



STUDY FACT SHEET

SUMMER 2020

What is the SJMDP Study?

The San Jacinto River Regional Watershed Master Drainage Plan (SJMDP) was a comprehensive regional study led by local study partners including the Harris County Flood Control District, Montgomery County, the City of Houston, and the San Jacinto River Authority. The study identified and developed information for communities to use for hazard mitigation planning along the channels included in this study. As extreme weather events and flood waters do not recognize jurisdictional boundaries, like county and city limits, the four study partners worked together to address flooding as a regional issue.

This comprehensive study developed a set of hydrologic and hydraulic models for the major streams of the Upper San Jacinto River regional watershed that will provide a technical basis for local, state, and federal agencies to identify flooding vulnerabilities for existing infrastructure and impacts from future growth to improve flood resiliency in the **watershed**. The models developed for this study used the new Atlas 14 rainfall data, the most current terrain data, and the latest technology to develop a comprehensive model that represents the various streams and their interaction with the San Jacinto River watershed. Potential projects supported by the results of this study are intended to reduce flood risks to people and property located throughout the watershed resulting in better informed and more resilient communities.

Information developed includes non-regulatory **inundation maps** (not intended to replace [current FEMA effective Flood Insurance Rate Maps](#)) for the studied streams that show the extent and depth of **riverine flooding** of the major streams within the watershed for an array of simulated storm events. Additionally, information was gathered about the number of structures, acres of land, properties, and miles of roadway as well as critical infrastructure and evacuation routes, that are located within the inundated areas.

Study Goals

The goals of the SJMDP were to:

- Provide a comprehensive Flood Mitigation Plan that supports the needs and objectives of each study partner;
- Identify the vulnerabilities of the region's 13 major rivers and streams to flood hazards using Atlas 14, the most current rainfall data developed by the National Oceanic and Atmospheric Administration (NOAA);
- Develop approaches to enhance public information and flood level assessment capabilities during a flood disaster event; and
- Evaluate flood mitigation strategies to improve community resilience.

KEY STUDY TERMS

Watershed: A region of land or "drainage area" that drains to a common channel or outlet, mostly creeks and bayous, either directly or through a series of systems that may include storm sewers, roadside ditches, and/or tributary channels.

Inundation maps: Maps that show where flooding may occur over a range of water levels in a community's local stream or river.

Riverine flooding: Flooding caused by water leaving the banks of creeks and bayous due to heavy rainfall.

Headwaters: the initial source of the water in a stream.

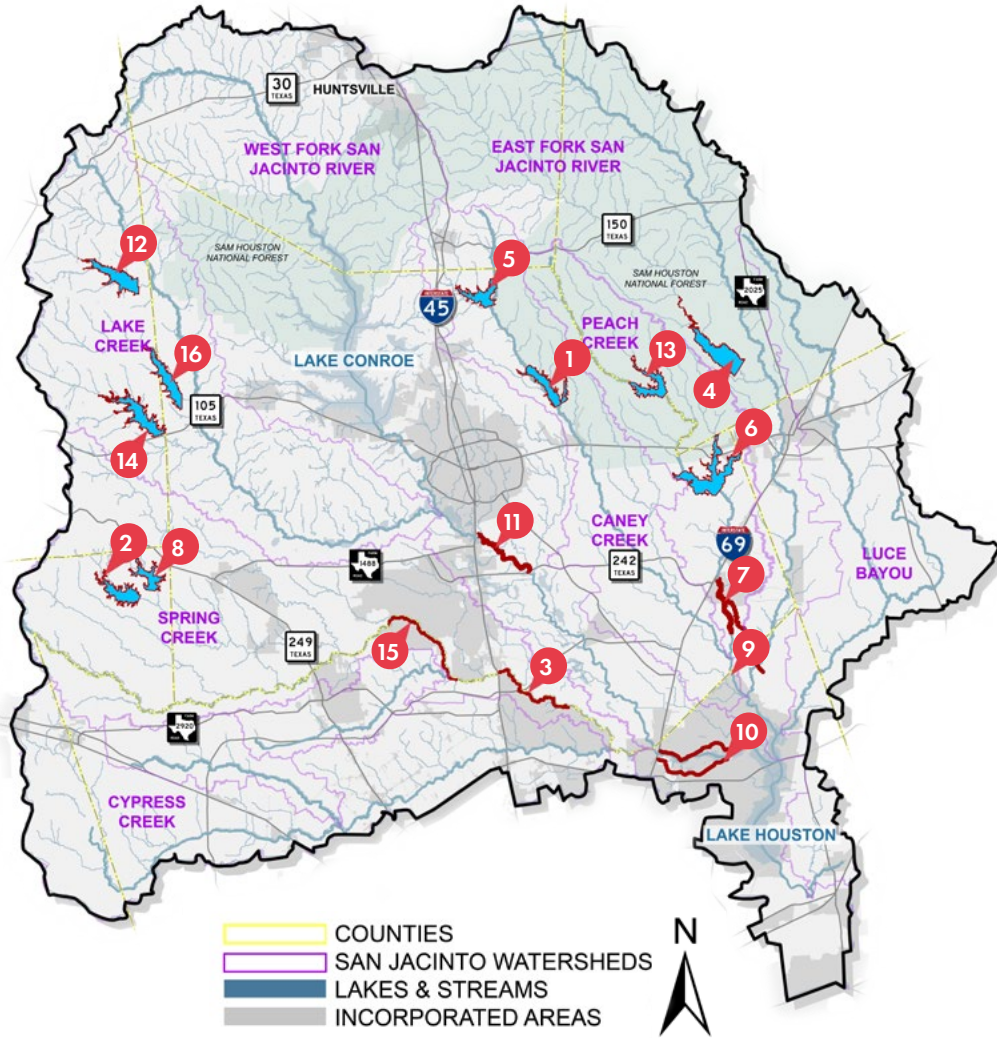
Hazard Mitigation Plans: A Hazard Mitigation Plan is a document that identifies hazards and develops long-term strategies to reduce loss of life and property by lessening the impact of disasters, such as flooding. Government organizations engage in hazard mitigation planning to identify risks and vulnerabilities associated with natural disasters, and develop long-term strategies for protecting people and property. Mitigation plans are key to breaking the cycle of disaster damage, reconstruction, and repeated damage.

SJMDP Projects

The projects identified by the SJMDP were designed to address the concerns expressed by the various stakeholders in this region. Sixteen large flood mitigation projects (6 potential channel conveyance improvement locations, 10 potential stormwater detention basins, or reservoirs) have been prioritized to reduce vulnerability to flood hazards on the main channels and improve watershed resilience.

#	Project Name
1	Caney - Detention at SH 105
2	Spring - Walnut Creek Detention
3	Spring - I-45 Channelization
4	East Fork - Winter's Bayou Detention
5	Caney - Detention at FM 1097
6	Peach - SH 105 Detention
7	Peach - I-69 Channelization
8	Spring - Birch Creek Detention
9	Caney - US-69 Channelization
10	West Fork - Kingwood Benching
11	West Fork - River Plantation Channel
12	Lake - Garret's Creek Detention
13	Peach - Walker Creek Detention
14	Lake - Caney Creek Detention
15	Spring - Woodlands Channelization
16	Lake - Little Caney Creek Detention

STUDY AREA MAP



Study Area

The study area includes the Upper San Jacinto River watershed which extends from the headwaters in Walker County to the Interstate 10 crossing at the San Jacinto River in Harris County. This area covers approximately 2,900 square-miles of the watershed upstream of Interstate 10, located in seven different counties:

- Grimes County
- Harris County
- Liberty County
- Montgomery County
- San Jacinto County
- Walker County
- Waller County

The 535 miles of major streams evaluated as part of this study include West Fork San Jacinto River, East Fork San Jacinto River, San Jacinto River, Lake Creek, Cypress Creek, Little Cypress Creek, Spring Creek, Willow Creek, Caney Creek, Peach Creek, Luce Bayou, Tarkington Bayou, and Jackson Bayou.

Funding

As projects move forward, there may be more opportunities for multiple funding sources, including through federal and state grant programs. The study partners will consider various funding sources, including:

Federal

- FEMA
- U.S. Department of Housing and Urban Development
- Natural Resource Conservation Service
- Environmental Protection Agency

State

- General Land Office
- Texas Water Development Board

Local

- Bonds
- Tax Increment Reinvestment Zones

Project Implementation

Now that vulnerabilities to flood hazards have been identified and flood mitigation strategies have been recommended, a clear path to project implementation is needed to move the SJMDP forward. The SJMDP identified both watershed-wide policies and regional projects that can be implemented within the San Jacinto Watershed to reduce flood risk. The recommendations were categorized into short-term and long-term solutions:

- Short-term solutions, or additional studies, recommended policy changes, etc., can be implemented within a five-year window, if appropriate funding and partnerships are in place. These typically require less funding and have fewer implementation constraints than the long-term solutions.
- Long-term solutions, or structural solutions, consist of the recommended projects that will take more than five years to complete once implementation begins, due to funding, environmental permitting, construction time, or other project constraints. The SJMDP has completed the planning phase of developing flood mitigation solutions in the watershed.

SHORT-TERM SOLUTIONS

- **Vision Group** – This group would establish a regional entity across county boundaries for continuing to cast a vision for regional project implementation and common drainage criteria throughout the basin. The group could foster collaboration to evaluate the path forward in reducing vulnerabilities to flood hazards and improving resiliency.
- **Policy** – While each entity may not need identical drainage criteria, common base criteria would standardize the minimum requirements needed for future development. Policies that could be standardized include detention methodology, hydrologic and hydraulic methodology, floodplain analysis, and minimum finished floor elevations.
- **Conservation Areas** – Identify areas along major streams that could be set aside as conservancy areas to preserve the floodplain and prevent increase in flood risk.
- **Flood Monitoring/Warning Enhancements** – Adding rainfall and water surface elevation gages to provide both the emergency managers and the public with additional information to determine flood risk.

- **Flood Response** – Improve flood response by enhancing communication, identifying and prioritizing improvements to critical infrastructure in flood prone areas, and developing public education strategies.
- **Buyouts** – Acquiring property and removing it from potential flood risk is often the most cost-effective approach. There are over 600 structures identified within the 20% ACE (5-year) storm at an anticipated buyout cost of \$190 million. The counties and regional groups should seek funding to develop a buyout program for these frequently flooded structures.
- **Floodplain Re-Mapping** – The updated modeling for the existing flood hazard assessment showed that current elevations and floodplains used within the basin are outdated. The average 1% ACE (100-year) water surface elevation increased between 0.5 and 4.5 feet in the watershed. This means structures built to current standards could still be within the 1% ACE and are more susceptible to flooding. Re-mapping the watershed would provide updated flood risk information to agencies and the public.
- **Watershed Protection Studies** – Watershed protection studies for each of the watersheds would further analyze the flooding potential on the tributaries of the major streams and identify local drainage improvements needed. A recommended priority of studies would begin with Spring Creek, followed by West Fork, Caney Creek, Peach Creek, Lake Creek, Luce Bayou, and East Fork.

LONG-TERM SOLUTIONS

- Long-term solutions consist of structural solutions, including:
- **Stormwater Detention Basins** are excavated, man-made dry dams that capture runoff, detain it, and release at a slower flow rate. The result is lower water surface elevations downstream. Each detention facility was conceptually designed to provide flood damage reduction benefits along the major streams in the watershed.
 - **Channel Conveyance Improvements** consist of excavating channels to allow for more capacity of flow, thereby reducing the water surface elevations in the vicinity of the project area. Channel conveyance improvements can range from concrete-lined sections, to man-made channels that incorporate environmentally friendly features.

**WE ARE
HERE**

IMPLEMENTATION TIMELINE



A Note About Flooding...

What are Floodplains?

From time to time, due to heavy rainfall, bayous and creeks naturally come out of their banks and inundate the adjacent land. This area is referred to as a floodplain. A floodplain is defined as any land area susceptible to being inundated by water from any source. Each bayou and creek has its own floodplain, where water collects, pools, and flows during the course of a storm event. As every flood is different, floodplains are typically expressed by stating their annual exceedance probability or the chance of a particular storm to occur in any given year.

What is a 100-year Flood?

The term 100-year flood is misleading. The 1 percent floodplain or 100-year floodplain represents an area of inundation having a 1 percent chance of being equaled or exceeded in any given year. It does NOT mean that if a 1 percent flood event does occur, another 1 percent flood event will not happen for 99 years.

Flooding Fact: It is a common misconception that, in Harris County's past, floodplains were contained within the channel banks, and that land development has caused all the area's flooding problems. That is not necessarily true. Nature can and will provide more rainfall than the area's bayous, creeks, and channels can handle.

Flooding Fact: Statistically, a 1 percent flood has a 26 percent chance of occurring during a 30-year period – the length of many mortgages.

Resources for Flooding Risk:

Floodplain maps produced by FEMA are a key tool used by the Harris County Flood Control District and FEMA to communicate flooding risks to citizens. Interactive maps are publicly accessible online at www.harriscountyfemt.org. To learn more about the different types of flooding in Harris County visit www.hcfcfd.org.



Caney Creek

How Can I Get Help Now?

The participating study partners are interested in hearing from you. Please contact your local representative with comments and questions:

- **Harris County Flood Control District**
Jing Chen, jing.chen@hcfcfd.hctx.net
- **San Jacinto River Authority**
Matt Barrett, mbarrett@sjra.net
- **Montgomery County**
Darren Hess, darren.hess@mctx.org
- **City of Houston**
Adam Eaton, adam.eaton@houston.tx.gov

Other Resources and Documents

- **FEMA Assistance**
www.fema.gov/individual-disaster-assistance
- **FEMA Hazard Mitigation Planning**
www.fema.gov/hazard-mitigation-planning
- **HCFCD Home Buyout Program**
www.hcfcfd.org/Resilience/Countrywide-or-Multi-Watershed/Home-Buyout-Program

VISIT THE STUDY WEBSITE: WWW.SANJACSTUDY.ORG