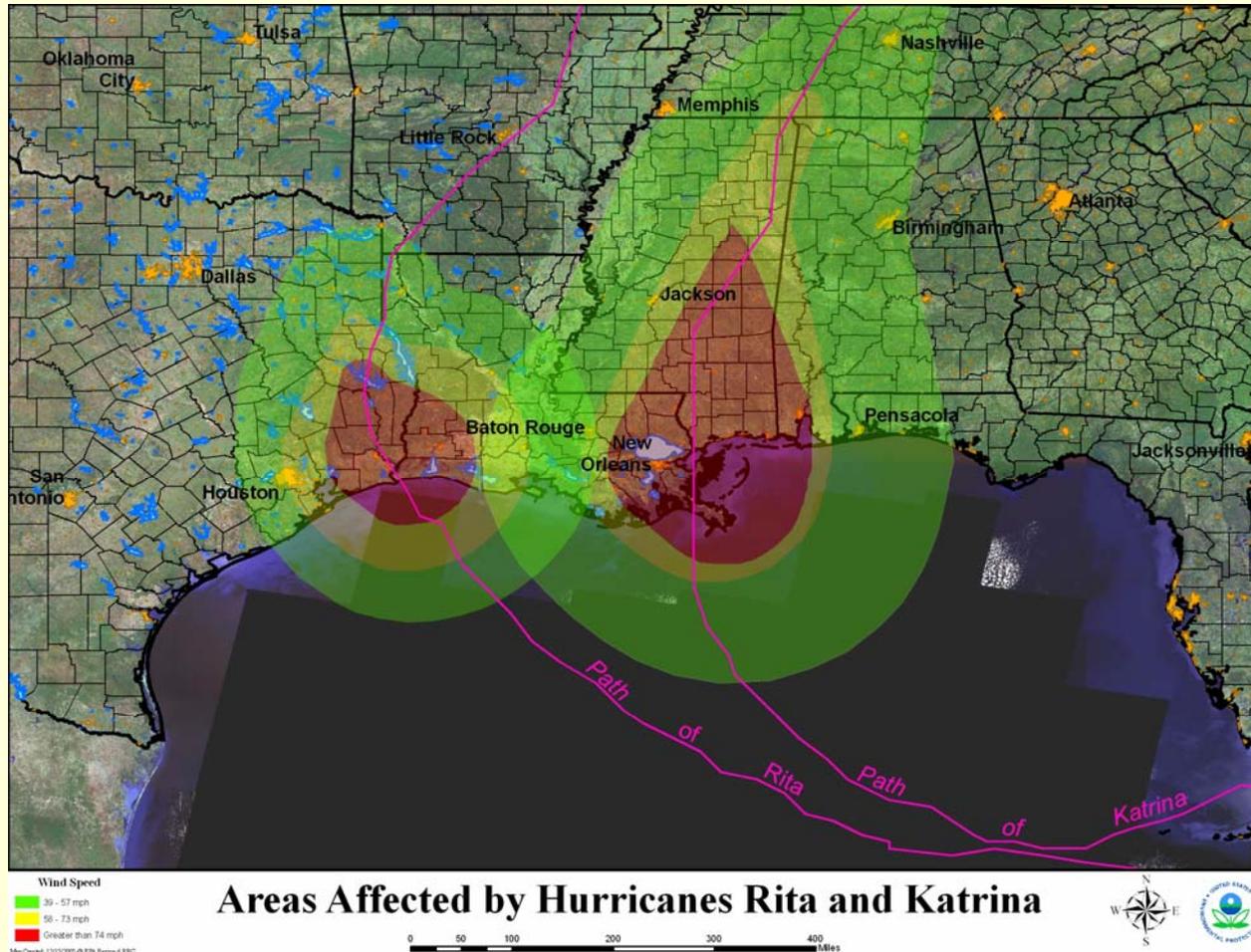
# ENVIRONMENTAL SAMPLING IN RESPONSE TO HURRICANES KATRINA AND RITA



SUPERFUND SITE  
REMEDIATION  
CONFERENCE

JANUARY 25, 2007

# Hurricane Katrina Wind Track



Lake  
Pontchartrain

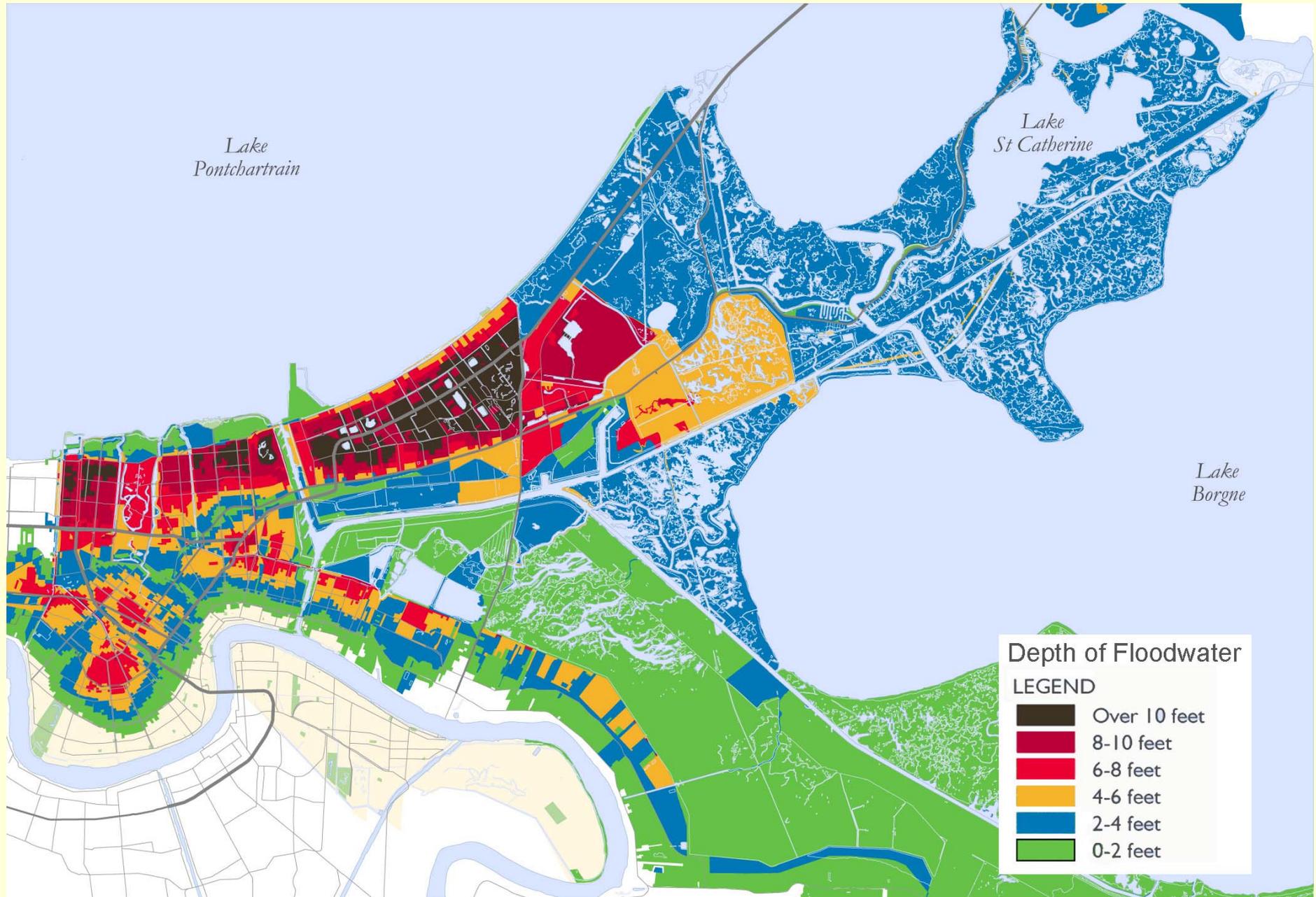
Lake  
St Catherine

Lake  
Borgne

### Depth of Floodwater

#### LEGEND

	Over 10 feet
	8-10 feet
	6-8 feet
	4-6 feet
	2-4 feet
	0-2 feet



# FEMA Mission Assignments

- Search & Rescue
- Environmental Sampling
- Drinking Water Assessment
- Wastewater Assessment
- Reconnaissance and Assessment of Industry/Spills
- Collection of Household Hazardous Waste
- Removal of Orphan Drums/Hazardous Debris
- Emergency Response for Spills & Special Sampling

# ACCOMPLISHMENTS

September 30, 2006

- 17.5M pounds of Household Hazardous Waste
- 4.3M Hazardous Waste Containers
- 4M pounds of Non-Hazardous Waste
- 388,000 White Goods (appliances)
- 766,000 Electronic Goods (computers, TVs)
- 1,730 Firearms/76,000 lbs of Munitions
- Spill cleanup at priority sites

# Environmental Sampling

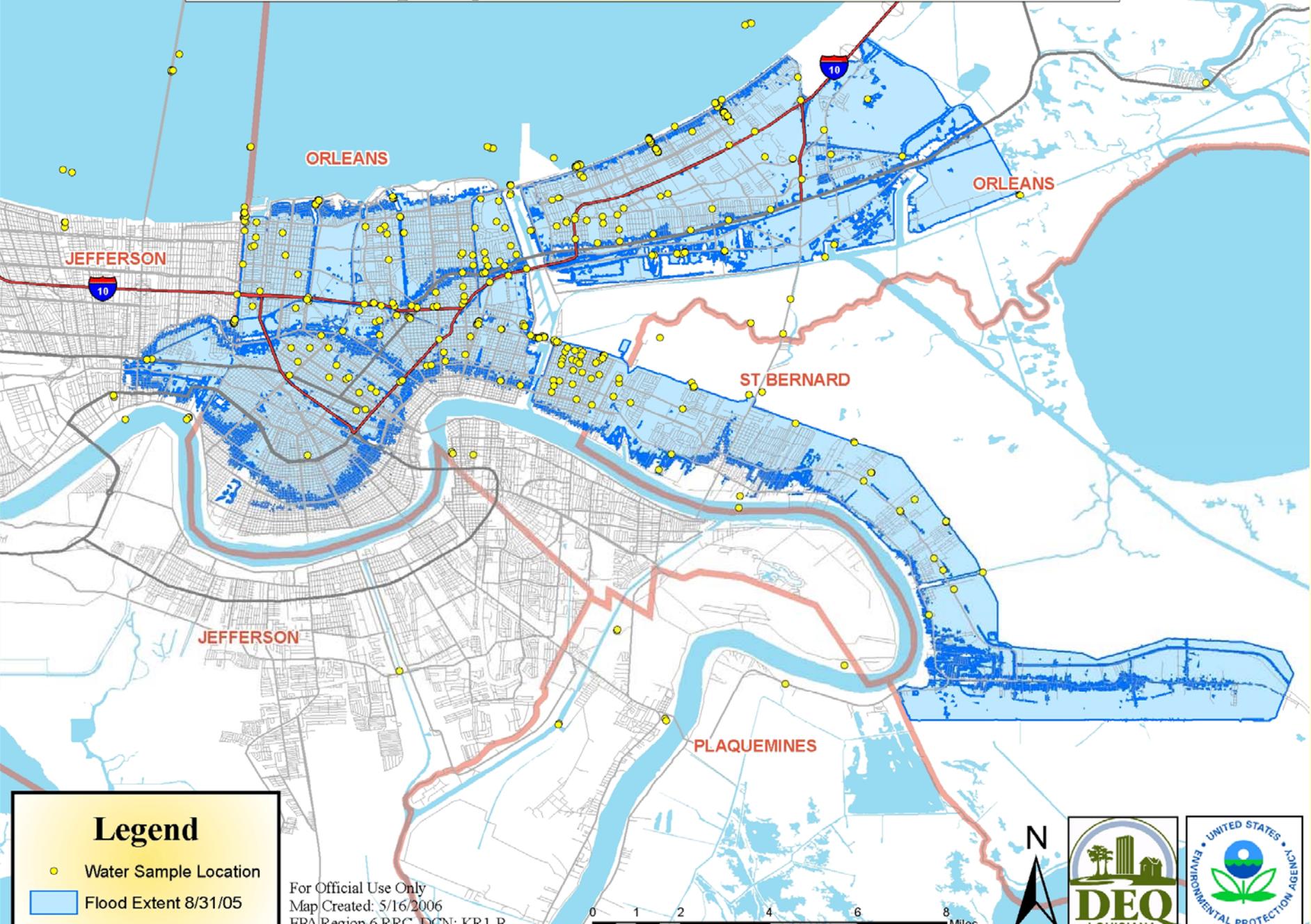


- Surface Water & Floodwater (650 samples)
- Drinking Water (3,600 trucks)
- Sediment (2,600 samples)
- Air (11,000 samples)
- Sampling plans reviewed by Science Advisory Board





# Water Sampling Locations in the New Orleans Area



**Legend**

- Water Sample Location
- Flood Extent 8/31/05

For Official Use Only  
Map Created: 5/16/2006  
EPA Region 6 RRC, DCN: KR1-P



# Floodwater



- Lake Ponchartrain, an estuarine lake, was the source of floodwater in New Orleans area
  - Numerous samples revealed elevated bacteria levels
    - Unsanitary conditions resulted from the commingling of floodwaters with sewage collection system waters
  - Average chemical concentrations were below short-term (90 days) incidental ingestion and dermal levels
    - Low levels of metals (i.e., arsenic, lead) and of pesticides (i.e., Atrazine, Dieldrin) were detected

# Sediment Sampling

- Four phases focused on residential areas
- Staging areas, temporary housing sites
- Results compared to:
  - LA Risk Evaluation/Corrective Action Program
  - EPA cancer risk range
- Analytes
  - VOCs/SVOCs
  - Total Metals
  - Pesticides, PCBs, Herbicides
  - Total Petroleum Hydrocarbons
  - Fecal Coliform

# Phase 1 Sampling

- September 10 – October 14, 2005
- Objective: identify environmental conditions
  - What might emergency personnel and returning residents encounter
  - Visual sampling plan (biased)
  - Statistical number of samples by zip code
  - Included re-investigation at 145 locations
- 450 samples collected

# Phase 2 Sampling

- October 29 – November 27, 2005
- Objective: identify 3-acre “hotspots”
- Lower Ninth Ward and St. Bernard Parish
- Random sampling
- Only lead detected above screening levels
- 280 samples collected

# Phase 3 Sampling

- February 12 – 21, 2006
- Focused on 43 Phase I or II locations
- Objective: original results isolated or represent larger area
- Arsenic, benzo(a)pyrene, or lead only
- Up to 10 composite samples within 500-ft radius of original sample
- Thompson Hayward pesticide facility

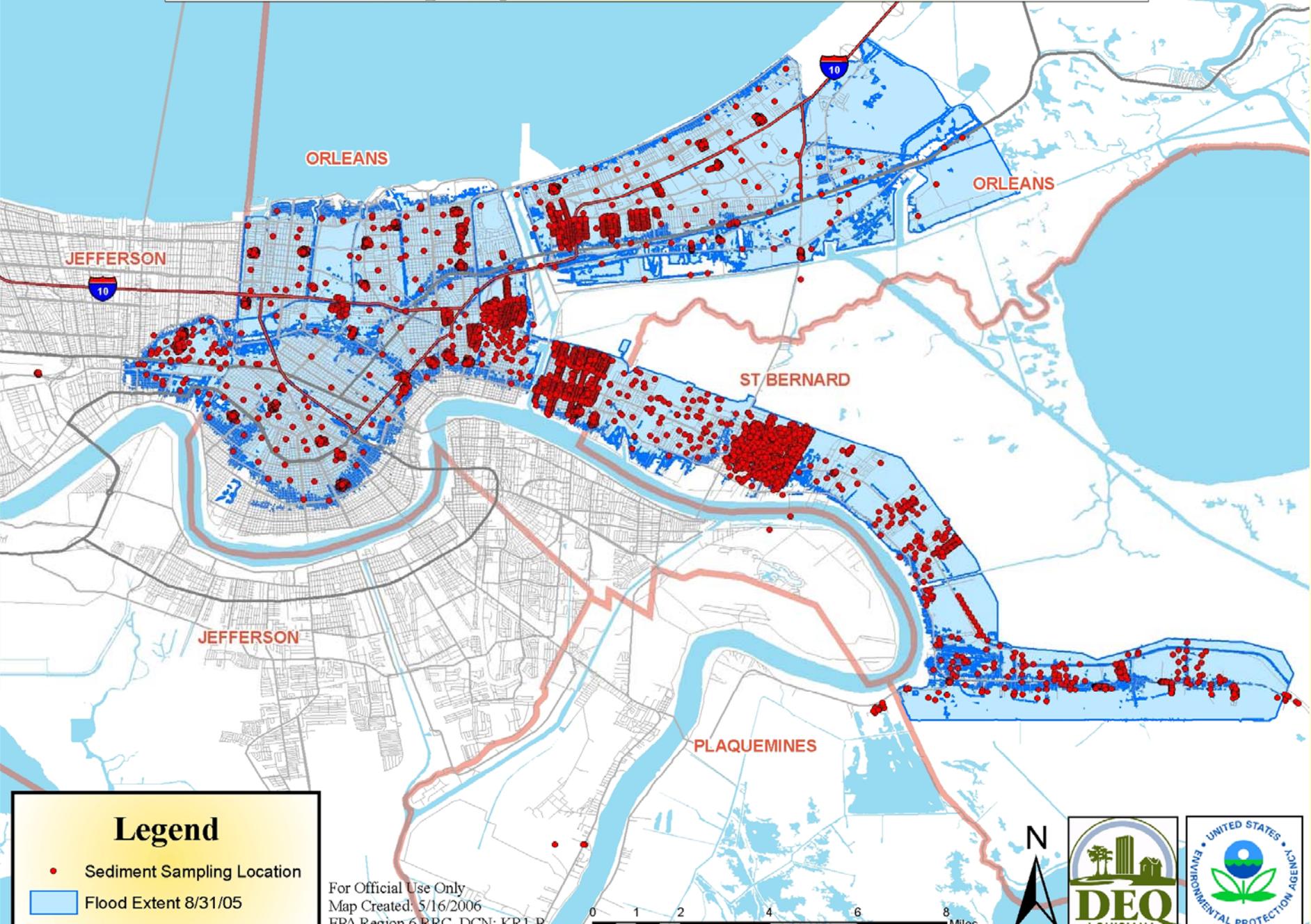
# Phase 4 Sediment Sampling

- February 6 – June 30, 2006
- Two objectives:
  - Where is sediment > 0.5 inches remaining
  - Identify 1-acre “hot spots”
- Set up 200-foot grid in the flooded areas
- Collected 586 samples at 1,676 locations

# Waste Collection Sites, Temporary Housing Locations

- Household Waste Collection Sites
  - Soil quality before site use
  - Soil quality before site closure
- Temporary Housing Locations
  - FEMA travel trailer locations
  - Evaluate potential health impacts to residents

# Sediment Sampling Locations in the New Orleans Area



**Legend**

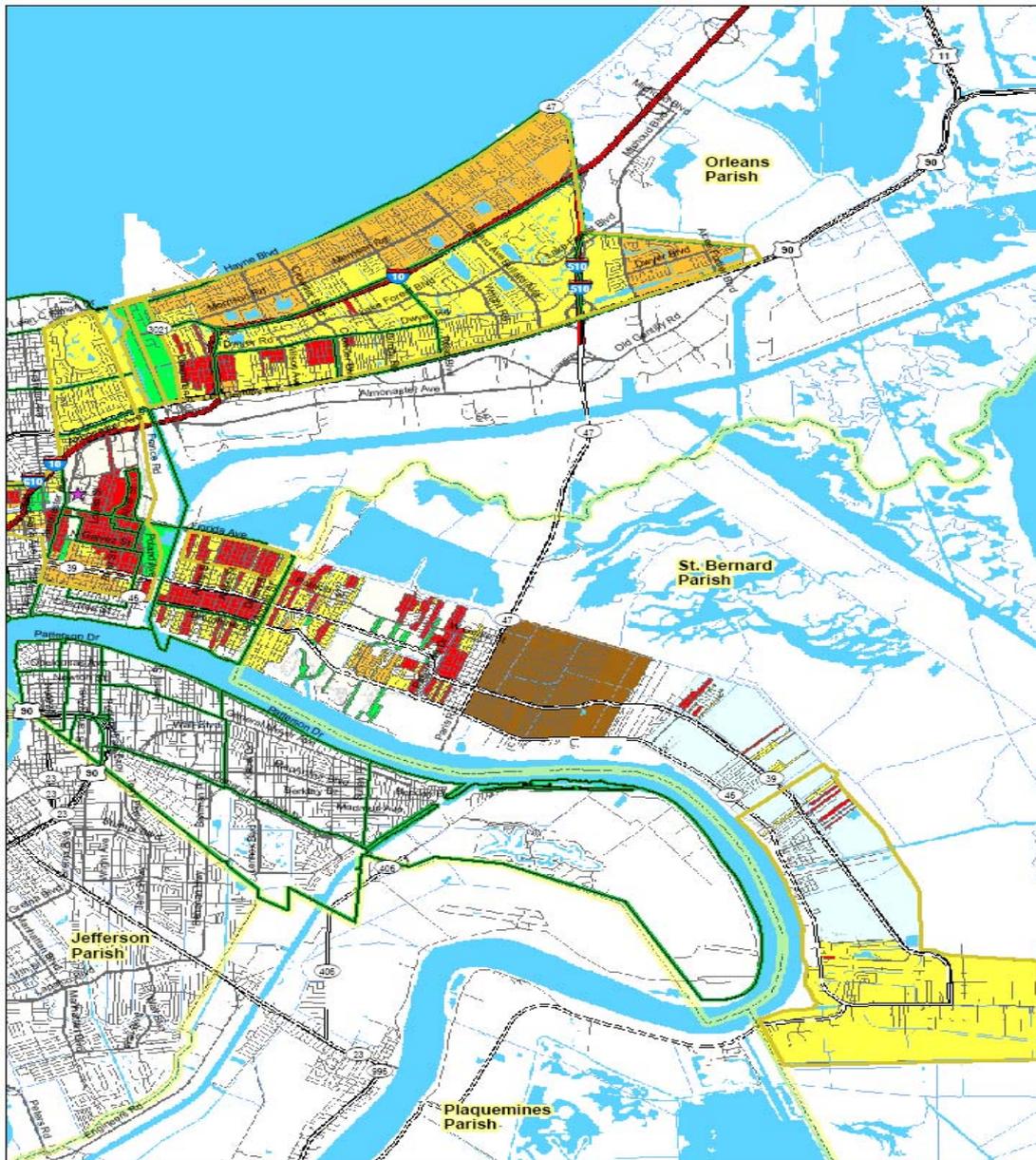
- Sediment Sampling Location
- Flood Extent 8/31/05

For Official Use Only  
Map Created: 5/16/2006  
EPA Region 6 RRC, DCN: KR1-P



# Sediment Conclusions

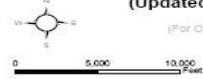
- Sediments would not cause adverse health impacts
- Arsenic associated with herbicides at golf courses
- Benzo(a)pyrene found in one isolated area of Agriculture Street Landfill
- Several isolated areas with elevated petroleum chemicals: DRO and ORO
- Lead in soil predates the hurricane



- ★ Agriculture Street NPL Site
- Neighborhoods
- Recon Area
- Commercial
- No Sediment
- Not Enough Sediment
- Sample
- Murphy Oil Spill Area
- West St Bernard
- Upper Ninth
- Lower Ninth
- East Bernard
- Eastern Creoles

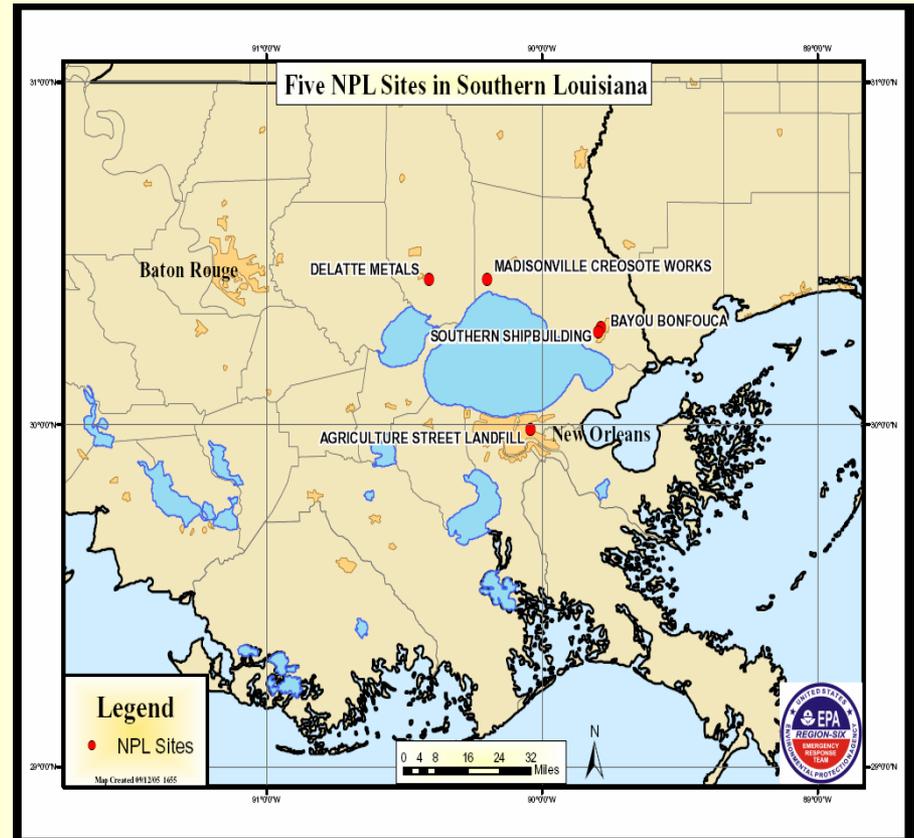
**Sampling Recon Index Map**  
(Updated: 07/01/2006)

(For Official Use Only)



# Superfund NPL Sites

- 17 LA & 28 TX NPL sites were evaluated
- Sites within the wind swath of hurricanes were sampled
- Used existing O&M & Five Year Review Plans
- All sites were secure



# Marsh Recovery

Container Assessment Team: Allison, Schacher Date: 02 Nov 2005 10:33:50 Lat: 29° 46' 54.18" Long: -89° 18' 43.89"



N 29° 14.906' W 089° 09.270' 390 ft 233°  
11/11/2005 1:42:06 PM



11 OCT 2005 11:15  
NSF-HT1-051111



# Summary of Marsh Operations

- Plaquemines Parish
  - >2000 Orphaned Drums and Containers
- Cameron Parish
  - >5900 Orphaned Drums and Containers



# Marsh Operational Limitations

- Remote Locations
- Daylight Hour Operations
- Heavy Equipment
- Natural Resource Issues
- Permitting Requirements



# EPA Response to Gulf Coast Hurricanes

- What questions do you have?
- <http://www.epa.gov/katrina/>



# Contact Information

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