



Conveyance and Hydraulic Structures

Jason Chapman (DOTD)

Dave Ramirez (USACE)

November 14, 2018

LOUISIANA
WATERSHED
INITIATIVE

working together for sustainability and resilience

USACE New Orleans District Conveyance and Hydraulic Structures

DATASET WORKSHOP

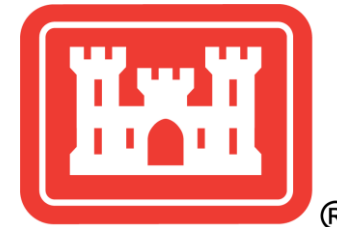
Dave Ramirez, P.E., D.WRE

Chief, Water Management

New Orleans District

david.a.ramirez@usace.army.mil

DATE 9:00 am – 10:30 am



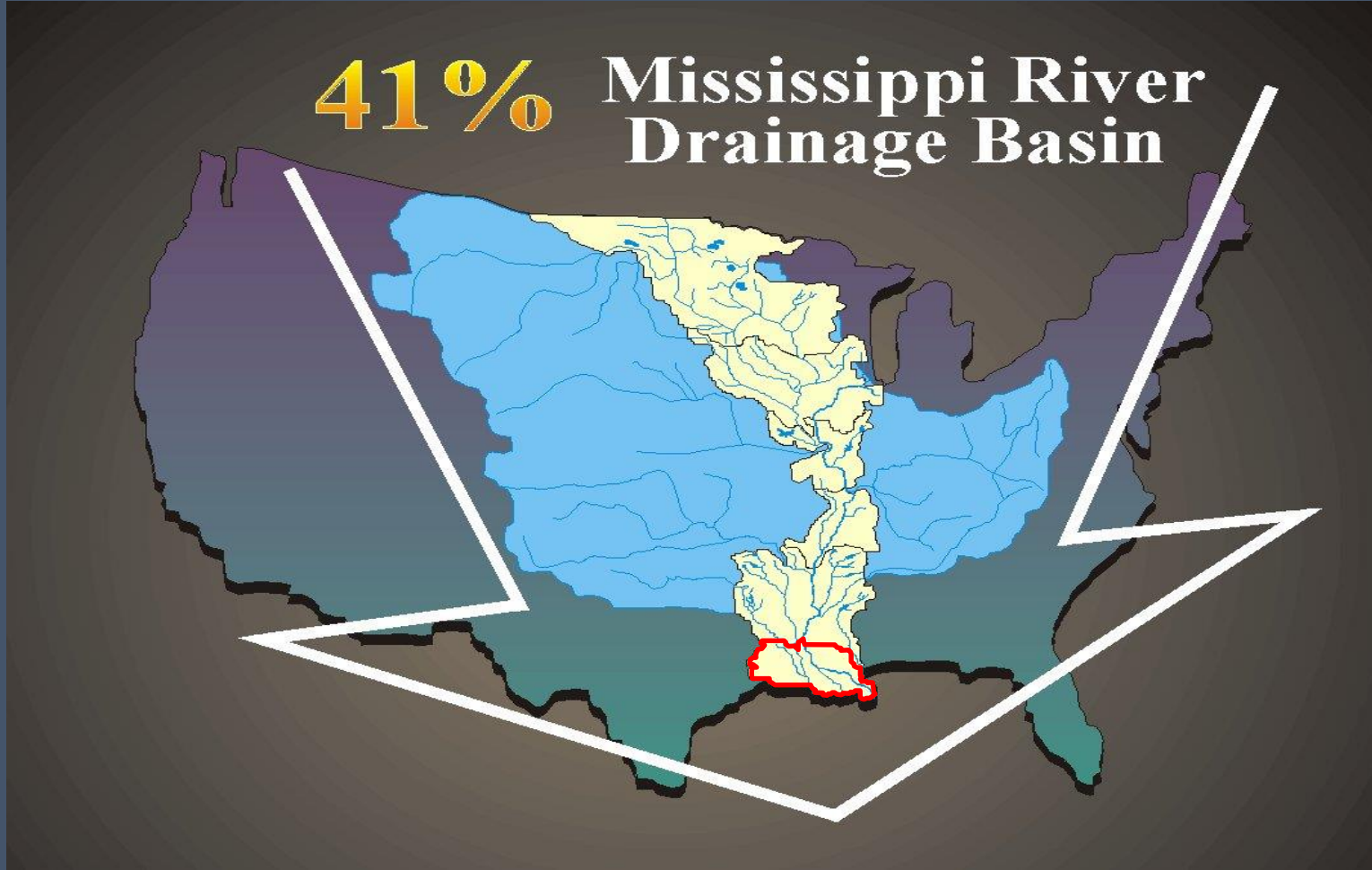
Outline

- **USACE Hydraulic Structure Inventory**
- **River Management**
 - Flood Risk Reduction
 - Navigation
- **Hurricane Risk Reduction**
 - Navigation
 - Roadway
 - Railroad
 - Drainage
 - Access
- **Data Collection for Hydraulic Structures**
- **Discussion**



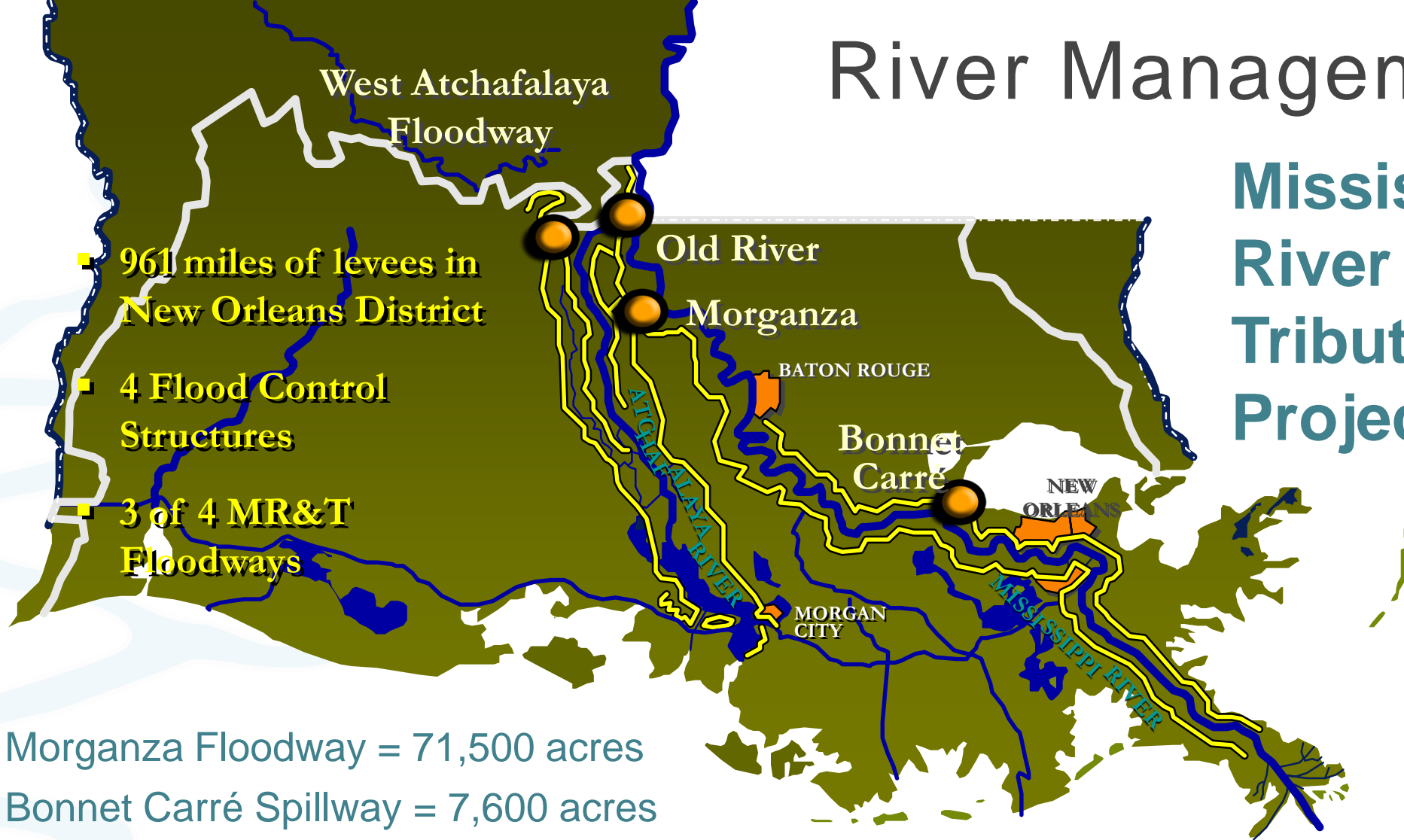
New Orleans District

41% Mississippi River
Drainage Basin



River Management

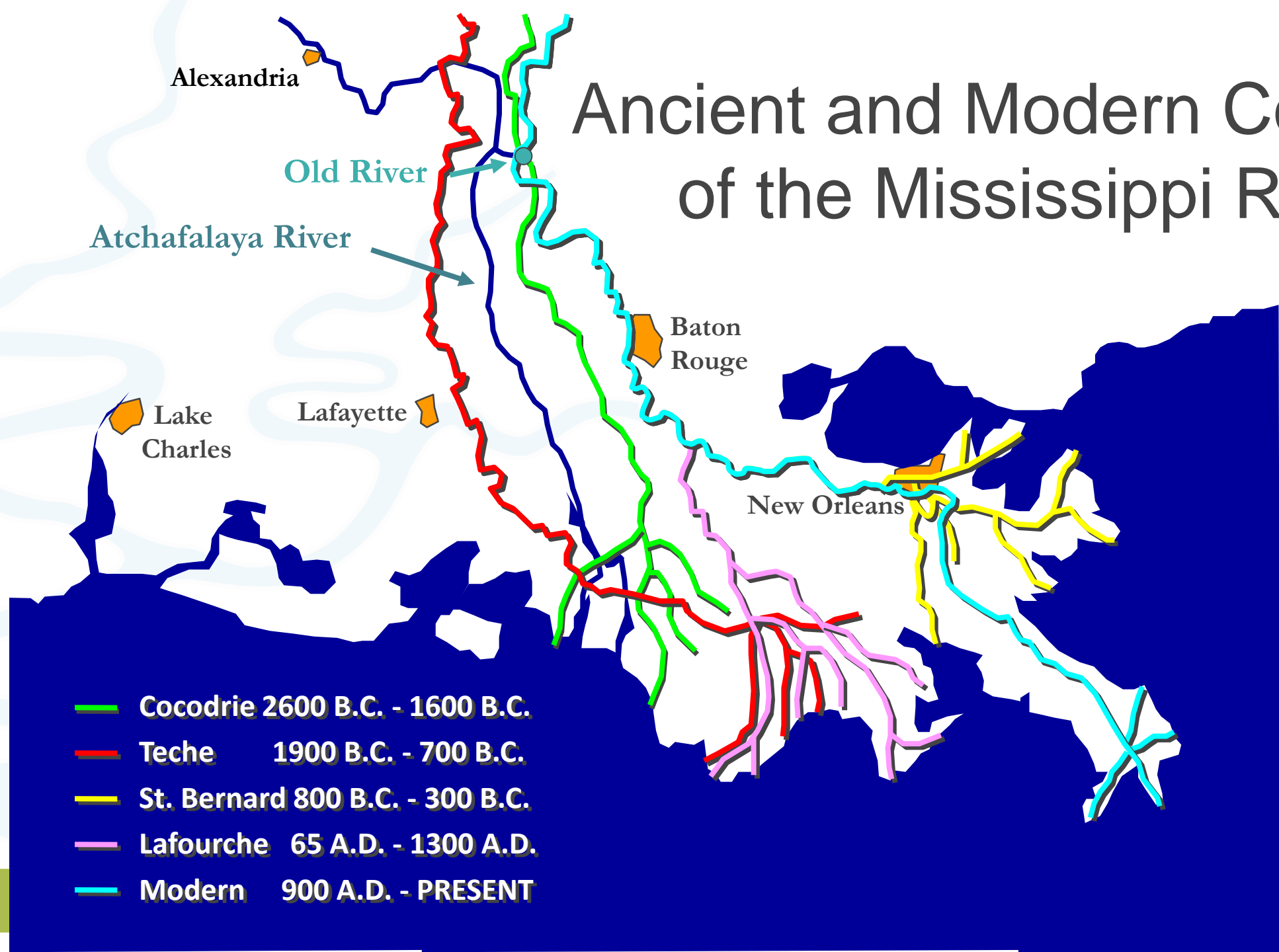
Mississippi River and Tributaries Project



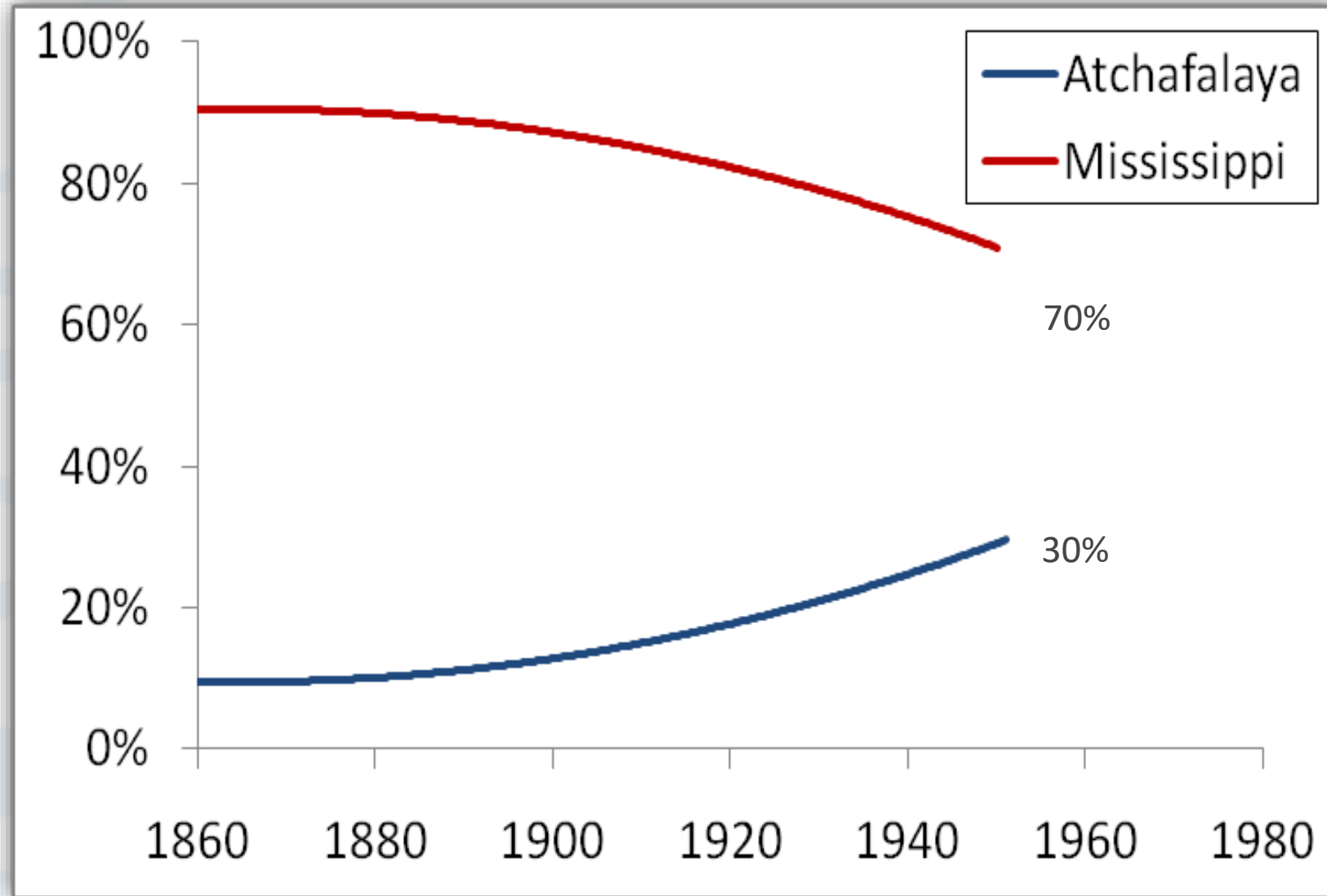
- Morganza Floodway = 71,500 acres
- Bonnet Carré Spillway = 7,600 acres
- West Atchafalaya Floodway = 154,000 acres
- Red River Backwater Area = 373,000 acres



Ancient and Modern Courses of the Mississippi River



Flow Distribution After Shreve's Cutoff



Purpose of the Old River Control Complex

The U.S. Army Corps of Engineers operates the Old River Control Complex (ORCC) in accordance with the authorizing law, the Flood Control Act of 1954, to maintain a stable relationship between the Mississippi and Atchafalaya Rivers

- Designed and is operated to prevent capture of the Mississippi River by the Atchafalaya River
- Operated to maintain the distribution of flow and sediments between the Mississippi and Atchafalaya Rivers in approximately the same proportion as occurred naturally in 1950
- In 1950, the annual flow distribution below the latitude of Old River was approximately 70 percent in the Mississippi River and 30 percent in the Atchafalaya River (70/30 distribution)



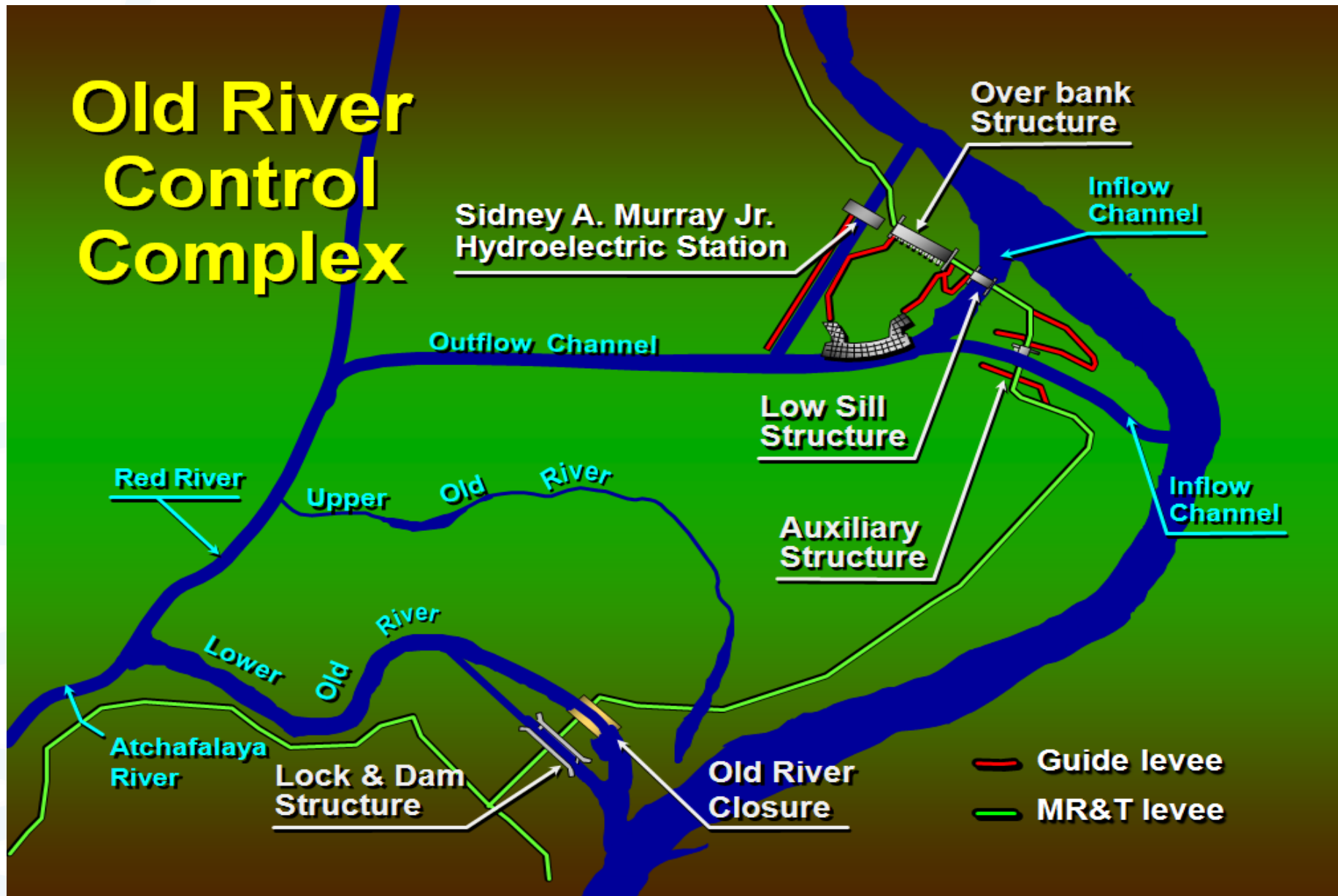
The Old River Control Complex (ORCC)



WORKING TOGETHER FOR SUSTAINABILITY AND RESILIENCE



Old River Control Complex

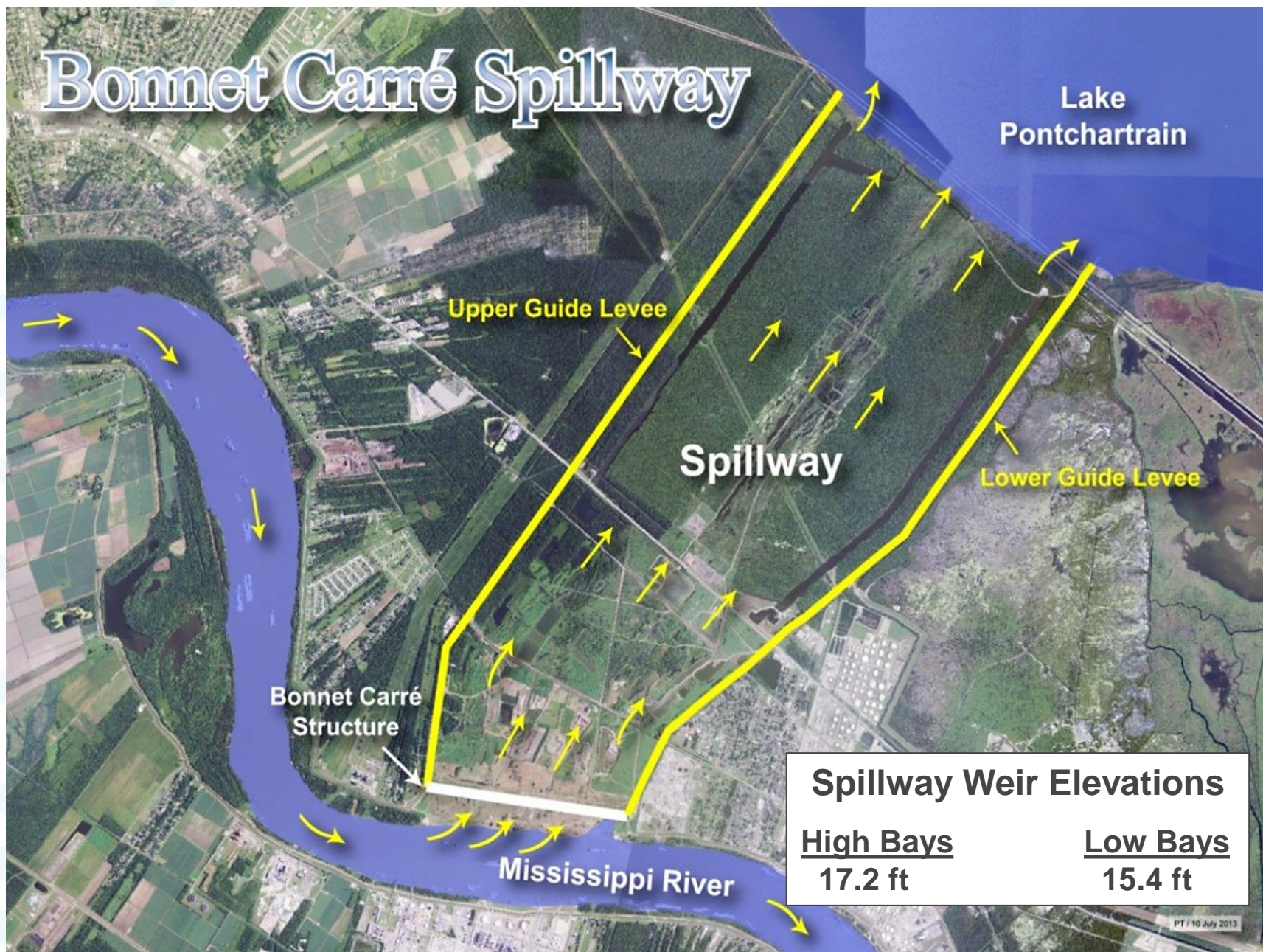


Bonnet Carre Spillway

- Completed 1932
- 7,600 acre Floodway
- Structure Operated 12 times
- Design Flow of 250,000 cfs
- 2011 Flows of 316,000 cfs



Bonnet Carré Spillway



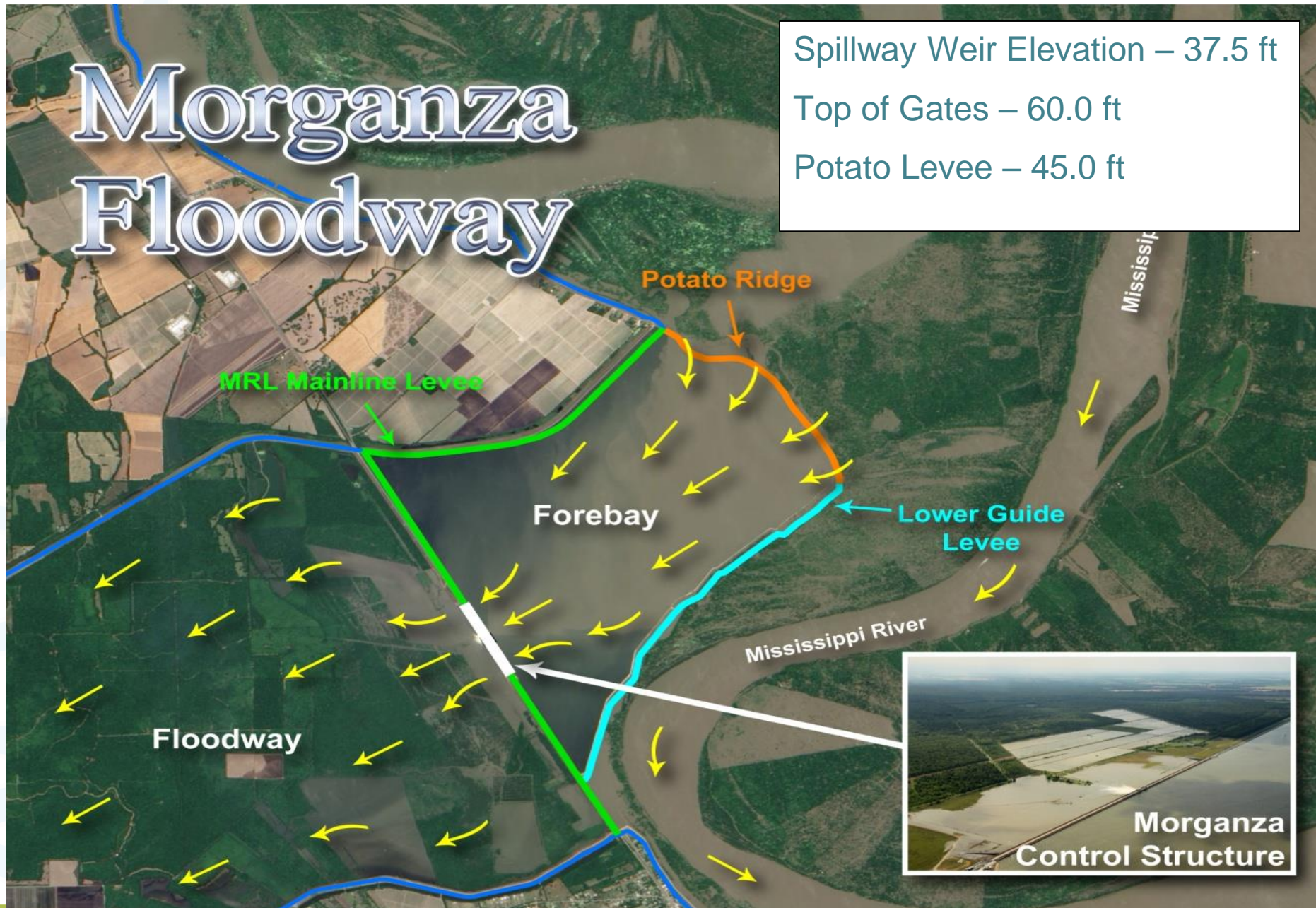
Morganza Floodway

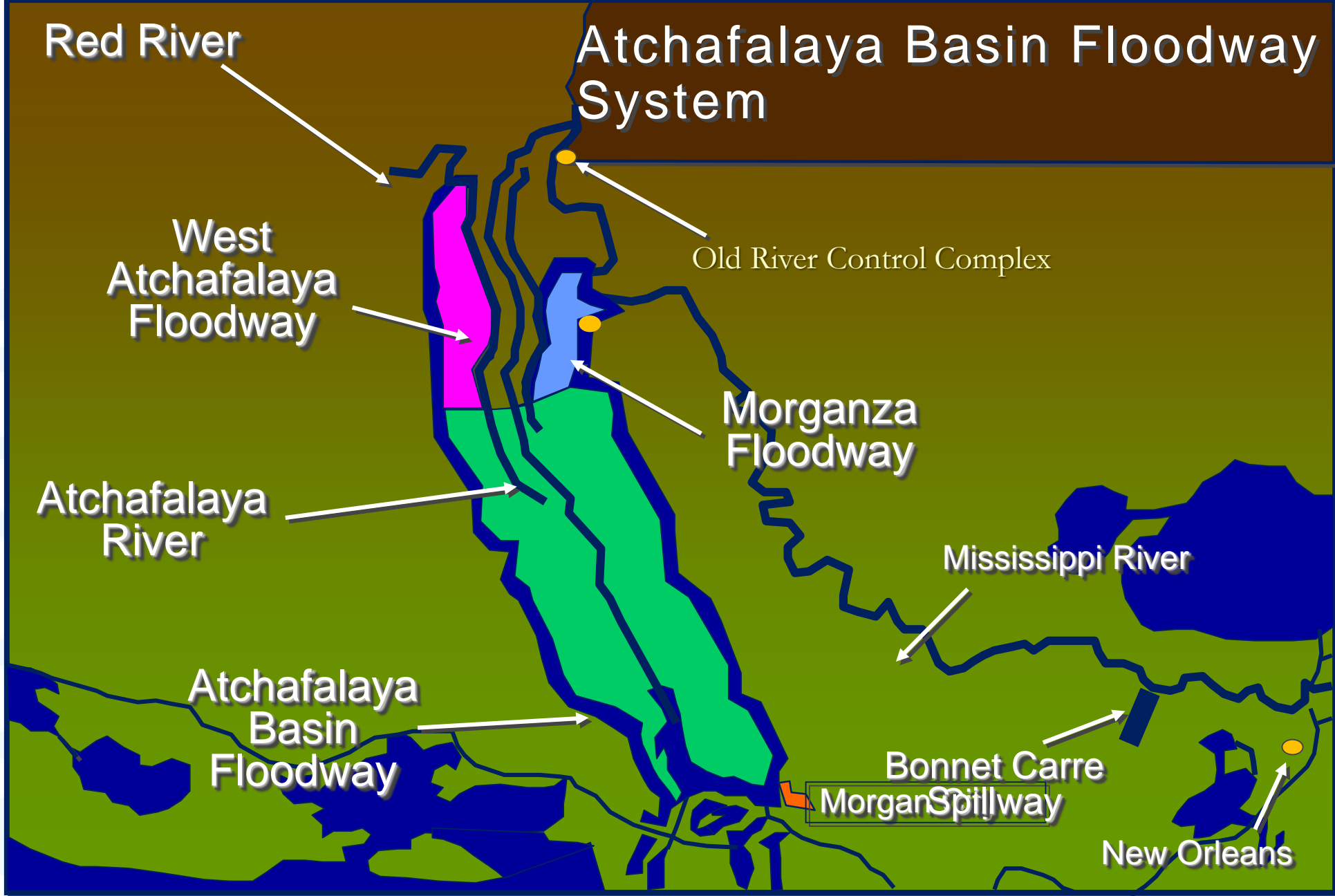
- Completed in 1954
- 71,500 acre Floodway – Completely flooded in 2011
- Operated in 1973 and 2011
- Design Flow of 600,000 cfs
- 2011 Peak Flows of 186,000 cfs



Morganza Floodway

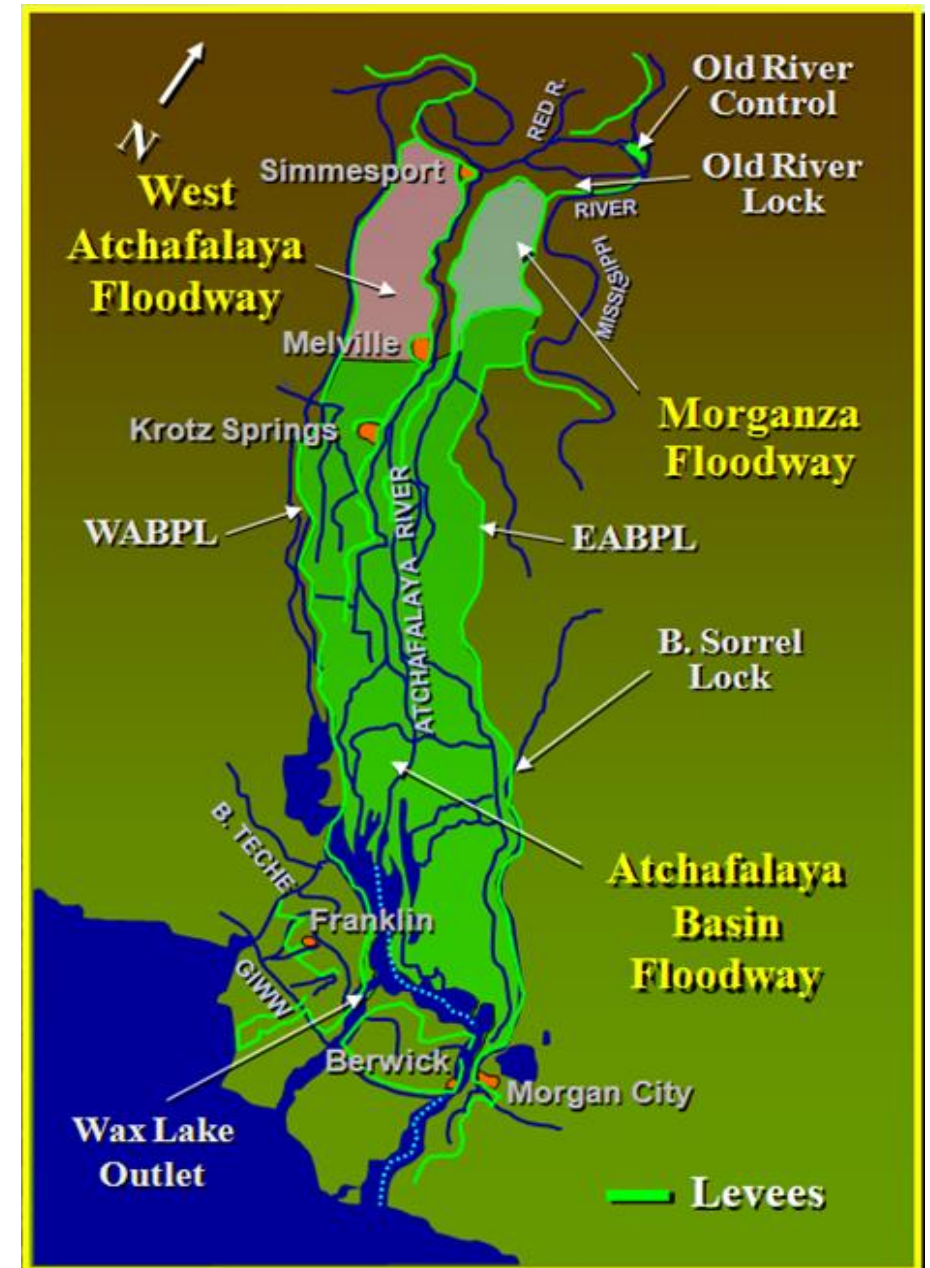
Spillway Weir Elevation – 37.5 ft
Top of Gates – 60.0 ft
Potato Levee – 45.0 ft





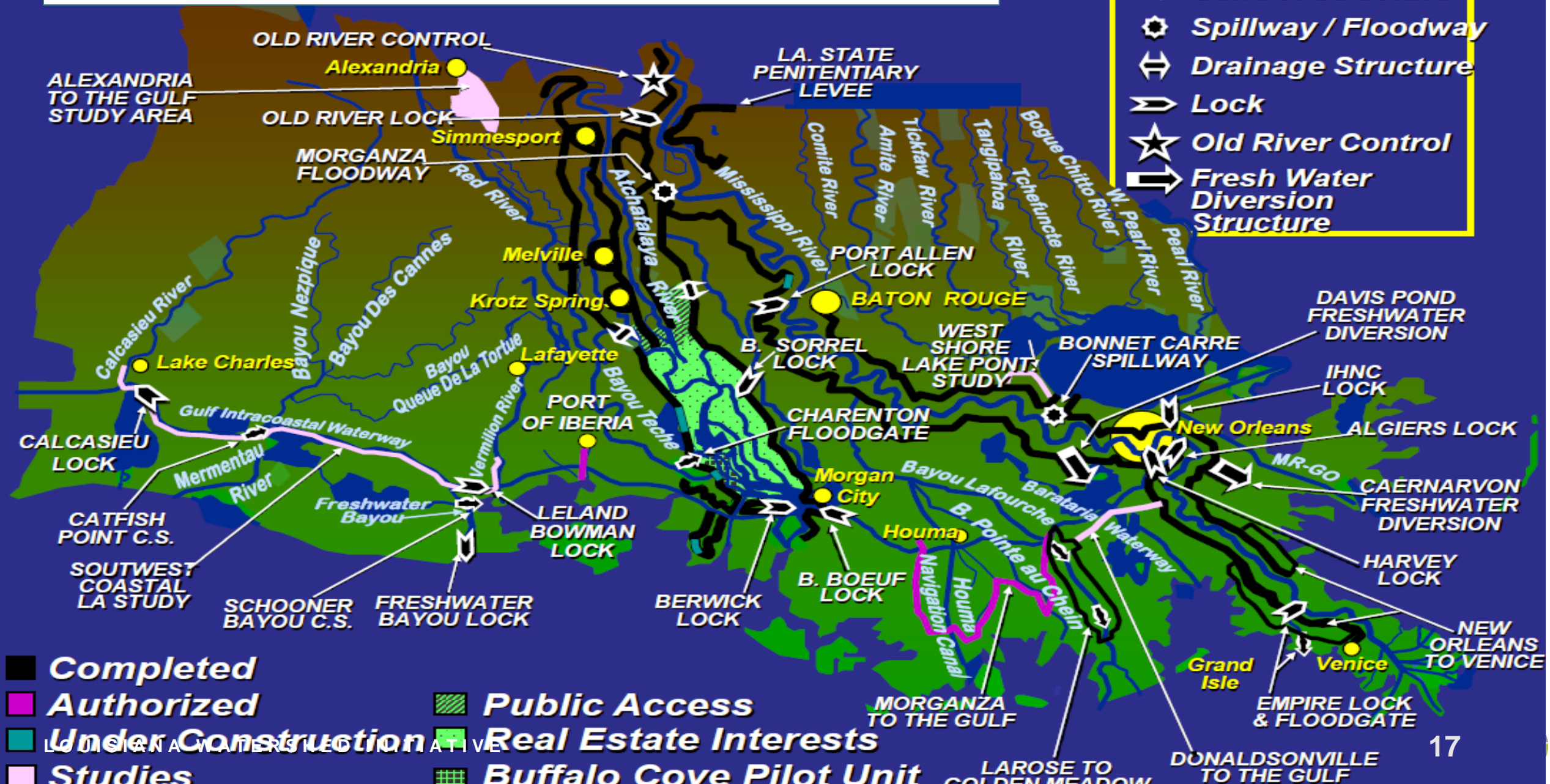
West Atchafalaya Floodway

- Completed in 1935
- 154,000 acre Floodway
- Has never been operated
- Design flow 250,000 cfs
- Not operated in 2011 because the Red River and Ouachita Rivers did not experience major flooding



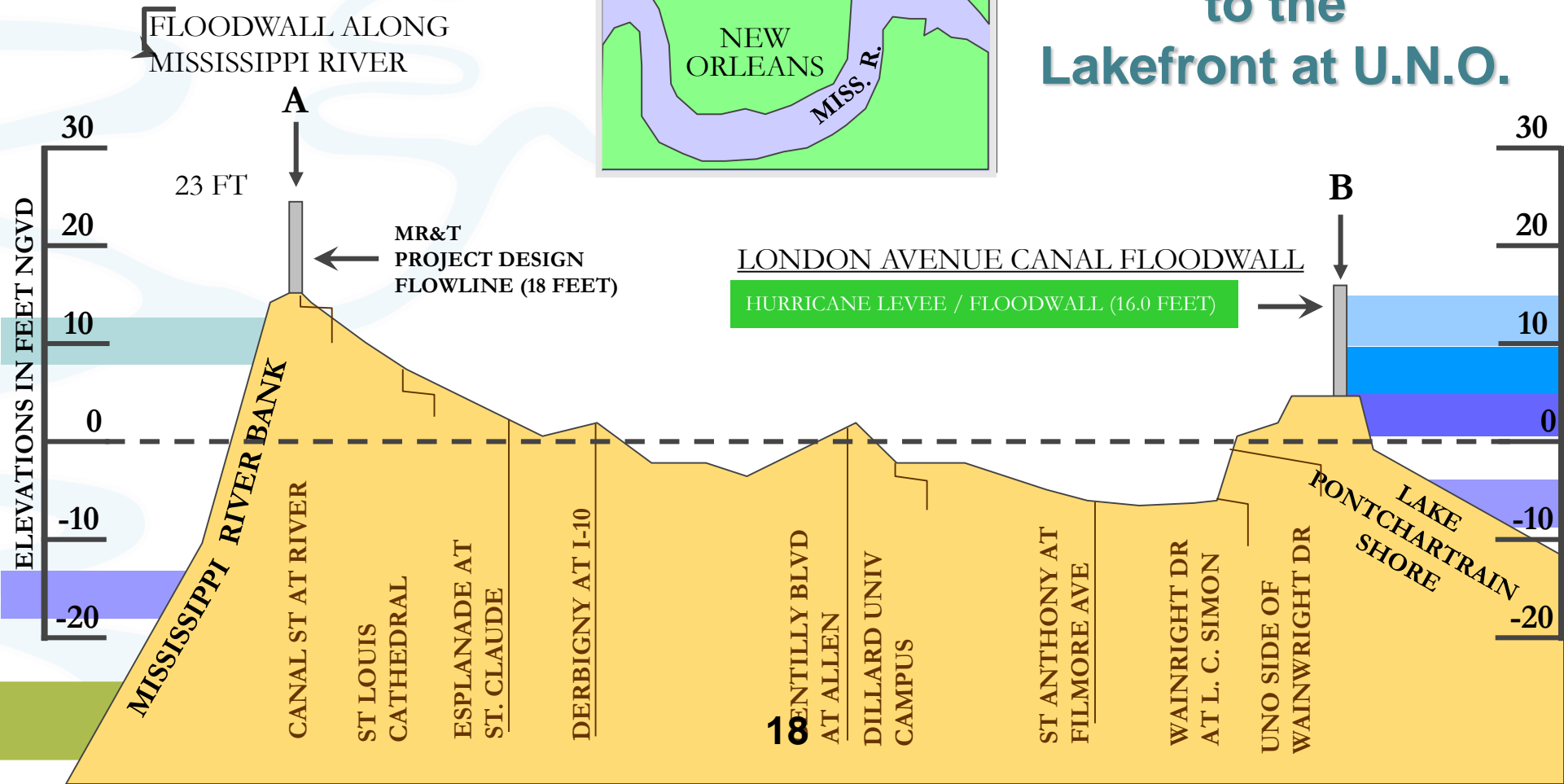
Navigation Structures

-  Levee
-  Control Structure
-  Spillway / Floodway
-  Drainage Structure
-  Lock
-  Old River Control
-  Fresh Water Diversion Structure



Hurricane Risk Reduction

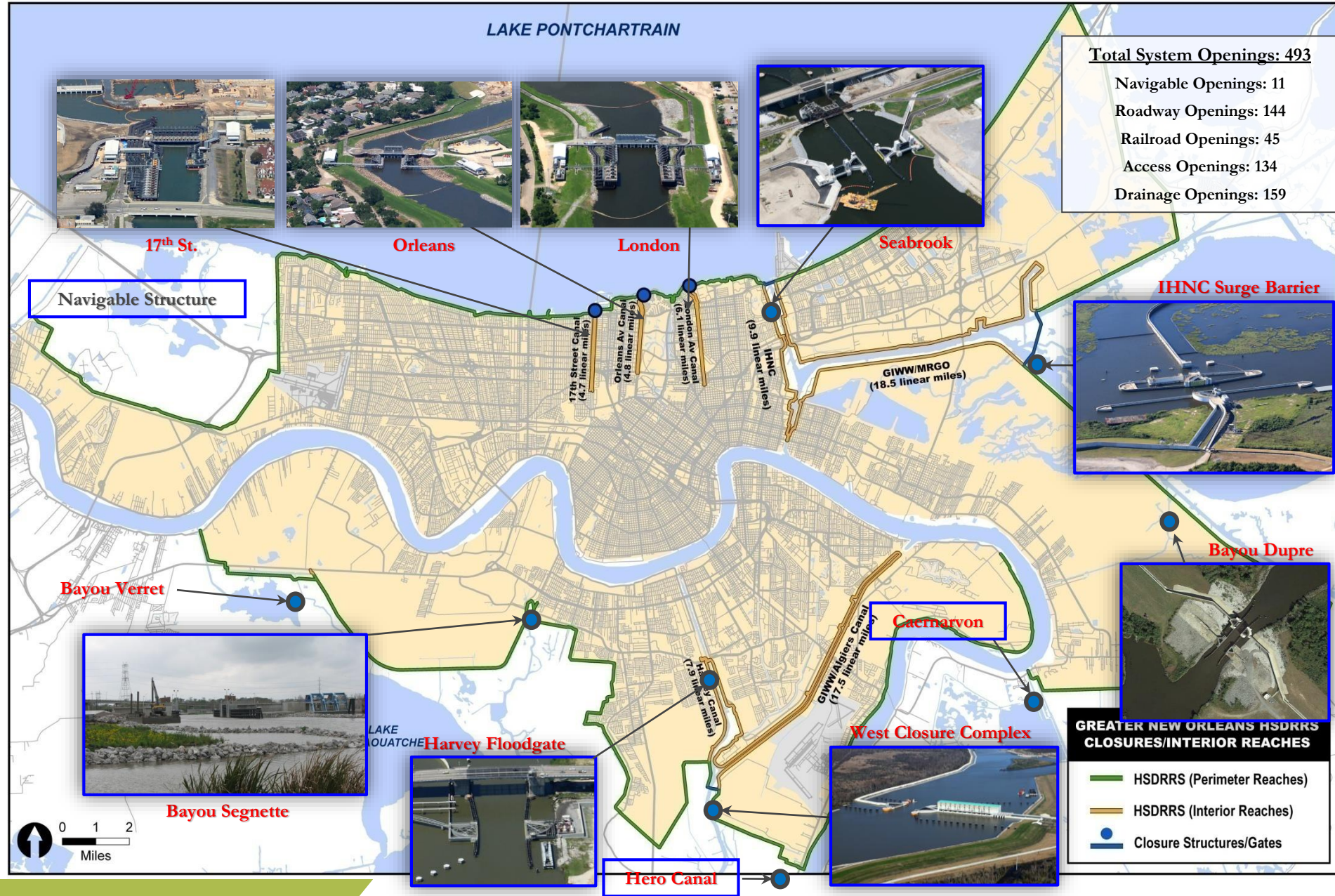
City of New Orleans Ground Elevations



From Canal St. at Mississippi River to the Lakefront at U.N.O.



A Stronger System Than Ever Before



Outfall Canals

17th St. Canal



Trigger: 3.0 ft

Pumping Capacity: 9,200
cfs

Orleans Ave. Canal



Trigger: 5.0 ft

Pumping Capacity: 2,200
cfs

London Ave. Canal



Trigger: 2.5 ft

Pumping Capacity: 5,200
cfs



Southeast Louisiana Urban Flood Damage Reduction Project (SELA)

Purpose

- Improve the storm water drainage systems to provide flood damage risk reduction from a ten-year rainfall event

Orleans Parish

- Improve 12 major drainage lines and 3 pumping stations

Jefferson Parish

- Improve 24 drainage canals and 4 pumping stations

Total Estimated Construction Value:

\$960 M

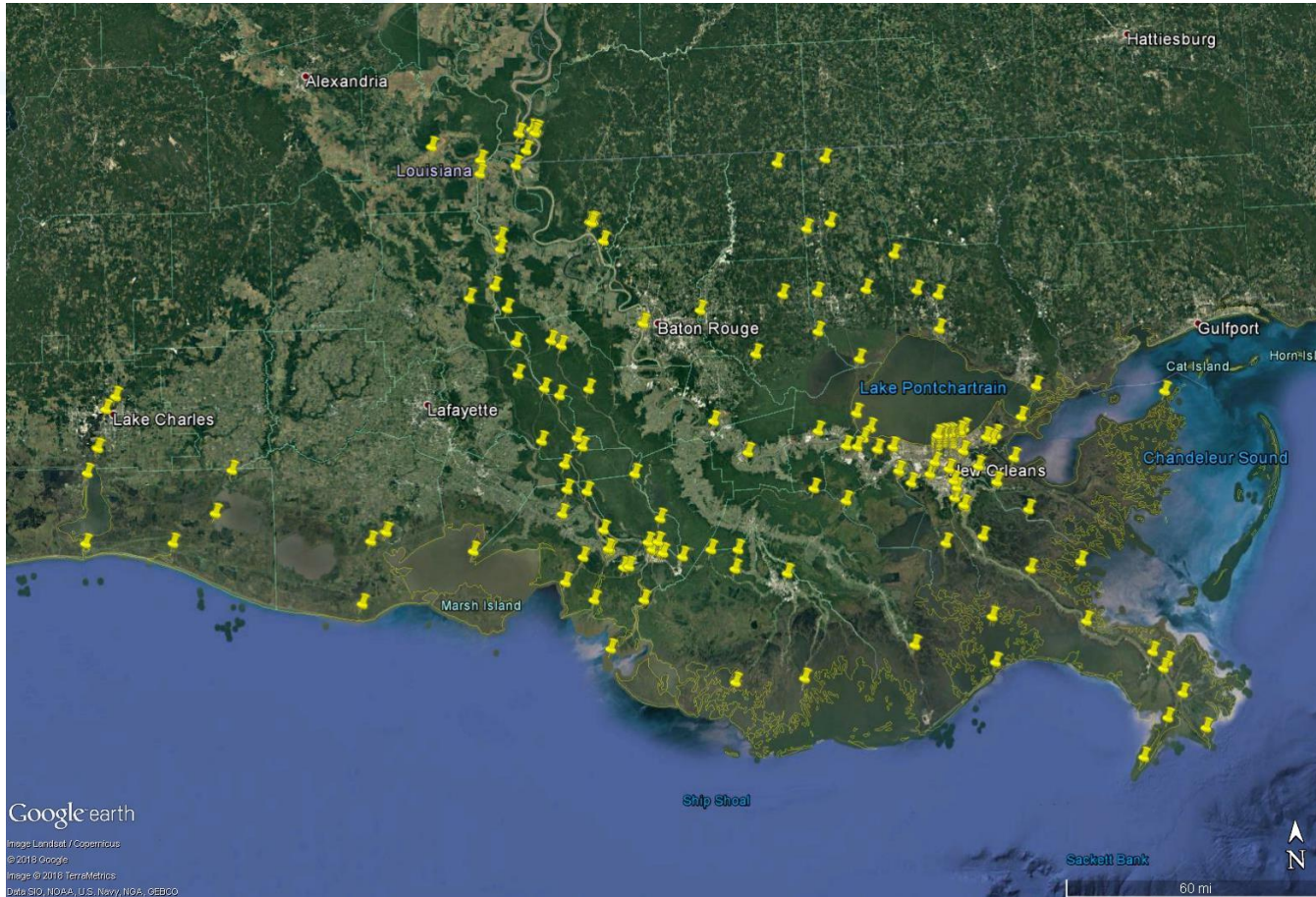


Data Collection for Hydraulic Structures

- **Over 120 Real-time gages**
 - Stage
 - Water temp.
 - METs
- **Over 150 high water staff gages**
 - Bonnet Carre Spillway
 - Morganza Spillway
 - Atchafalaya Basin



Hydraulic Structure Data Collection



- **Mississippi & Atchafalaya Rivers**
 - Navigation
 - River forecasting
 - Operation of control structures e.g. Old River Control Structure affects river forecast
 - Staff gages at every flood control or navigation structure.
- **Large concentration surrounding New Orleans**
 - HSDRRS
 - floodgates, pumping stations, surge reduction barrier, outfall canals, levees




Data Availability

- **MVN real-time gage data available to public online at [Rivergages.com](https://www.rivergages.com)**
 - Not funded/supported by MVN
 - Maintained by Rock Island District
 - No control if system crashes or goes offline
 - Other ways for public to view data (DADDS, EDDN), but require station satellite ID and not user friendly
- **Co-Op gages on USGS website (Current Conditions Louisiana Real-time Stream flow.)**



Discussion





Statewide Geospatial Topographic Mapping Initiative (GIS)

DATASET WORKSHOP

Jason Chapman, P.E.

Louisiana DOTD

Data Collection & Management Systems

November 14, 2018 9:00 am – 10:30 am

LOUISIANA
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INITIATIVE

working together for sustainability and resilience

Why Do We Collect Data??



Federal and State Reporting

- Federal Government Entities
- State Government Entities
- Local Planning Organizations
- Parish and City Officials



Louisiana Legislation

In 2012, Act 409 amended and reenacted R. S. 48:36 to read as follows:

§36. Topographic mapping

- A. The department shall develop and maintain a statewide digital geospatial database for topographic mapping with the assistance of other state agencies or departments. The department shall act as authority for geographic names, set standards for the mapping of topographic features, and plan and manage data collection for incorporation into a statewide database for topographic mapping. Rules and regulations shall be promulgated by the department in accordance with the Administrative Procedure Act as are necessary for the planning and managing of the geospatial data associated with topographic mapping.
- B. The department shall submit a written report to the House and Senate committees on transportation, highways, and public works providing for a program and plan of implementation for the development and maintenance of a statewide digital geospatial database for topographic mapping as required by subsection A of this section no later than December 31, 2012.



What does that mean?

Louisiana Legislation Breakdown

48:36. Topographic Mapping

A – 1. **La DOTD** will develop a statewide geospatial database for topographic mapping with **assistance of other state agencies**.

A – 2. **La DOTD** will act as authority for Geographic Names.

A – 3. **La DOTD** will set standards for mapping topographic features.

A – 4. **La DOTD** will plan and manage data collection and incorporation into a statewide geospatial database for topographic mapping.

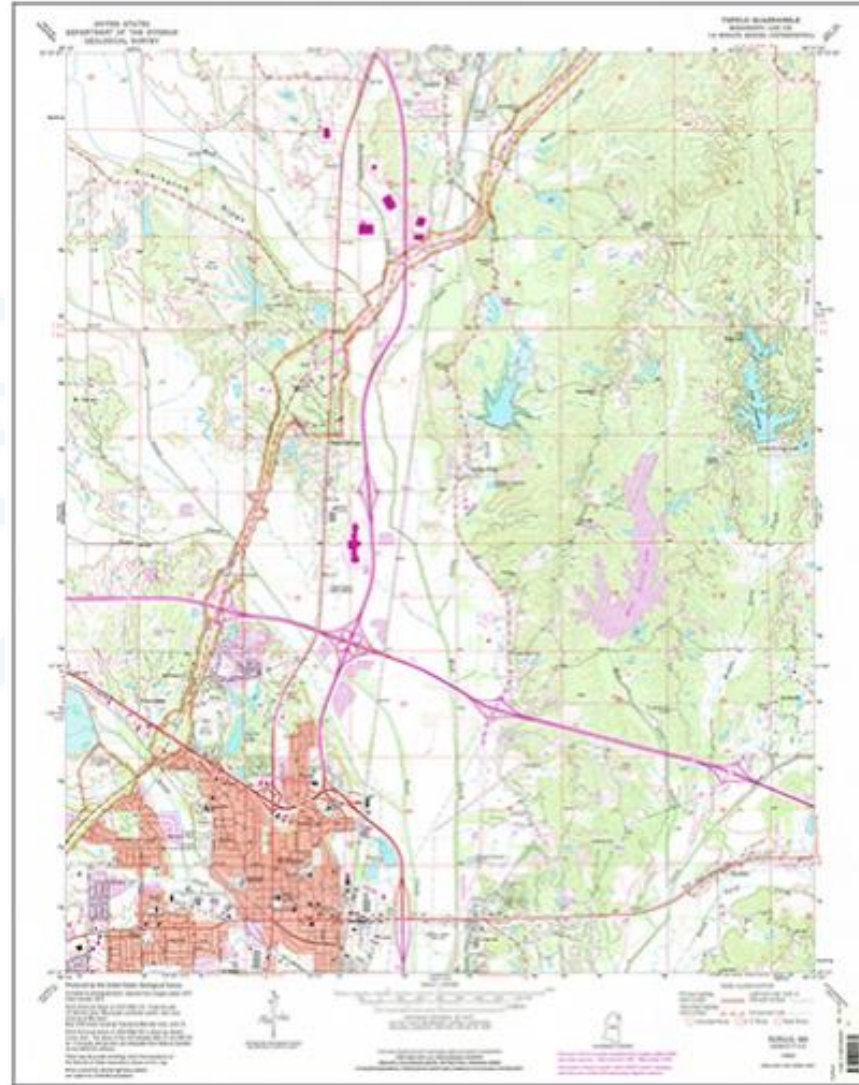
48:36. Topographic Mapping

A – 5. Rules and regulations will be promulgated by the **La DOTD** with APA for planning and managing geospatial data for topographic mapping.

B – 1. **La DOTD** will submit a written report and plan of implementation by December 31, 2012.



Topographic Map

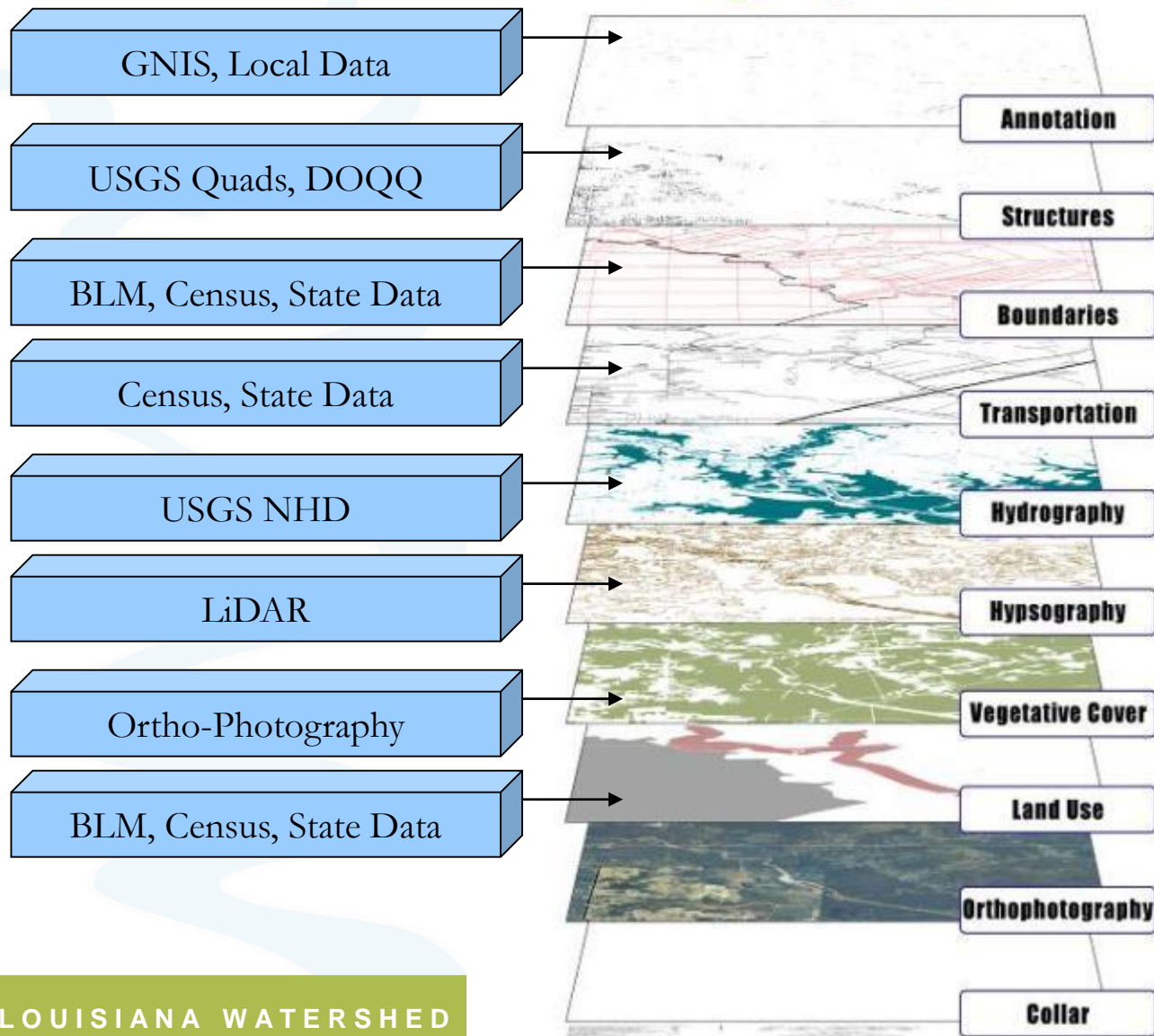


What is a Topographic Map??

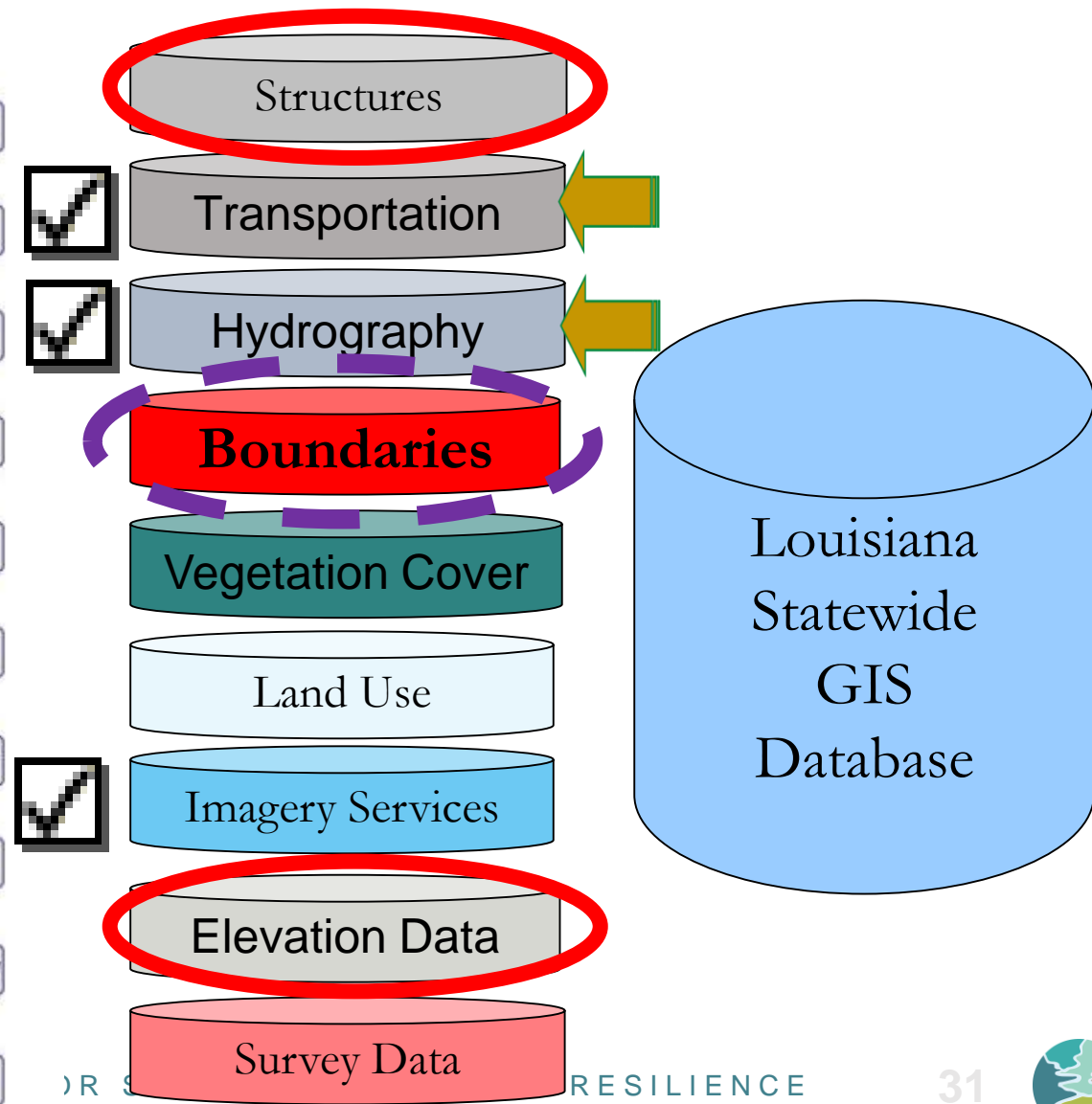
Louisiana Revised Statute 48:36

Traditional Basemap Sources

French Settlement Quadrangle Framework Layer Separation of Data Layers from Digital Base Map



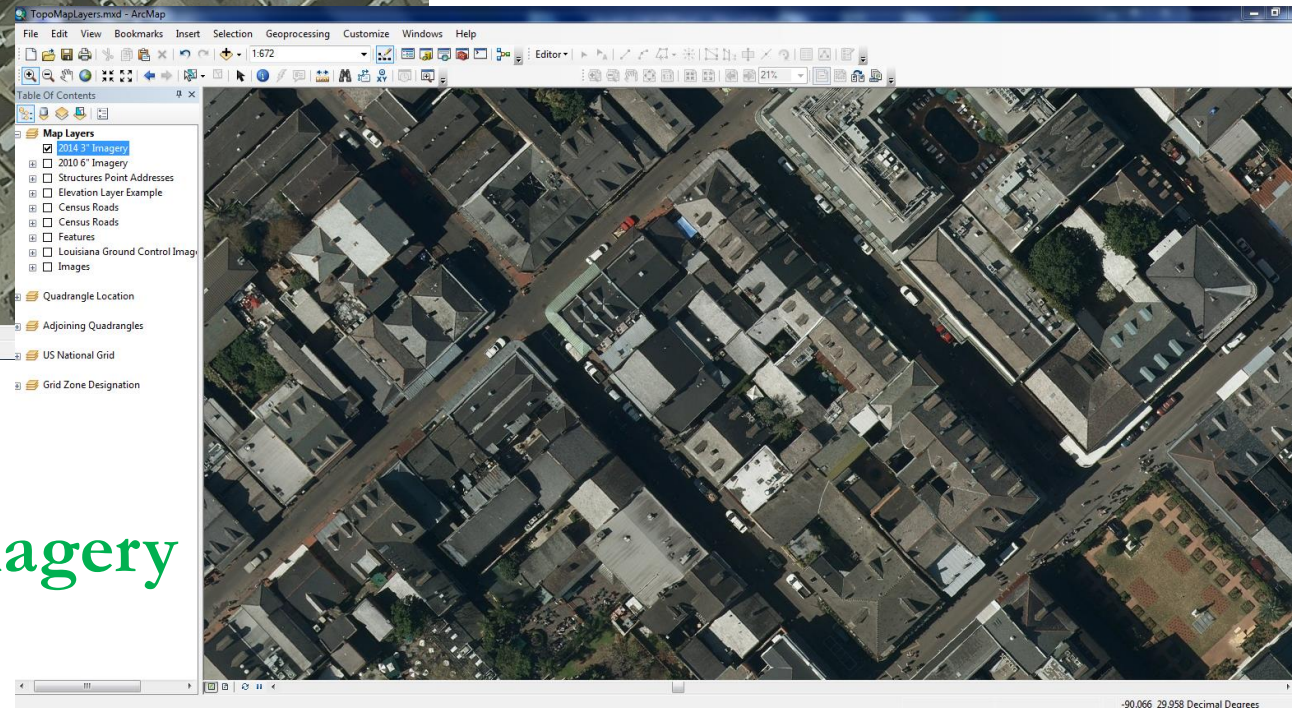
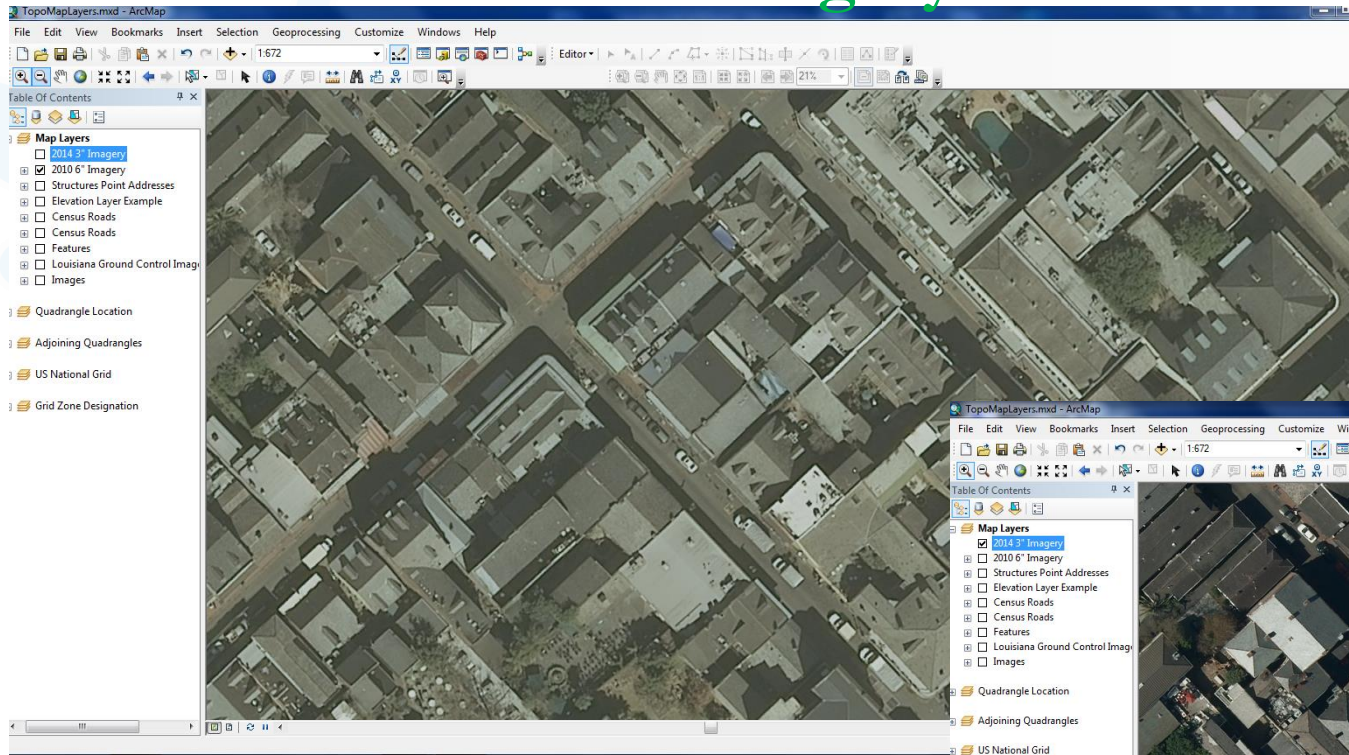
Digital Editing Database



Louisiana Imagery Service

2010 12" Imagery

- DOTD is currently procuring an Imagery Service to continue using to create and maintain GIS data.
- Plans are to provide 2017+ imagery statewide as collected by La DOTD over a 3 – 5 year cycle.

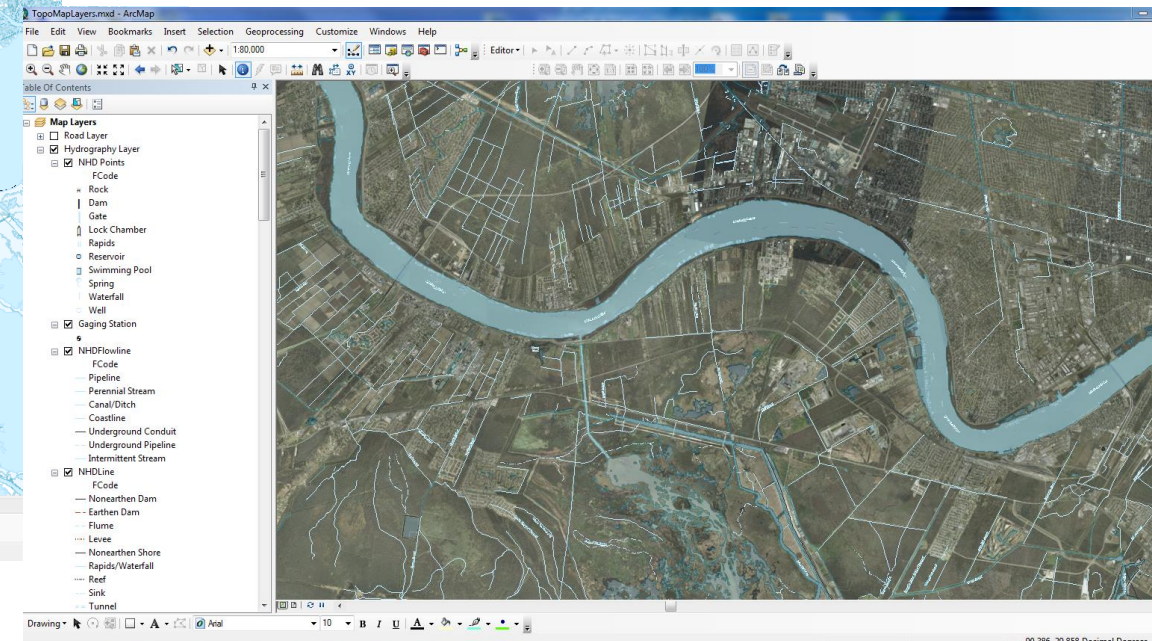
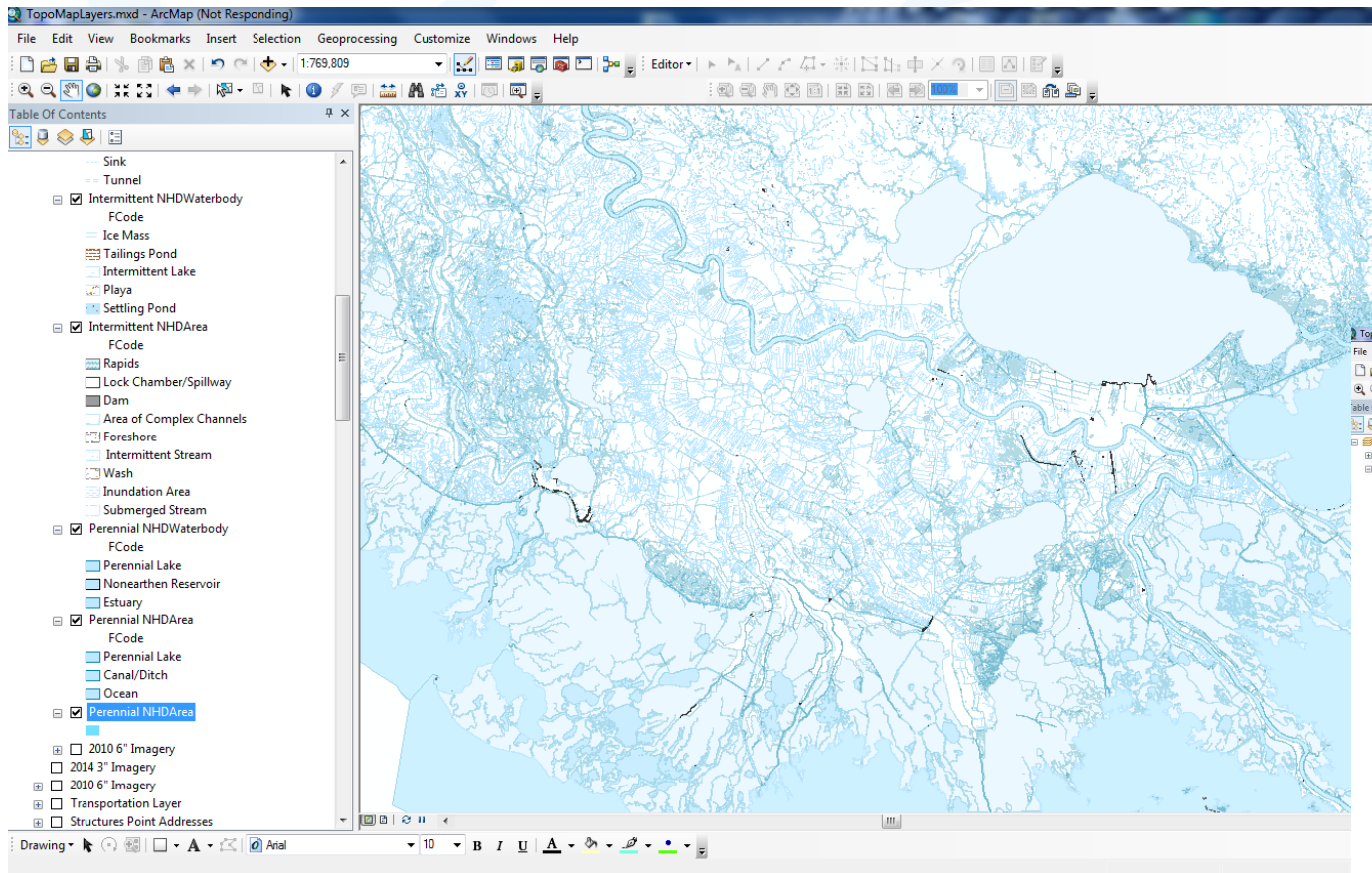


2014 4" Imagery



Hydrography Layer

- GOHSEP and DOTD invested in the development of the Hydrography Layer completed in 2014 using the 2010 Imagery Layer
- Hydrography Layer includes:
 - Water Point Features
 - Water Linear Features
 - Water Polygon Features
 - Swamp Features
 - Shoreline Features
- Necessary updates to the USGS National Hydrography Dataset for Louisiana are being performed by La DEQ who is the USGS Steward.

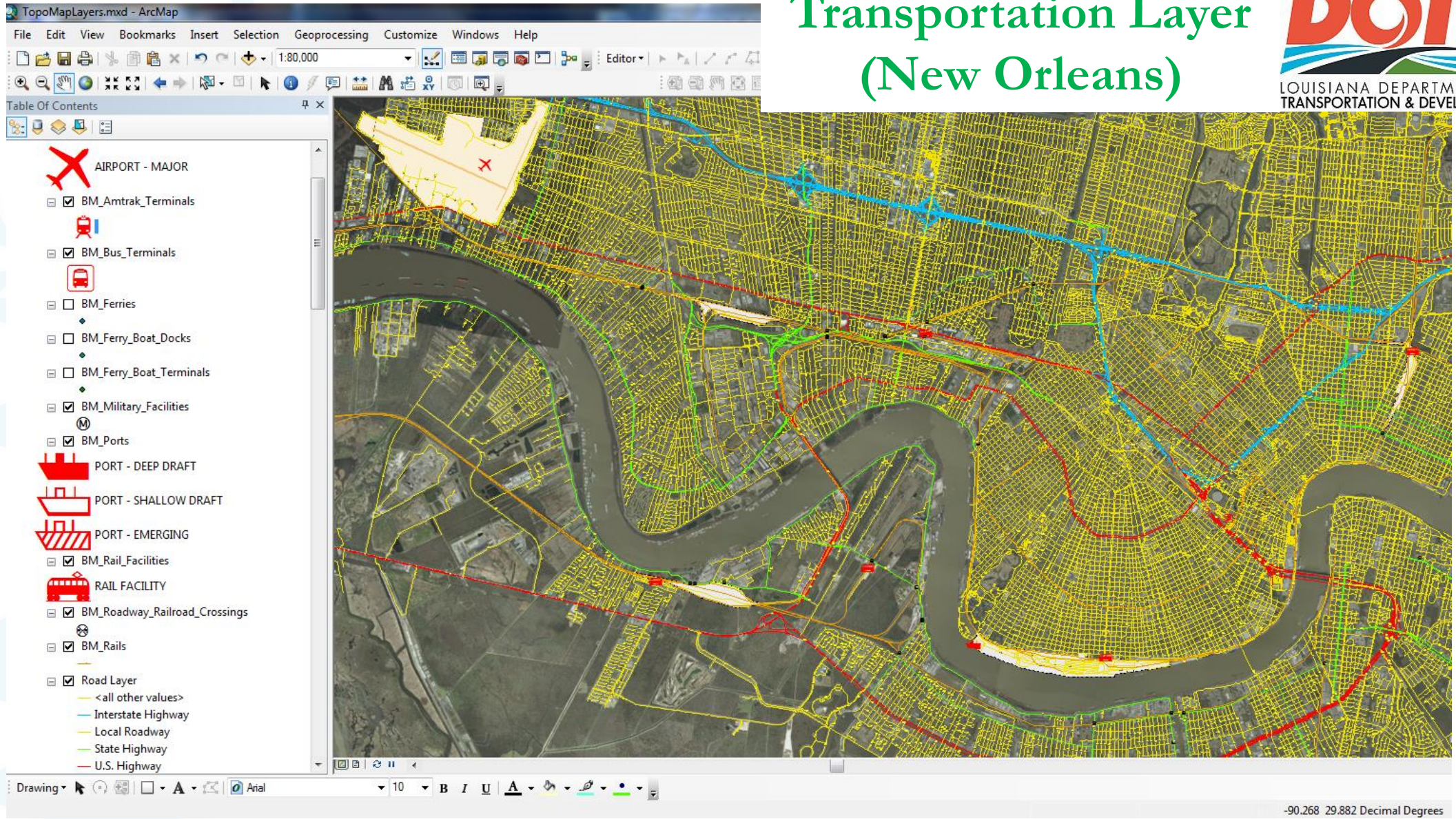


Transportation Layer

- FHWA requiring all states to submit an “ARNOLD” (All Road Network of Linear Referenced Data)
- DOTD invested an initial “ARNOLD” development in 2007
- DOTD has completed a revision of the “ARNOLD” completed in 2015 using the 2010 Imagery Layer
- Transportation Layer includes:
 - Roads
 - Rails
 - Airports
 - Ports
 - Passenger Rail Stations
 - Bus Stations
 - Freight Rail Facilities
 - Airport & Railyard Areas
- Annual Maintenance of Transportation Layer
- State and Local Government working TOGETHER to improve and share GIS data for government use



Transportation Layer (New Orleans)



U.S. Department of Transportation
Federal Highway Administration

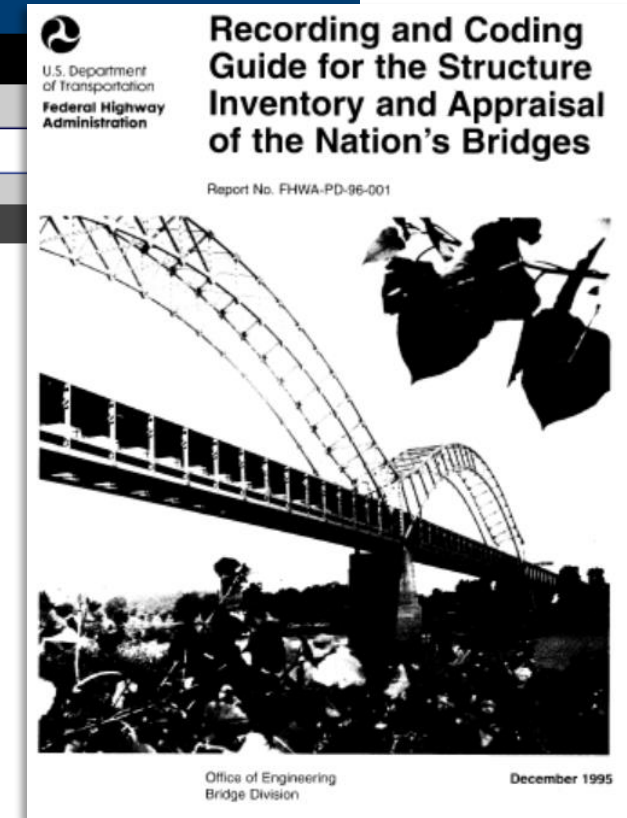
Bridges & Structures

Structures	Geotech	Hydraulics	Safety and Management	
	Bridge Inspection	Tunnel Inspection	Bridge Preservation	Bridge Management
	Load Rating	NBIS	NBI	

Home / Programs / Bridges & Structures / Safety / Bridge Inspection / National Bridge Inventory

National Bridge Inventory (NBI)

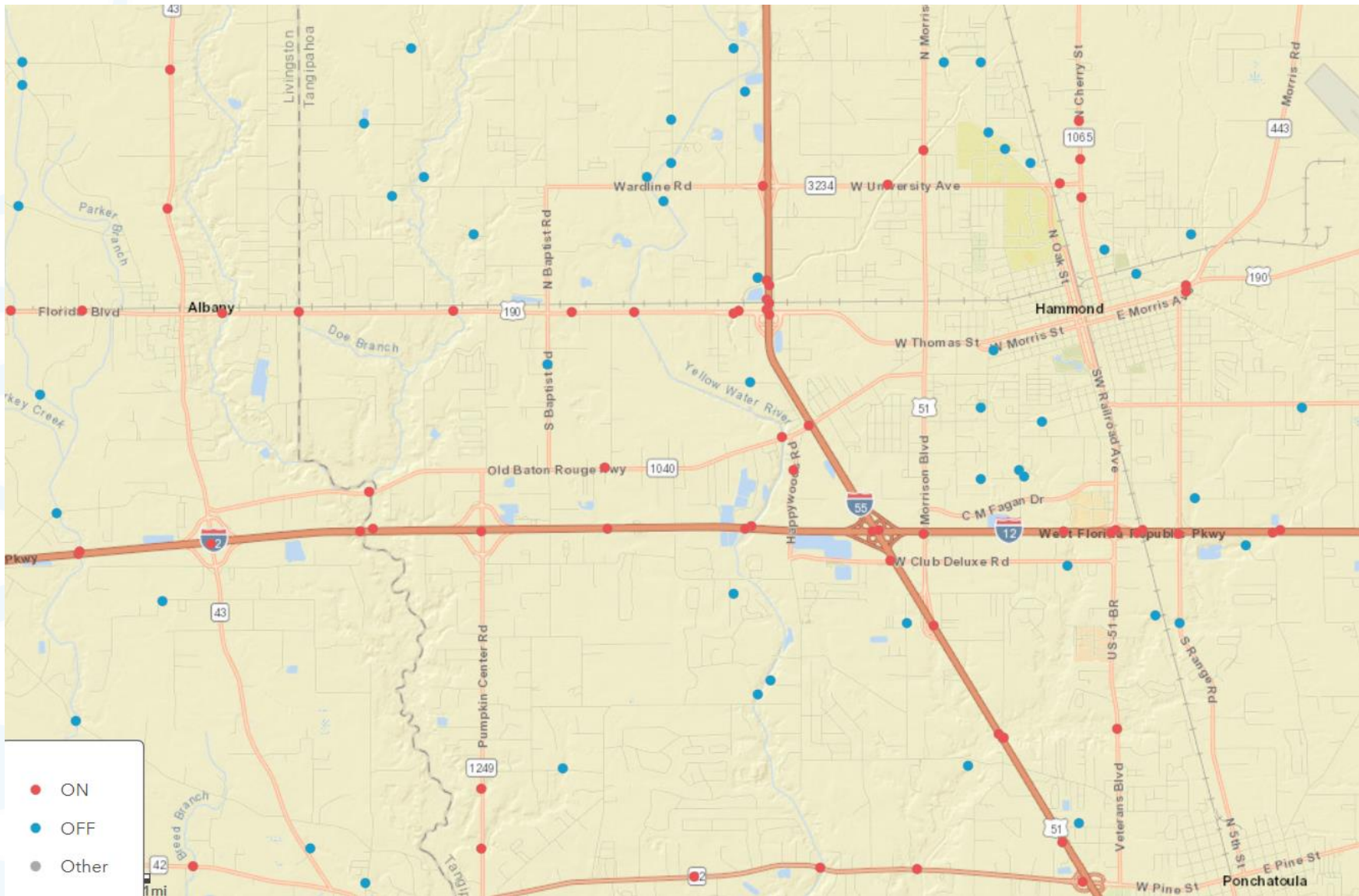
- [NBI Regulations, Memos, and Documents](#)
- [Download NBI Data](#)
- [Tables of Frequently Requested NBI Information](#)
- [Recording and Coding Guide for the Structure Inventory and Appraisal of the Nations Bridges](#)
 - [Errata Sheets for Coding Guide](#)
 - [Record Format](#)
- [NBI Submittal File Check](#)
 - [NBI Data Checks](#)
- [FIPS Codes](#)
- [Download NBI Element Data](#)
- [Specification for the National Bridge Inventory Bridge Elements](#)
- [NBI Element File Check](#)
 - [NBI Element Checks](#) (.pdf, 0.1 mb)
 - [Example XML](#) (4 mb)



Updated: 07/26/2018



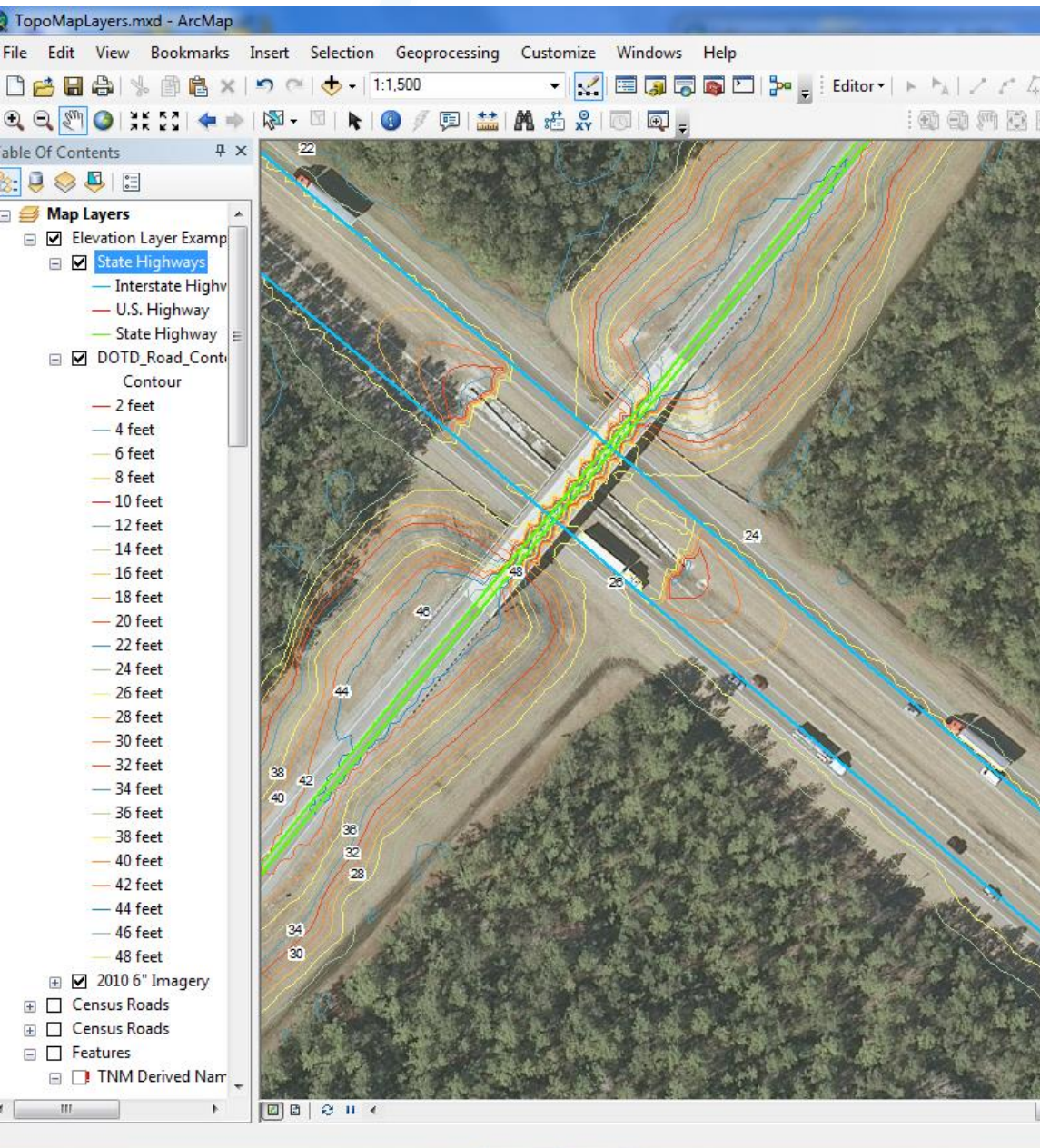
Published Bridge Layer



Elevation Layer

- DOTD is in the development process of an Elevation Layer using data acquired through regular data collection contracts
- State Highway System is collected on a two year cycle using a detailed process to assure accuracy of the x,y,z gps point data
- Non-State Roadways are being collected in a one-time cycle around the state along with a number of roadway assets. This cycle will also provide accurate x,y,z gps point data
- Two Features for the Louisiana Elevation Layer
 - Digital Elevation Model features using the roadway elevations and LIDAR data in cooperation with USGS
 - Ground Elevation Contours feature

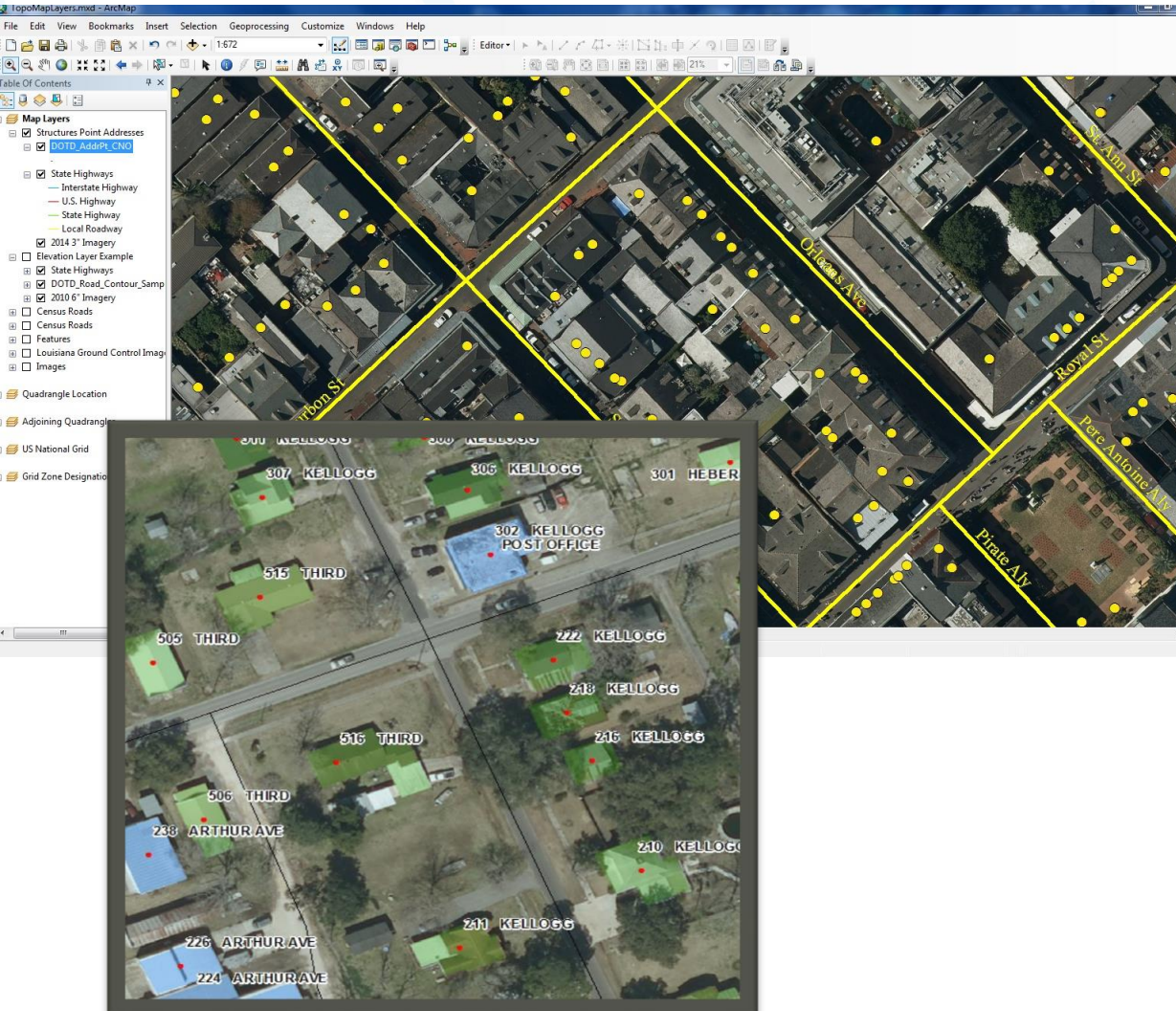




Contour Development Phase One



Structures Layer



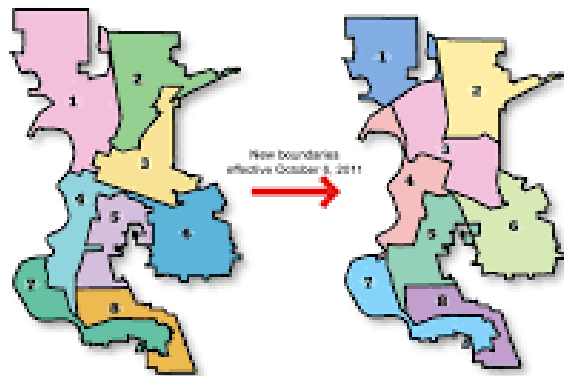
- La DOTD has begun developing a Structures Layer in the past two years
- La DOTD is working with various government agencies as well as willing local address authorities to:
 - Develop a Building Footprint for all structures in a Parish
 - Map all Residential Addresses in a Parish
- Incorporate existing Structure and Address Data as acquired into an improved statewide roadway layer to provide government geocoding abilities
- Associate the addresses directly with the road segment where they are located



Boundaries Layer



Representation, Reapportionment and Redistricting

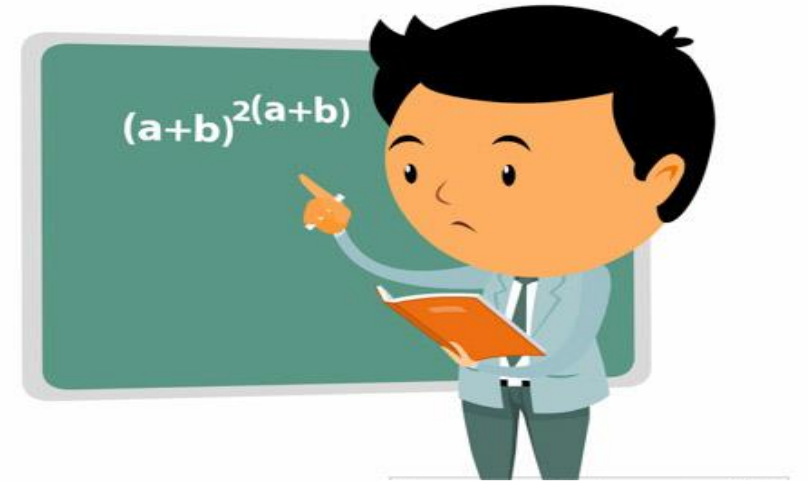


- La DOTD has begun working with La Secretary of State to coordinate and use authoritative boundaries for GIS.
- Boundaries are determined by Local Government authorities:
 - Parish – Parish Boundary & Election Precinct Boundaries
 - Municipality – Municipal Boundary
 - State – Agency Boundaries across State
- All Municipal boundary changes must be submitted to Parish Registrar. Parish Registrar must submit all Parish boundary changes to the LA SoS.
- Boundaries are compiled by La SoS and State Demographer from Parish Registrars and provided to US Census for Reapportionment.

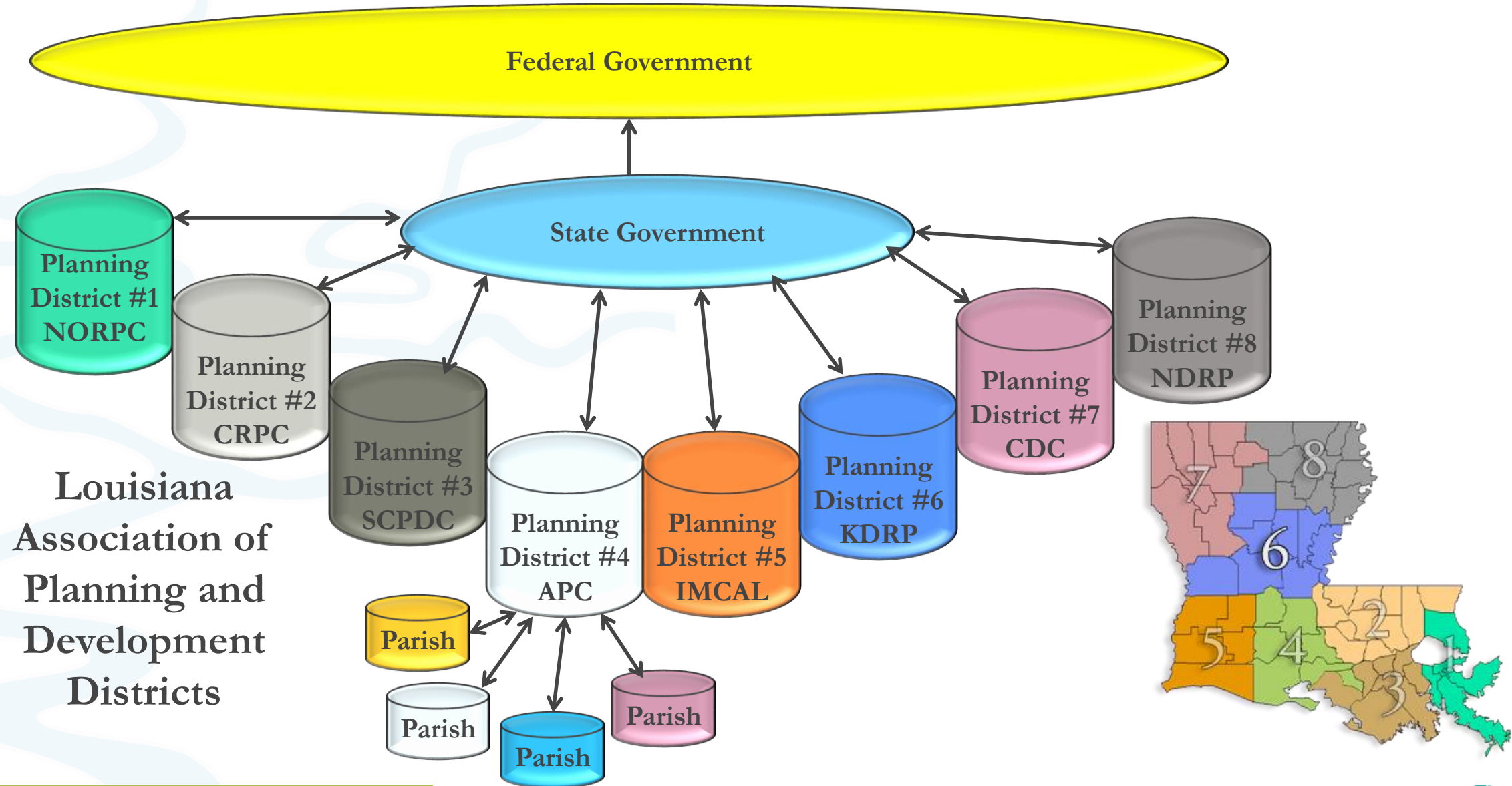


What's the Collaboration Solution?

- **DOTD Hosted GIS System**
- **Data Provided by Authoritative Sources**
 - State Agencies
 - Metropolitan Planning Areas
 - Parishes
 - Municipalities
- **Low Cost Maintenance Methods Provided**
- **One Centralized Source for Data Maintenance & Distribution**



One Possible Solution



Louisiana
Association of
Planning and
Development
Districts



Publication Services - REST

<https://giswebnew.dotd.la.gov/arcgis/rest/services>

GIS Story Map (Interactive)

ArcGIS REST Services Directory

[Home](#) > [services](#)

[JSON](#) | [SOAP](#)

Folder: /

Current Version: 10.41

View Footprints In: [ArcGIS Online map viewer](#)

Folders:

- [Applications](#)
- [Boundaries](#)
- [DevTemp_Data](#)
- [Elevation](#)
- [Hydrography](#)
- [Imagery](#)
- [Landcover](#)
- [Live_Data](#)
- [LTRC](#)
- [PLS](#)
- [Static_Data](#)
- [Structures](#)
- [Transportation](#)
- [Utilities](#)

Services:

None

Supported Interfaces: [REST](#) [SOAP](#) [Sitemap](#) [Geo Sitemap](#)



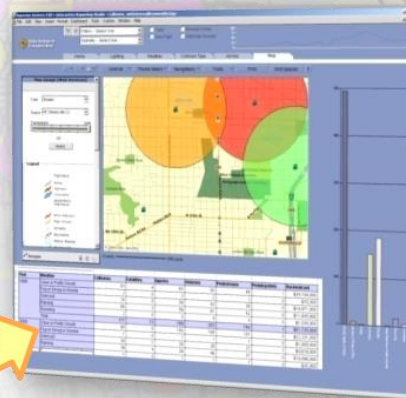
Capabilities for Sharing

Maximizing technology for local, regional, state & public collaboration

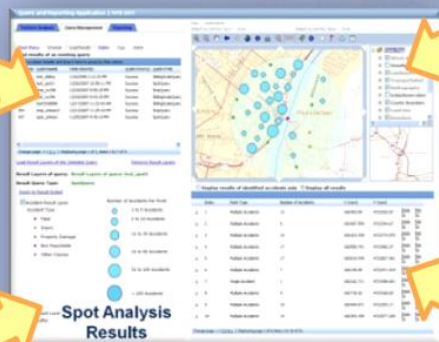
Local Government
Collaboration



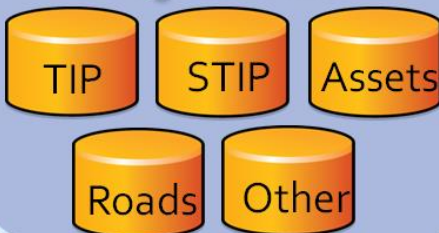
State
Collaboration



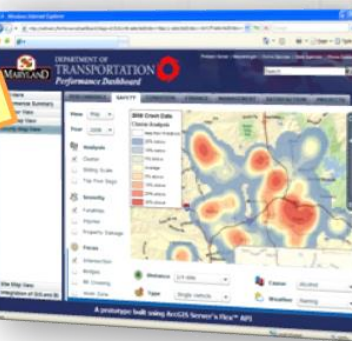
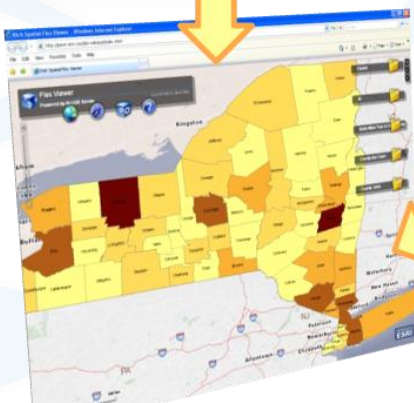
Web Environment



Planning and Feedback



Regional, MPO
Collaboration



Public Collaboration





Louisiana Statewide Geospatial Database

Create the Database

Receive & Compile the Data

Centralize the Data in One Location

Distribute the Data to All State Agencies

Receive Updated Data and Repeat the Cycle

The Goal for Geospatial Data is “**One Source**”

DOTD ArcGIS Rest Services

<https://giswebnew.dotd.la.gov/arcgis/rest/services/>

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THANK YOU

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