
ROAD
ENDS
500FT


SHERIFF

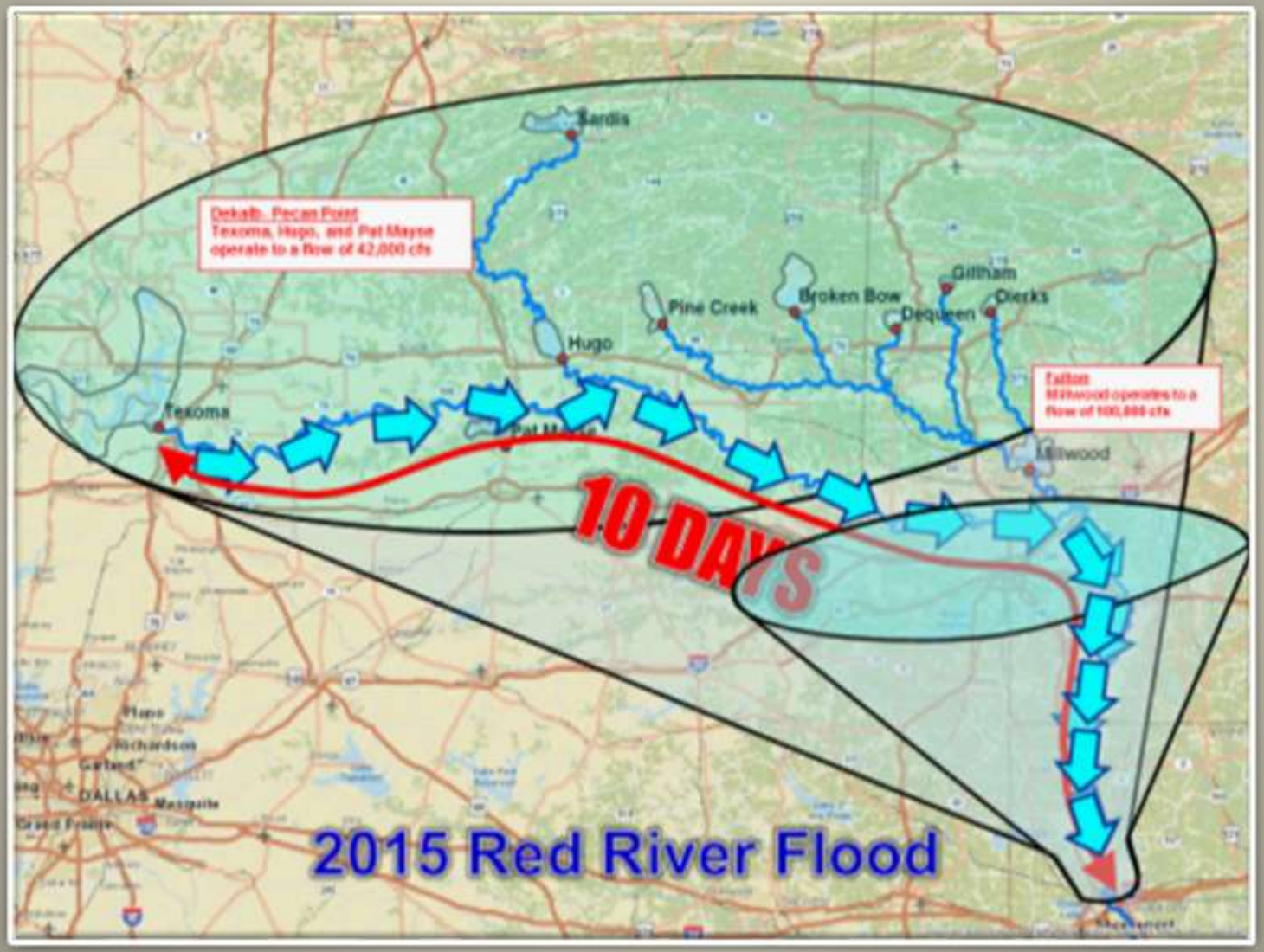
Red River Flooding

June 2015

Caddo and Bossier Parishes

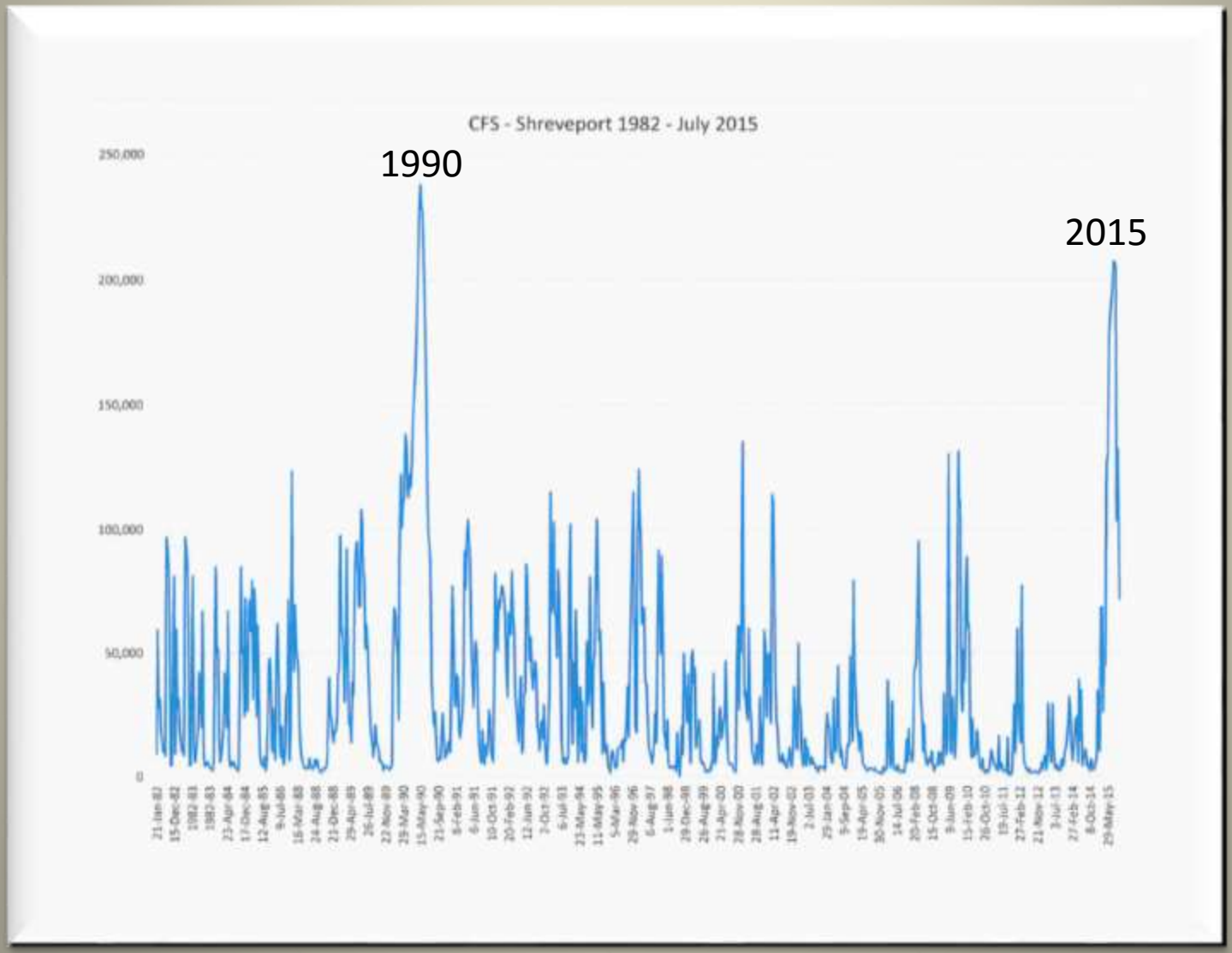
Presented by: Flood Technical Committee

Where the Rain Falls Matters
I-30 versus I-20

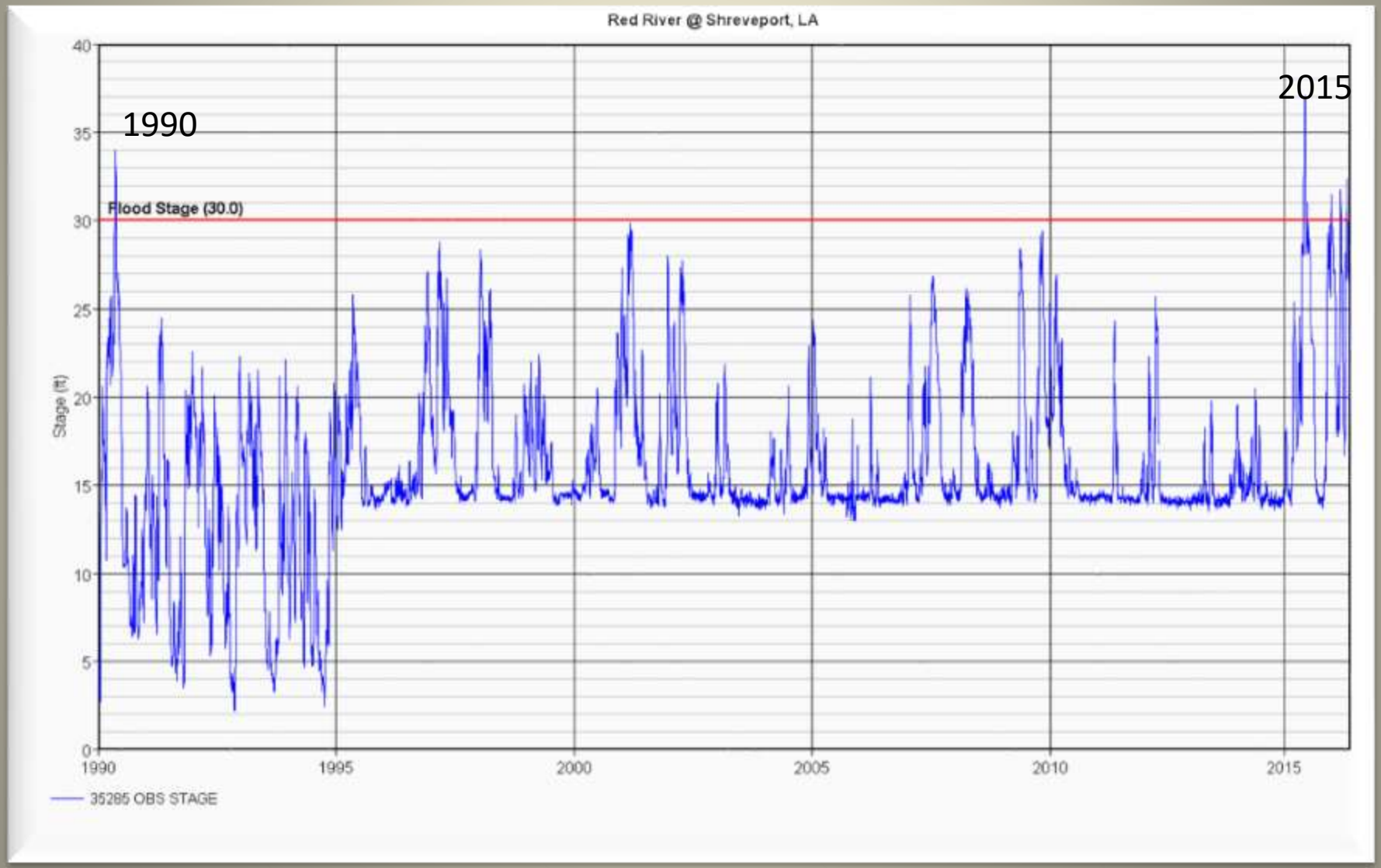


I-20 Backwater and Tributary Floods (Localized) 2016 Flood

Less Water Flow Than 1990



Higher Crest – Lower Flow



The Times

DOWN & OUT

Fourth-seeded Iowa State defeats Little Rock, 78-61. See more NCAA Tournament coverage inside Sports.

'SOMETHING HAS CHANGED'

Army Corps points to what's happening below Red River's surface

"Something has changed inside the dam. We're going to try to figure out what's going on with this thing."

Flood Technical Committee

- Red River Valley Association (Chair)
- Caddo Sheriff/Office of Homeland Security and Emergency Preparedness
- Caddo and Bossier Parishes
- Cities of Shreveport and Bossier City
- Caddo and Bossier Levee Districts
- Caddo-Bossier Port
- Red River Watershed Management Institute
- Red River Waterway Commission

Purpose of Committee

- To coordinate with federal agencies: Corps of Engineers, National Weather Service, US Geological Survey (USGS), and Federal Emergency Management Agency (FEMA)
- To investigate causes; siltation and urbanization
- To consider mitigation for future impacts
- To analyze data and provide recommendations to community leaders

Definitions

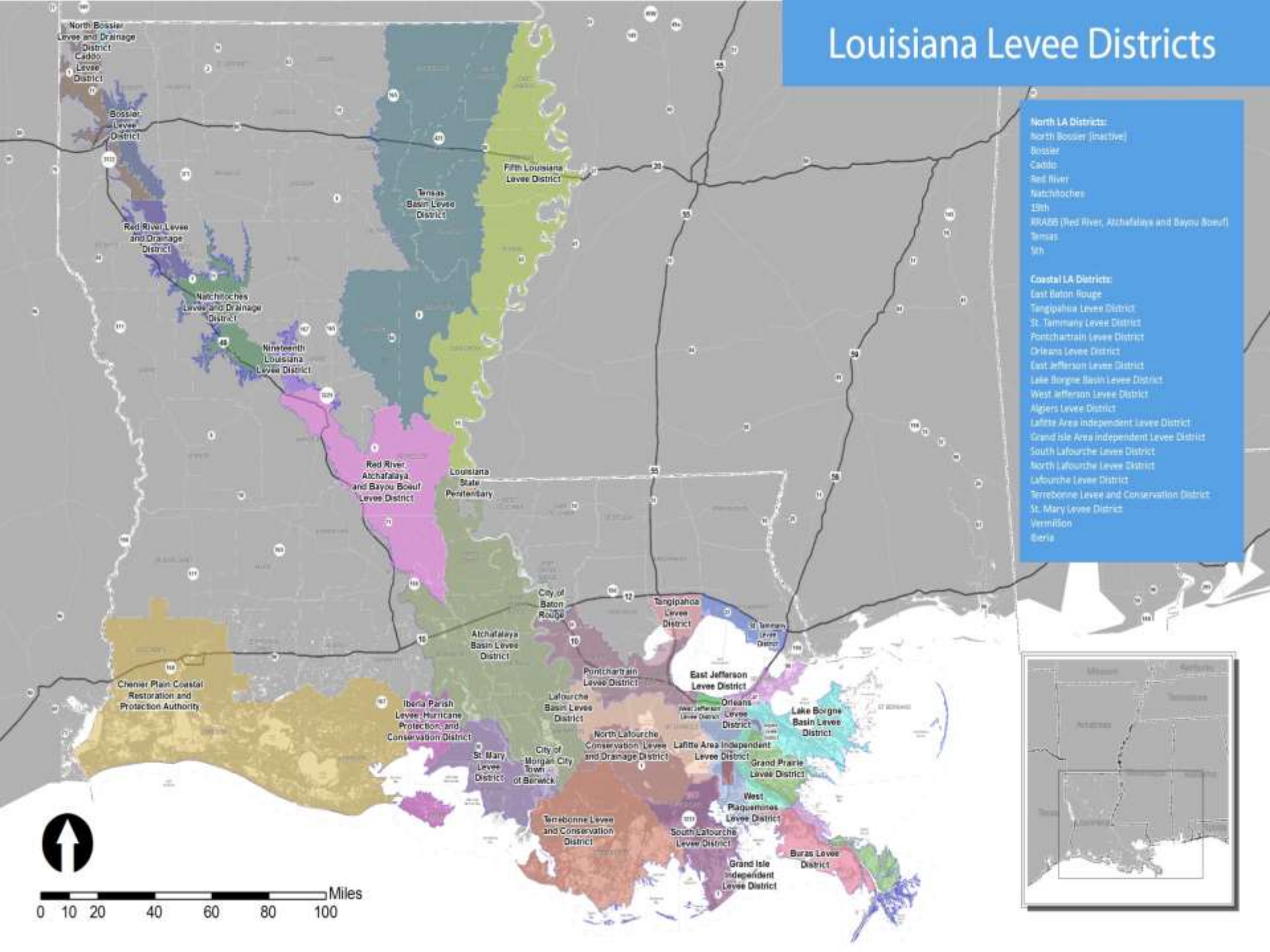
- **Base Flood Elevation (BFE)** – The computed elevation to which flood water is expected to rise during the base flood. FEMA responsibility.
- **Cubic Feet per Second (CFS)** – Amount of water (flow) passing a point in the river. Measured by the gage at Texas Street Bridge.
- **High Water Mark (HWM)** – The highest point the river reached during the flood crest.
- **Flood Insurance Rate Maps (FIRM) -** FEMA responsibility.

June 2015 Historical Flood
Red River – Shreveport/Bossier

Red River Facts

- Named for the RED-BED country (sedimentary rocks) of its watershed. There are several rivers with the same name.
- It originates at elevation 3,440 feet in the Texas panhandle and New Mexico.
- It travels across Texas, Oklahoma, Arkansas and Louisiana where it discharges at elevation 34 feet into the Atchafalaya/Mississippi in West Feliciana Parish.
- 1360 miles long, 65,595 square mile drainage basin, average discharge rate of 57 kcfs and maximum rate of 303 kcfs, April 7, 1945.

Louisiana Levee Districts

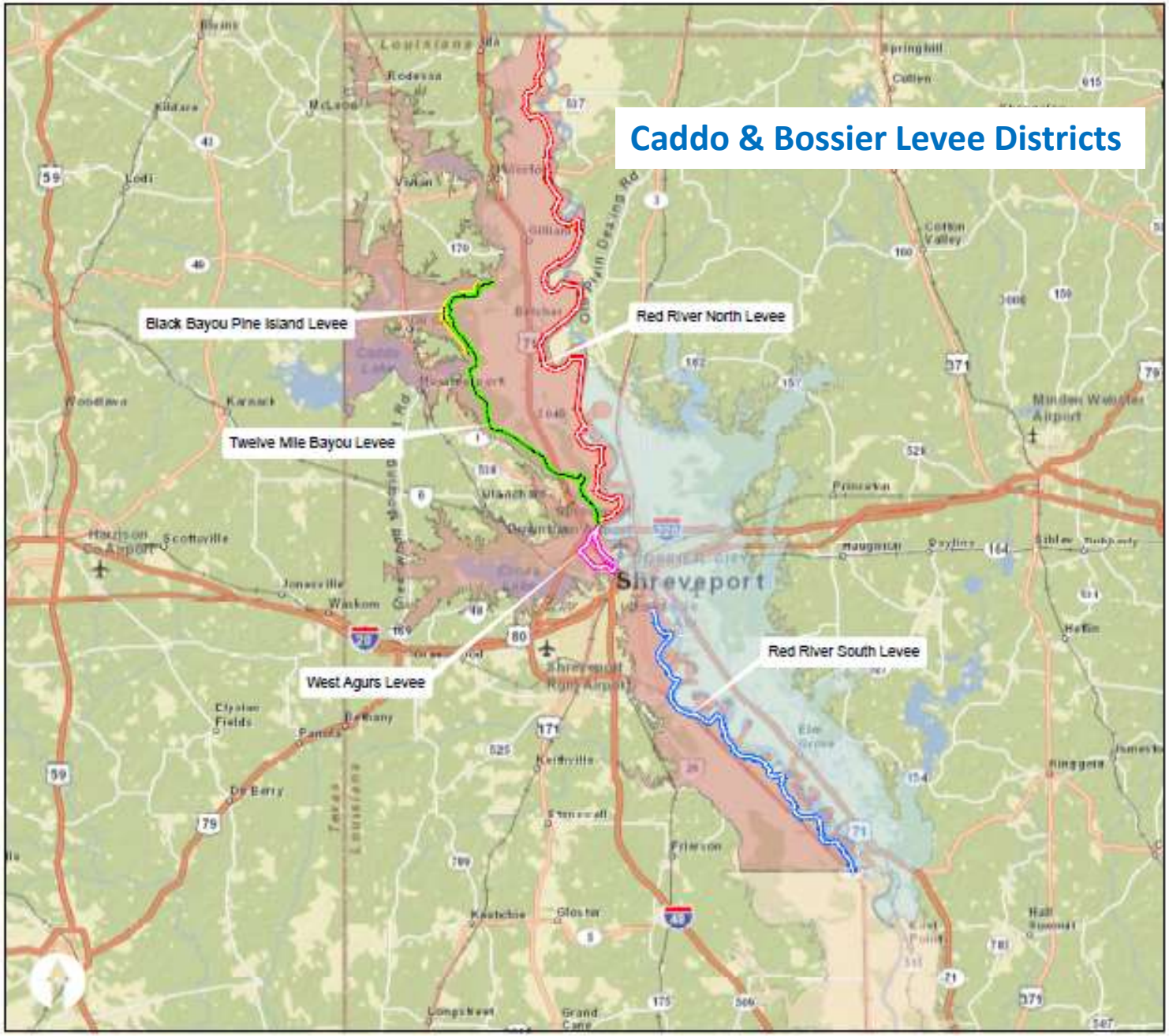


North LA Districts:

North Bossier (inactive)
Bossier
Caddo
Red River
Natchitoches
19th
RRABB (Red River, Atchafalaya and Bayou Boeuf)
Tensas
5th

Coastal LA Districts:

East Baton Rouge
Tangipahoa Levee District
St. Tammany Levee District
Pontchartrain Levee District
Orleans Levee District
East Jefferson Levee District
Lake Borgne Basin Levee District
West Jefferson Levee District
Algiers Levee District
Lafitte Area Independent Levee District
Grand Isle Area Independent Levee District
South Lafourche Levee District
North Lafourche Levee District
Lafourche Levee District
Terrebonne Levee and Conservation District
St. Mary Levee District
Vermillion
Iberia


Caddo & Bossier Levee Districts
Black Bayou Pine Island Levee
Red River North Levee
Twelve Mile Bayou Levee
West Agurs Levee
Red River South Levee
Shreveport

Caddo Levee District

- **Caddo Levee District is charged with operating and maintaining 119.35 miles of levee system**
- **80.37 miles along the Red River**
- **28.98 miles along Twelve Mile Bayou, Black Bayou, and Cherokee Park Bayou**
- **Provides flood protection for over 30,000 residents and 200,000 acres of land**

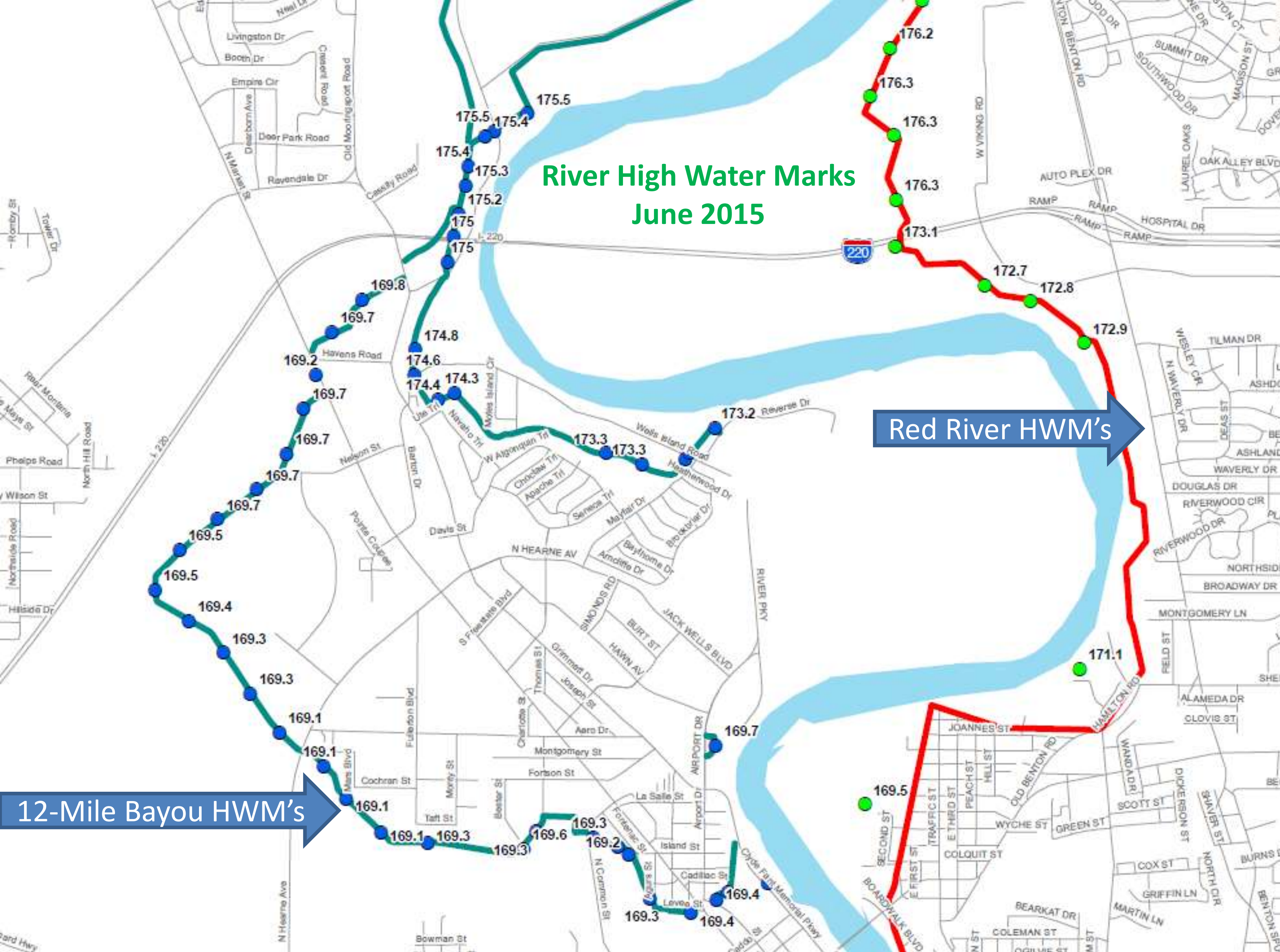
Bossier Levee District

- **Bossier Levee District is charged with operating and maintaining 67.4 miles of levee system**
- **48.6 miles along the Red River**
- **18.8 miles along Red Chute Bayou**
- **Provides flood protection for over 157,000 acres of land in Bossier Parish and 4,000 acres in Red River Parish**

Why were the Levees Built?

- The original levees in Caddo and Bossier were built by local farmers along areas they owned on the Red River and Twelve Mile Bayou.
- The purpose of the levees was to create farm land for agricultural use.
- The heights of the levees were modified over the years.
- Some of the levees were re-built and some had to be relocated.

High Water Marks (HWM)


River High Water Marks
June 2015
Red River HWM's
12-Mile Bayou HWM's
176.2
176.3
176.3
176.3
173.1
172.7
172.8
172.9
171.1
169.5
175.5
175.5
175.4
175.4
175.3
175.2
175
175
174.8
174.6
174.4
174.3
173.3
173.3
173.2
169.8
169.7
169.2
169.7
169.7
169.7
169.7
169.5
169.5
169.4
169.3
169.3
169.1
169.1
169.1
169.1
169.3
169.3
169.6
169.3
169.2
169.3
169.4
169.4
169.7
I-220
220
Havens Road
Wells Island Road
Reveille Dr
N HEARNE AV
RIVER PKY
JACK WELLS BLVD
AIRPORT DR
JOANNES ST
HAMILTON RD
OLD BENTON RD
BOARDWALK BLVD
Clyde Fant Memorial Pkwy
HOSPITAL DR
AUTO PLEX DR
TILMAN DR
WAVERLY DR
DOUGLAS DR
RIVERWOOD CIR
RIVERWOOD DR
BROADWAY DR
MONTGOMERY LN
ALAMEDA DR
CLOVIS ST

Red River Base Flood Elevations vs Observed June 2015 High Water Marks

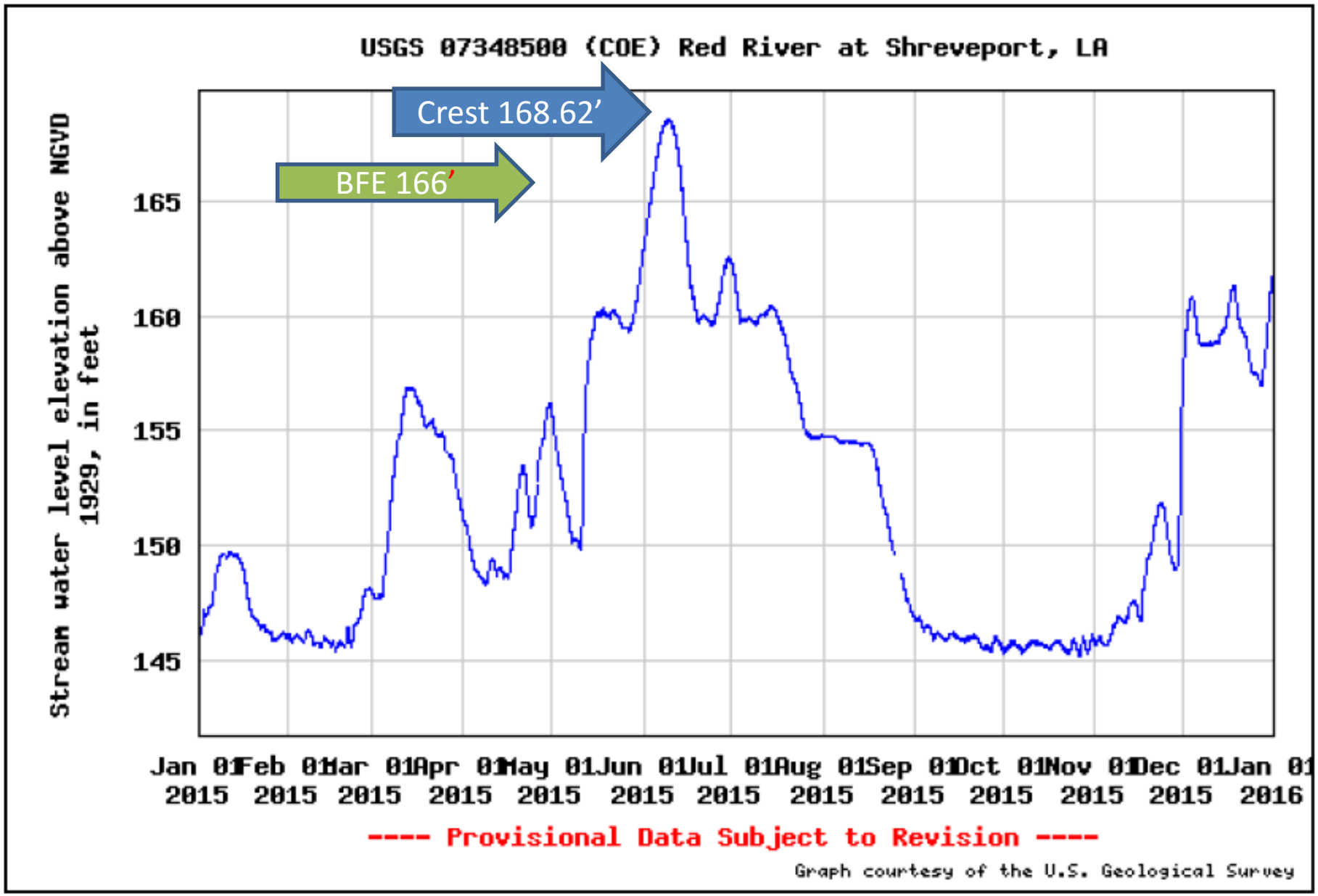
Location	BFE	HWM	Feet above BFE
Flournoy/E. Kings	160.00	160.60	0.60
Bagley Road	160.00	162.60	2.60
70th Street Bridge	162.00	164.90	2.90
Barksdale Bridge	163.00	165.70	2.70
RR at Veterans Park	164.40	167.20	2.80
I-20	165.40	168.20	2.80
Texas St. Bridge	165.90	168.75	2.85
Cross Bayou	166.00	169.50	3.50
Airport @ Jack Wells	167.00	170.21	3.21
Airport/Wells Island	170.00	173.20	3.20
I-220	171.00	175.00	4.00
3049 & George Rd.	172.00	176.20	4.20

Twelve Mile Bayou - BFE's vs June 2015 Observed High Water Marks

Location	BFE	HWM	Feet above BFE
Cross Bayou @ Red River	166.00	169.40	3.40
N. Market	166.00	169.40	3.40
N. Common	166.00	169.30	3.30
N. Hearne	166.00	169.10	3.10
N. Market	166.00	169.20	3.20
3049 / I-220	165.40	169.80	4.40

Date	HWM	Flow(kcfs)
30-Jun-15	31.05	132
9-Jun-15	37.14	206
1-Nov-09	29.45	131
5-Mar-01	29.8	135
15-May-90	34.5	230
29-Apr-73	26.55	156
5-May-66	29.6	174
8-May-58	33.7	249
11-Jun-57	32.82	228
20-May-53	27.32	173

Red River 2015

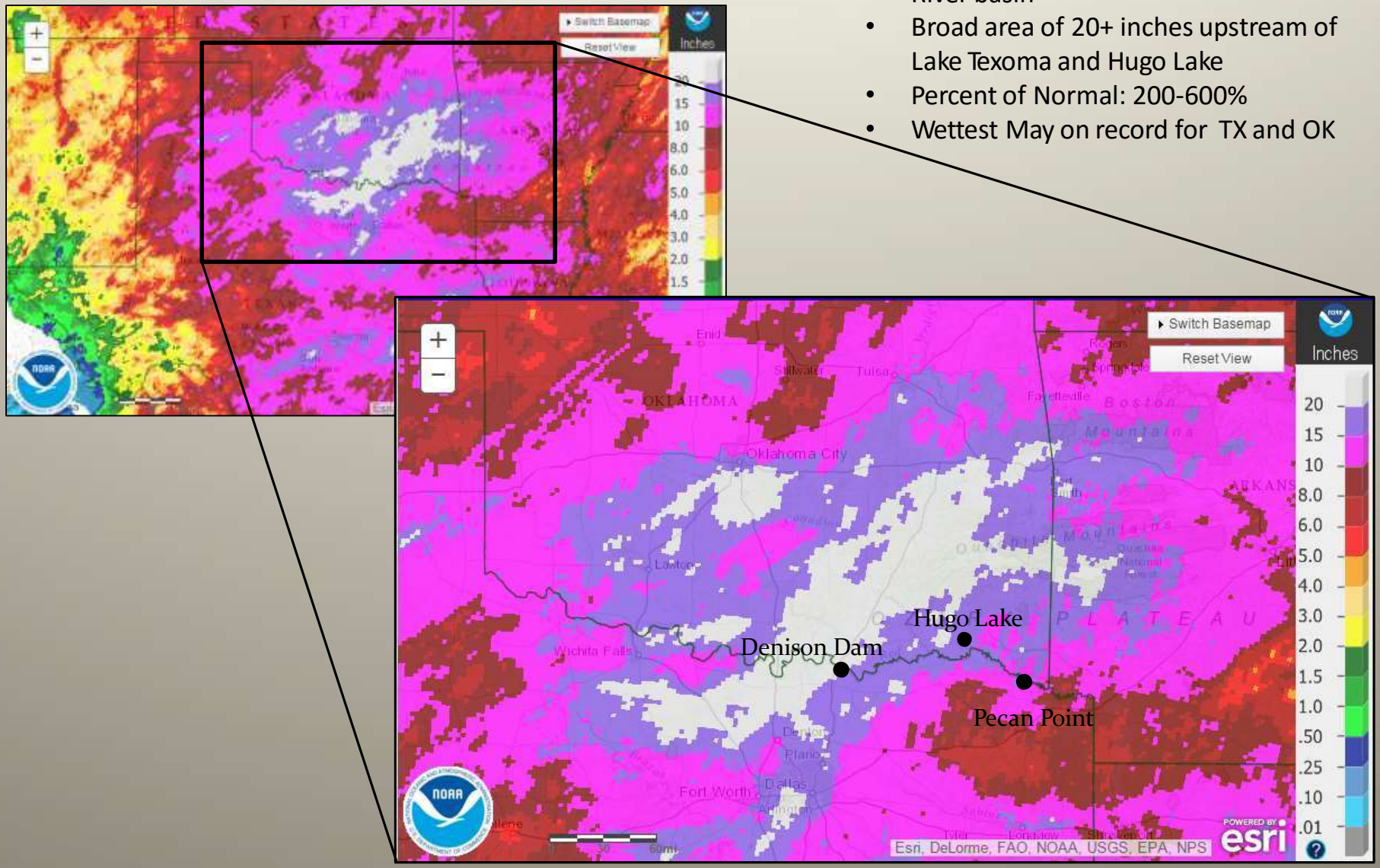


What Could Have Caused this Flood?

May Rainfall Totals

Record Rainfall

- Widespread 10+ inches over the Red River basin
- Broad area of 20+ inches upstream of Lake Texoma and Hugo Lake
- Percent of Normal: 200-600%
- Wettest May on record for TX and OK



Waterway Project – Locks and Dams Dikes and Revetments

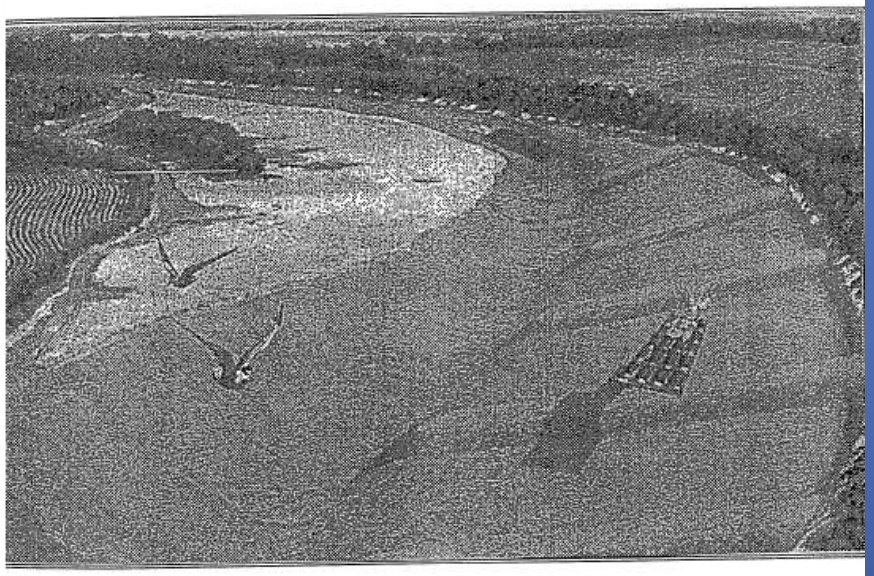
Sand and Sediment Accumulation

Sand and Sediment Accumulation

Corps of Engineers 1998 DRAFT STUDY

DRAFT

RED RIVER SEDIMENT TRANSPORTATION STUDY



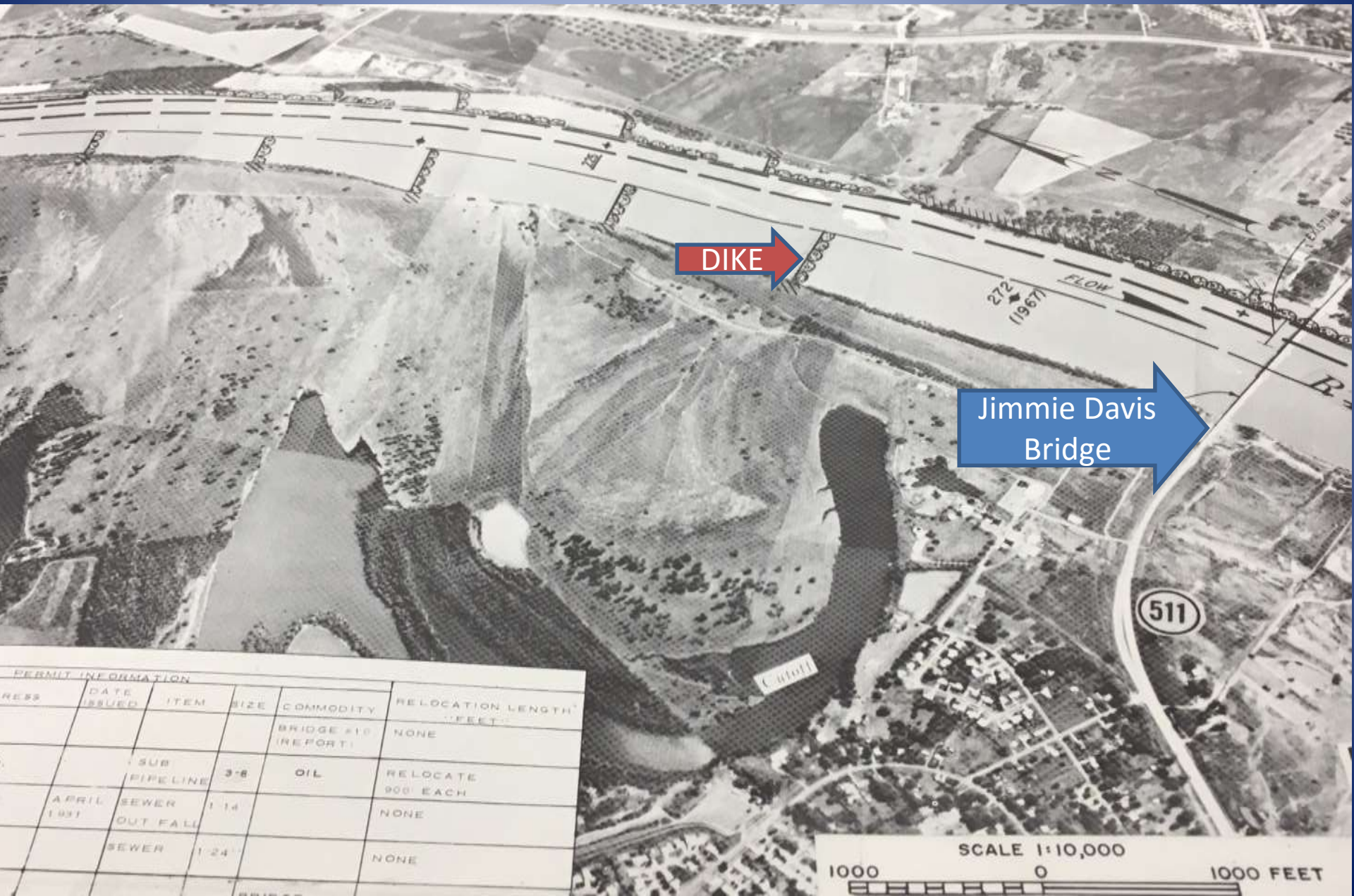
US Army Corps of Engineers ®
Tulsa District

MARCH 1998

Executive Summary

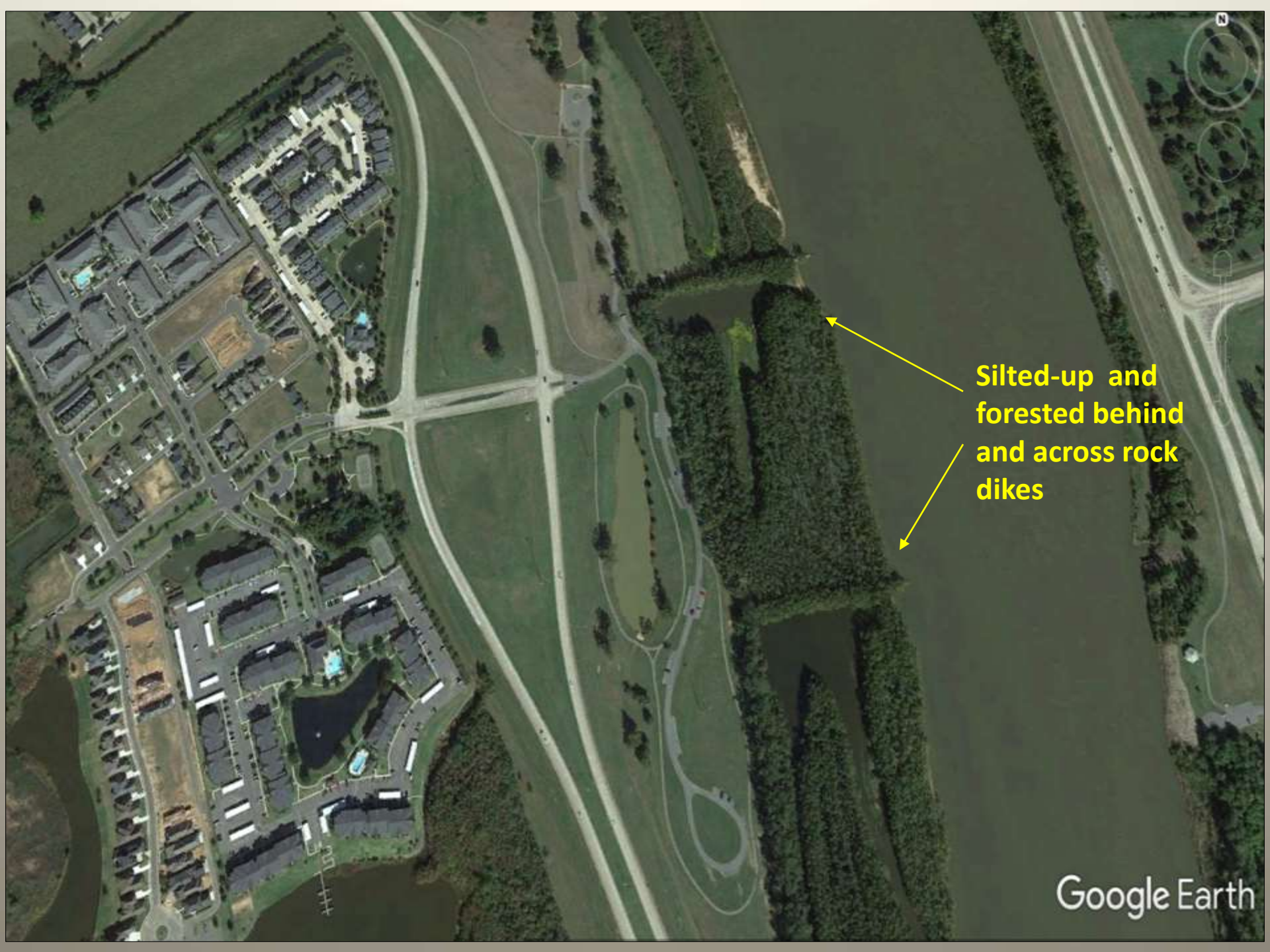
The results of the Red River Sediment Transportation Study showed that the majority of the sediments entering the Red River above Index, Arkansas, are falling along various points on the river to form sandbars and shoals prior to reaching Index. However, the study determined that all the sand sediments flowing past Index, Arkansas, which are estimated to be approximately **1.6 million cubic yards (2.29 million tons of wet sand) per year** are ending up in the navigation channel at **Pool 5** near **SHREVEPORT.**

North of Jimmie Davis Bridge 1976

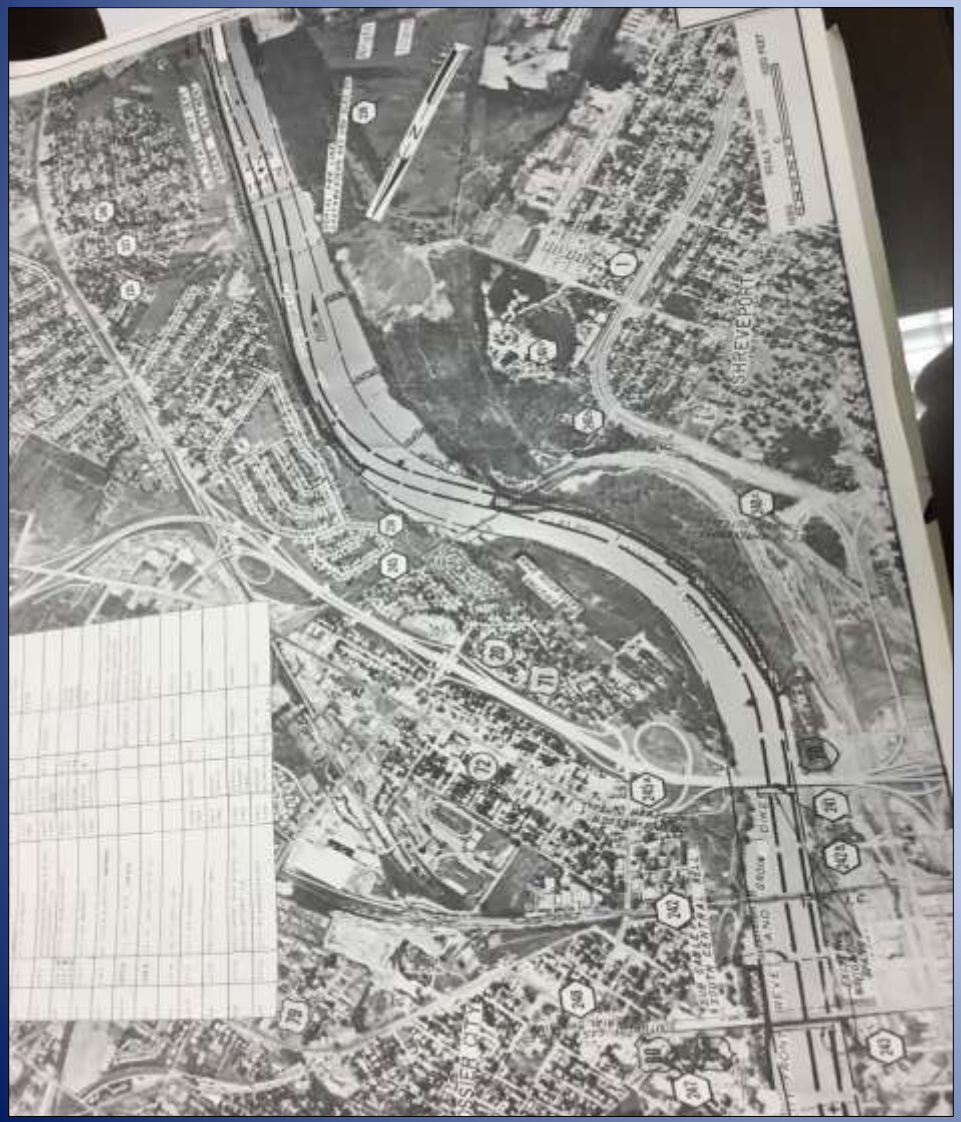


Rock Dikes - 2002

Choke Points - Obstructions and Changes (Man-made and Natural)


Silted-up and forested behind and across rock dikes
Google Earth

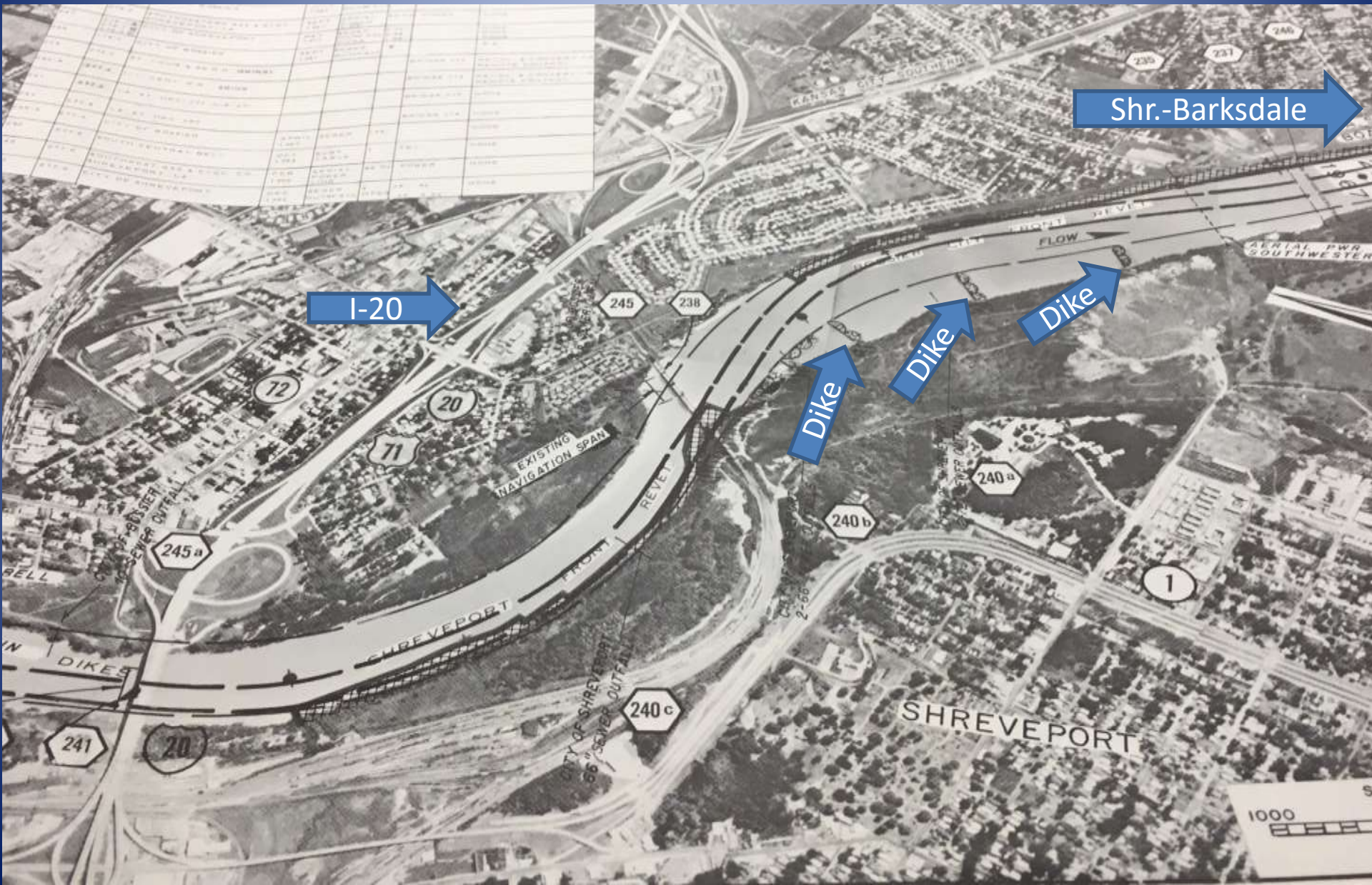
Development on both sides of the Red River after 1980



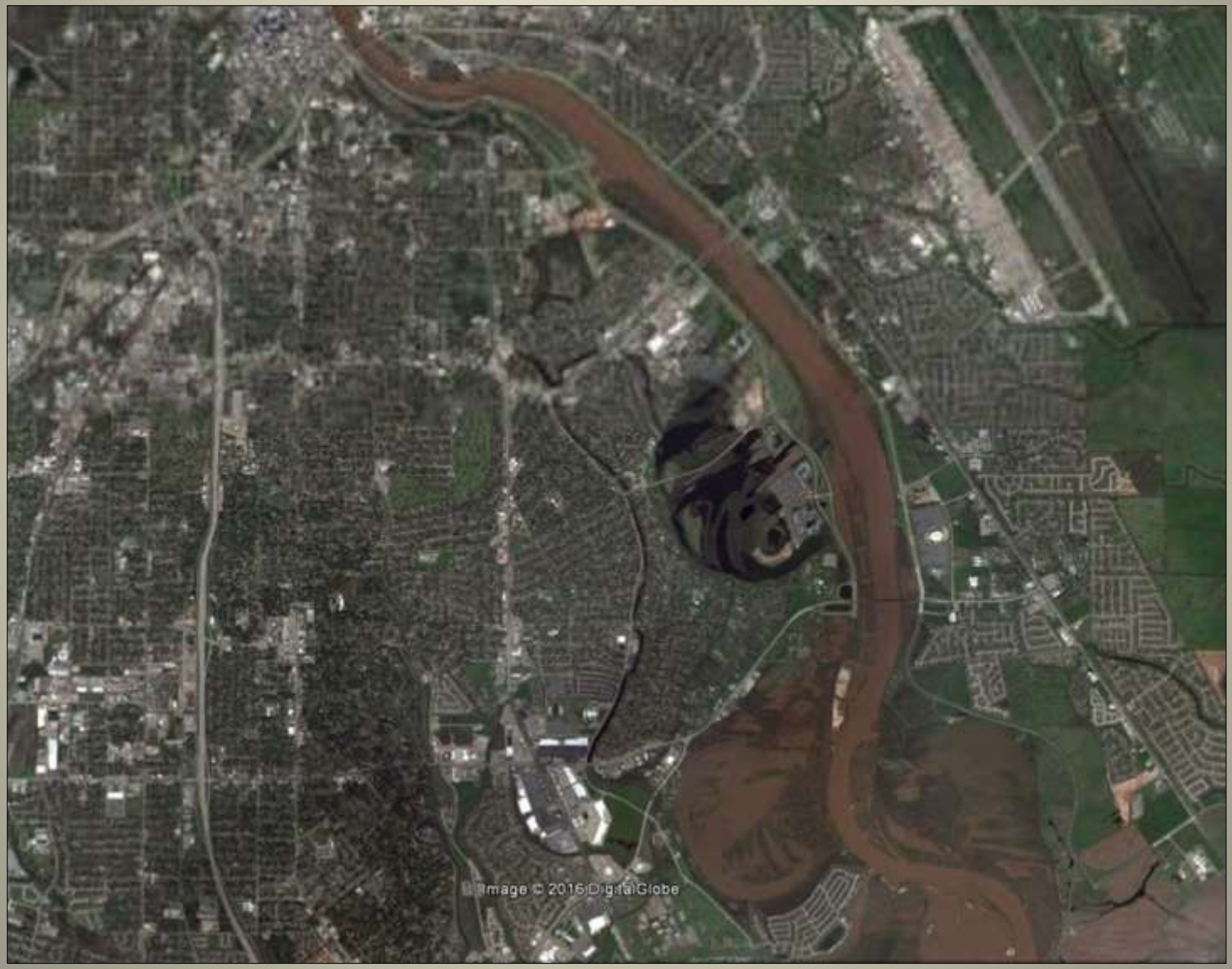
Jimmy Davis Bridge / Fant Parkway

Parkways are a Barrier, but not a Levee

Vacant Land South of I-20



Urbanization in Flood Plain

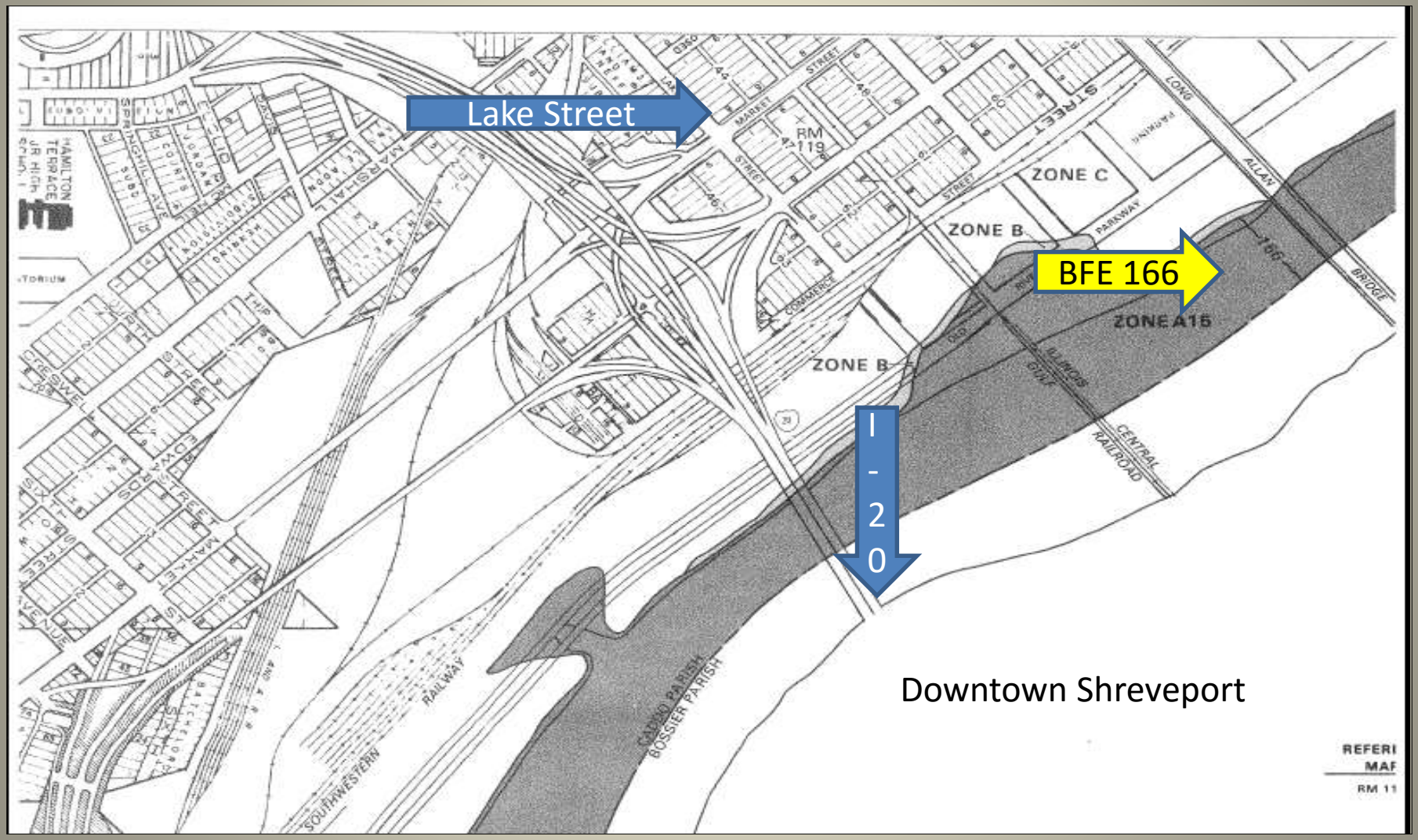


HOW ACCURATE ARE THE

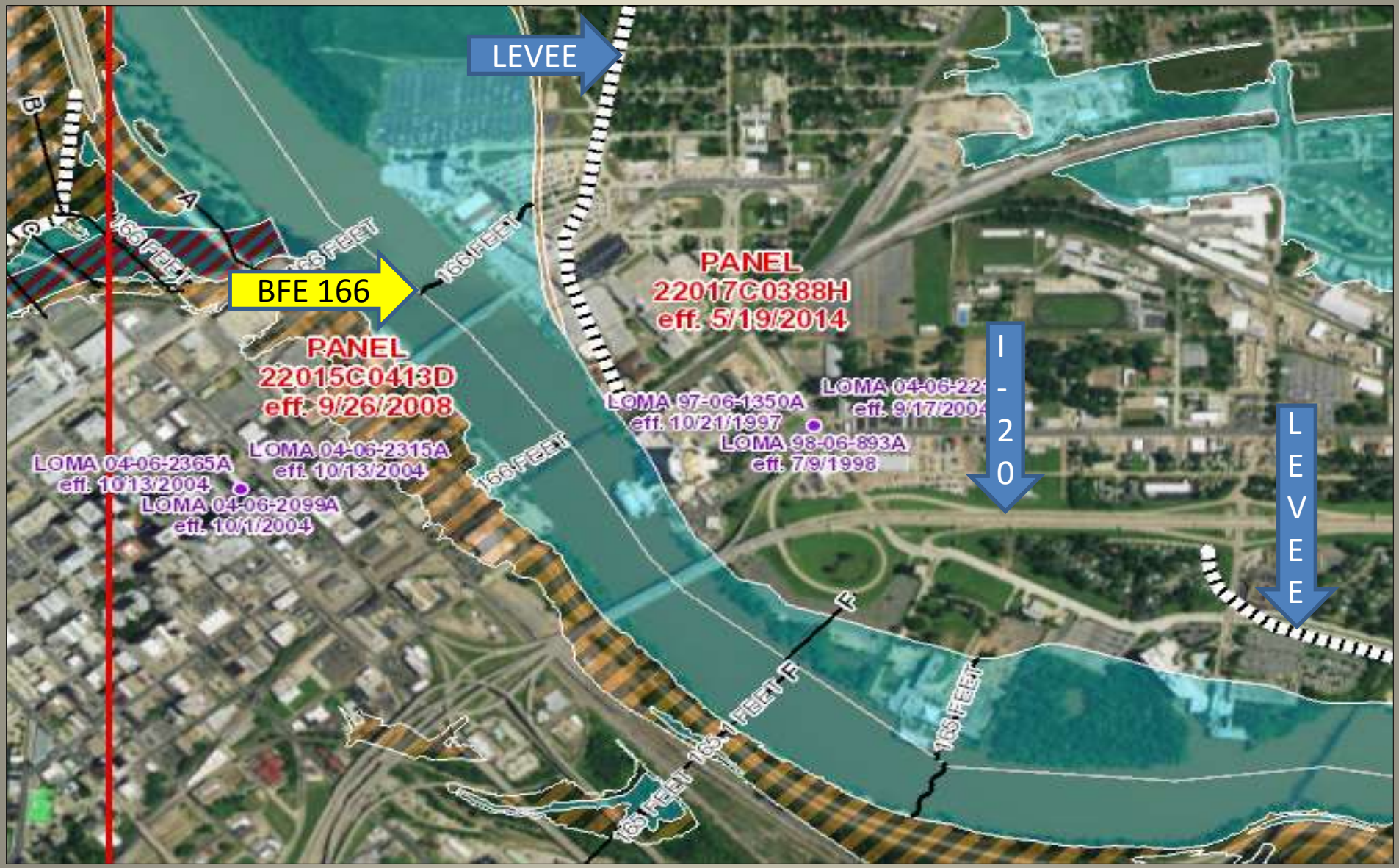
Flood Insurance Rate Maps (FIRM)

PUBLISHED BY FEMA?

Original FEMA Flood Map 1984



Current FEMA Flood Map 2014



How Accurate are the Flood Maps Published by FEMA?

- The first maps published for the Caddo – Bossier area were in the early 1980's.
- Maps are usually updated every 10 years to insure current Base Flood Elevations are available.
- Maps are used by public agencies to regulate development located in flood prone areas.
- Base Flood Elevations usually change with the increase of development within the watershed of a stream.

How Accurate are the Flood Maps Published by FEMA ?

- Improvements to the river's channel will result in **lower** Base Flood Elevations.
- Encroachments on the river's channel or obstructions of the channel will result in **higher** Base Flood Elevations.
- The Base Flood Elevation of the Red River was established in the late 1970's at an elevation of 166 feet near downtown Shreveport.
- The Base Flood Elevation shown on the current maps that were published in 2014 is 166 feet at the same location – **NO CHANGE.**

How Accurate are the Flood Maps Published by FEMA?

- The Base Flood Elevation by FEMA for the Red River **has not changed** since the late 1970's (approximately 35-40 years).
- The Red River's channel **has changed** in the last 30-40 years.
- The overflow area for backwater flood storage on both sides of the River has experienced **significant reductions.**

What has been learned?

- FEMA's Base Flood Elevations of the Red River shown on the FIRM are outdated and not accurate.
- FEMA's BFE's of the Red River's tributaries (Twelve Mile Bayou in Caddo and Loggy Bayou in Bossier) are impacted by backwater flooding from the Red River, are not accurate, and are outdated.
- The Red River's main channel has been changed due to siltation since the BFE's were established by FEMA.

What has been learned?

- Significant changes in the land use between the two Levee Systems has occurred since the BFE's were established by FEMA.
- The height of the existing levee system in Caddo and Bossier Parishes may not meet the three (3) foot free board (safety factor) established by FEMA, which may result in de-certification of the levee system.
- Removal of silt from the river's channel by dredging to provide flood protection is not economically feasible and possible.

What has been done?

- A Flood Technical Committee was formed.
- Completed documentation of High Water Marks (HWM's) along the levee system on the Red River in both parishes.
- Corps initiated a $1.5 million Hydraulic & Sediment Survey, but only received $250,000. The FY 2017 budget requires $1.25 million to complete the survey.
- The survey is from Lock 1 to Hwy 72 Bridge, AR.
- FEMA needs the Corps data for BFE / Maps / Insurance.

What has been done?

- Bossier Parish and Bossier City have enacted legislation which allows use of established HWM's to regulate future developments on land located between the levee system and the Red River.
- Caddo Parish and the City of Shreveport have adopted a voluntary policy that recommends the use of high water marks for development on land between the levee and the Red River.

What Should be Done to Protect Lives and Property?

- Local public agencies should use the HWM's to regulate development on land located between Caddo and Bossier levee systems.
- Local public agencies should establish legislation that will allow preservation of open space for flood plain storage protection.
- Local public agencies should establish legislation that mandates mitigation (Flood Plain Compensation) for development authorized on land located between the levee systems on both sides of the river.

What Should be Done to Protect Lives and Property?

- Corps of Engineers should complete the Hydraulic Model and Sedimentation Survey of the Red River.
- FEMA needs the Corps data for BFE / Maps / Insurance.
- FEMA should establish accurate Base Flood Elevations for the Red River and its tributaries in Caddo and Bossier Parishes.
- Levee Boards should ensure the height of the levee system meets or exceeds FEMA's certification requirements.


Discussion / Questions