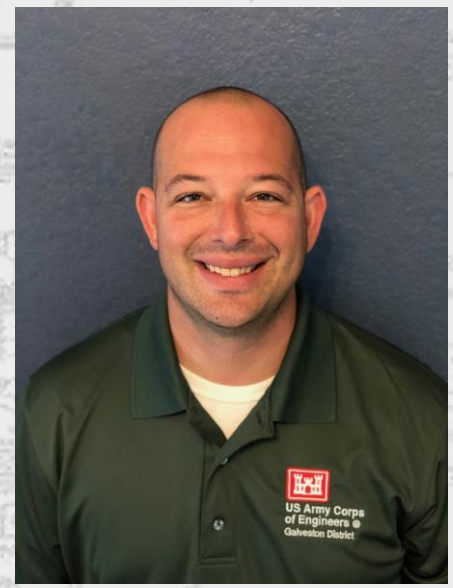
Hurricane Harvey: 5th Year Anniversary



David Mackintosh
Chief, Houston Project Office
USACE–SWG

Kenneth Darko
Dam Safety Program Manager
USACE–SWG

Lisa McCracken Mairs
Project Manager
USACE–SWG

Scott Elmer
Assistant Director of Operations
Harris County Flood Control District

US Army Corps of Engineers ®

HURRICANE HARVEY- 5TH ANNIVERSARY

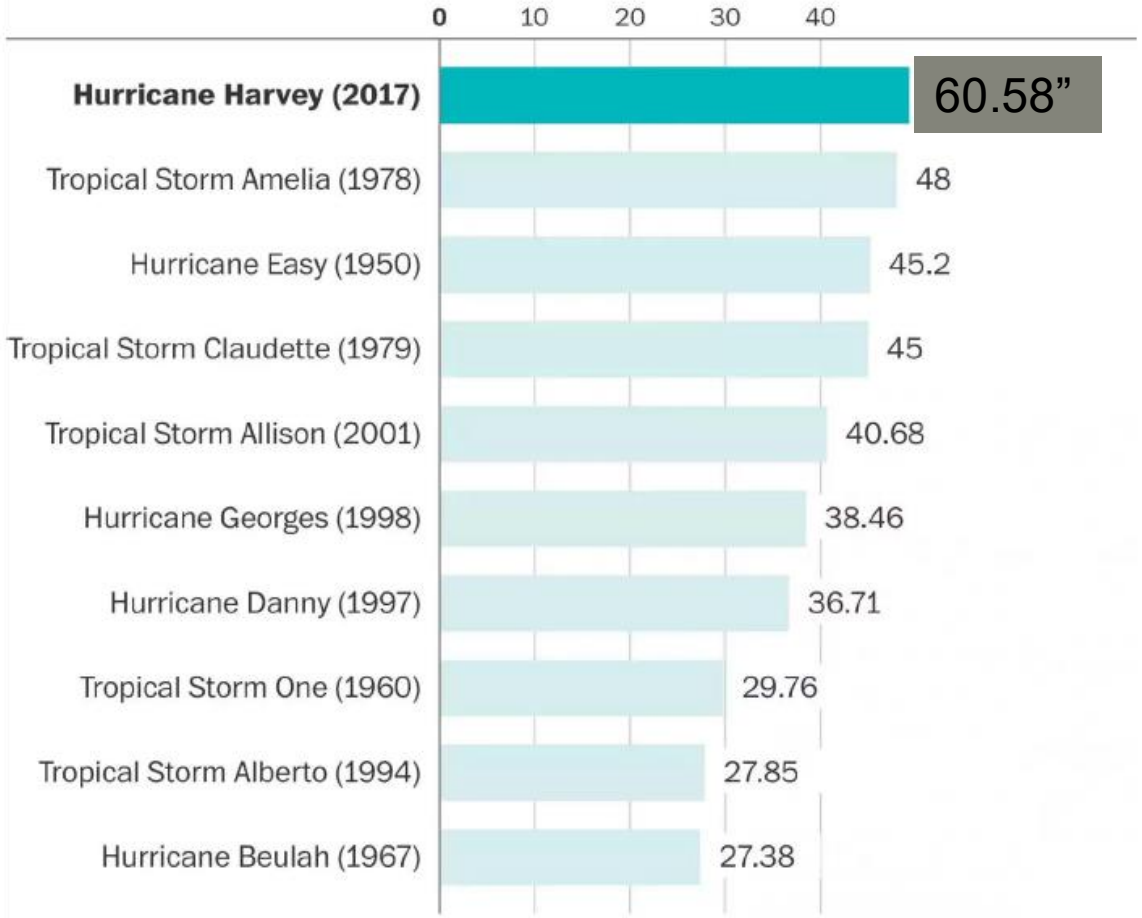
Kenneth Darko-Kagya - USACE
Dam Safety Program Manager
Lisa McCracken Mairs - USACE
Project Manager
Scott Elmer - HCFCD
Asst. Director of Operations
David Mackintosh – USACE
Natural Resource Manager

Date: 6 OCT 2022

HOW MUCH RAINFALL

Wettest storms in U.S. history

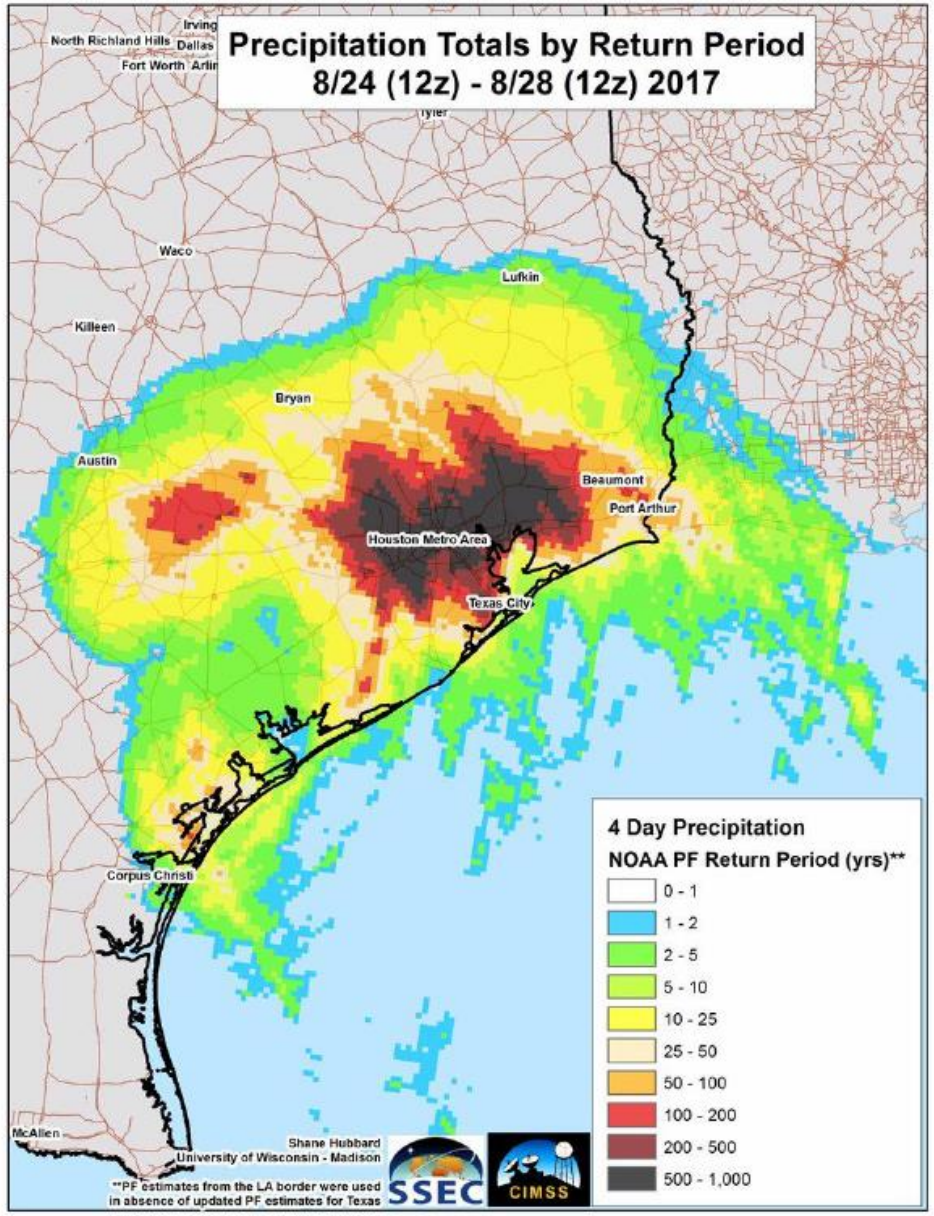
With around 50 inches of total rainfall through Tuesday, Hurricane Harvey is now the rainiest tropical storm in the Lower 48.



Hawaii mountain peaks have reported larger rainfall totals.

Source: National Weather Service

CAPITAL WEATHER GANG



These inundation maps are provided by the United States Army Corps of Engineers Galveston District to assist communities to understand current operations at the Addicks and Barker Reservoirs.

Disclaimer

While the United States Army Corps of Engineers, (hereinafter referred to as USACE) has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guarantee, either express or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. The USACE, it officers, agents, employees or servants shall assume no liability of any nature for the errors, omissions, or inaccuracies in the information provided regardless of how caused.

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HURRICANE HARVEY – AUGUST 2017

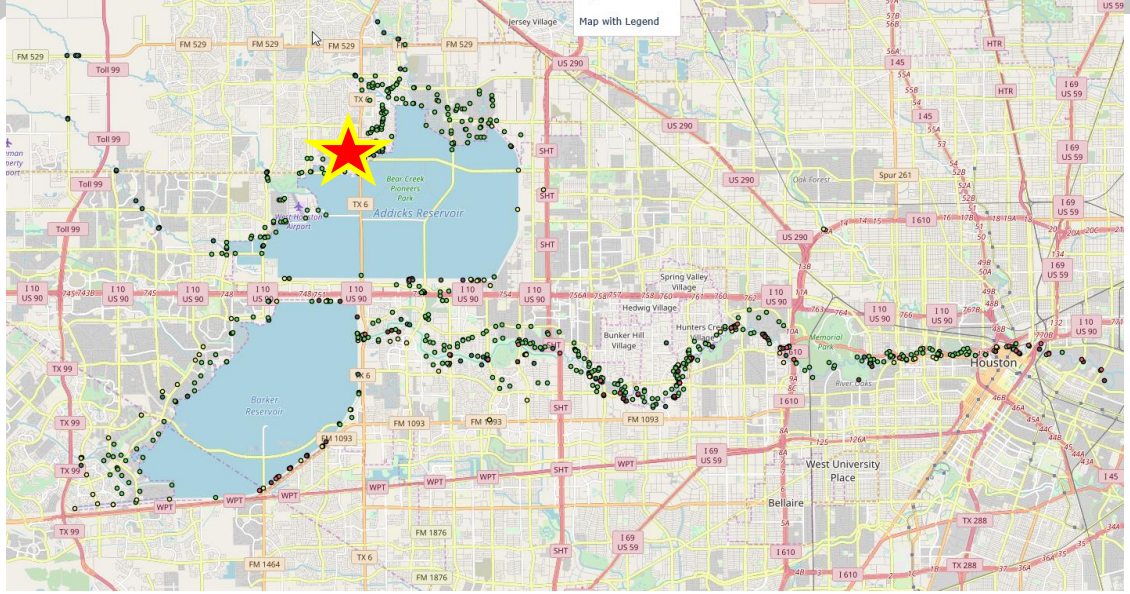
ADDICKS RESERVOIR			
DATE	ELEVATION AT DAM	SURFACE AREA IN ACRES	STORAGE IN ACRE-FEET
30 AUG 2017	109.09	16,982	217,726
23 APR 2016	102.65	12,834	123,067
09 MAR 1992	97.46	9,189	65,264
SPILLWAY DESIGN FLOOD	115.00	20,910	329,676

BARKER RESERVOIR			
DATE	ELEVATION AT DAM	SURFACE AREA IN ACRES	STORAGE IN ACRE-FEET
30 AUG 2017	101.56	15,149	170,941
23 APR 2016	95.25	12,090	85,816
09 MAR 1992	93.60	11,494	66,489
SPILLWAY DESIGN FLOOD	108.00	19,330	281,267

The Dams are designed for events as large and larger than Harvey. But, the system is constrained due to:

- Upstream change in land use. More water reaches the dams and reservoirs fill up faster
- Increased presence of life and property upstream and downstream.
- High water levels in Addicks & Barker reservoirs can extend beyond project lands. There could be downstream impacts when water is released at certain levels according to the Water Control Manual.

HURRICANE HARVEY FLOODING


Map with Legend
Addicks Reservoir
Barker Reservoir
Houston
West University Place
Bellaire
Bunker Hill Village
Hedwig Village
Spring Valley Village
Jersey Village
Oak Forest

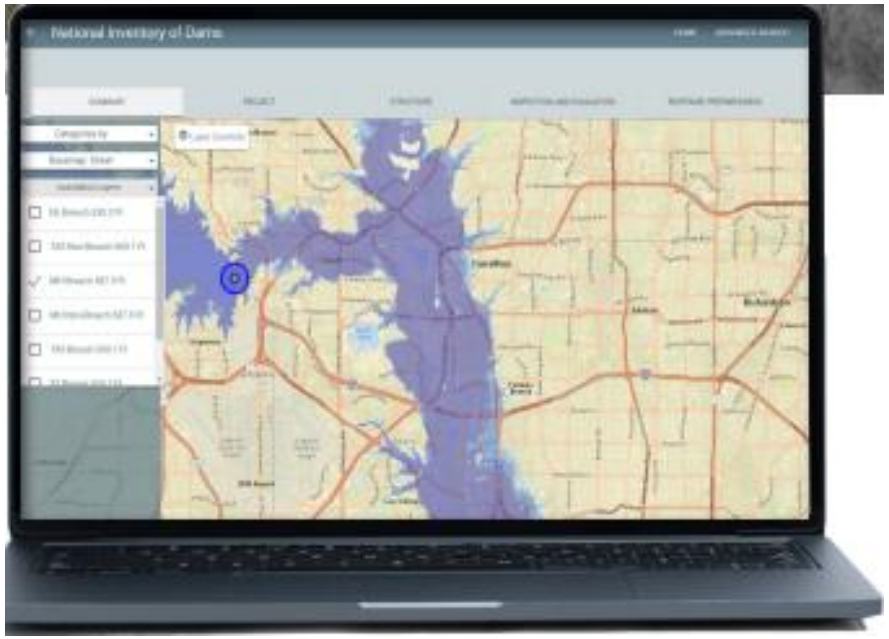

Bear Creek Village

5-Years After Harvey - USACE

INUNDATION MAPS – NATIONAL INVENTORY OF DAMS (NID)

Increased Communication

- USACE releases inundation maps and risk about dams to the public.
- Inundation maps show possible flooding near dams.



Where Can I find These Maps

NID Website: https://nid.sec.usace.army.mil/#/

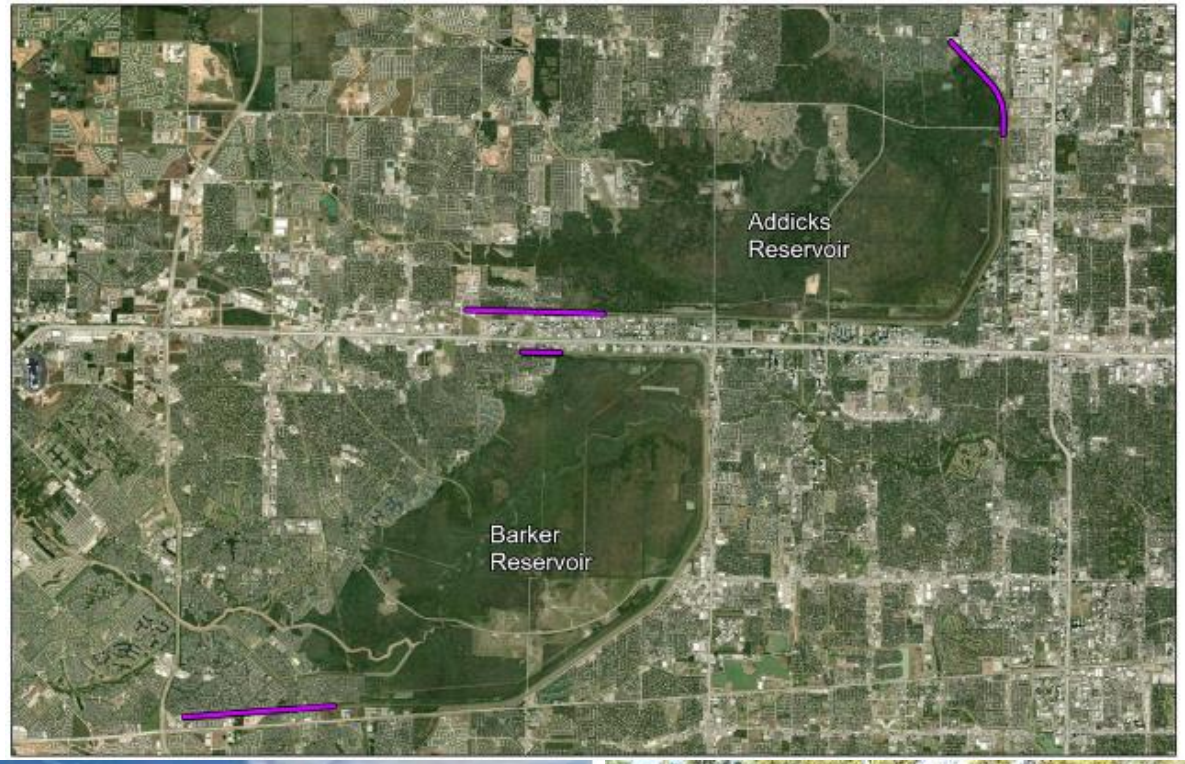
NID: Congressionally authorized database that documents dams in the U.S. and its territories.

ADDICKS DAM CONSTRUCTION

BARKER DAM CONSTRUCTION

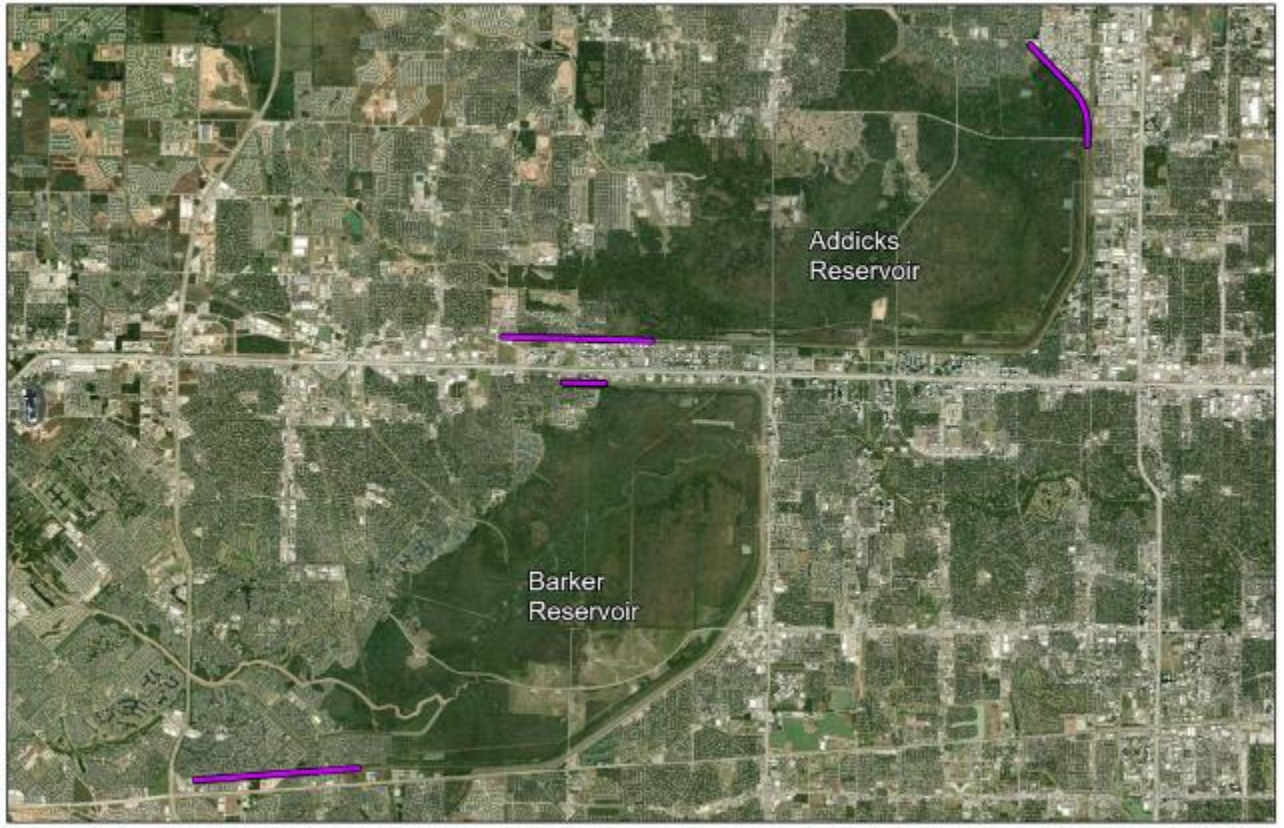
INTERIM REPAIRS – DAM SPILLWAY

- Contract Awarded April 2020
- Repaired opened joints
- Sealed Cracks
- Repaired damaged and replaced concrete slabs



DAM SAFETY MODIFICATION STUDY

- Ongoing Dam Safety Modification Study
- Reassess the integrity of Addicks and Barker spillways in light of changed hydrologic conditions and determine if and what measures are needed to address concerns.
- Permanent Repair

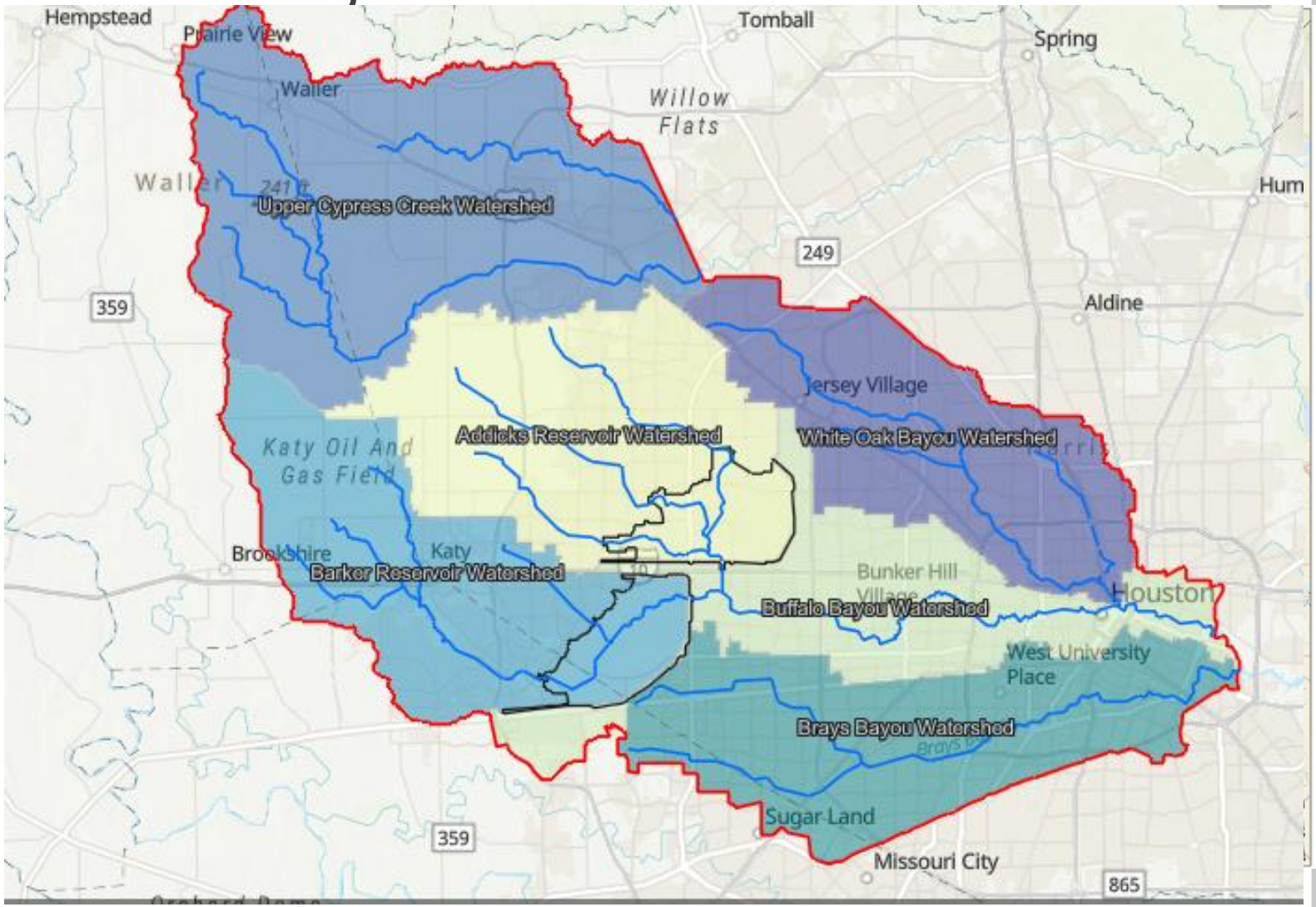


BUFFALO BAYOU AND TRIBUTARIES, RESILIENCY STUDY, TX

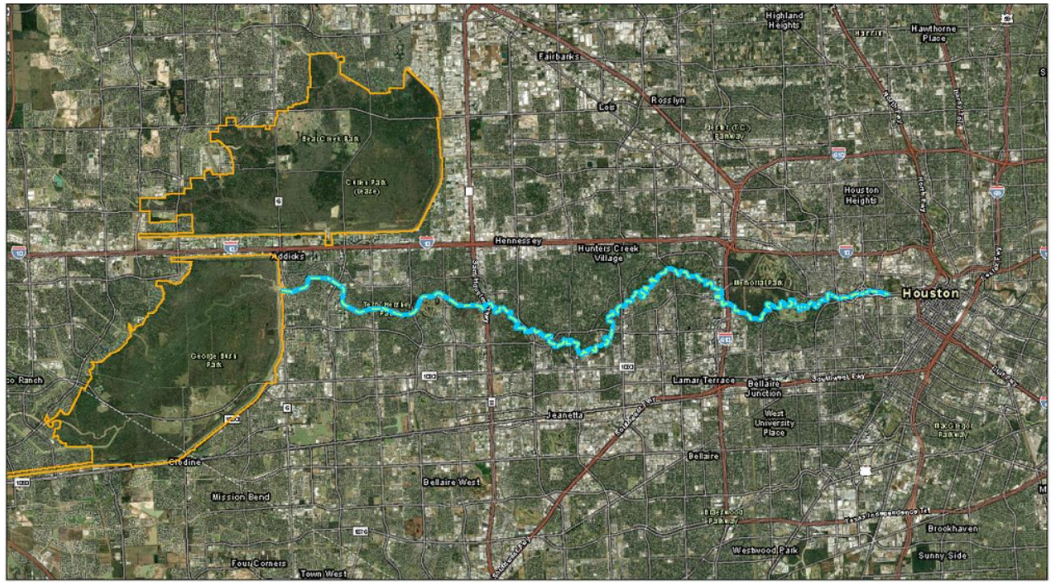
Goals

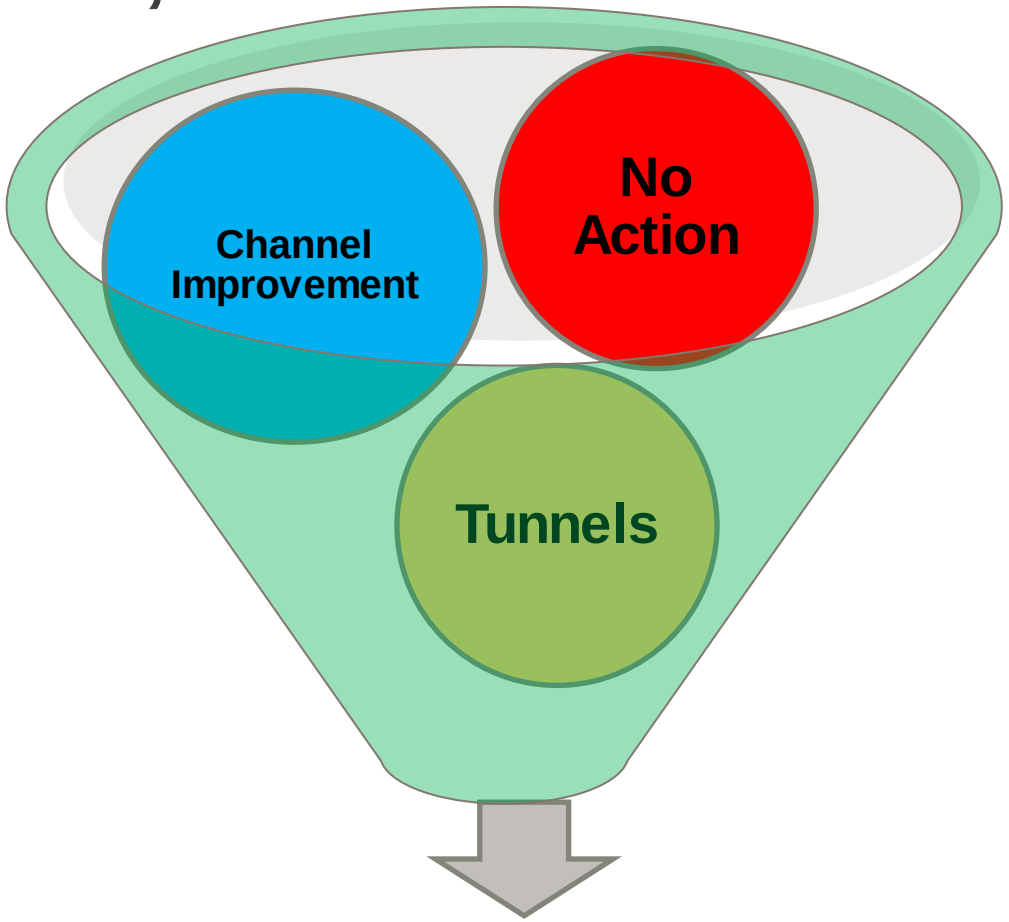
- Identify and evaluate how we can reduce flood risks downstream and upstream of Addicks and Barker Dams

- Evaluate the dams for continued structural integrity, focusing on the uncontrolled spillways



BUFFALO BAYOU AND TRIBUTARIES, RESILIENCY STUDY, TX





Flood Risk Alternatives

METROPOLITAN HOUSTON REGIONAL WATERSHED ASSESSMENT, TX

Authorization: WRDA of 1986, Section 729, as amended in WRDA 2000, WRDA 2007

Purpose: Flood Risk Management (FRM)

Non-Federal Sponsor: Harris County Flood Control District

Study Cost: $3 M

Scope: This Assessment was a 3 million dollar study that included the 22 primary watersheds within Harris County, which encompass 1,756 square miles within the Houston Metropolitan region, each having unique flooding problems.

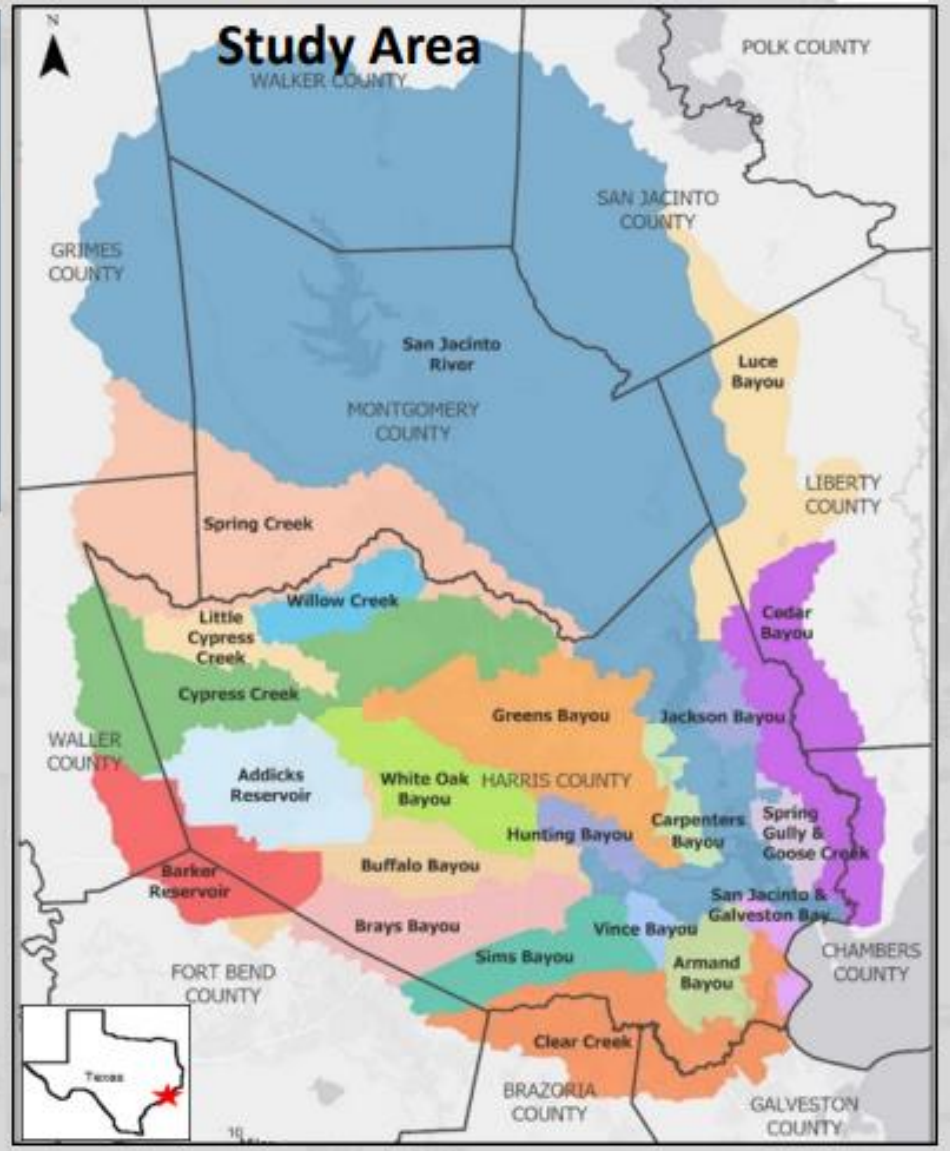
Status: Assessment complete

WHAT IS AN ASSESSMENT?

- Comprehensive and strategic evaluations and analyses that include diverse political, geographic, physical, institutional, technical and stakeholder considerations
- Strategic roadmap to inform future investment decisions by multiple agencies
- Inform multiple audiences and decision makers and provide a strategic roadmap to inform future investment decisions by multiple agencies

Assessment Timeline:

Shared Vision Milestone	Recommendation Milestone	Draft Watershed Plan	Final Watershed Plan
Jan 2017	Apr 2018	Jun 2021	Oct 2021



METROPOLITAN HOUSTON REGIONAL WATERSHED ASSESSMENT, TX

ASSESSMENT ACTIVITIES

- Inventory of Flood Vulnerability
- Agency Jurisdiction and Summary
- FRM tools and Scale of Effectiveness
- Mitigation approach
- Regional Coordination
- Education

Key Findings

Mulitple agencies are impacted and engaged	Technical and analytical investment should be specific and coordinated
Public underestimates flood risk	Risk communication must emphasize responsibility and tradeoffs
Traditional FRM approaches won't catch up with flood risk -Increasing precipitation, population & development -Constraints in built communities	Scale of flood risk will require paradigm change and coordination -Cross-jurisdictional and higher level layering of actions is necessary

Future Actions

Regional Coordinating Body Creation

- Explore goals, objectives, and function
- Leverage the TWDB Regional Flood Planning effort to assess needs and keep communication ongoing

Risk Communication

- Suggesting future analysis of risk and priority areas and topics when the remapping is completed by Harris County Flood Control District (HCFCD)
- Assess USACE policies as they apply to this region

Update Watershed Assessment

- Revisit the priorities and data on a 2-5 year interval

5-Years After Harvey - HCFCD

HARRIS COUNTY FLOOD CONTROL DISTRICT

USACE STAKEHOLDER PARTNERING FORUM

MEETING DATE: October 6, 2022

20

OUR MISSION

Provide flood damage reduction projects that work, with appropriate regard for **community and natural values**.

Cypress Park in the Cypress Creek watershed

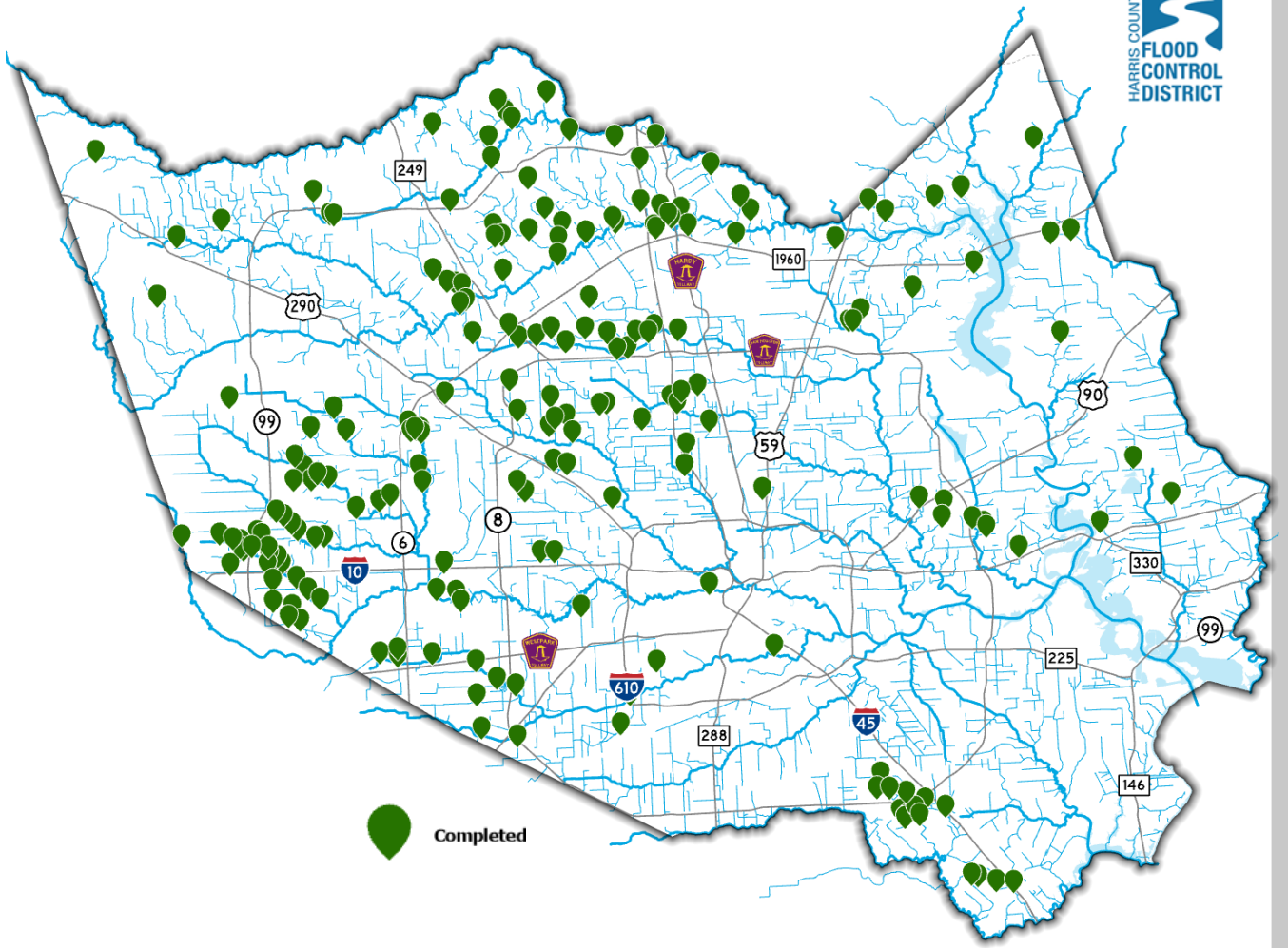
Progress since Hurricane Harvey:

A stronger, more resilient Harris County

Received **voter approval for the 2018 bond program**, which has resulted in **229** individual projects completed, valued at approx. **$448 million**

Reduced risk of flooding for **14,000+** homes and businesses

Removed **4.7 million** cubic yards of sediment from channels through maintenance efforts



Progress since Hurricane Harvey:

A stronger, more resilient Harris County

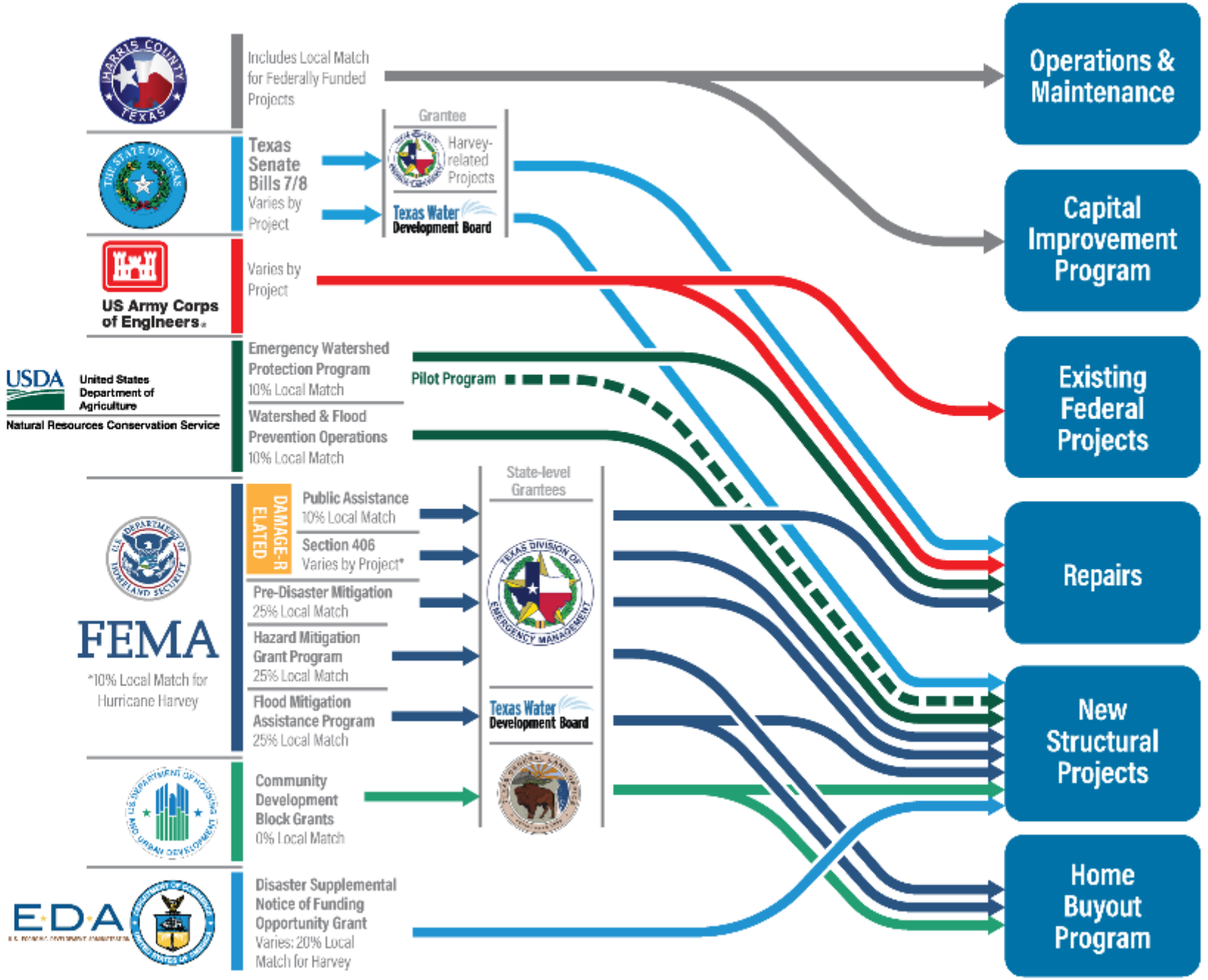
802 buyouts completed with **2,200+** people relocated from flood-prone areas

180 community engagement meetings with **14,000+** registered attendees and **8,500+** comments received

Created the **Community Flood Resilience Task Force** to enhance and strengthen conversations with the community on equitable flood resilience planning

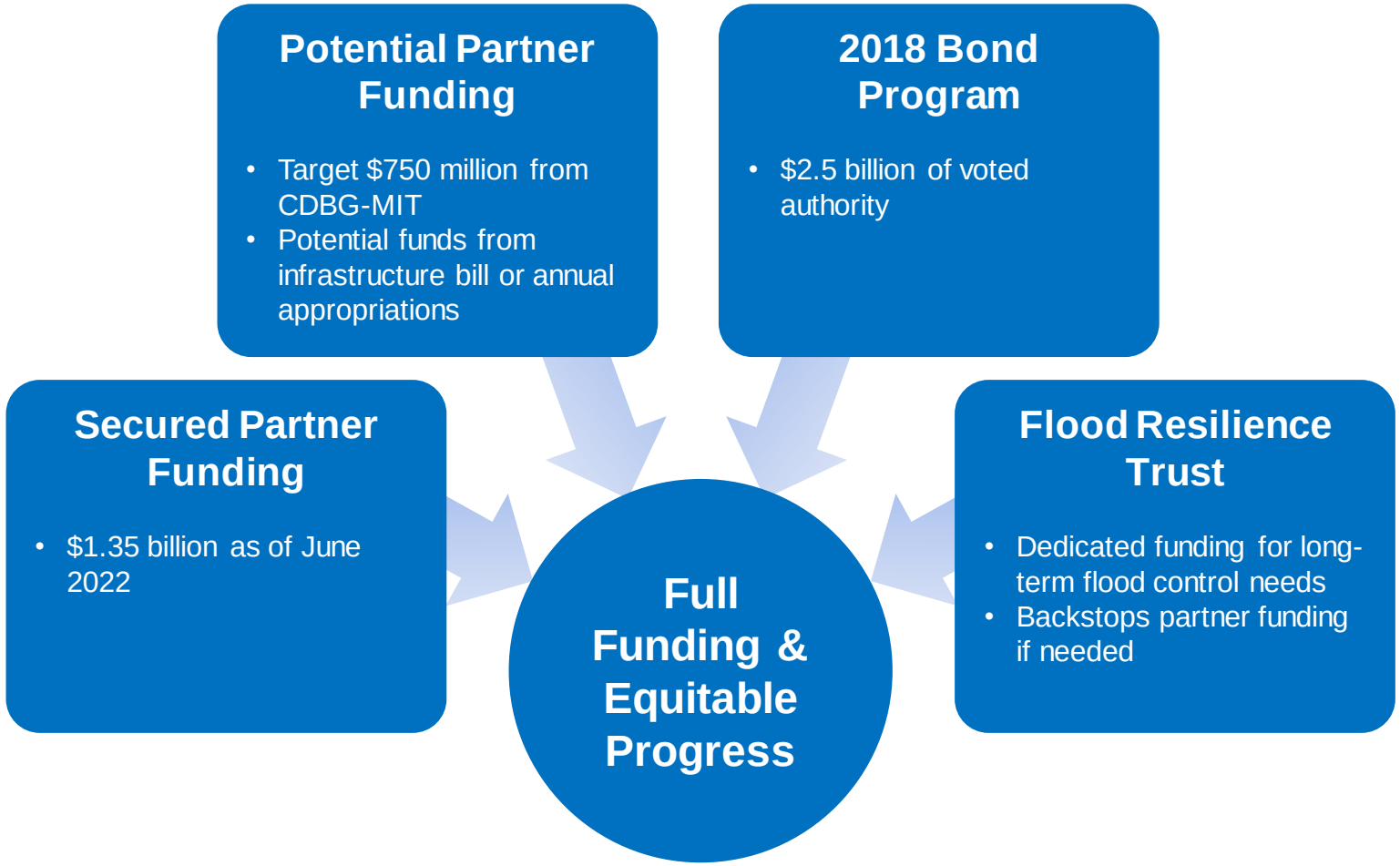
Together, we're making Harris County stronger and more resilient for generations to come.

How is HARRIS COUNTY FLOOD CONTROL DISTRICT funded for disaster recovery & resiliency?



FUNDING FLOOD RESILIENCE EFFORTS

- Leveraging a combination of partnership and local dollars to fund projects across Harris County
- Approaching projects using the Prioritization Framework approved by Commissioners Court
- Continuing to pursue additional sources of partnership funding

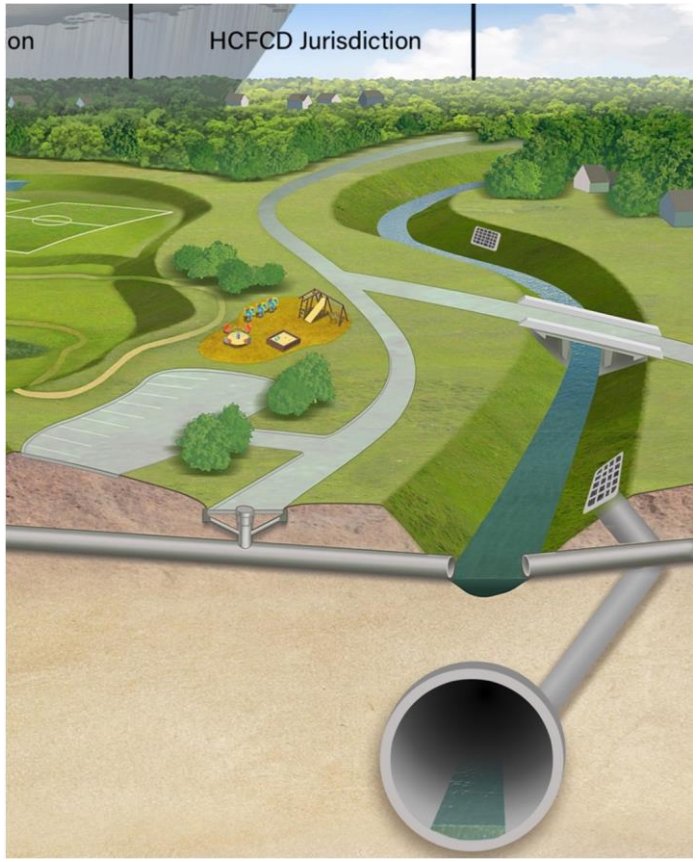


FEASIBILITY STUDY OF STORMWATER CONVEYANCE TUNNELS

- Separate from and independent of USACE's Buffalo Bayou Tributaries and Resiliency Study

- Has potential advantages, including:
  - Expanding flood damage reduction options
  - Making our stormwater network more robust
  - Reducing community disruption and increasing resiliency
  - Reducing environmental impact

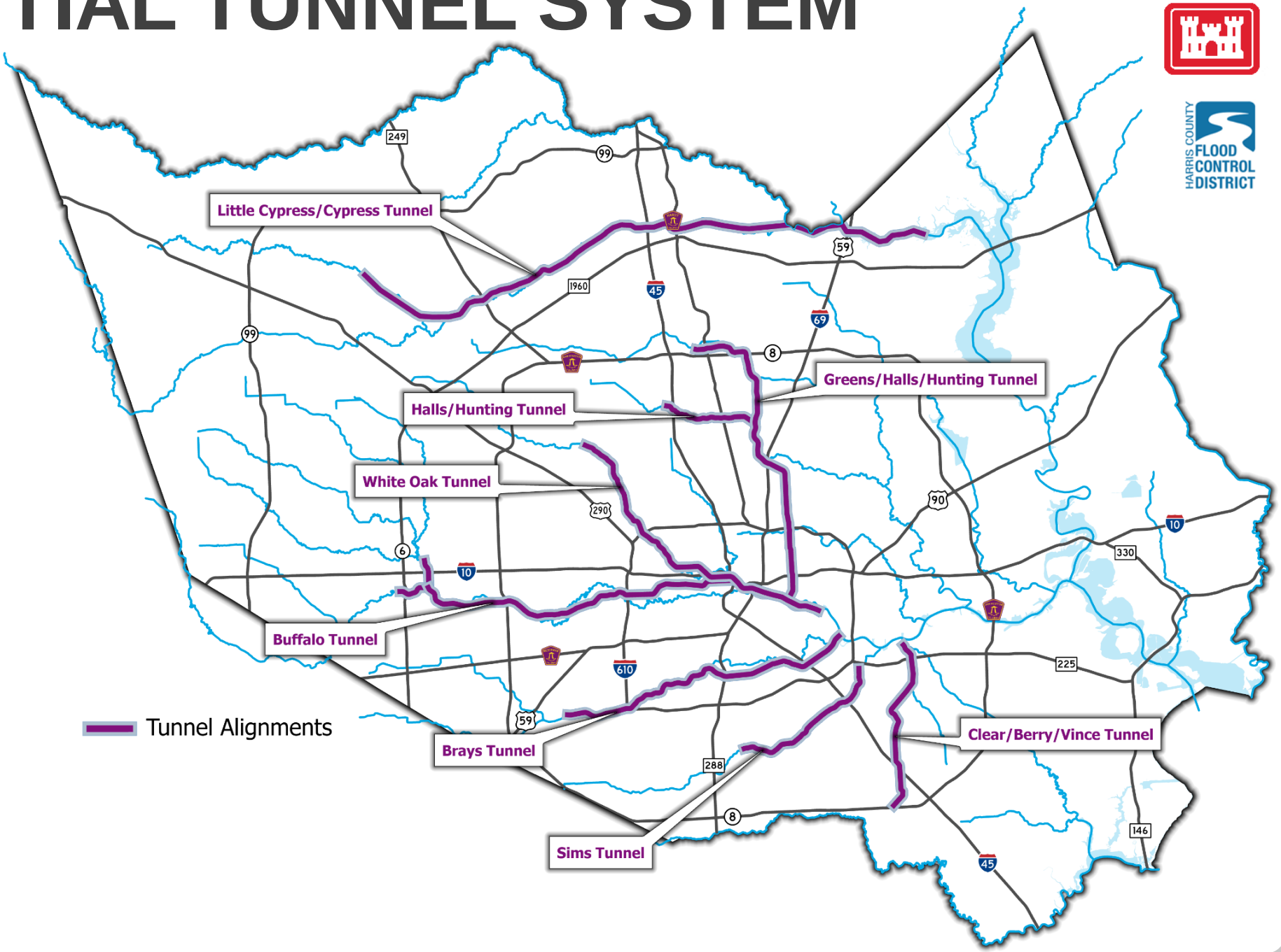
- Works with channels during heavy rain events to move water downstream to strategically placed outlets



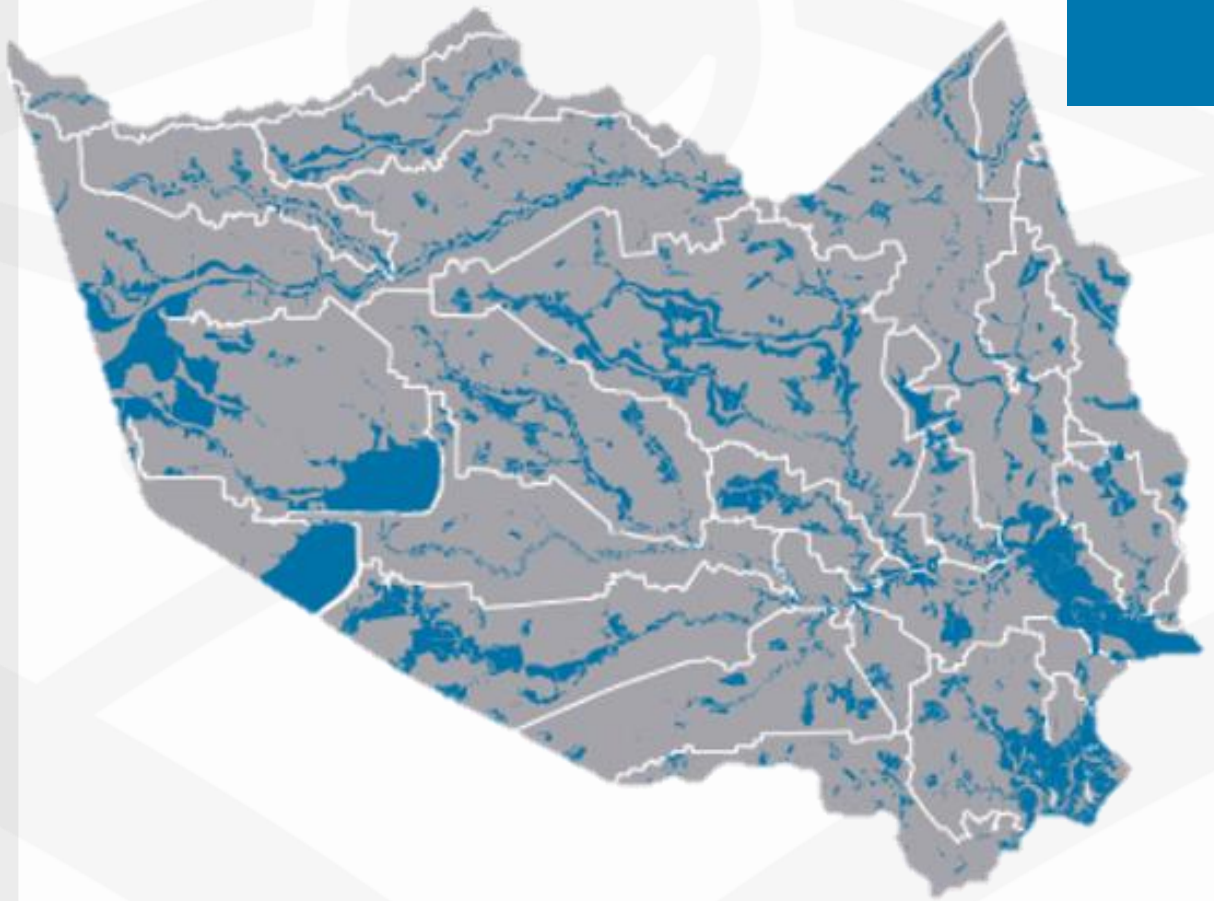
POTENTIAL TUNNEL SYSTEM

- Located where tunnels would likely be most effective and beneficial
- Estimated 80,000-120,000 future instances of flooding avoided
- Estimated cost of $30 billion

NOTE: All alignments are preliminary and will be refined in Phase 3.



WHAT IS MAAPNEXT?



MAAPnext is a comprehensive, county-wide floodplain study that is developing new:

- Flood Insurance Rate Maps (FIRMs)
- Flood Insurance Study Reports
- Flood Risk Products
- Engineering Tools
- Educational Resources
- Online Interactive Mapping Tools

HARRIS COUNTY FLOOD CONTROL DISTRICT

MAAPnext Modeling, Assessment & Awareness Project

GET FLOOD INSURANCE

EVERYONE NEEDS IT

Flooding conditions can occur year-round, and you do not have to live in the 100-year floodplain to be at risk.

Flood loss claims as a result of Hurricane Harvey

- Approximately 68% were outside of the FEMA mapped 100-year floodplain.

Hurricane Season: June-Nov

Flood Season: Year-round

HARRIS COUNTY FLOOD CONTROL DISTRICT

WE WANT TO HEAR FROM YOU!

Please visit our website at **www.hcfcd.org** to learn more about projects and upcoming community meetings, ask questions and sign up for our mailing list.


Harris County Flood Control District


Harris County Flood Control District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