

HARRIS COUNTY FLOOD CONTROL DISTRICT

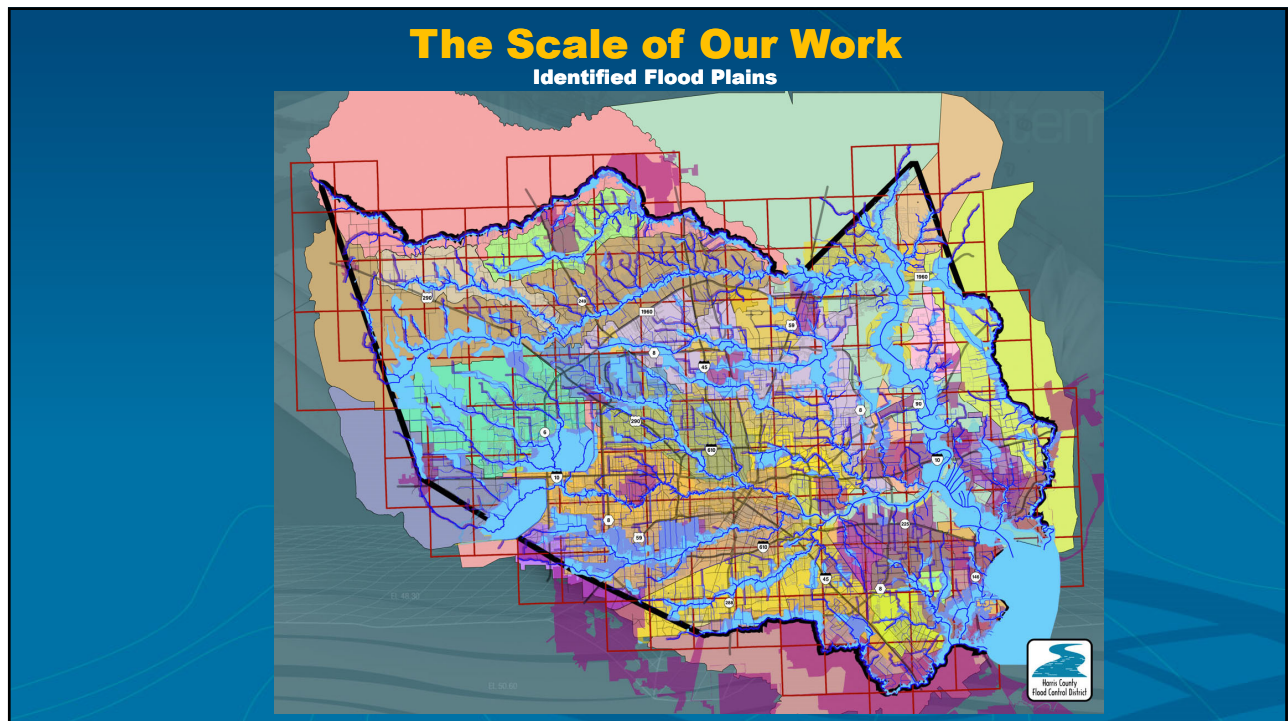
MAAPnext
Modeling, Assessment & Awareness Project

MAAPnext Updates

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Harris County Flood Control District

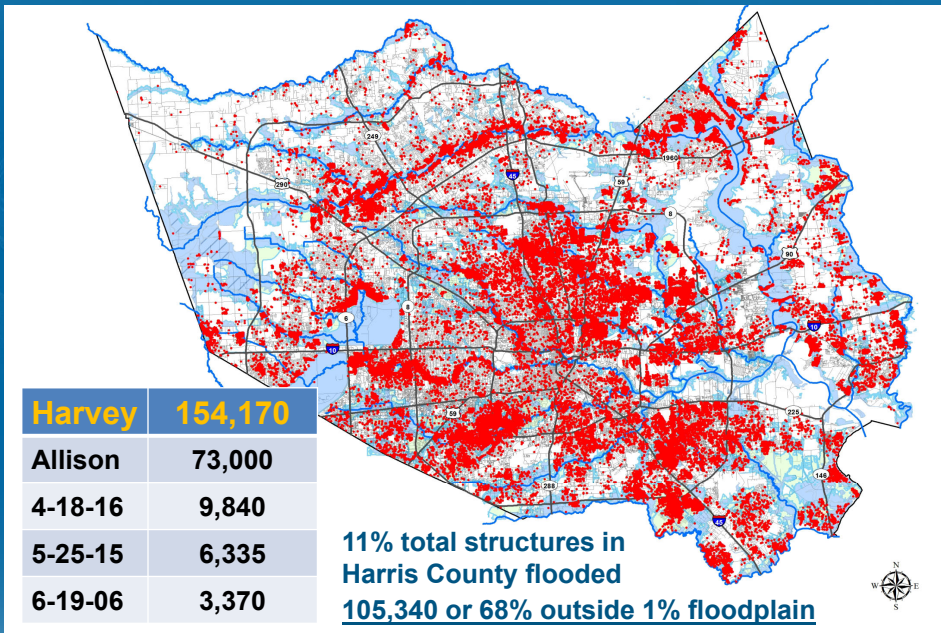
Wednesday, December 20, 2023

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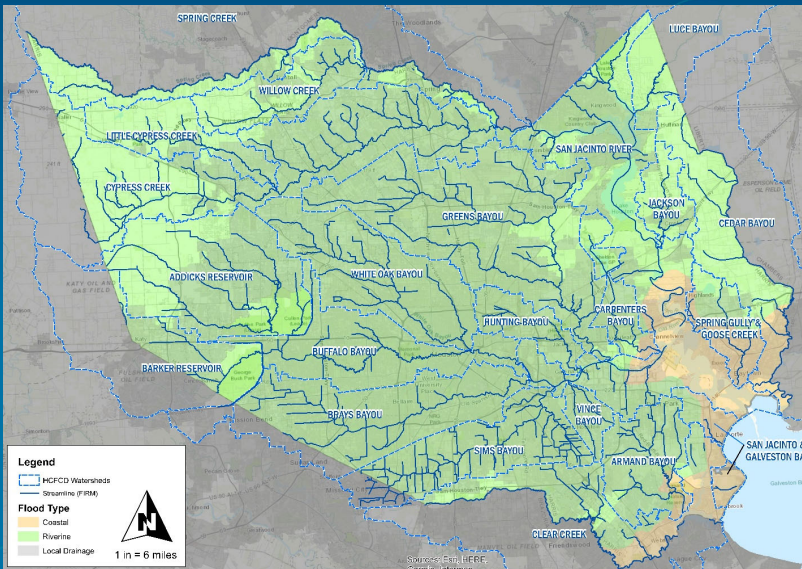
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Study Drivers & Need

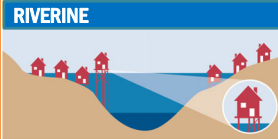


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Flooding Types



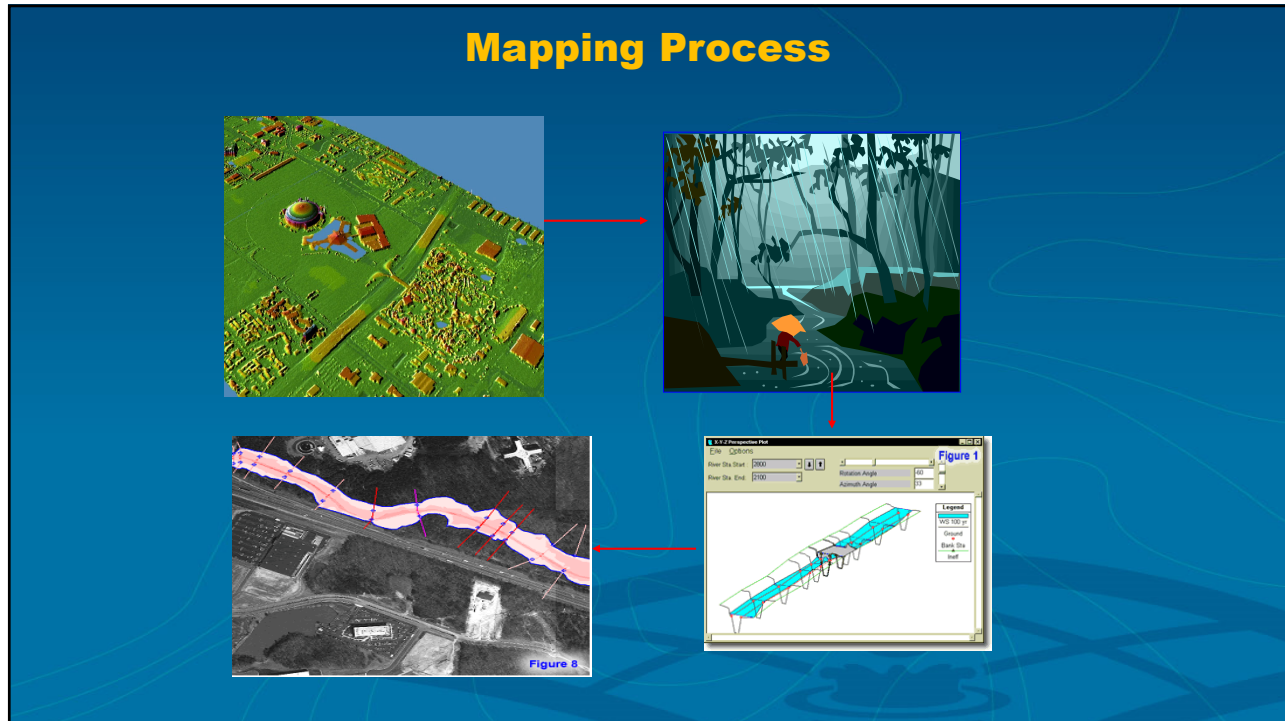
FIRMs – Flood Hazard Depicted



FIRMs – Flooding Not Depicted



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Key Changes

- Rainfall – NOAA Atlas 14
 - ~30% **Increase** in 100-YR
 - Approx. 13” to 18”
 - ~36% **Increase** in 500-YR
 - Approx. 19” to 25”

MAAPnext 100-Year Rainfall is approximately equal to Current 500-Year Effective Rainfall totals

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The start of the Journey

- Harris County Flood Control District
 - Cooperating Technical Partner since 2000
 - TSARP 2001
 - Model Management 2010
 - LOMR Delegation 2010
 - 1D/2D modeling for overflow 2012
 - MAAPnext - FY18, FY19, FY20
 - Extensive coordination with FEMA
 - Includes Communications and support after maps are released



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MAAPnext Goals

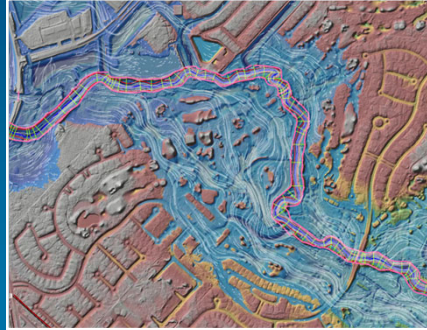
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 - **Empower county residents** with flood risk information and education.
- 
 - **Lead the nation** in delivering innovative and reliable floodplain mapping and flood risk analysis.
- 
 - **Equip Harris County** with up-to-date, comprehensive floodplain mapping and flood risk tools.

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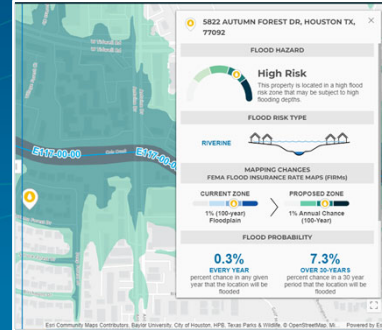
The MAAPnext Three-Step



Modeling



Assessment



Awareness

Mission Statement: Create better models using updated technology, assess results to develop a better understanding of flood factors, patterns, and risks, and do a better job of communicating flood risk concepts to Harris County residents.

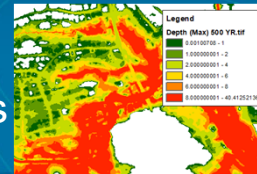


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WHAT IS MAAPnext?

- The Modeling, Assessment and Awareness Project (MAAPnext) is a comprehensive, county-wide floodplain study that developed new:
 - Flood Insurance Rate Maps (FIRMs)
 - Flood Insurance Study Report
 - Flood Risk Products
 - Engineering & Regulatory Tools
 - Educational Resources
 - Online Interactive Mapping Tools



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Challenges & Approaches




Hydrology Inputs

- NOAA Atlas 14
Texas release 09/2018
- Increases for estimated 24 hour rainfall
3-4" across Harris County

Flood Elevation & Extent

- Unsteady State Model
(FEMA exception - SID73)
- Coupled 1D-2D Model
(FEMA exception - SID73)
Main Channel - 1D
Floodplains - 2D

Support Local Floodplain Management

- Defend Floodway Areas
Floodway is safety based
Floodway maintains critical flood capacity/storage areas
- Existing Local Higher Standards
No Adverse Impact review will have access to data
Harder for fill placement in critical floodplain storage

Urban Environment & Hydrology

Urbanization of Basin

- Basin Development Factor

Ponding/Shallow Flood

- Rain on Grid

- Floodway Delineation with Product Number
(velocity and depth)
(FEMA exception - SID69)
(FEMA exception - SID72)

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MAAPnext Model Tech

Rainfall Data

Sub-Watershed Areas

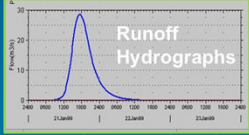
Green & Ampt Loss Data

Impervious Cover

Clark UHG Tc & R

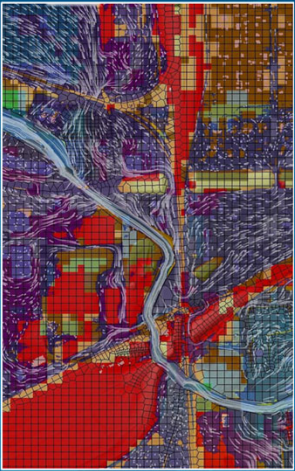
HEC-RAS 1D/2D

↑



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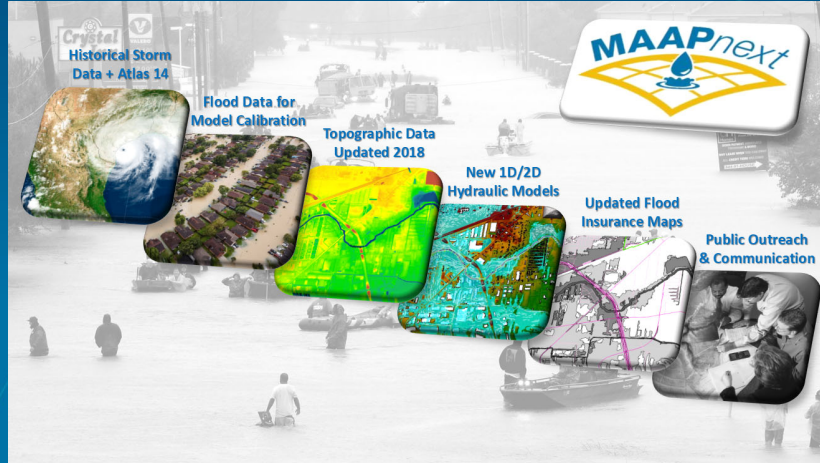
HEC-HMS



Flow hydrographs are inserted directly into the HEC-RAS model at specific locations or along user-defined stream segments.

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MAAPnext Tech Components



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Communication Tools



MAAPnext.org (2019)



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ONGOING OUTREACH ACTIVITIES AND TOOLS

- Website – MAAPnext.org
- Quarterly Community Advisory Group
- Quarterly Technical Advisory Group
- Partnerships with Floodplain Administrators and Elected Officials
- Educational Videos
- Social Media

The smartphone displays the MAApNext mobile application. The screen shows the same "KNOW YOUR FLOOD RISK" header as the website. Below the header, it says "Get your personalized flood risk report" and includes a search bar with the text "Search your address to learn about your flood risk". There are two buttons: "VIEW ON THE MAP" and "VIEW YOUR FULL REPORT". At the bottom, it says "Get SMART" and "Knowledge is power, and we're here to help you know more about MAApNext, flooding and how to protect."

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PLANNED OUTREACH ACTIVITIES AND TOOLS

PRIOR TO FEMA'S PRELIMINARY DATA RELEASE

- Speakers Bureau/Presentations to Organizations and Groups
- Digital Advertising and Media Campaigns
- [MAAPnext University \(online\)](#)
- Targeted Mailers
- Interactive, Multilingual Public Meetings

COINCIDES WITH FEMA'S PRELIMINARY DATA RELEASE

- Website – MAAPnext.org
 - [MAAPnext Online Tool](#)
 - Location-Specific Flood Risk Report
- Continued Coordination with Floodplain Administrators and Elected Officials
- Public Service Announcements and Paid Public Awareness Campaign

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Interactive Meetings

- Educational public meetings in conjunction with results release

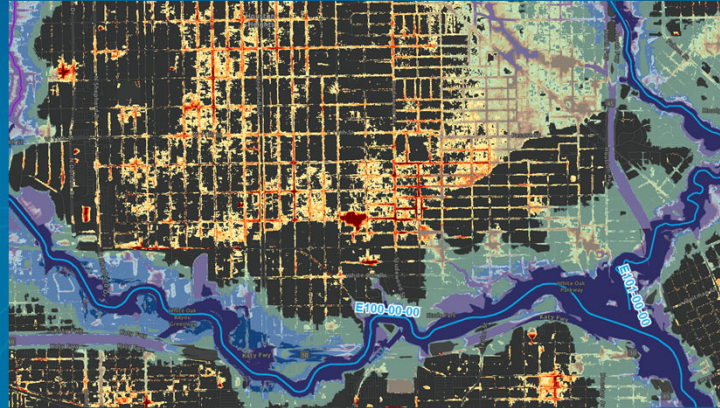
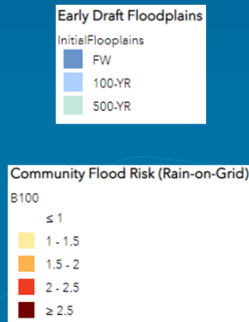


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Example Results Discussion

Flood Risk Products:

- Community Flood Risk / Urban Flood Risk
 - Non-FIRM based; Captures different type of flooding
 - Biggest missing piece of the flood risk picture



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Online MAAPnext Application

- All results accessible via most mobile and desktop devices
- GOAL: Provide context & tools to understand and use results
- Dynamic messaging based on a location's specific risk scenario

MAAPnext FLOODPLAIN REPORT
Current as of 3/17/2023

1234 Anystreet Road | **Armand Bayou Watershed**
Houston, TX 77007

Regional planning is important on Armand Bayou due to past historical flooding and future development, which is expected for this area. Scattered floodplains in areas along the main channel and in Pasadena, Deer Park, and La Porte watershed is also vulnerable to storm surges from hurricanes or tropical. Structural flooding has occurred several times in the past.

TYPE

HIGH

WHY ARE THE FLOOD RISK MAPS CHANGING?
MAAPnext results are currently draft and for informational use only. Official FEMA's Flood Insurance Rate Maps (FIRMs) will be updated to reflect results from MAAPnext by early 2024.

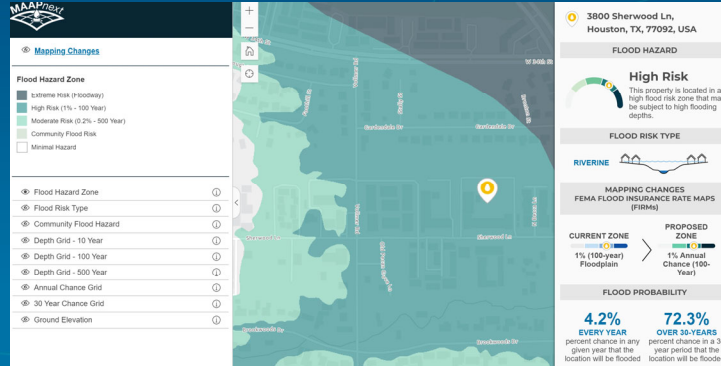
1 Significant increases in expected rainfall events. These are based on NOAA's Atlas 14 data, which contain the latest rainfall data for much of the U.S.

2 Cumulative flood damage reduction



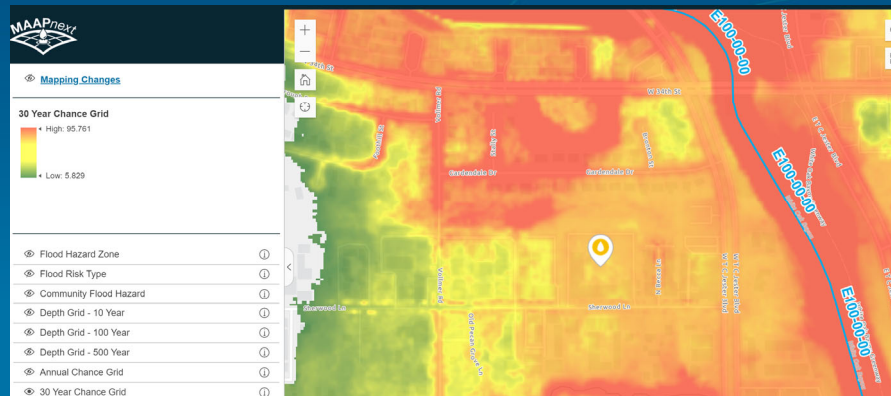
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Online MAAPnext Application



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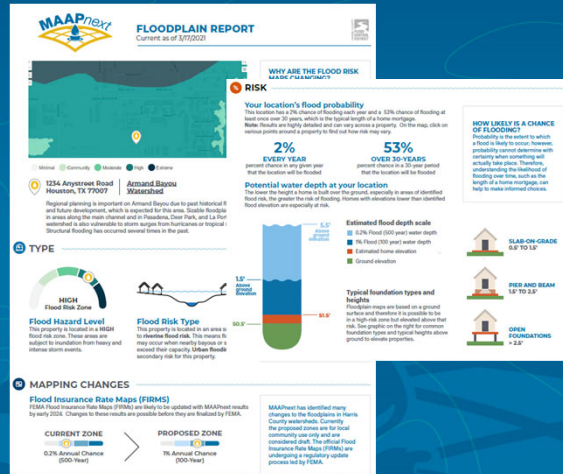
Online MAAPnext Application



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Online MAAPnext Application

- Provides full location specific report



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WHAT TO EXPECT



Atlas 14 1% rainfall is roughly equal to the old 0.2% rainfall.



The number of structures in the MAAPnext 1% Floodplain is less than the number of structures located in the current 0.2% Floodplain.



Changes to floodplains can vary highly from specific locations, with some areas seeing higher or lower increases than others.






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WHAT TO EXPECT

430+ Total Miles of studied streams added in MAAPnext Models.

Floodplain extents are reduced in some areas due to the completion of major federally funded flood damage reduction projects.

The number of structures located within the new 100-year floodplain is greater than the number located within the existing floodplain but less than the number of structures located within the current 500-year floodplain.

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FLOOD INSURANCE RATE MAP (FIRM) UPDATE TIMELINE

Milestone Responsibility ◆ HCFCF ◆ FEMA

WE ARE HERE

2019 PROJECT KICK OFF

2019
DEVELOP MODELS & MAPPING
Early 2019 Grant 1
Late 2019 Grant 2

2022
DELIVER MODELS & MAPPING TO FEMA
Jan. 2022 Grant 1
Jan. 2022 Grant 2

2023/2024
PRELIMINARY MAPS (FIRMS) RELEASED BY FEMA
Maps available to public

6-9 MONTHS
HCFCF & FEMA to hold Open Houses to review preliminary maps and accept comments

18-24 MONTHS (TYPICAL)

90 DAYS 3 MONTHS
PUBLIC APPEAL & COMMENT PERIOD

3-6 MONTHS
REVISE MODELS & MAPPING AS NEEDED

3-6 MONTHS
REVISED PRELIMINARY FIRMS (IF REQUIRED)

6-9 MONTHS
LETTER OF FINAL DETERMINATION

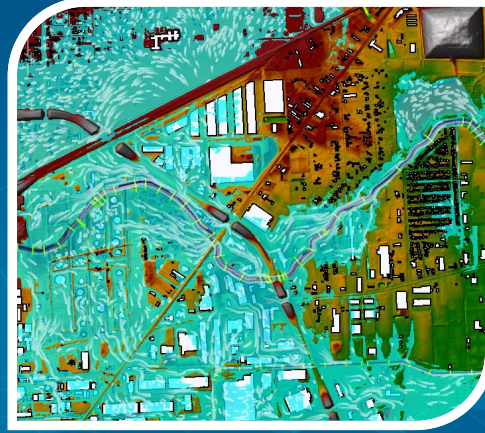
6 MONTHS
MAPS RELEASED EFFECTIVE

Activities in this box outline federal due process requirements to ensure affected property owners are provided formal means to appeal and comment on the changes prior to the issuance of final effective maps.

**Note: This timeline is an estimate, as FEMA is leading this step in the formal Flood Insurance Rate Map update process.*

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Questions?



Floods are powerful. But so is knowledge.