

WEST FORK SAN JACINTO RIVER

FLOOD PROTECTION PLANNING AND FLOOD EARLY WARNING SYSTEM ENHANCEMENTS

PUBLIC MEETING

July 12, 2017

San Jacinto River Authority

Montgomery County

City of Conroe

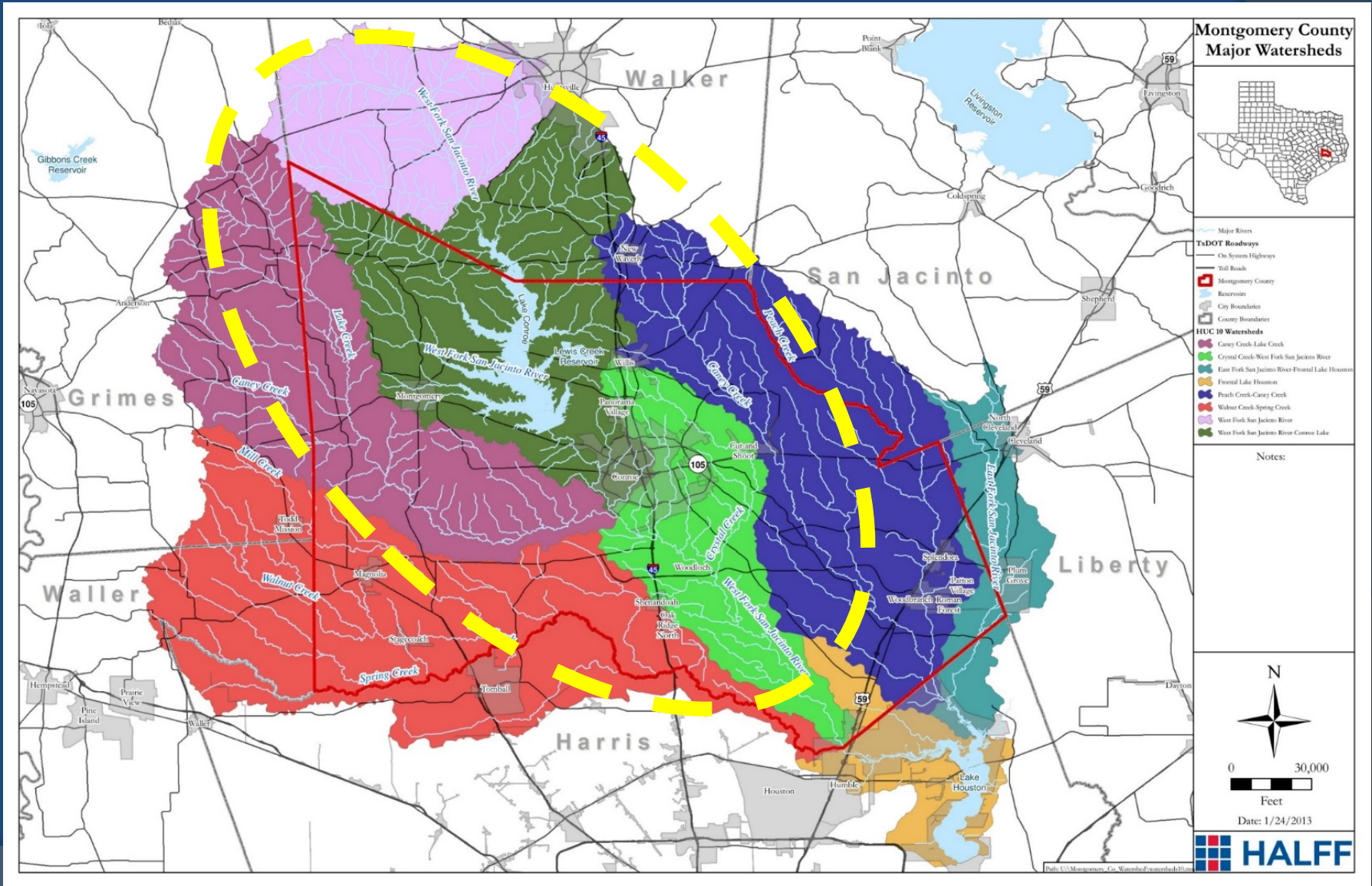
Texas Water Development Board



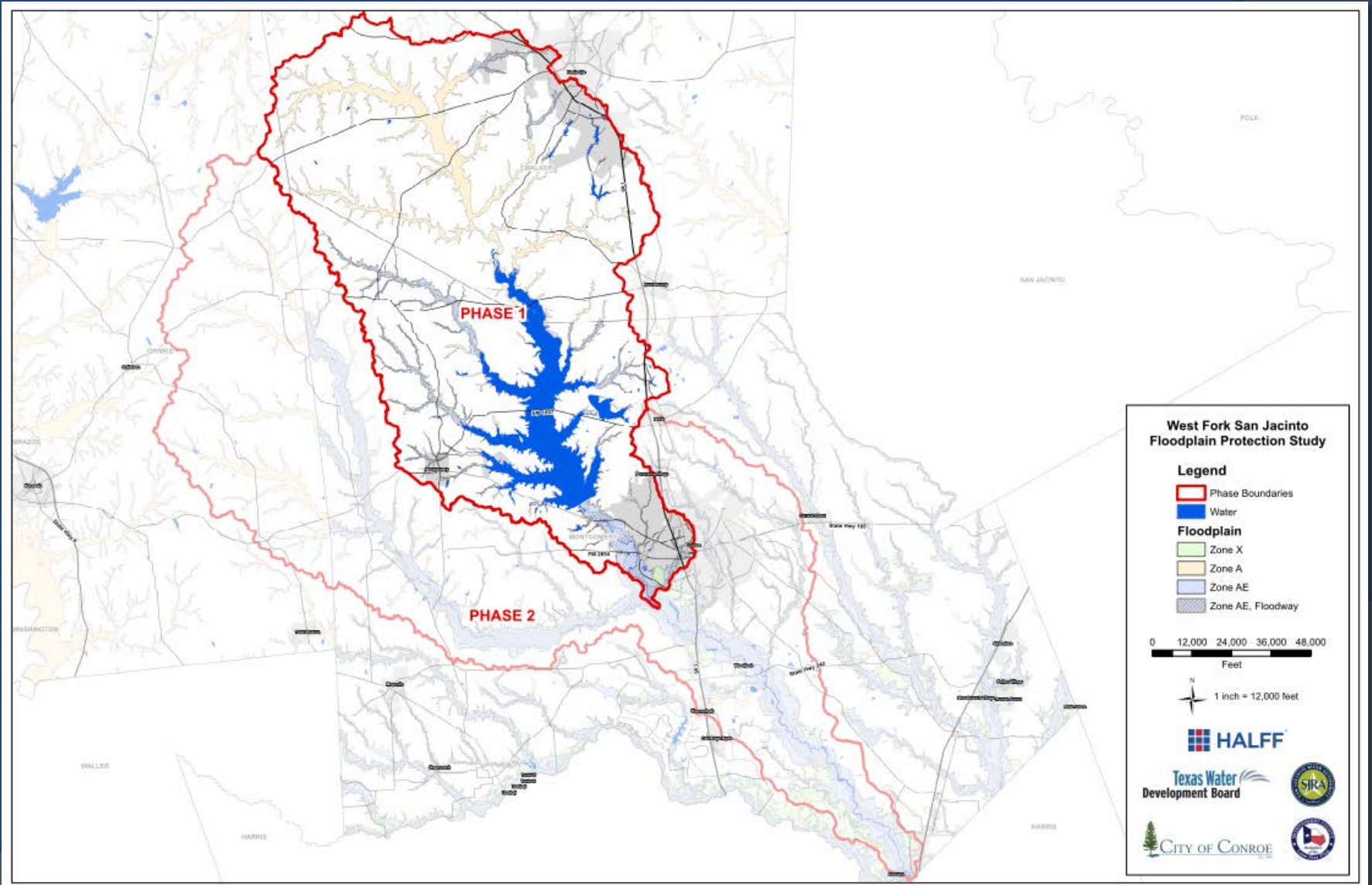
West Fork San Jacinto River

- Watershed consists of 990 square miles (Phase 1 is 503 square miles)
- The main stem is approximately 70 stream miles
- Average rainfall ranges from 43 to 48 inches per year
- The elevation change is 210 feet over nearly 60 miles

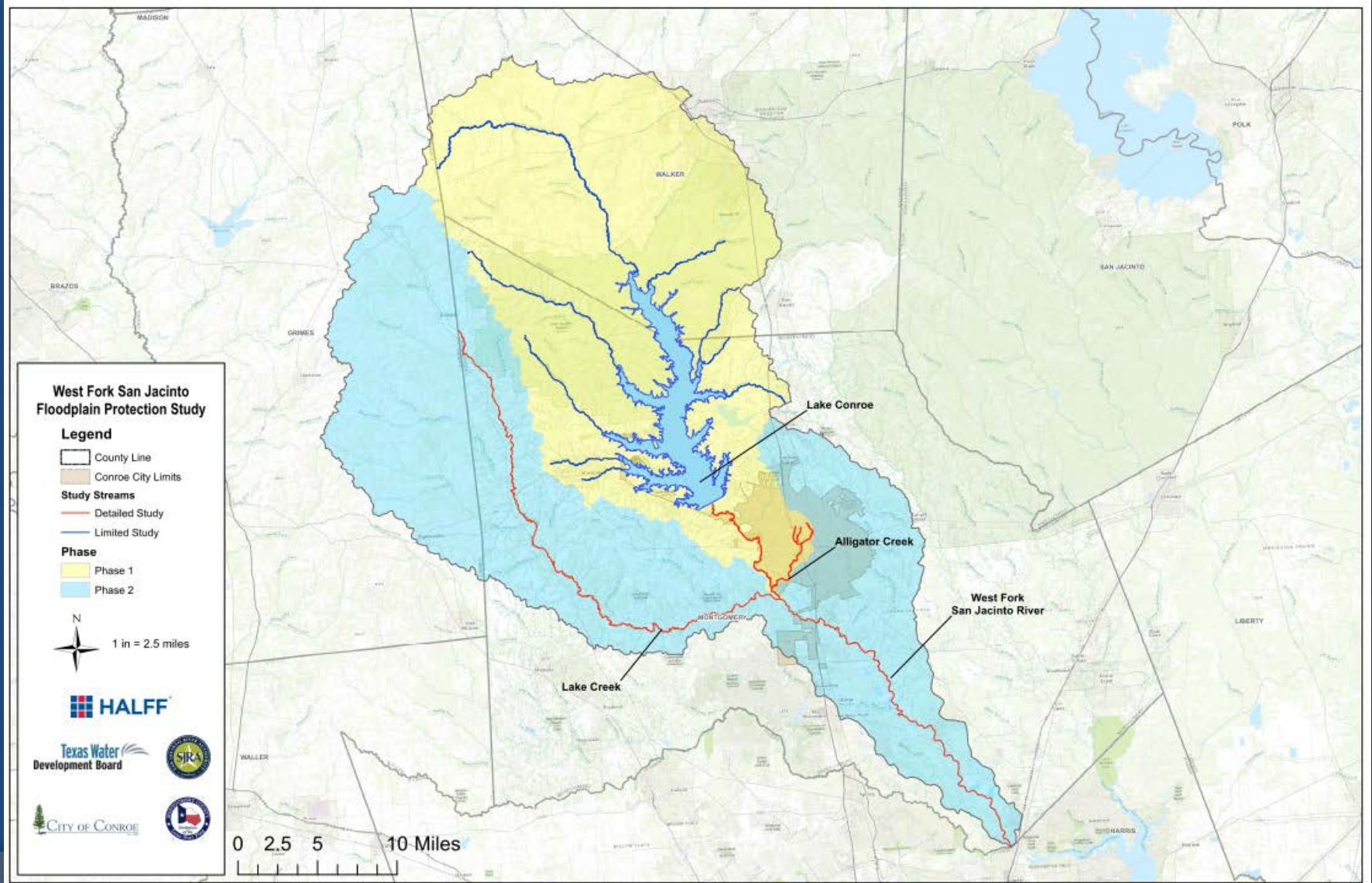
West Fork San Jacinto River Basin



FEMA Effective Floodplain



Study Area



Reasons for Study

- Mapping for Lake Conroe and West Fork SJR was established in 1985
- In 1994, a devastating storm event occurred in the watershed
- Recent 2015 and 2016 storms brought significant rainfall
- Lake Conroe has been above the 100-year elevation multiple times
- Need to address the watershed from a comprehensive basin wide perspective



<i>Date</i>	<i>Peak Lake Level (ft MSL)</i>	<i>Peak Release (cfs)</i>
October 1994	205.6	33,000
May 1983	204.6	8,500
May 2016	204.5	22,200
November 1998	204.2	27,400
November 2002	203.8	21,700
June 2001	203.8	9,800
March 2016	203.1	7,600
April 2016	203.3	7,000

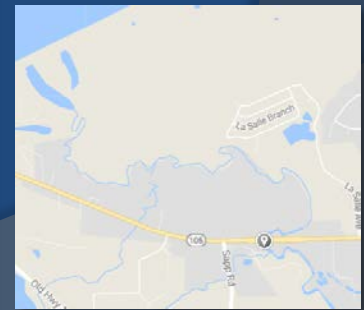
Goals of Study

- ① Develop local strategies for responding to floods and formulate a flood protection plan to identify flood risk and mitigation solutions
- ① Update hydrologic and hydraulic models for West Fork San Jacinto and Alligator Creek
- ① Calibrate new models to historical events to provide flood volumes, flood depths, and historical durations
- ① Facilitate planning for emergency response and sound floodplain management
- ① Enhance existing early flood warning system

Historical Photos/Data

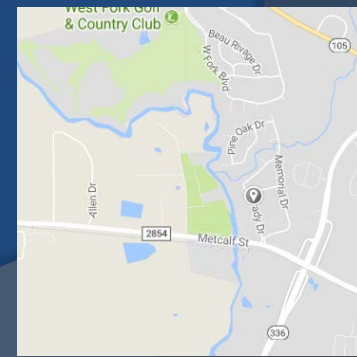


West Fork
San Jacinto River
at SH105
5/30/2016



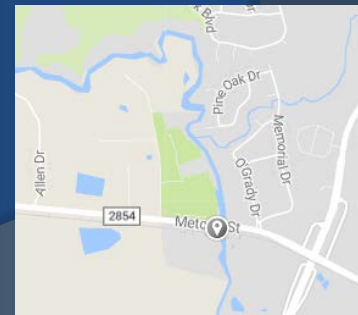


West Fork
San Jacinto River
at McDade
Estates
5/28/2016



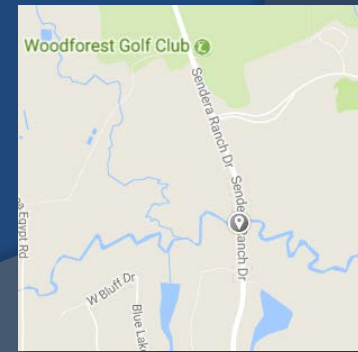


West Fork
San Jacinto River
at FM 2854
5/28/2016



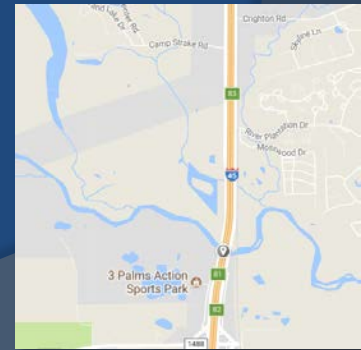


Lake Creek at
Fish Creek
Thoroughfare
5/30/2017



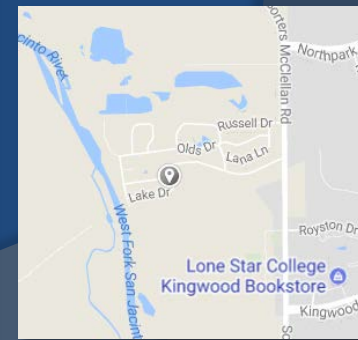


West Fork
San Jacinto River
at IH-45
5/14/2015



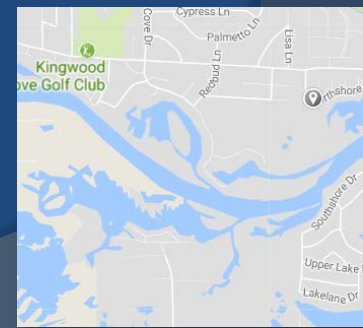


West Fork
San Jacinto River
near Kingwood
5/30/2016



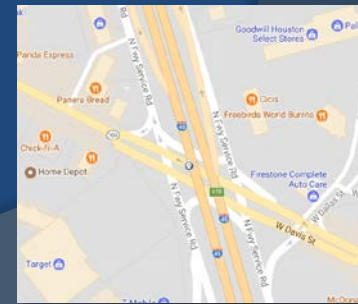


West Fork
San Jacinto River
at Kingwood
5/30/2016



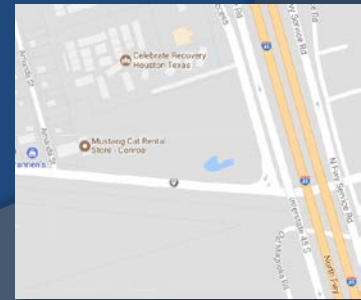


Alligator Creek
at
SH 105 and IH-45
5/27/2016



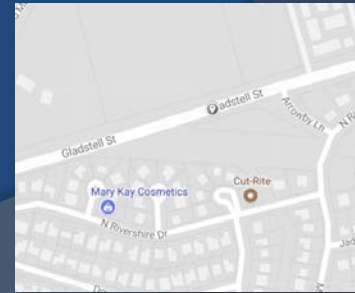


Alligator Creek
at FM 2854
5/27/2016





Alligator Creek
overflow at
Gladstell
5/27/2016



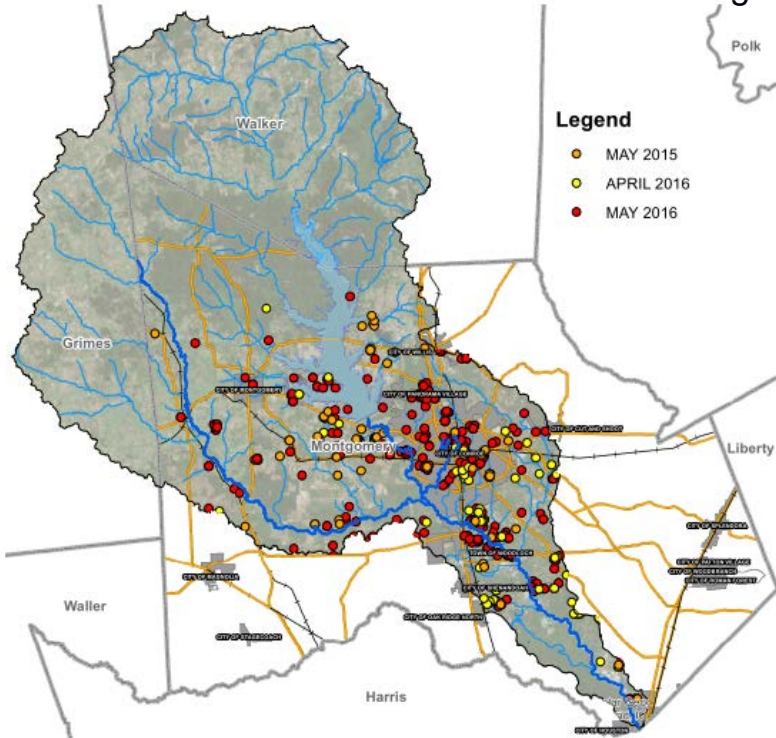


Live Oak Branch
at FM 2854
5/27/2016

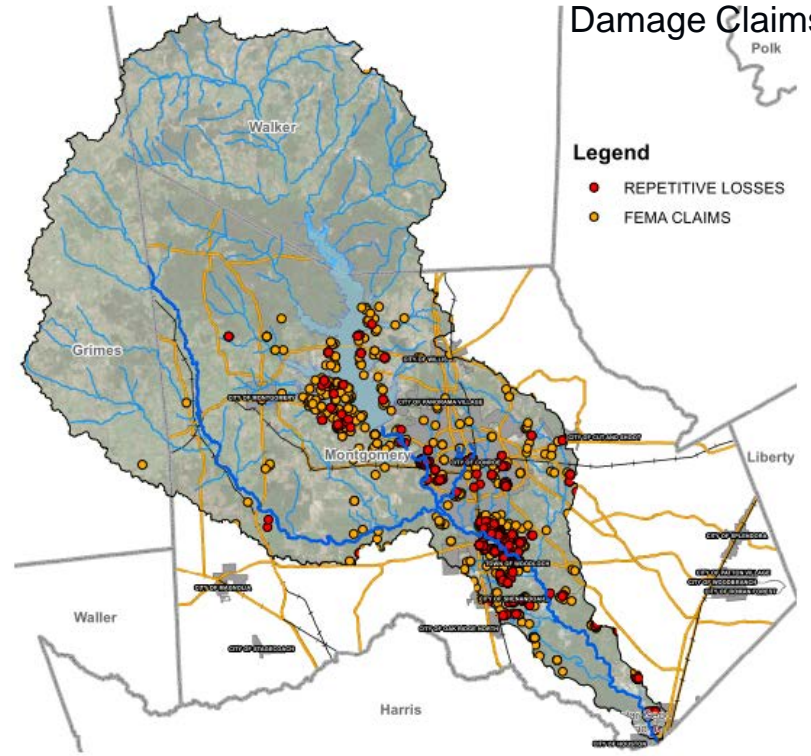


Flooding

Flood Damages

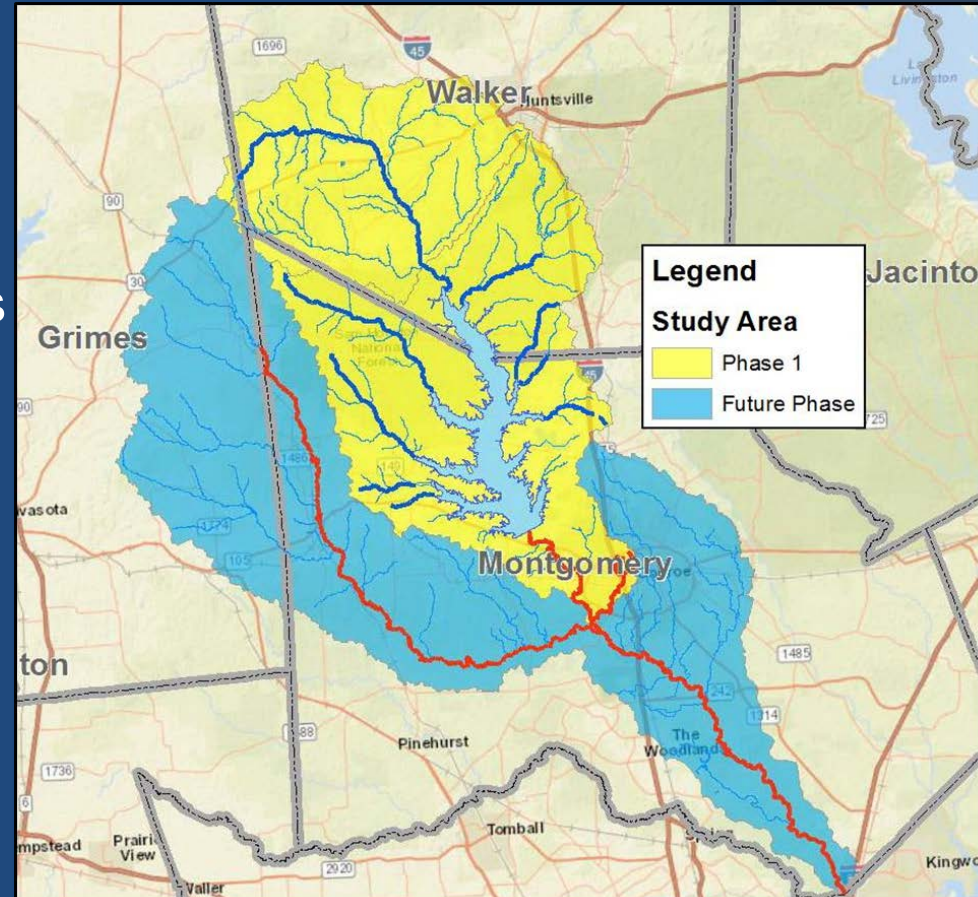


Damage Claims



Study

- Multiple phase Flood Protection Planning Study
 - Phase I – 110 stream miles
 - Phase II – 69 stream miles
 - Identification of potential flood damages, floodplain extents, and flood reduction recommendations
- Flood Warning Enhancements
 - Improvements to Flood Warning System
 - Recommendations for alert systems



Application

- Application was submitted to the TWDB
- Included Resolutions from SJRA, Montgomery County and City of Conroe
- Grant was awarded in August 2016



RESOLUTION NO. 4286-16

A RESOLUTION AUTHORIZING THE CITY OF CONROE, TEXAS TO SUPPORT THE SAN JACINTO RIVER AUTHORITY APPLICATION FOR FLOOD PROTECTION PLANNING GRANT ASSISTANCE FILED WITH THE TEXAS WATER DEVELOPMENT BOARD

WHEREAS, the San Jacinto River Authority (SJRA), desires to develop a basin-wide Flood Protection Planning Study for the West Fork of the San Jacinto River Basin, understanding that the river and its tributaries drain areas within the City of Conroe, Texas;

WHEREAS, the City of Conroe recognizes the proposed planning does not duplicate existing projects with the exception of updating existing flood protection planning information; and

WHEREAS, SJRA recognizes the proposed planning includes the study of Alligator Creek through the City of Conroe; and





WHEREAS, SJRA will appropriate in-kind and project management services, if the grant is awarded and the City of Conroe, Texas will consider appropriating matching funds in the amount of \$140,000 to assist with the financing of the Flood Protection Planning Study; and

WHEREAS, the City of Conroe will work with SJRA to pursue implementation of viable solutions identified through the proposed planning effort and will pursue and identify potential sources of funding for implementation of viable solutions; and

Texas Water Development Board
Application for Flood Protection Grant

Flood Protection for the West Fork San Jacinto River Watershed
Applicant: San Jacinto River Authority
Prepared by:
HALFF
June 17, 2016

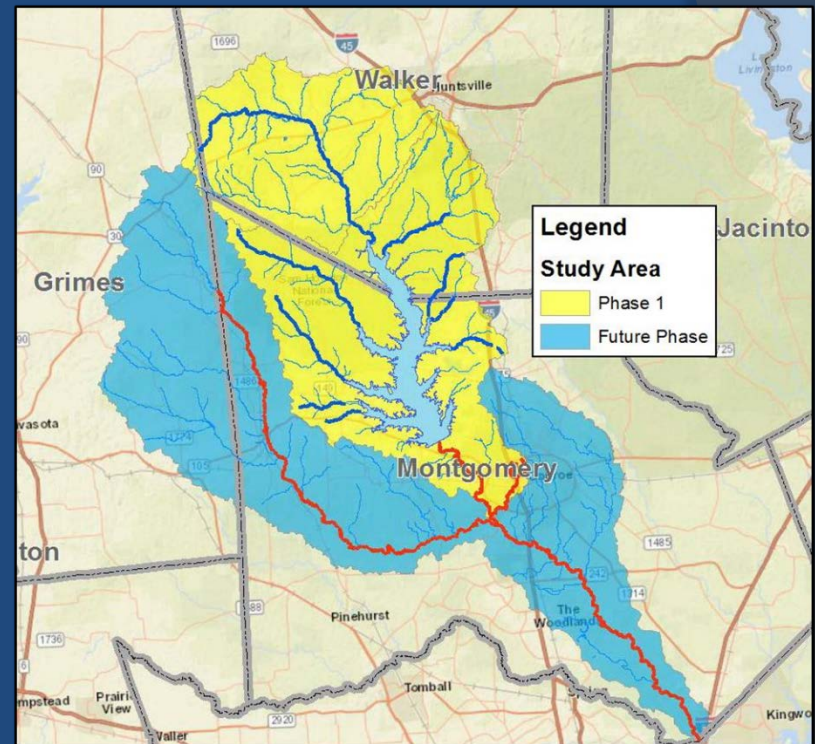
Study Participants

Participant	Contribution Percentage	Cost
	50%	\$460,000
	25%	\$230,000
	15%	\$140,000
	10%	\$90,000

Scope of Work

○ Flood Protection Planning Study

- Project Management
- Terrain Development
- Data Collection
- Field Survey
- Hydrologic Analysis
- Hydraulic Analysis
- Alternative Analysis
- Flood Damage Assessment
- Environmental Analysis
- Documentation



Project Management

Coordinate activities for flood protection study and flood response plans

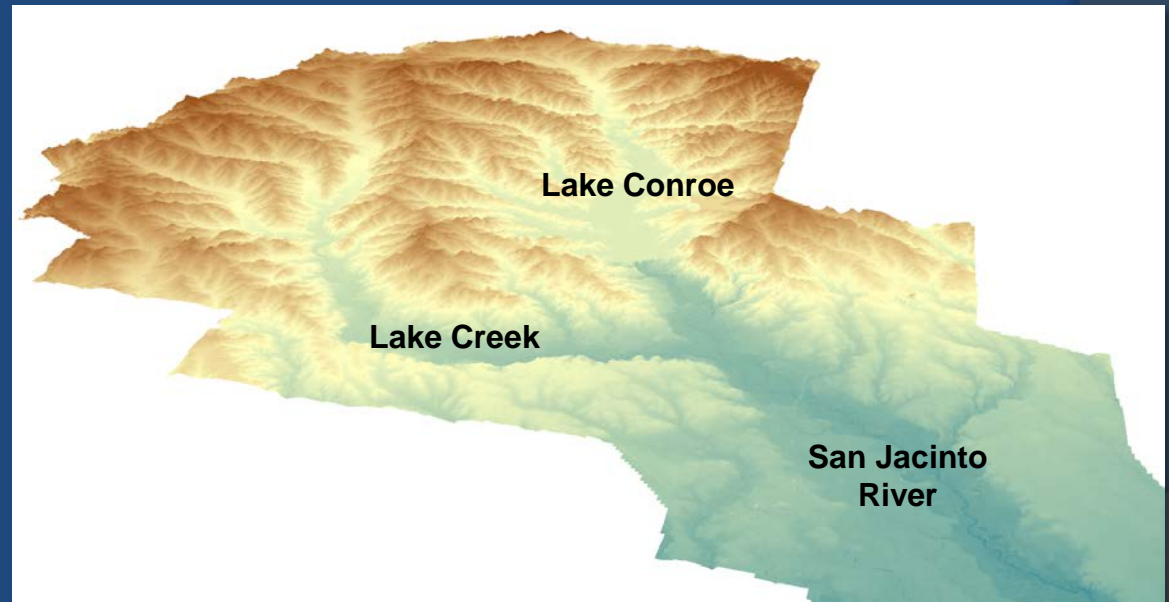
- Coordinate with participating entities
- Host 3 Public Meetings
- Flood Response Plan Coordination



Terrain Model Development

Prepare terrain information to be used for the H&H analyses

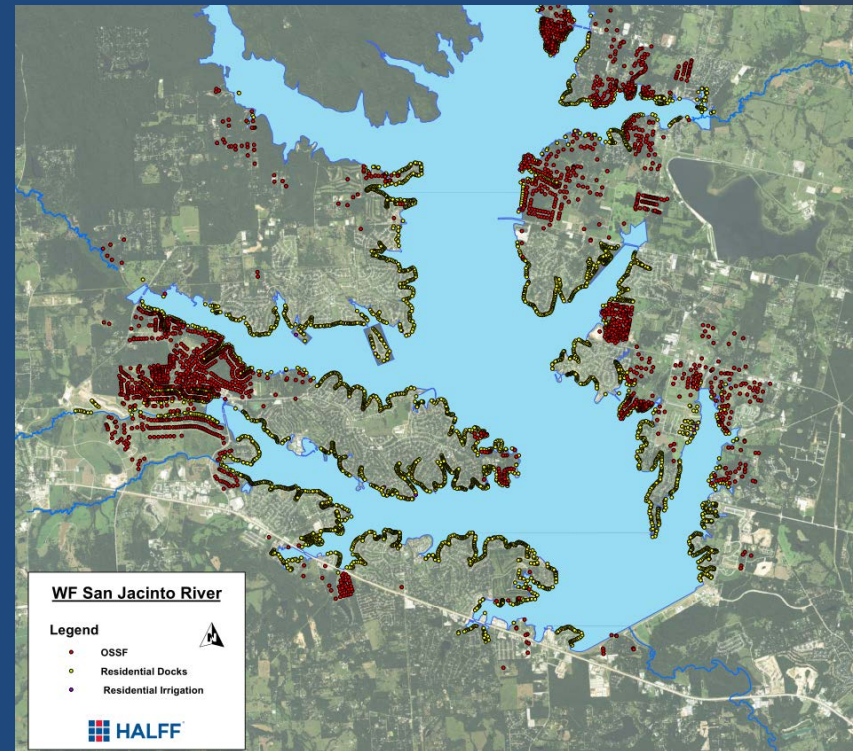
- Multiple Terrain Sources
 - 2008 H-GAC LiDAR
 - 2011 TNRIS LiDAR
 - USGS DEM Data
 - Bathymetry from TWDB



Basemap/Data Collection

Collect data necessary for the H&H analyses

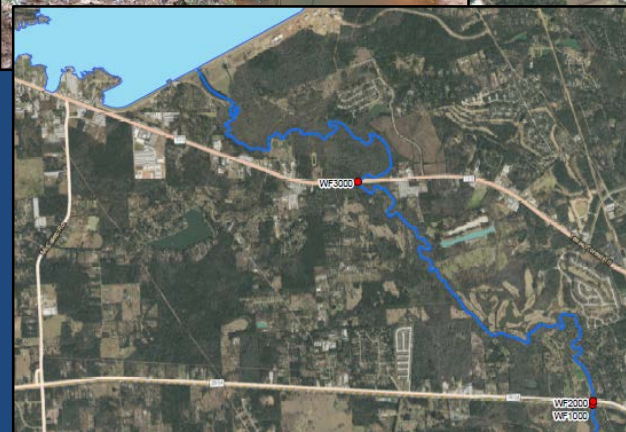
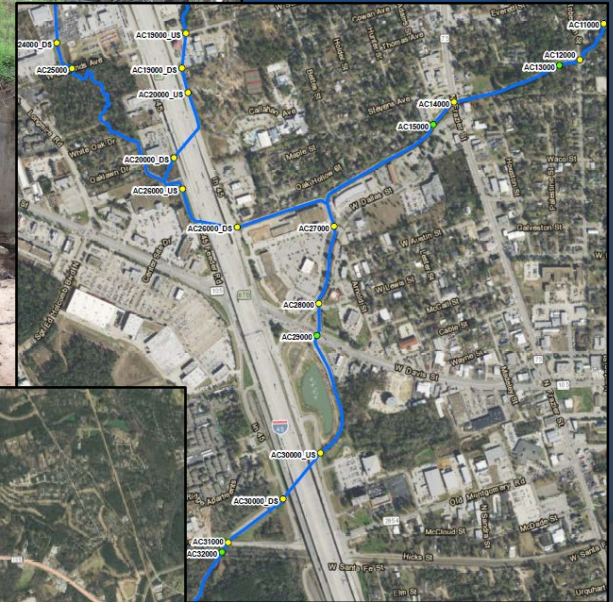
- GIS data
 - Aerial Photos
 - Soils
 - Stream Centerlines
 - Existing Land use/parcels
 - Effective Floodplain maps
 - Political areas
 - OSSF
 - Residential Docks
 - Residential Irrigation
- Data
 - Lake Conroe Operations
 - Lake Conroe Releases
 - FEMA effective models
 - As-builts for Alligator Creek



Field Survey

Collect field survey data at select bridge and culvert crossings and channel cross sections for the hydraulic model

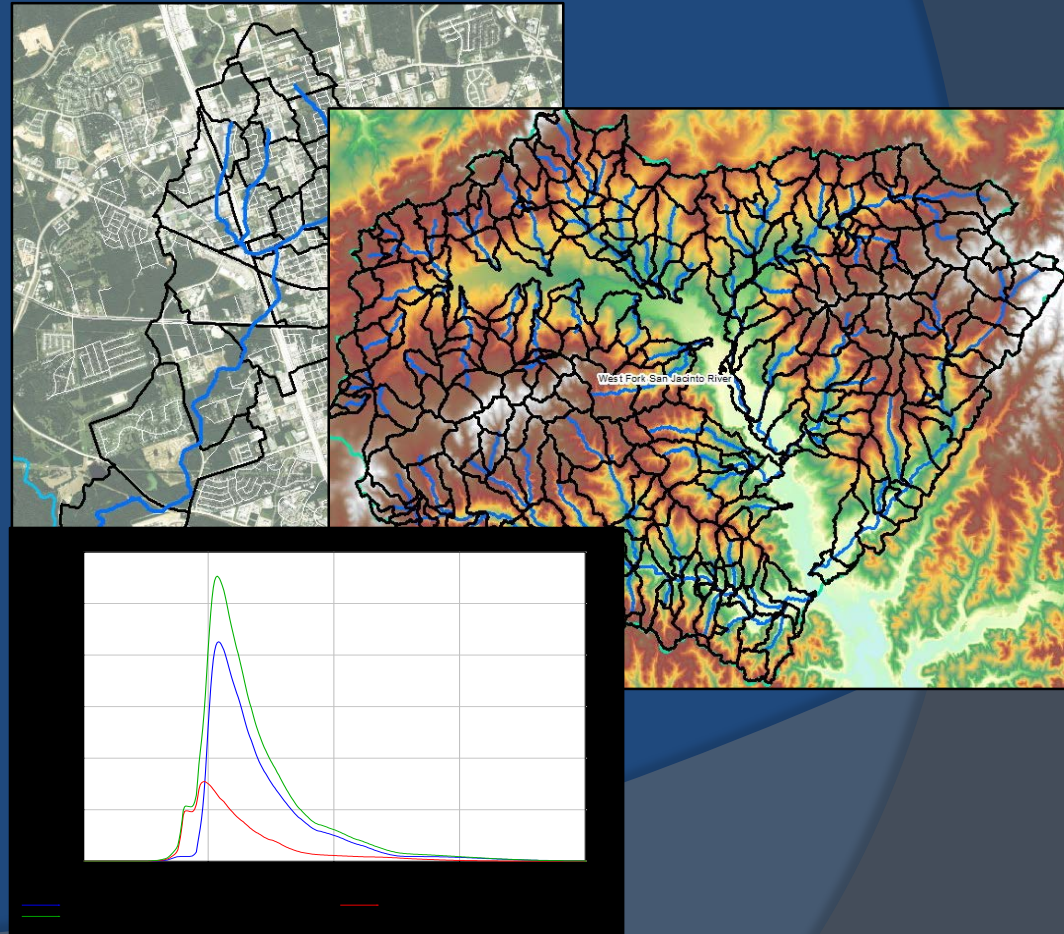
- Field Reconnaissance
- Survey Effort
 - Bridges and Crossing on Alligator and West Fork
 - Field notes and photos



Hydrology

Generate flow rates for streams into and out of Lake Conroe including the West Fork San Jacinto River and Alligator Creek

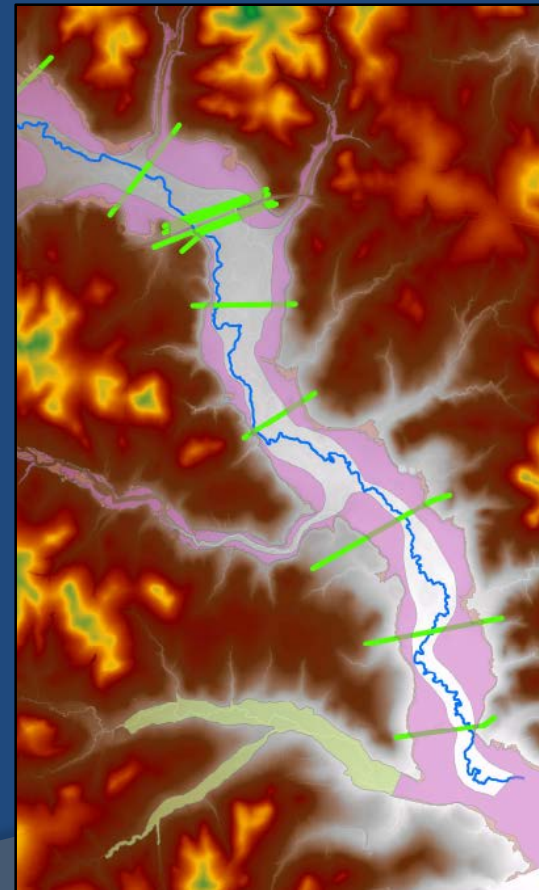
- Data Collection
- Hydrologic Model Development
- Period of Record
- Storm Centering



Hydraulics

Develop hydraulic HEC-RAS models to determine the floodplain extents for the West Fork San Jacinto River and Alligator Creek

- Data Collection
- Hydraulic Model Development
 - Alligator Creek
 - WFSJR
 - Lake Conroe Routing Models



Alternative Analysis

Develop flood damage reduction alternatives for major damage centers in West Fork San Jacinto River Basin and Alligator Creek

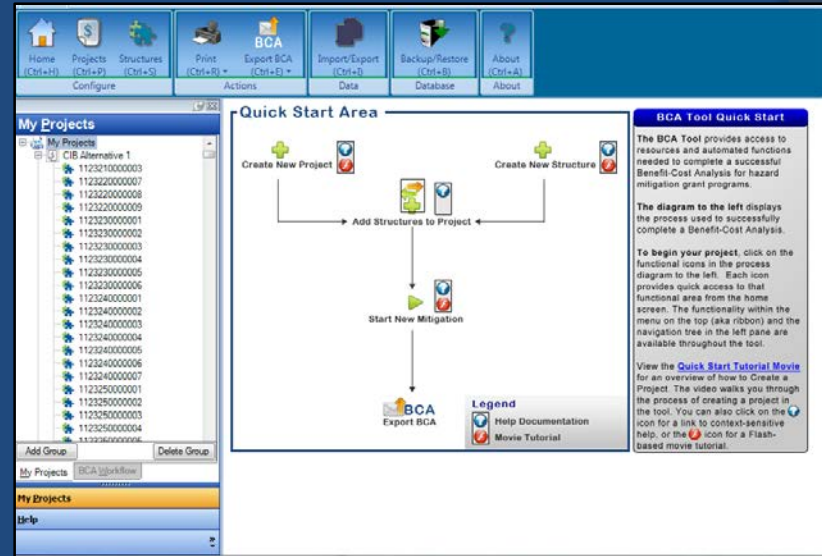
- Structural
- Non-Structural
- Cost Estimation
- Flood Response Plan



Flood Damage Assessment

Develop economic database for structures affected by flooding up to the 500-year storm event.

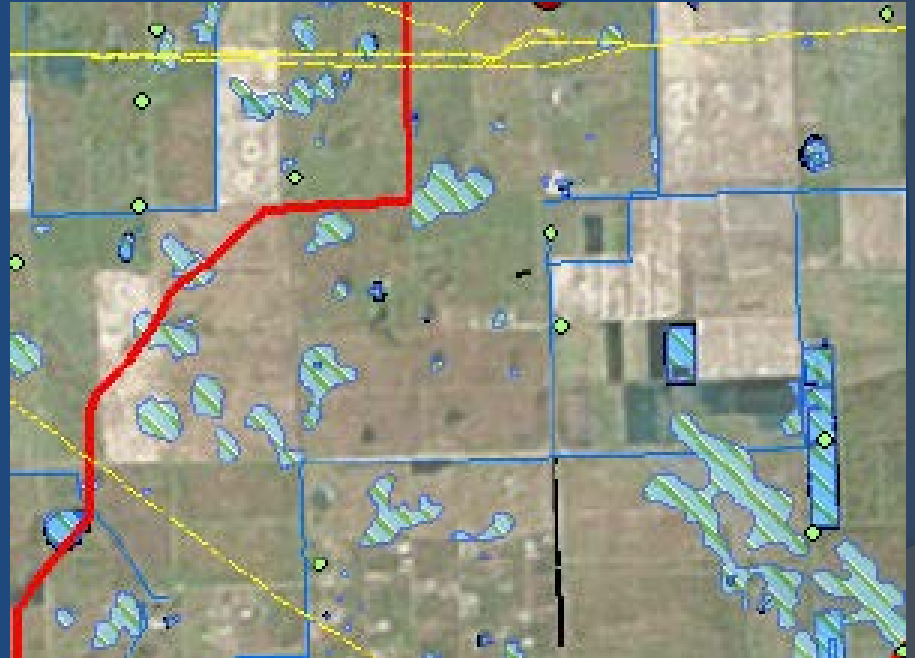
- Depth damage curves
 - Existing Conditions
 - Alternative Conditions
- Benefit/Cost Ratios



Environmental Analysis

Determine the location of possible critical environmental features outside of the Lake along the San Jacinto River

- High level analysis
- Critical environmental features



Schedule

- Feb 2017 – Study Kickoff
- July 2017 – Terrain Model, Field Survey, Public Meeting #1
- Dec 2017 – Hydrologic and Hydraulic Analysis
- Jan 2018 – Draft Existing Conditions
- Feb 2018 – Public Meeting #2
- May 2018 – Alternative Analysis
- May 2018 – Flood Damage Assessment
- May 2018 – Environmental Analysis
- June 2018 – Draft Report, Public Meeting #3
- August 2018 – Final Report

Questions