Memorandum

CITY OF DALLAS

DATE November 6, 2015

TO The Honorable Members of the Transportation and Trinity River Project Committee: Lee M. Kleinman (Chair), Deputy Mayor Pro Tem Erik Wilson (Vice-Chair), Sandy Greyson, Mayor Pro Tem Monica R. Alonzo, Adam Medrano, and Casey Thomas II

SUBJECT Flood Control Operations

On Monday, November 9, 2015, you will be briefed on Flood Control Operations. The briefing materials are attached for your review.

Please feel free to contact me if you have any questions or concerns.

Mark McDaniel
Assistant City Manager

c: Honorable Mayor and Members of the City Council
A.C. Gonzalez, City Manager
Warren M.S. Ernst, City Attorney
Craig D. Kinton, City Auditor
Rosa A. Rios, City Secretary
Daniel F. Solis, Administrative Judge
Ryan S. Evans, First Assistant City Manager
Eric D. Campbell, Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
Joey Zapata, Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Sana Syed, Public Information Officer
Elsa Cantu, Assistant to the City Manager – Mayor & Council

Flood Control Operations

Transportation and Trinity River Project Committee

November 9, 2015

City of Dallas

Overview

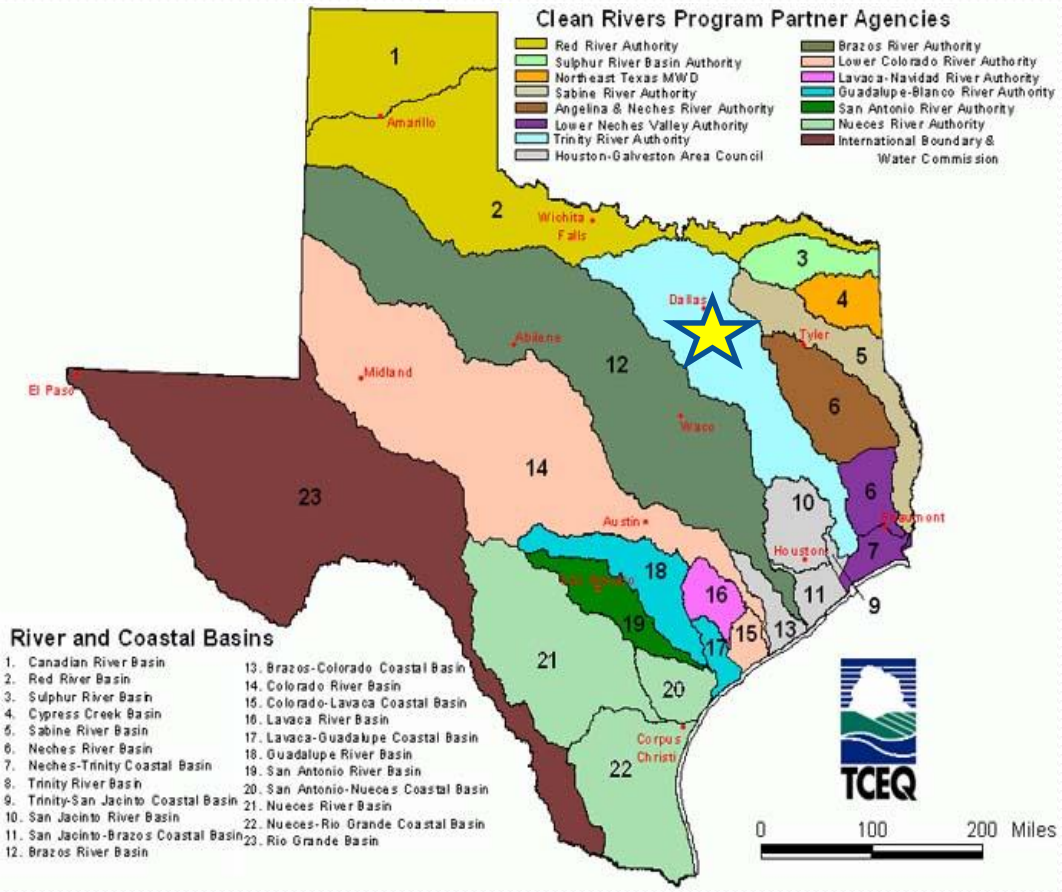
- Flood System Overview
- Flood Control Operations
- Successes and Opportunities

System Overview

Flood Management in Dallas

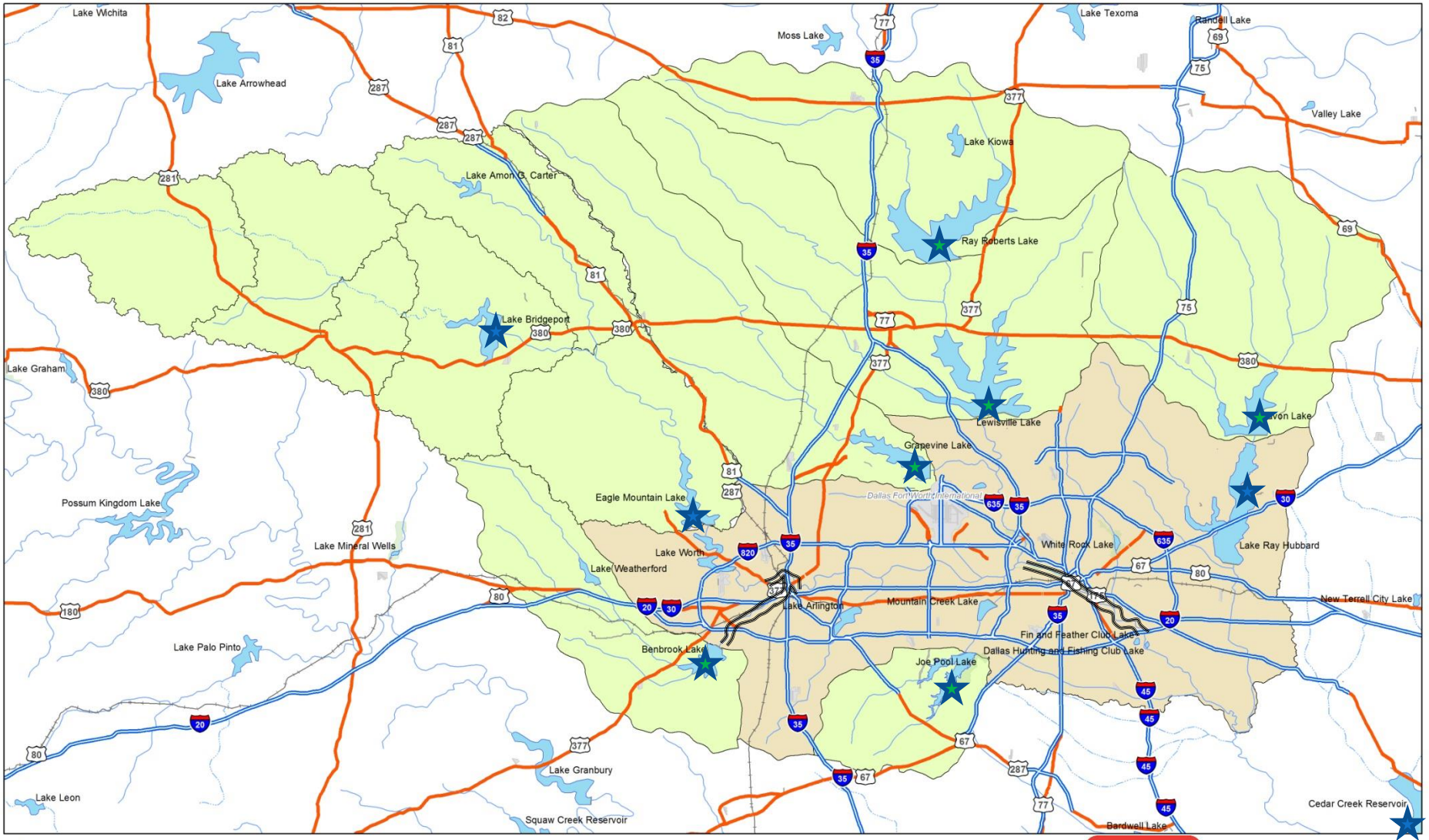
- **Regional Drainage Infrastructure:** Dams, multi-purpose reservoirs, channels and wetlands on the river-side of the levees to convey large volume events and protect urbanized areas
- **Local, "Interior" Drainage Infrastructure**: local drainage systems (levees, pump stations, pressure sewers, streams, creeks, channels, and storm sewers) to address runoff from the land-side of levees to convey it into the Trinity River)

Trinity River Watershed

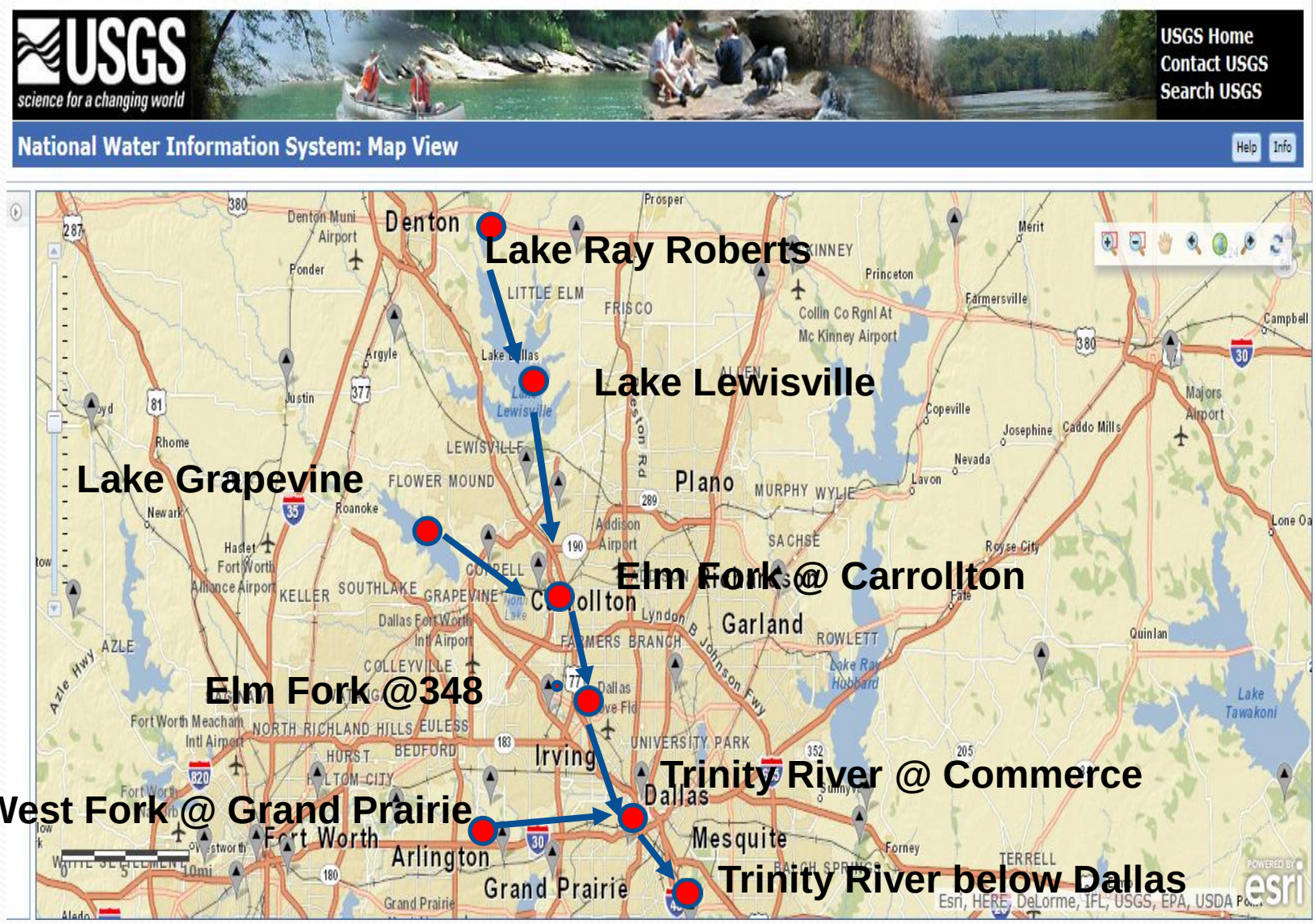


- Trinity River watershed extends from near Oklahoma border to Galveston Bay (shown in aqua)
- Trinity River drains a total area of >16,000 square miles
- About 6,050 square miles drain through Dallas Floodway

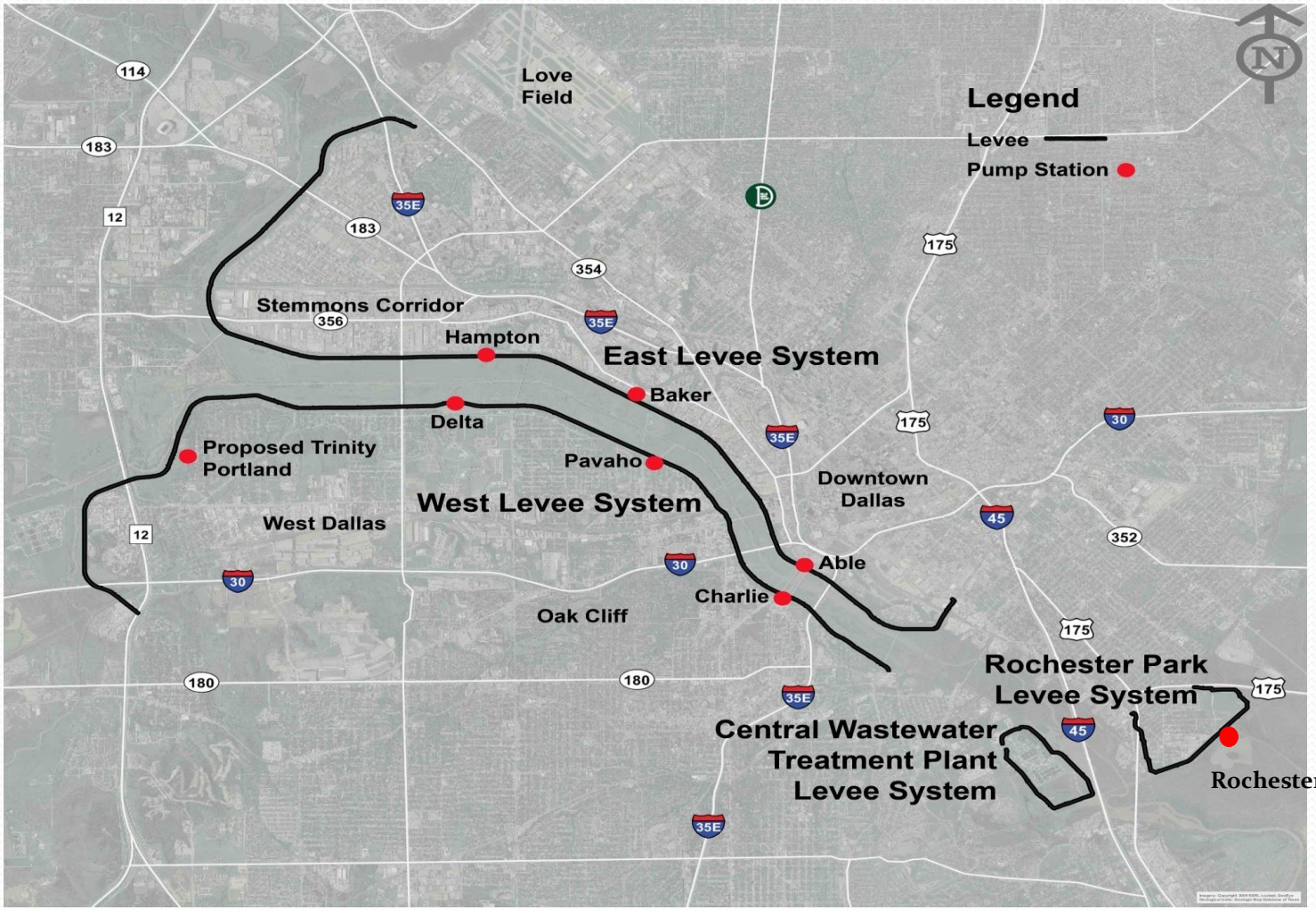
Area Reservoirs



USGS River Gage Locations



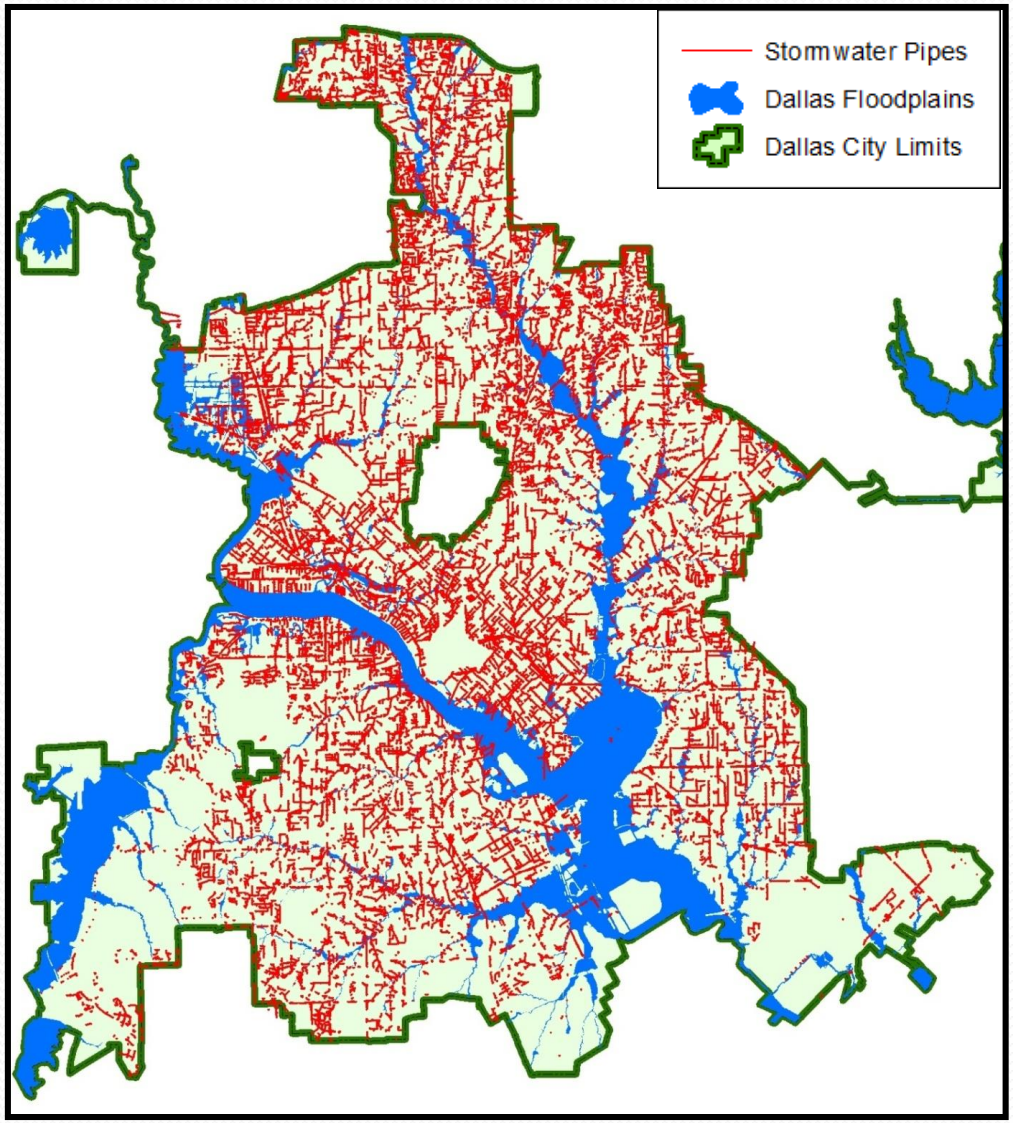
Dallas Floodway System Map



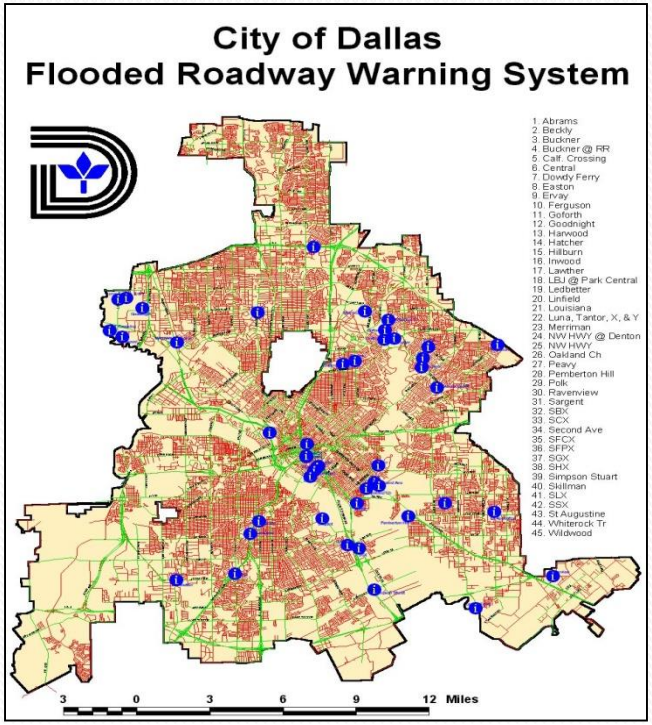
- 200,000 people work or live behind the levees
- $13.7 billion in real and personal property protected by the levees

Interior Drainage

- 1,800 miles of storm drainage pipes
- 115 miles of City owned creeks
- 48 miles of lined channels
- 180 ponds
- 11,000 outfalls
- 65,000 inlets

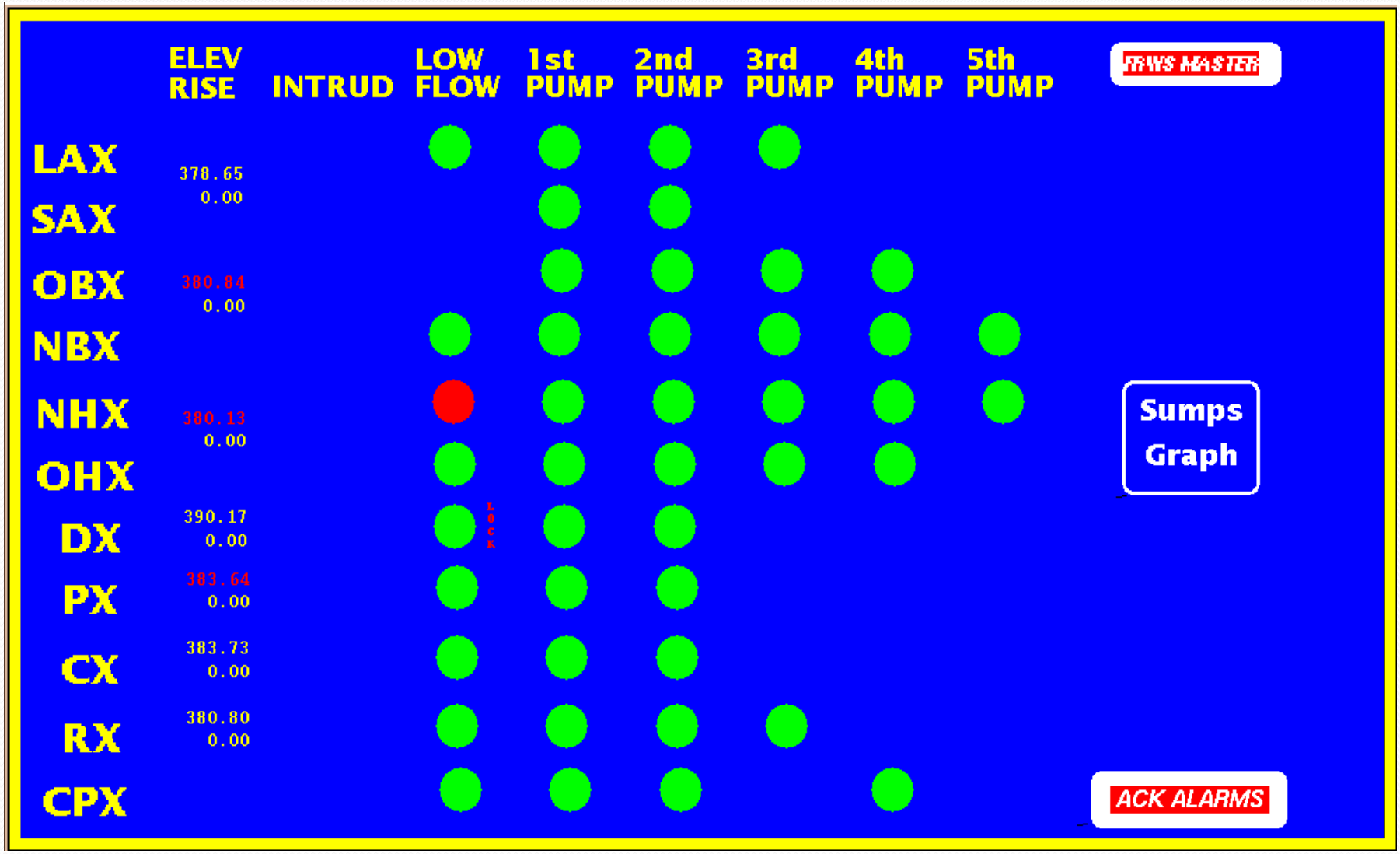


Flooded Roadway Warning System (FRWS)

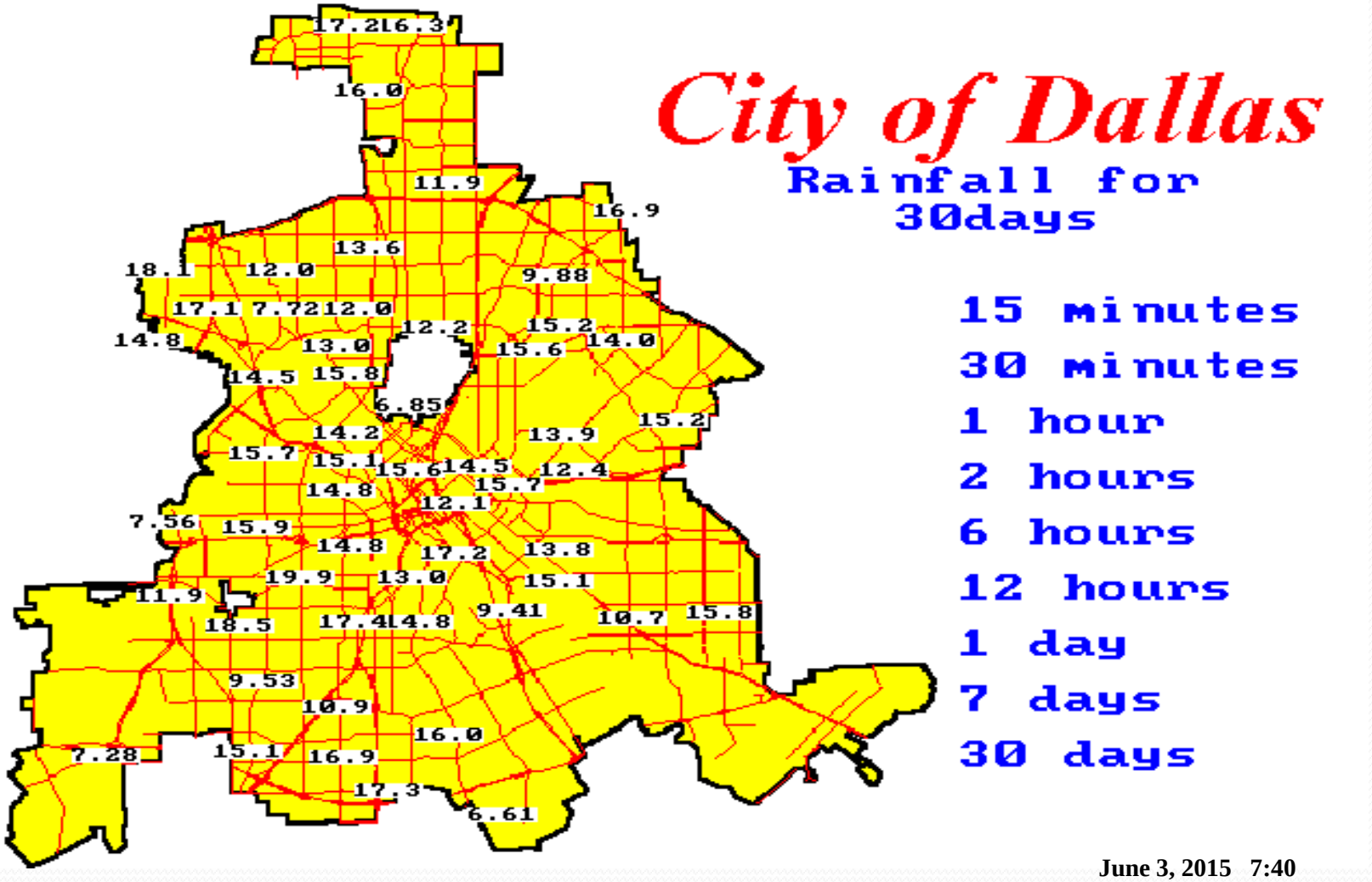


40 FRWS Locations Citywide
8 Underground lift stations

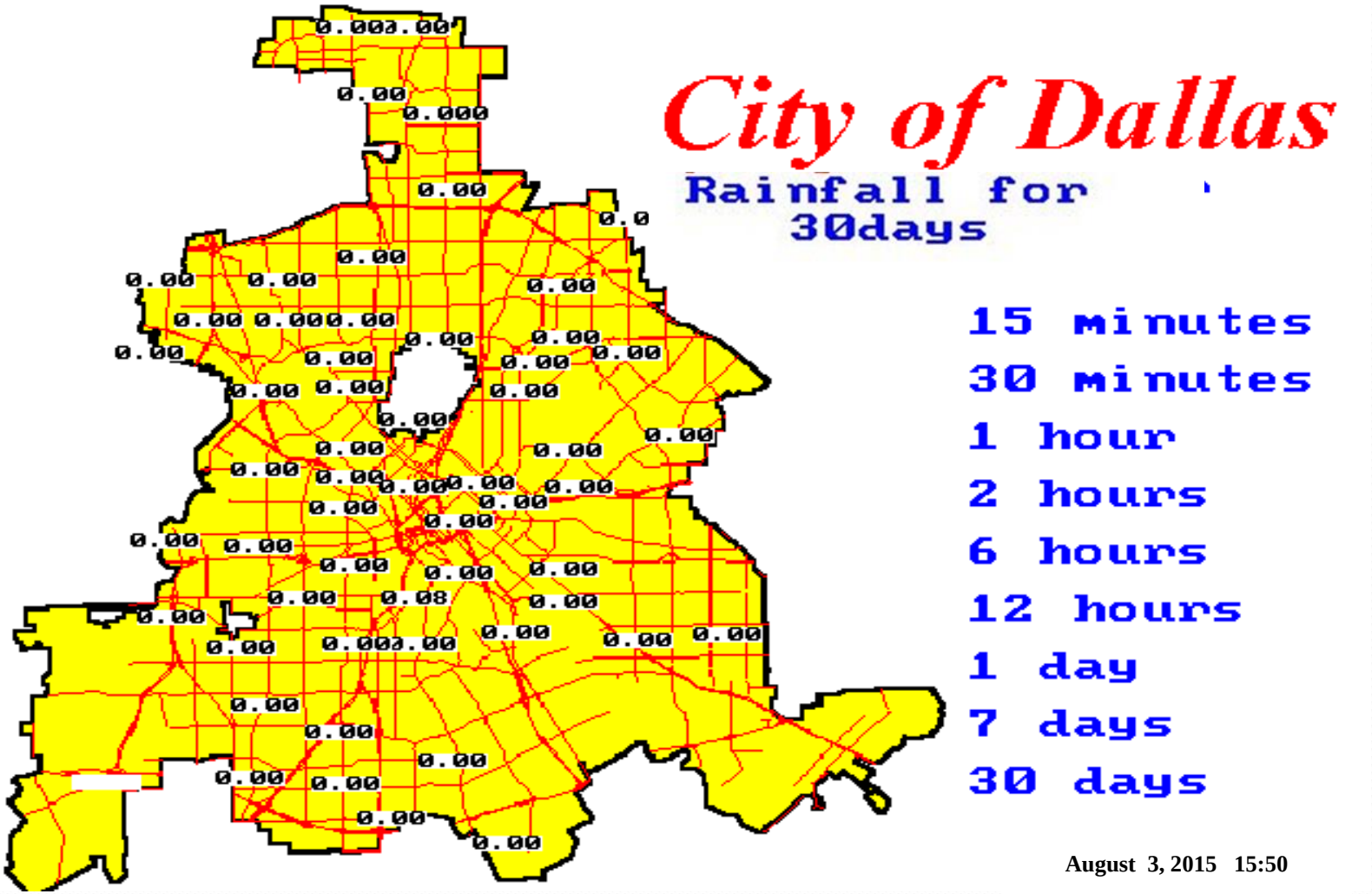
Pumping Operations – Supervisory Control and Data Acquisition (SCADA)



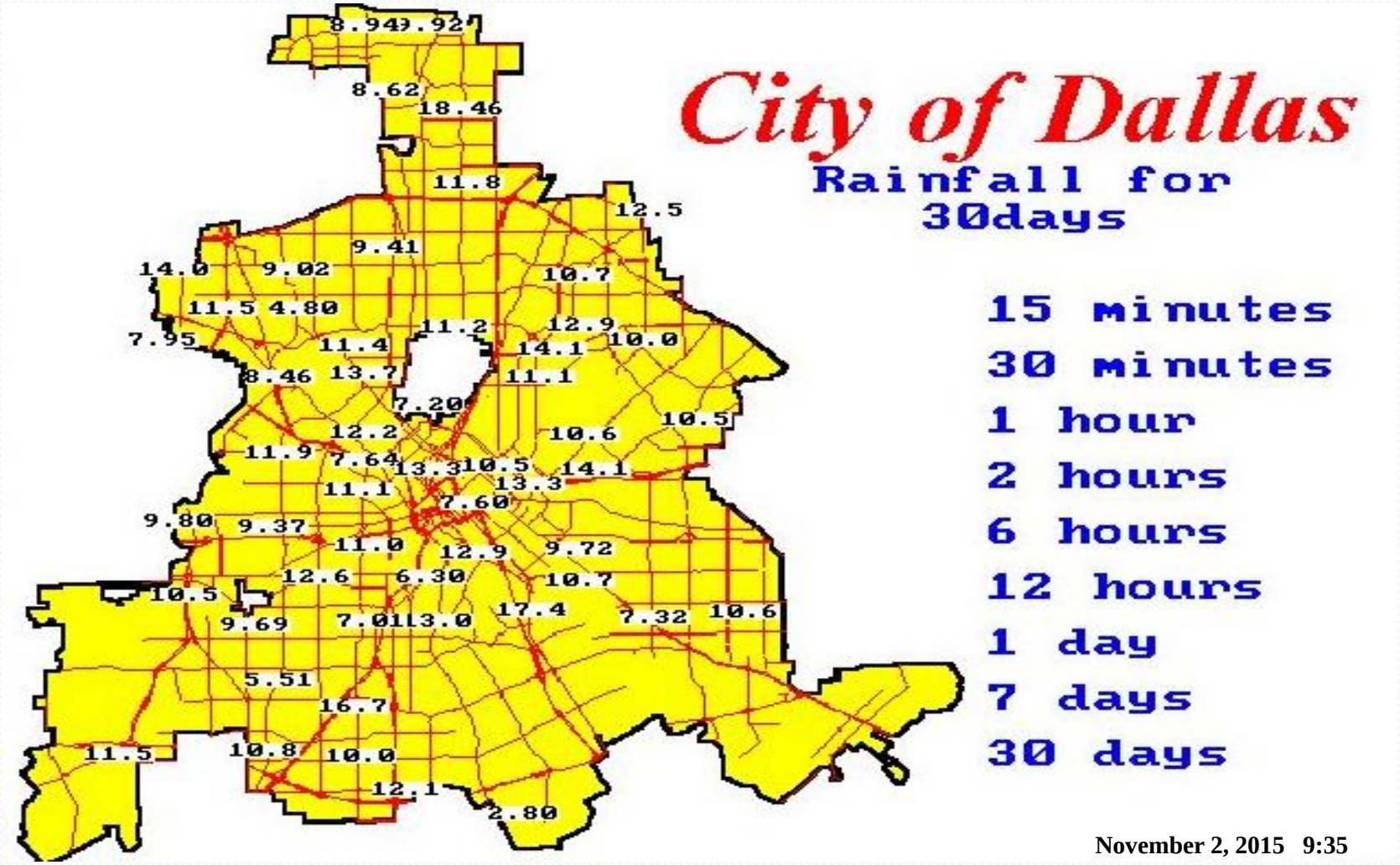
Total rainfall in 30 days as of June 3, 2015



Total Rainfall in 30 days as of August 3, 2015



Total rainfall in 30 days as of October 31, 2015



Pumping Systems –Spring Event

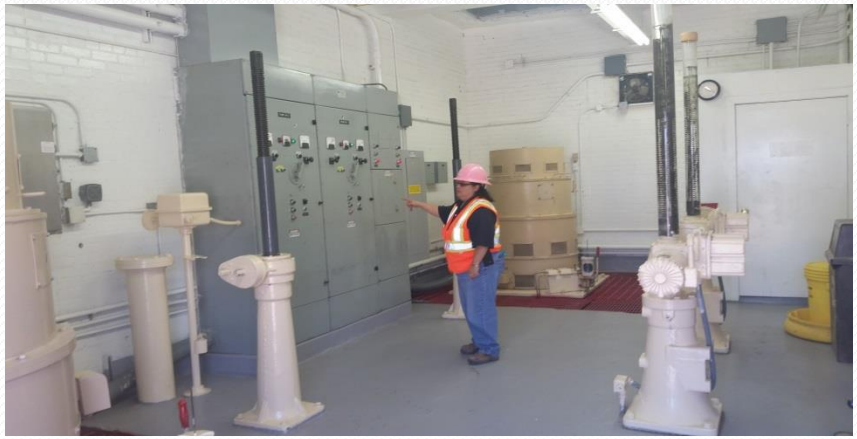
- At peak of event through Dallas, 33 pumps were operating
- Provided opportunity to thoroughly test/run new pump stations at Baker and Pavaho
- System functioned as designed

Localized Flooding – Spring Event

- Elm Fork (California Crossing, Luna, Tantor)
- Loop 12/Singleton Area (West Fork Trinity River)
- Luna Road/I35/Elm Fork (Luna/Tantor/California Crossing)(Elm Fork Trinity River)
- Peavy Road (Dixon Branch up stream of White Rock Lake)
- Goforth and Lawther (White Rock Creek)
- Other Street Flooding

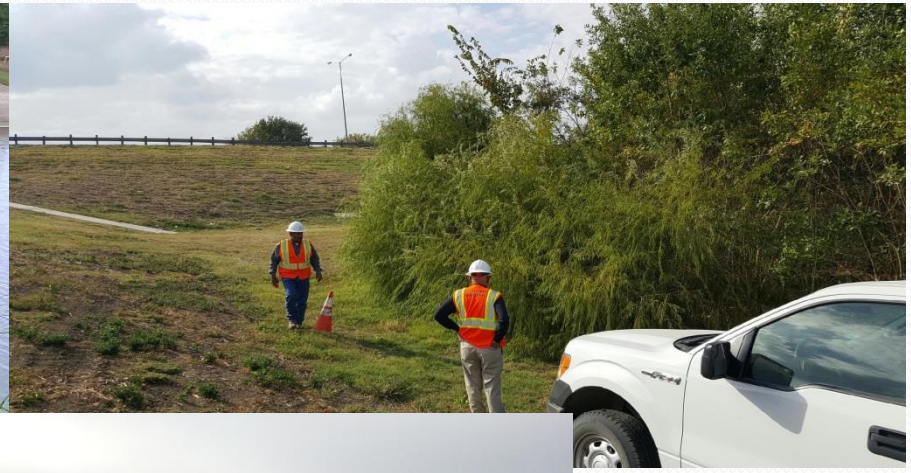
Pumping Systems –October Event

- At peak of event through Dallas, 28 pumps were operating
- System functioned as designed



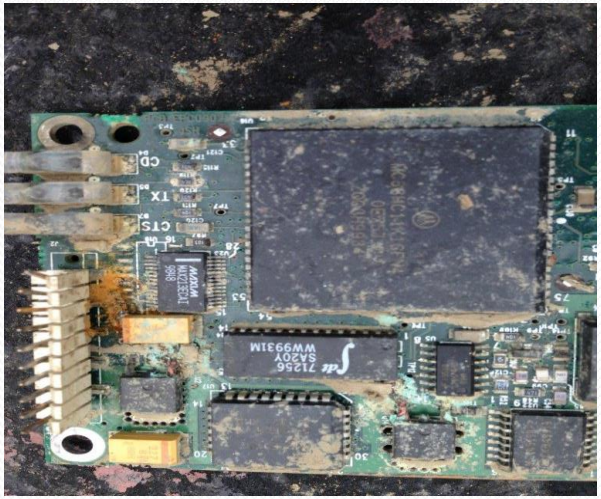
Flood Damages and Post-Flood Maintenance

System Inspection

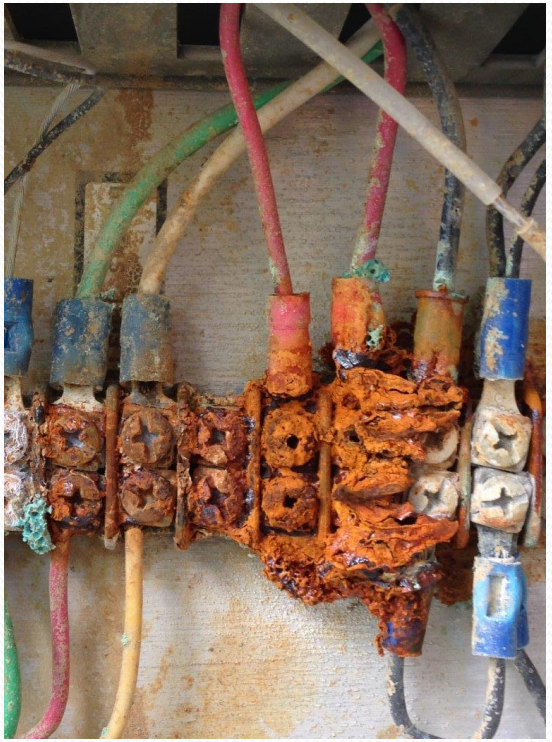


Damage to the system from flooding

Channel at 3132 Silverton



FRWS damages at various locations throughout the City



Repairing Damage to the System

Removing Blockages

Successes and Opportunities

Successes and Opportunities

- System and Emergency Operations Plan activation performed as designed with positive teamwork among all City departments and partners
- Limited localized flooding across the City
- Continue strengthening internal and external partnerships
- Continue addressing aging infrastructure and technology

Questions

Appendix

Future Funding Needs

Funding Needs - Modified Dallas Floodway Project, subject to federal appropriations process, but can be advanced by City at 100% City cost as a future work-in-kind credit

- Trinity Portland Pump Station, Operations Center and upgrades, and Delta Station, est. $60 - $70M
- Charlie Station Replacement, est. $46M
- Hampton Station Improvements, est. $76M

Note: Cost share for flood control projects is 65% federal/35% local; betterments are 100% local

Future Funding Needs

Funding Needs - Dallas Floodway Extension Project, subject to federal appropriations process

- Lamar Levee, est. $55-75M
- Cadillac Heights Levee, est. $42M
- Rochester Levee Extension, est. $28M

Note: cost share for flood control projects is 75% federal/25% local

Future Funding Needs

Funding Needs – Various locations across City

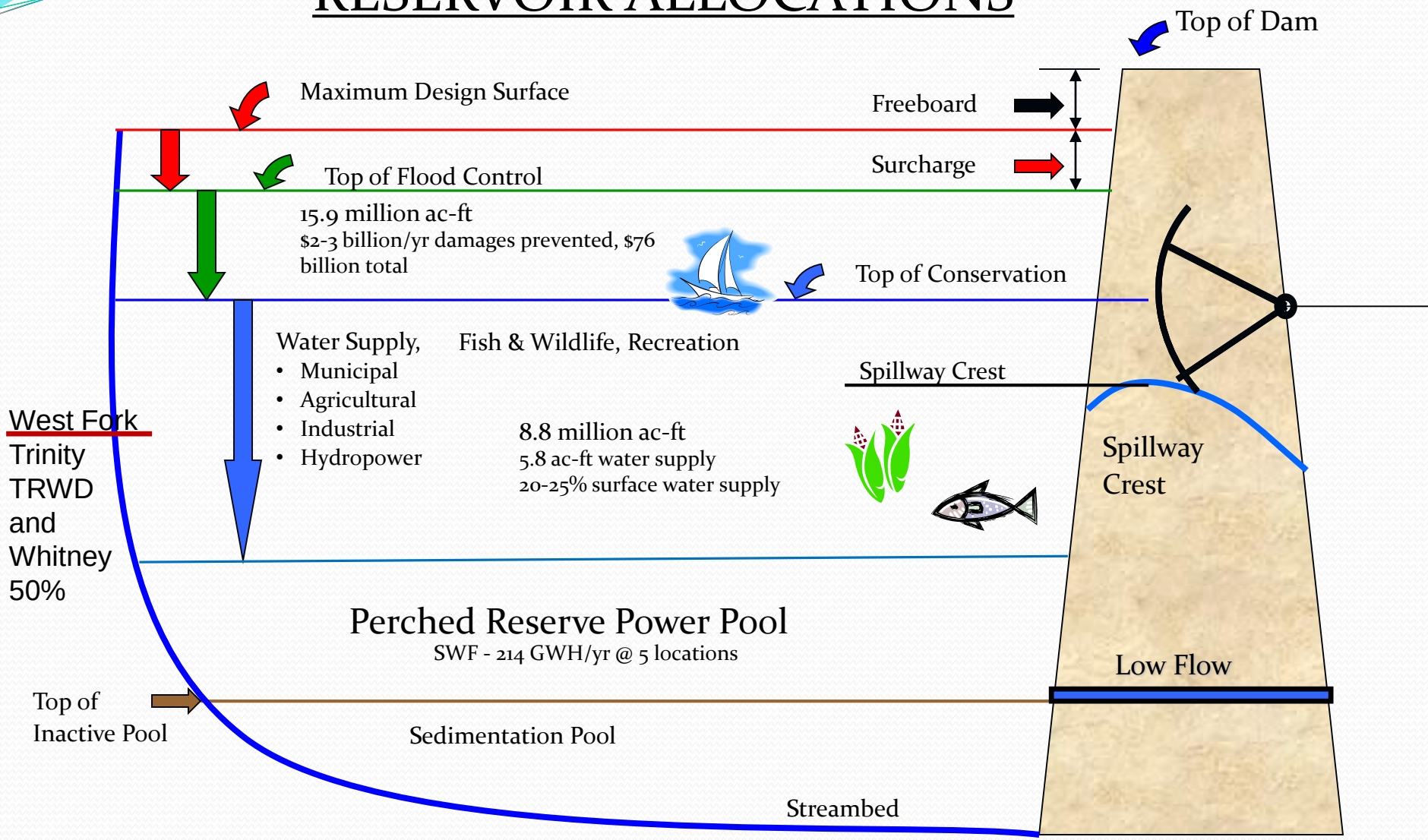
- Examples include Elm Fork (est. $150M), Dixon Branch (est. $100M), West Joe's Creek (est. $25M),
- West Dallas Eagle Ford Sump Basin (est. $6M)
- Westmoreland-Hampton Sump Basin (est. $2.5M)
- Prairie Creek Bridge at Dowdy Ferry (est. $15M)
- Examples include ongoing erosion control projects along various public creeks (current needs inventory $1B)
- Examples include voluntary buyouts of repetitive flood loss properties (current needs inventory $12M)

Note: Some projects may be eligible for grant and other funding sources, but resources are limited to US Army Corps of Engineers

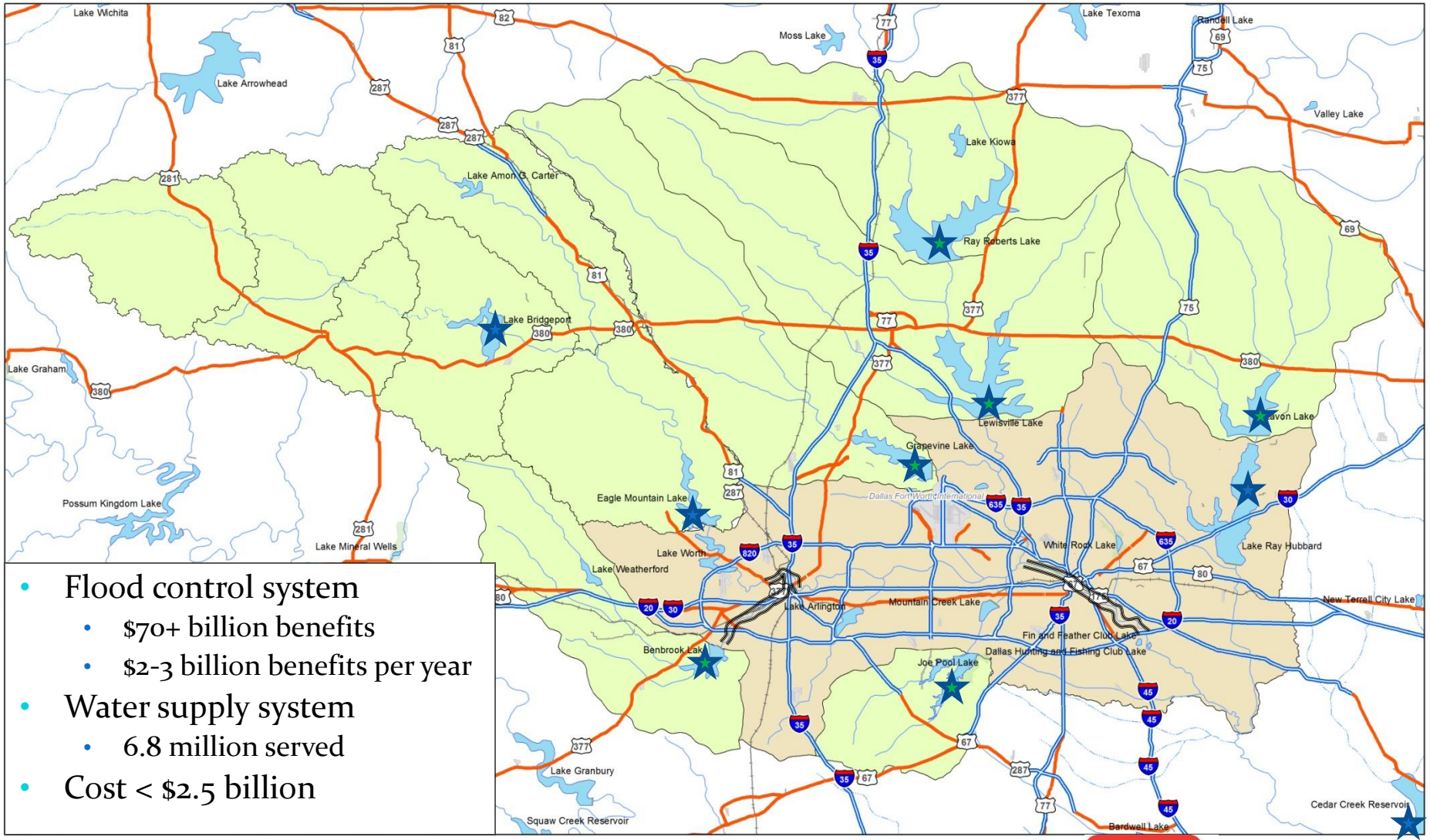
US Army Corps of Engineers Partner Information

US Army Corps of Engineers Partner Information

RESERVOIR ALLOCATIONS



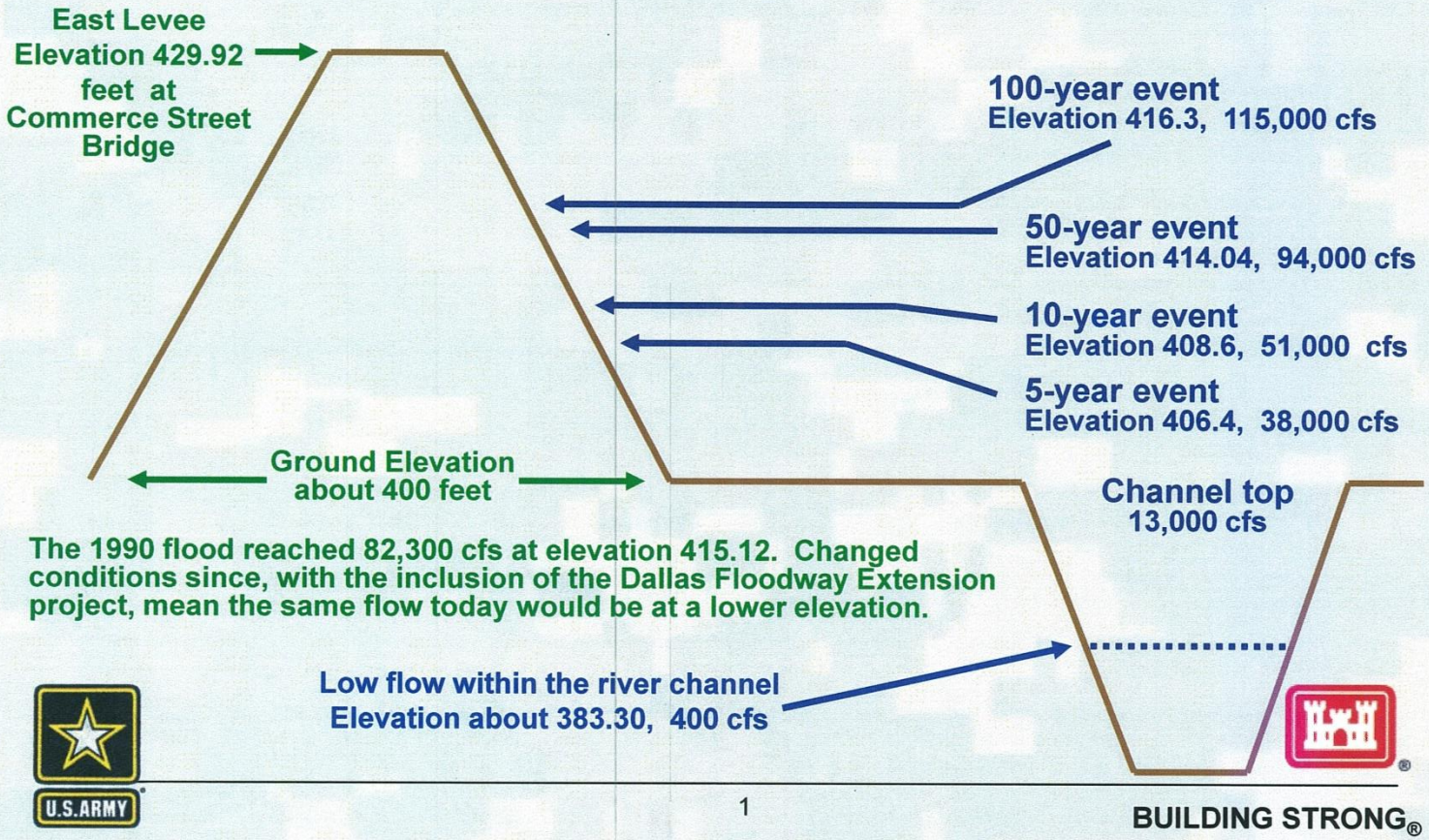
What Do You See?



- Flood control system
  - $70+ billion benefits
  - $2-3 billion benefits per year
- Water supply system
  - 6.8 million served
- Cost < $2.5 billion

Trinity River Flooding History

The existing Dallas Floodway can convey a flood event without overtopping that has a 1-in-1,500 chance of happening in any given year (a 1,500-year event) with a flow of 254,000 cubic feet per second



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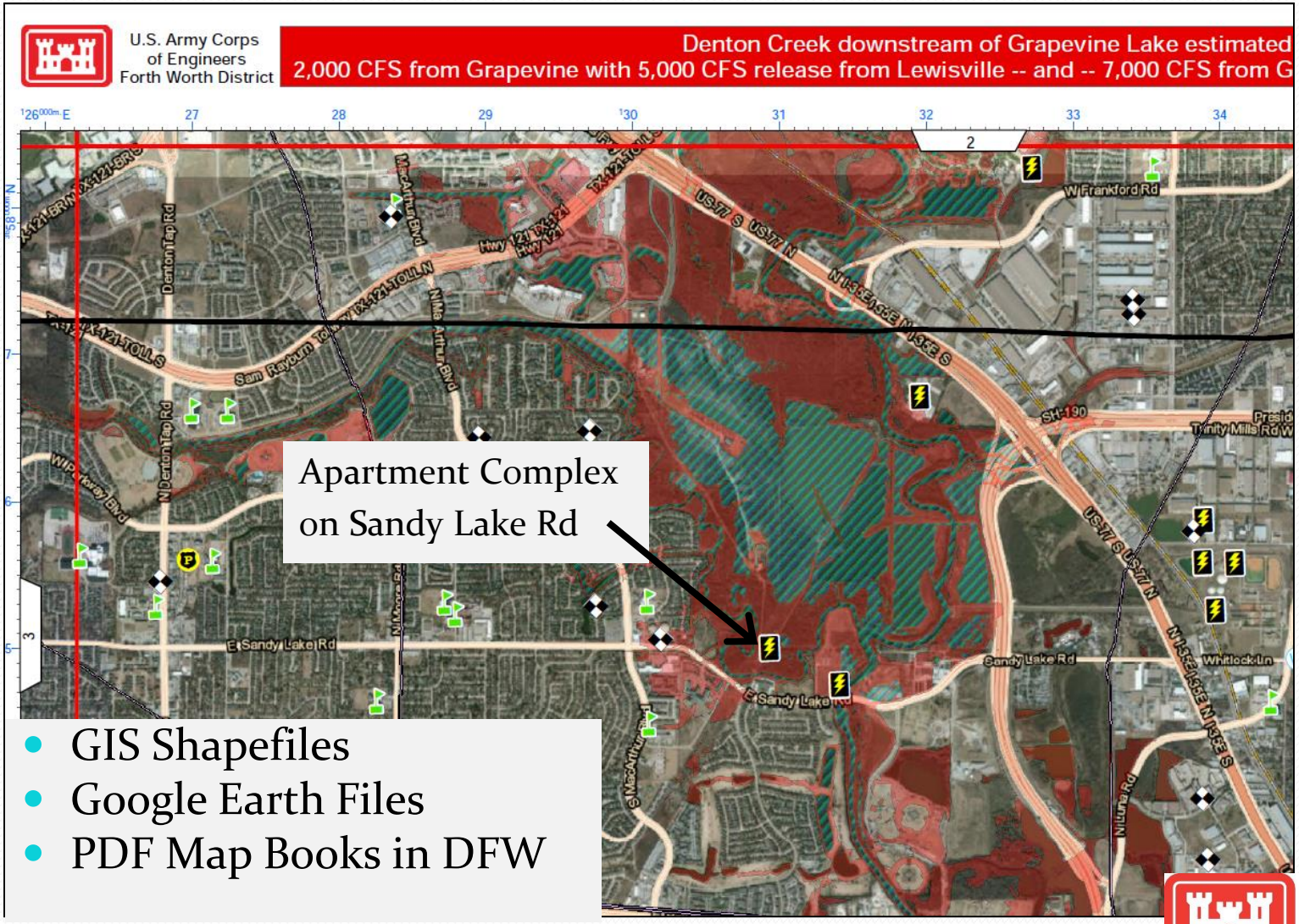
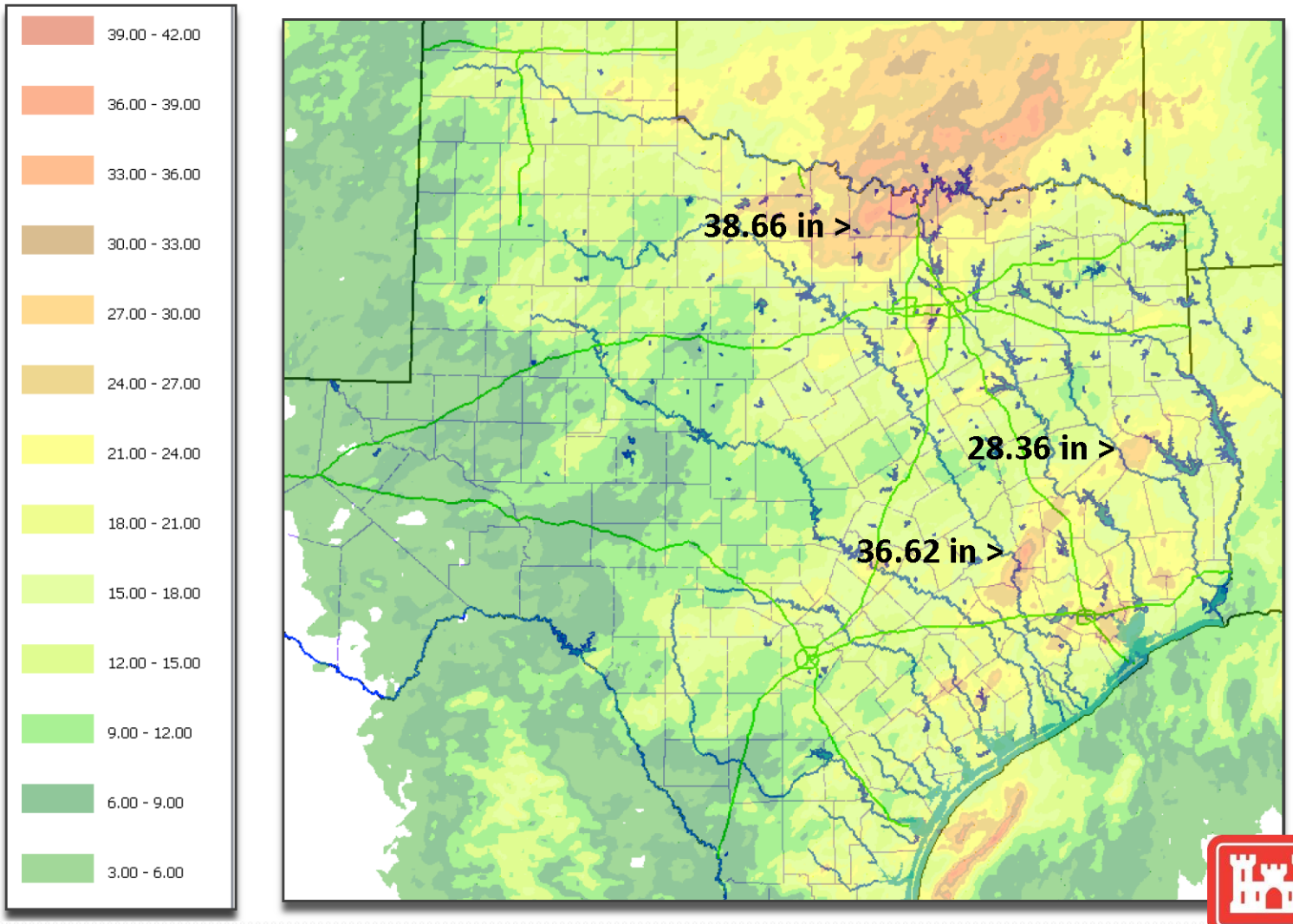
Inundation Products for Surcharge Releases



- GIS Shapefiles
- Google Earth Files
- PDF Map Books in DFW

Total Rainfall for May-June 2015



May – June 2015 Event

- Ended 2014 in significant drought
- TRWD projects on West Fork 10+ ft. low
- 20” – 30” rainfall across entire upper Trinity River
- 2.3 million ac-ft of flood storage occupied, enough water to cover Dallas and Tarrant county in 2’ of water
- Surcharge operations at 10 reservoirs (Neches/Trinity/Brazos)
- Damage inducing surcharge releases at Lewisville, Grapevine and Lavon
- Sequential events with little opportunity to make releases
- Dam safety personnel engaged at all projects with high pools (24/7)

Damages Prevented

Red River Basin	$5.2 million
Neches River Basin	$99.7 million
Trinity River Basin	$6.7 billion
Brazos River Basin	$173.5 million
Guadalupe River Basin	$59.9 million
Colorado River Basin	$23.7 million
Total	**$7.1 billion**