Cooperating Technical Partner (CTP) Information Exchange

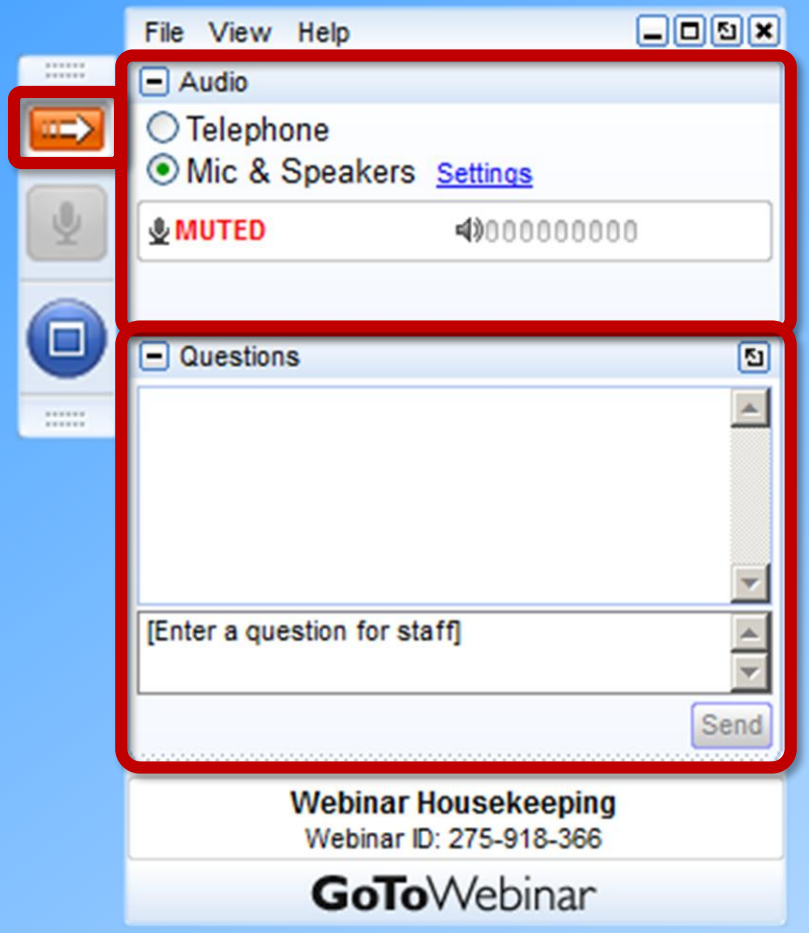
Accessing Flood Study Engineering Models

February 17, 2016
2:00-3:30 Central Time

Thank you for joining us today!

- ✓ Presentation will conclude by 4:30pm ET, 3:30pm CT
- ✓ Q&A will follow each speaker with additional questions at the end if there is time left

Attendee Participation



Your Participation

Open and close your control panel

Join audio:

- Choose **Mic & Speakers** to use VoIP
- Choose **Telephone** and dial using the information provided

Submit questions and comments via the **Questions panel**

Audio & Web Settings

- All lines will be automatically be muted.
- Use your **Question Panel** to submit questions during the presentation. The moderator will relay questions to the speaker.
- During Q&A at the end, please submit your question using the **Question Panel**.

Chat

Where you are connecting from today?

Questions

[Enter a question for staff]

Send

This Session is being Recorded

Welcome and Introductions

ASFPM Mapping and Engineering Standards Committee

CTP Sub-Committee

Co-Chairs:

Amanda Flegel, PE, CFM; Illinois State Water Survey

Steve Story, PE, CFM; Montana DNRC, Water Resources

ASFPM Science Services Program Manager
Alan Lulloff, PE, CFM; ASFPM

Goals:

Identify common concerns, provide opportunities for information exchange, identify training needs, promote and document the value of CTPs.

Welcome and Introductions

Presenters

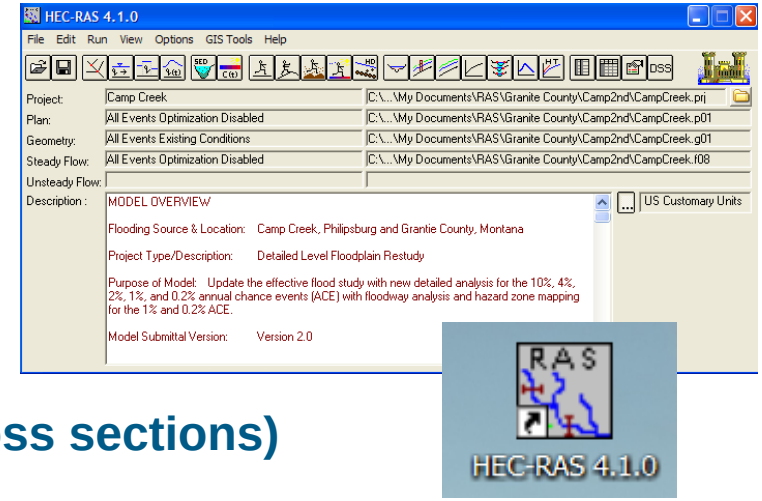
- **Steve Story**, State of Montana
- **Dave Guignet**, State of Maryland
- **John Refolo**, San Antonio River Authority

Agenda

- Introduction (Steve, 5 min)
- Background (Steve, 20 min)
- Examples (Dave and John, 45 min)
- Discussion

BACKGROUND

Why do we need to acquire Effective Flood Study Engineering Hydrologic & Hydraulic Models?

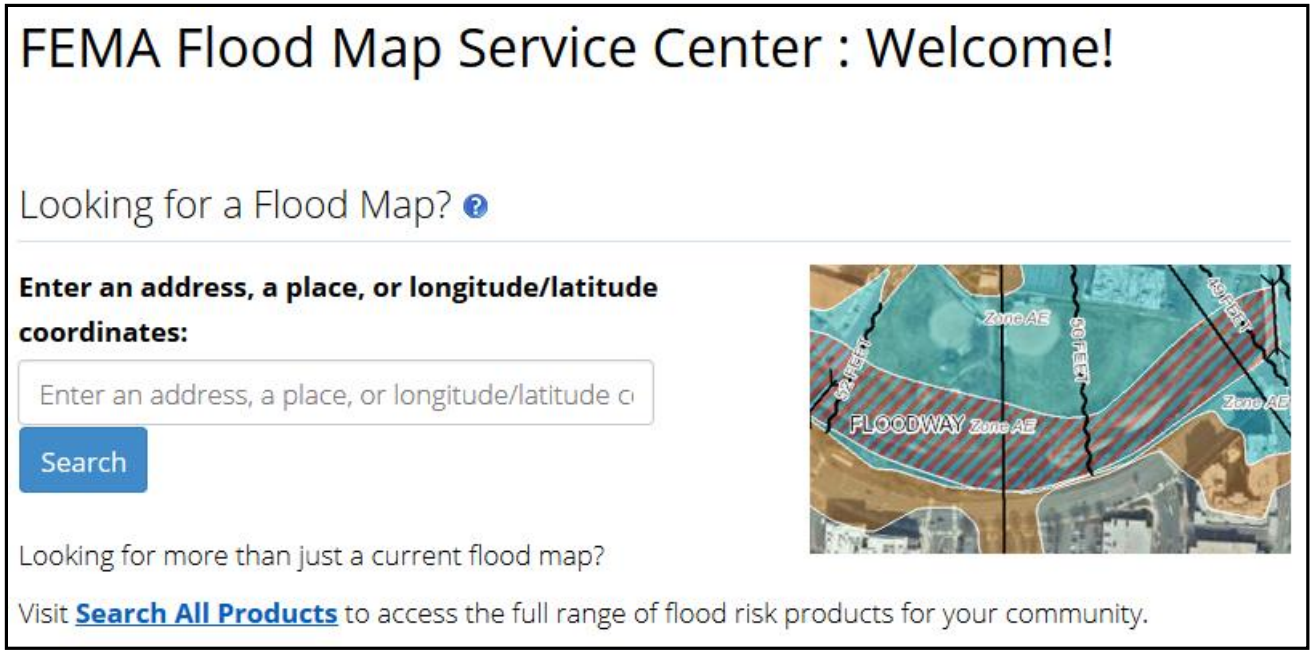


- **Floodplain Mapping Updates:**
  - MT-2's – CLOMR/LOMR
  - Floodplain Permit: No-Rise Analysis
  - New Floodplain Study
  - BFE Determinations (at un-lettered cross sections)
- **Fulfill Data Requests**
- **Other?** Inundation Mapping, Sensitivity Analysis, Scour Analysis…

BACKGROUND

How and Where do we acquire Effective Flood Study Engineering Hydrologic & Hydraulic Models?

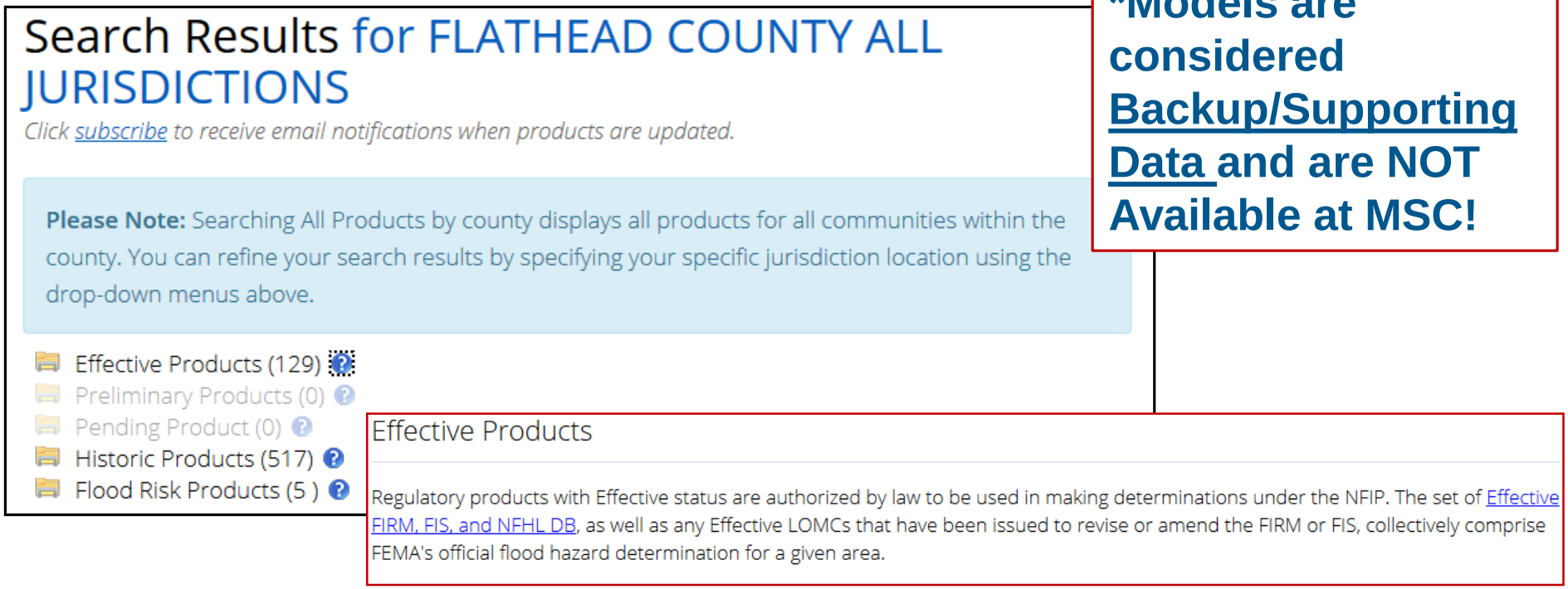
- **FEMA Map Service Center (MSC)?**



How and Where do we acquire Effective Flood Study Engineering Hydrologic & Hydraulic Models?

- **FEMA Map Service Center (MSC)? NO**

***Models are considered Backup/Supporting Data and are NOT Available at MSC!**



BACKGROUND

So where does FEMA store Effective Flood Insurance Study Backup/Supporting Data?

- **Pre-Map Modernization:**
  - **FEMA Engineering Library**
  - **NOTE – FEMA is digitizing this older backup data and transferring to the MIP – Anticipated completion is March 2017.**

- **Post-Map Modernization:**
  - **Citrix and Mapping Information Platform (MIP)**

FEMA Engineering Library – It's easy to get the data right? Through an online platform?

2. Where Can I Obtain The Backup Or Supporting Data For A Flood Insurance Study (FIS)?

The backup and supporting data used to develop the currently effective FIS report and Flood Insurance Rate Map (FIRM) are available from the FEMA Engineering Library. View the current fee schedule for requests for FIS backup data on the Flood Map-Related Fees page and to see if you are exempt from paying such fees. All requests for FIS backup data must be made in writing and should be sent to the following address for processing:

FEMA Engineering Library
847 S. Pickett Street
Alexandria, VA 22304
Phone: 1-877- 336-2627
Facsimile: 1-703- 212-4090

FEMA Engineering Library

How To Order Data From The FEMA Engineering Library

Requests for technical and administrative support data should be submitted to the FEMA Engineering Library **in writing**, either by mailing them to the address below or by facsimile transmission to 1-703-212-4090. The FIS Data Request Form has been created to help you request the appropriate data. That form also provides information on who is exempt from paying for these data. If you do not represent a fee-exempt organization, an initial **non-refundable fee** to cover the preliminary costs of research and retrieval is required. Your fee should be accompanied by a FEMA Payment Information Form.

> **FEMA Engineering Library**
> 847 S. Pickett Street
> Alexandria, VA 22304
> Phone: 1-877-336-2627
> Facsimile: 1-703-212-4090

Once research has been completed (approximately 6 days), an information specialist will contact you to discuss materials, cost and methods of obtaining the items relevant to your request. You will be invoiced for the remainder of the required fees. No data will be provided to you until all required fees have been paid.

BACKGROUND

FEMA Engineering Library Data Request

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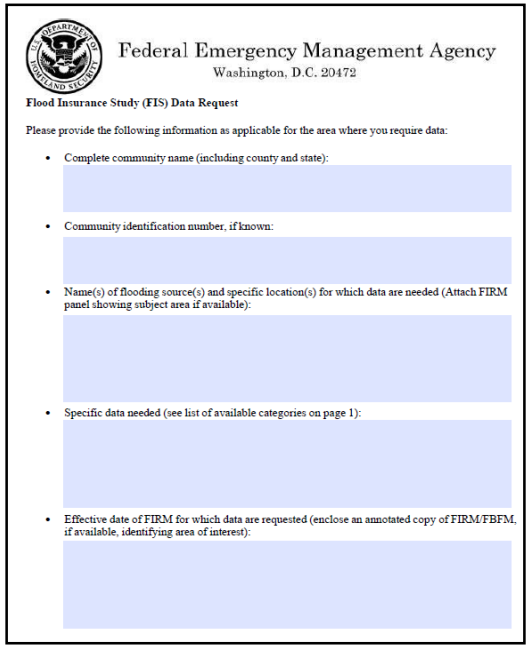
***Complete and submit (mail/fax) data request form. There may be a fee…**



Federal Emergency Management Agency
Washington, D.C. 20472

Flood Insurance Study (FIS) Data Request

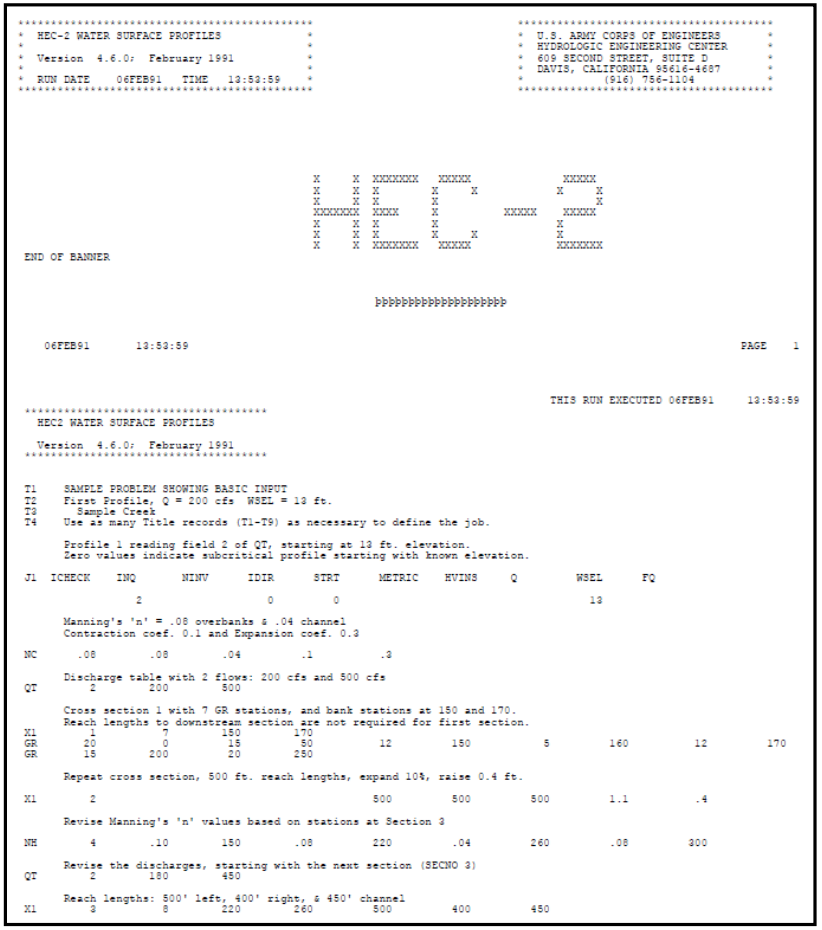
Please provide the following information as applicable for the area where you require data:

- Complete community name (including county and state):
- Community identification number, if known:
- Name(s) of flooding source(s) and specific location(s) for which data are needed (Attach FIRM panel showing subject area if available):
- Specific data needed (see list of available categories on page 1):
- Effective date of FIRM for which data are requested (enclose an annotated copy of FIRM/FBFM, if available, identifying area of interest):

BACKGROUND

RESULTS of FEMA Engineering Library Data Requests??

- Can be mixed!
- For older Hydraulic Models (HEC-2 for example) – may receive microfiche scans of input/output files (quality/legibility varies)
- Occasionally receive Model Files (probably varies by State/Region)



```
**********                                          **********
*  HEC-2 WATER SURFACE PROFILES                    *  U.S. ARMY CORPS OF ENGINEERS      *
*                                                  *  HYDROLOGIC ENGINEERING CENTER     *
*  Version  4.6.0;  February 1991                  *  609 SECOND STREET, SUITE D        *
*                                                  *  DAVIS, CALIFORNIA 95616-4687      *
*  RUN DATE    06FEB91   TIME   13:53:59           *  (916) 756-1104                    *
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                                                                        THIS RUN EXECUTED 06FEB91     13:53:59
**********
  HEC2 WATER SURFACE PROFILES

  Version  4.6.0;  February 1991
**********


T1    SAMPLE PROBLEM SHOWING BASIC INPUT
T2    First Profile, Q = 200 cfs  WSEL = 13 ft.
T3      Sample Creek
T4    Use as many Title records (T1-T9) as necessary to define the job.

      Profile 1 reading field 2 of QT, starting at 13 ft. elevation.
      Zero values indicate subcritical profile starting with known elevation.

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                   0         0                                     13

      Manning's 'n' = .08 overbanks & .04 channel
      Contraction coef. 0.1 and Expansion coef. 0.3

NC      .08       .08       .04       .1        .3

      Discharge table with 2 flows: 200 cfs and 500 cfs
QT        2       200       500

      Cross section 1 with 7 GR stations, and bank stations at 150 and 170.
      Reach lengths to downstream section are not required for first section.
X1        1         7       150       170
GR       20         0        15        50        12        150         5        160         12        170
GR       15       200        20       250

      Repeat cross section, 500 ft. reach lengths, expand 10%, raise 0.4 ft.

X1        2                                   500       500       500       1.1       .4

      Revise Manning's 'n' values based on stations at Section 3

NH        4       .10       150       .08       220       .04       260       .08       300

      Revise the discharges, starting with the next section (SECNO 3)
QT        2       180       450

      Reach lengths: 500' left, 400' right, & 450' channel
X1        3         8       220       260       500       400       450
```
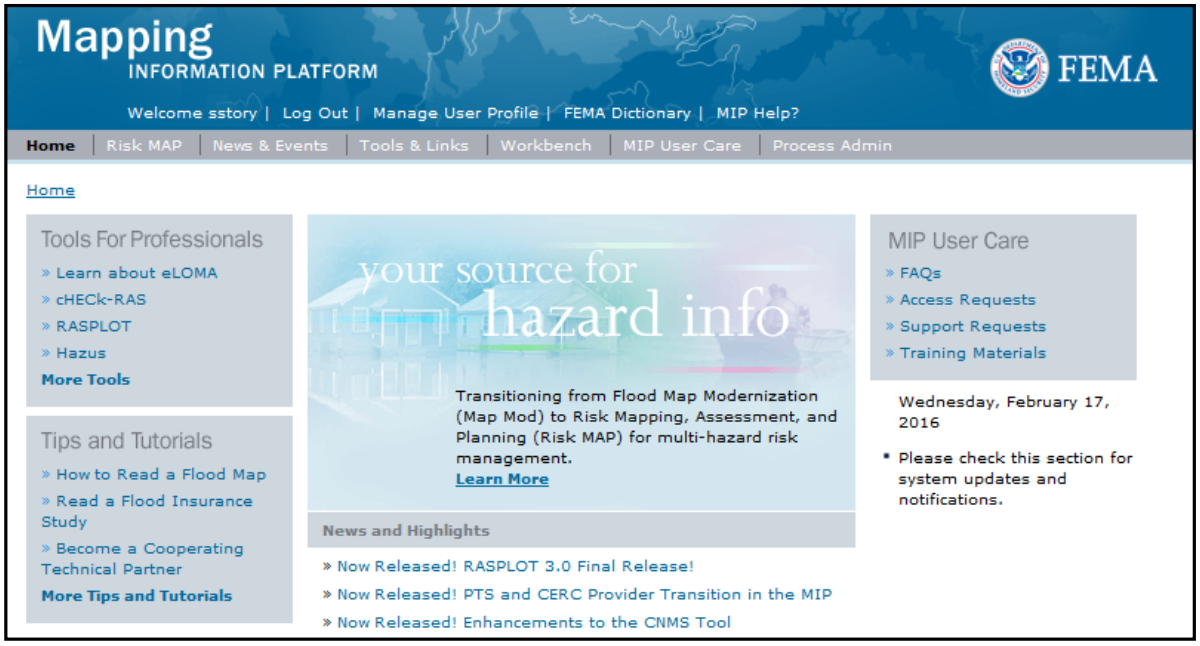

Mapping Information Platform (MIP)

https://hazards.fema.gov/femaportal/wps/portal

- FEMA is considering making the MIP publically accessible (like the MSC)
- Currently must be a CTP or Mapping Partner to procure access
- It is the Repository for Active & Effective FIS study backup/support data
- Older data (pre-Map Mod) is being migrated into the MIP (March 2017 completion)



Accessing Engineering Models

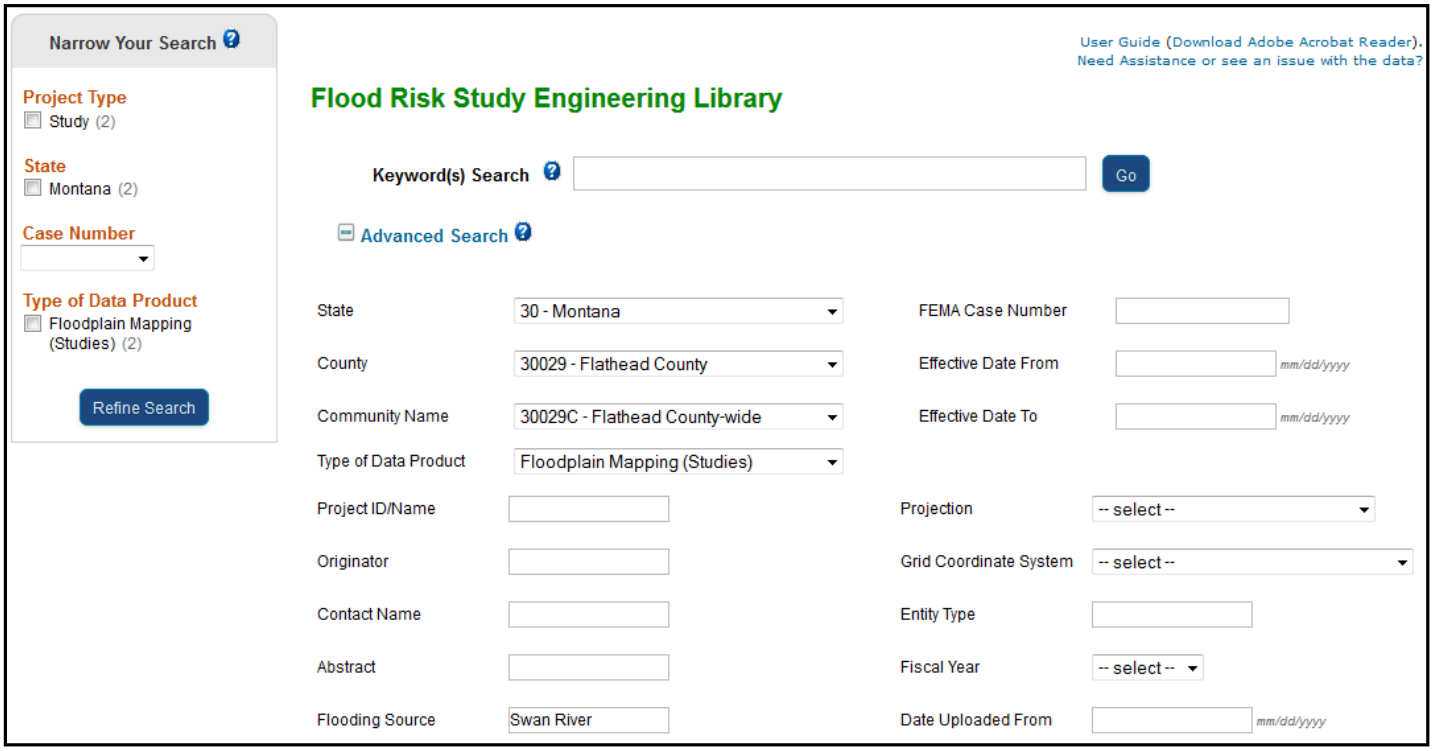
Mapping Information Platform (MIP)

How to find study/model data in the MIP?

- **First Option: Tools & Links Tab / File Explorer:**
  - **K Drive (Read Only): Designated "Archival" drive for storage of risk mapping project data (accessible through "File Explorer" or FRiSEL (Flood Risk Study Engineering Library) = "Search Engineering Data" Tab.**
  - **J Drive (Read/Modify dependent on MIP user permissions): Working drive for active risk mapping projects. Data for Manage Data Development activities is uploaded here.**

How to find study/model data in the MIP?

- **Second Option: Tools & Links Tab / Search Engineering Data:**
  - **FRiSEL (Flood Risk Study Engineering Library) = "Search Engineering Data" Tab.**
  - **Access to K Drive Only**



Mapping Information Platform (MIP)

How to find study/model data in the MIP?

- **MIP DEMO - Steve**

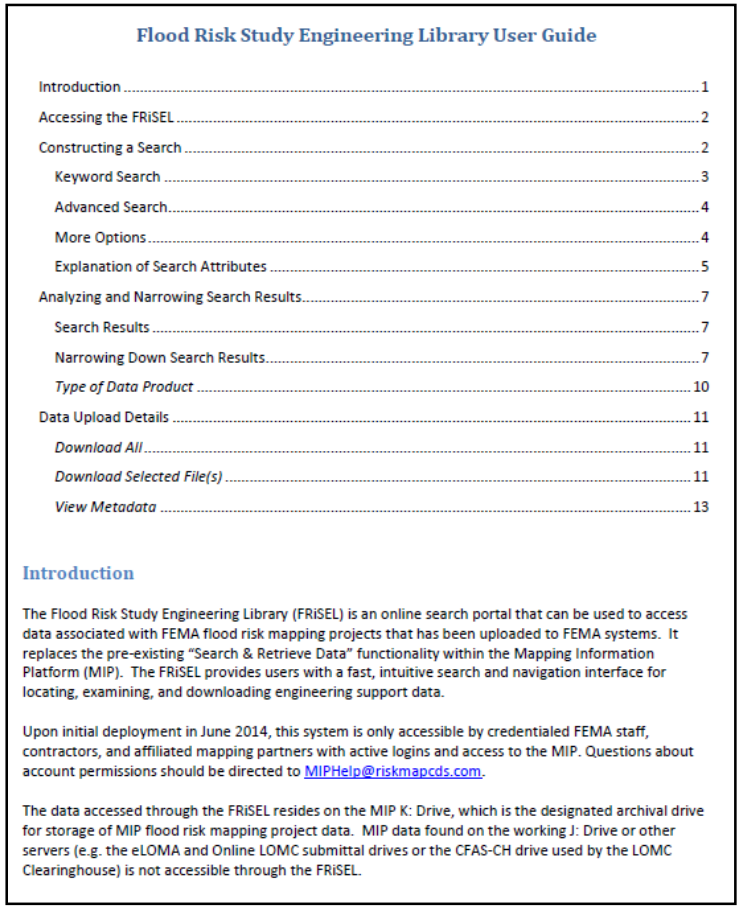
Accessing Engineering Models

Mapping Information Platform (MIP)

https://hazards.fema.gov/femaportal/wps/portal

Resource Documents:

- MIP File Explorer User Guide
- Flood Risk Study Engineering Library User Guide
- Naming Convention for MIP Projects
- Options for naming Watershed studies in the MIP
- Responses to MIP Questions from Region VIII CTPs



Flood Risk Study Engineering Library User Guide

Introduction

The Flood Risk Study Engineering Library (FRiSEL) is an online search portal that can be used to access data associated with FEMA flood risk mapping projects that has been uploaded to FEMA systems. It replaces the pre-existing "Search & Retrieve Data" functionality within the Mapping Information Platform (MIP). The FRiSEL provides users with a fast, intuitive search and navigation interface for locating, examining, and downloading engineering support data.

Upon initial deployment in June 2014, this system is only accessible by credentialed FEMA staff, contractors, and affiliated mapping partners with active logins and access to the MIP. Questions about account permissions should be directed to MIPHelp@riskmapcds.com.

The data accessed through the FRiSEL resides on the MIP K: Drive, which is the designated archival drive for storage of MIP flood risk mapping project data. MIP data found on the working J: Drive or other servers (e.g. the eLOMA and Online LOMC submittal drives or the CFAS-CH drive used by the LOMC Clearinghouse) is not accessible through the FRiSEL.

Questions?

ASFPM Mapping and Engineering Standards Committee

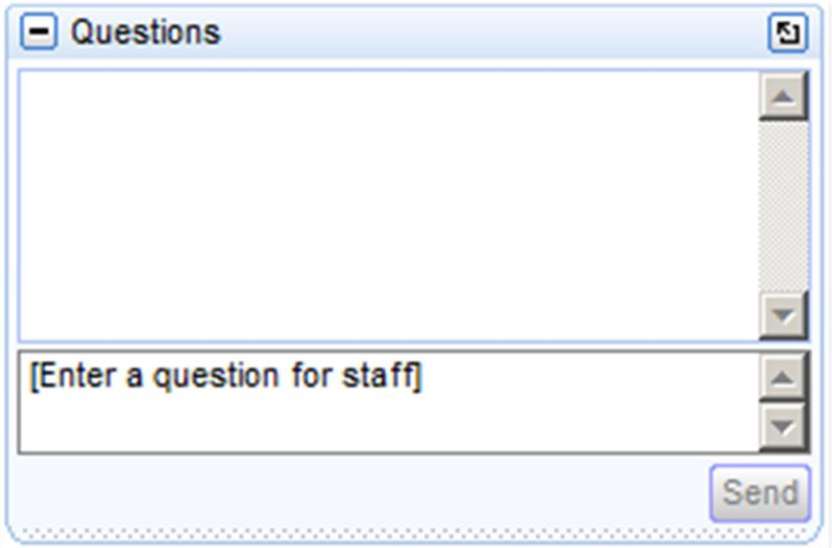
CTP Sub-Committee

Co-Chairs:

Amanda Flegel, PE, CFM; Illinois State Water Survey

Steve Story, PE, CFM: Montana DNRC, Water Resources

If you have requested info from the Engineering Library please comment on the process. Please enter comments about success rate, turn-around time or general comments in the “Questions” chat box.



Maryland Data Download Tool
mdfloodmaps.com

ASFPM CTP Information Exchange
February 17, 2016

Dave Guignet, State NFIP Coordinator
Maryland Department of the Environment

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Maryland's Role & Authority

- **1933 - State of Maryland – Waterway Construction Statute: Required permits for activities that changed course, current or cross-section of a stream**
- 1970's – State takes on Coordinator Role for NFIP as most communities enroll in program / 100-year floodplain defined… (**By default - State Regs used same limits**)
- **1978 Waterway Construction Regs Issued – Required comparison (Existing Conditions vs. Proposed Conditions) to protect adjacent properties from flooding**
- **1970's / 80's – Maryland's FIRM's produced in (PAPER)**

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Maryland's Role & Authority

- **Result: State was issuing Waterway Construction Permits (In Paper) and Applicants Applied (and submitted) LOMR's to FEMA separately**
- ***Result : State Permits were "Corrupting" limits displayed on FEMA Regulatory Map***
- **Required Two Studies to Create and Compare Existing Studies (Today) vs. Proposed Conditions (State) and Compute (somehow) FEMA (1970's) Existing Studies vs. Proposed Conditions for FEMA LOMR**
- **Many Communities Issued their Floodplain Permit After State Issued a Waterway Construction Permit – thinking it was One Review !**
- **Process continued for 30+ years before Solution Hit**

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Maryland's Solution …

- **Maryland wanted to Combine the Studies Into One Initial Starting Point to Eliminate Paper Silos that had Communities and Applicants Stuck in Middle**
- **State Recognized that MAP MOD had Dual Potential to Eliminate Gap (and Modernize the Process)**
- Early 2000's FEMA picked 7 Maryland Counties for Digital Conversion
- 2005 – State prepared Business Plan (Pending Funding) for remaining 17 counties with new studies to close Gap Between Current Existing Conditions vs. FEMA Regulatory Conditions
- **State's Goal New Studies Over Digital Conversion**

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Maryland Remapping Process

- As CTP Partner Maryland Contributed Large Amounts of Digital Data Already in Hand (Imagery / topo / Tax Maps
- **Maryland had (or was in process of acquiring) State-wide LiDAR with 4 foot DEM's**
- State has Developed Regression Equations using a GIS-Hydro Equivalent already derived in Maryland) predating USGS stream stats
- **Needed a Way to Collect (Update) Data on Bridges and Culverts in Floodplain (more later)**
- State Initiated New Studies in Remapping Process

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Maryland Remapping Process

- Business Plan was Accepted Pending Annual Funding Review for New Studies (New Studies Included….)
- **New GeoHEC-RAS Models in All Detailed Areas**
- **Replace Most of Approximate A-Zones with Model Backed Analysis**
  - Created Hydrology
  - Field Inventory of Bridges and Culverts
  - GeoHEC-RAS Models for most Approximate A-Zones
- **All Cross-Sections Cut from LiDAR**
- **All Field Data (and Modeling Info) Tagged to GIS data points (minimized processing steps !!!)**

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After 8 years …

- Almost 90 % of Maryland Floodplains are now in a Digital format
  - About 50 % Issued as Effective
  - About 20 % Issued as Preliminary
  - About 20 % in Production Nearing Prelim.
  - Final 10 % are just underway
- All Field Data Tagged to GIS data points
- Regression Equations tagged to GIS points

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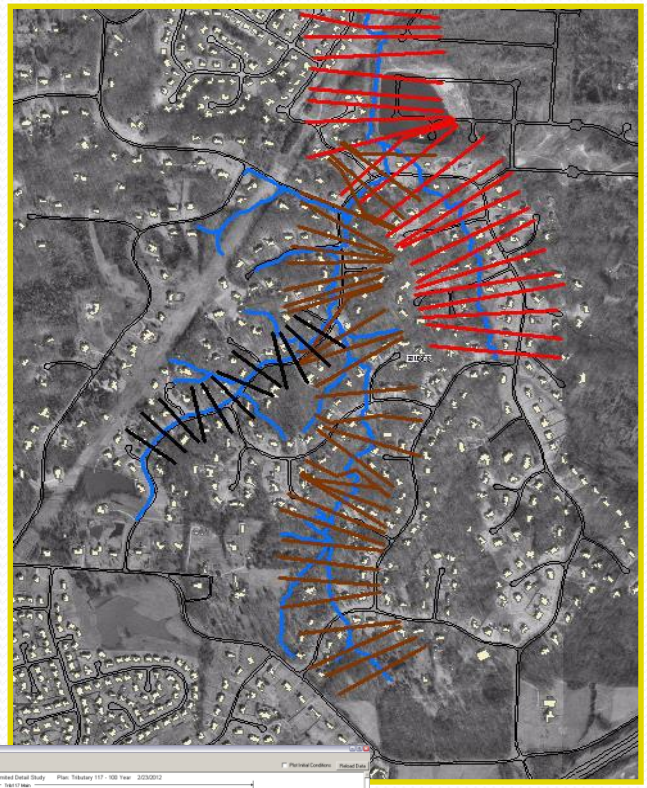
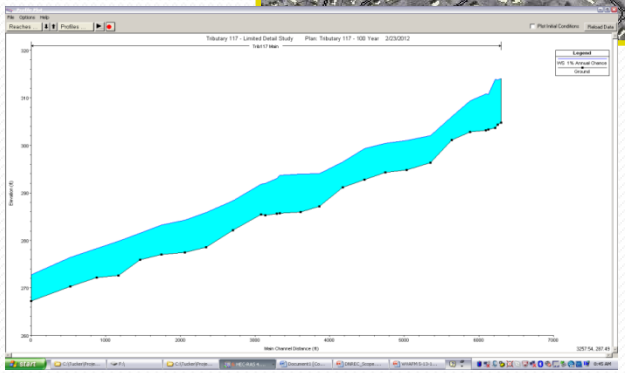
FEMA Zone A's - Automated Approx. FPs

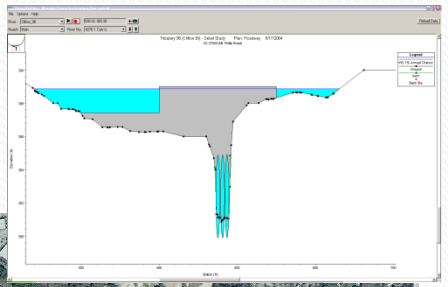
- Automated H&H modeling and mapping
  - Regression Equation Hydrology and HEC-RAS Hydraulics
- Minimal/no model and mapping refinement
- **Bridges/culverts not included in models**
  - WSELs may not be accurate upstream of structures
- WSEL/flood profile data can be used to support permitting and LOMAs
- Can be used as a baseline to upgrade to enhanced/limited detailed/detailed studies
- Can support depth and elevation grid development
- **No BFEs depicted on DFIRM**
- Most cost effective option

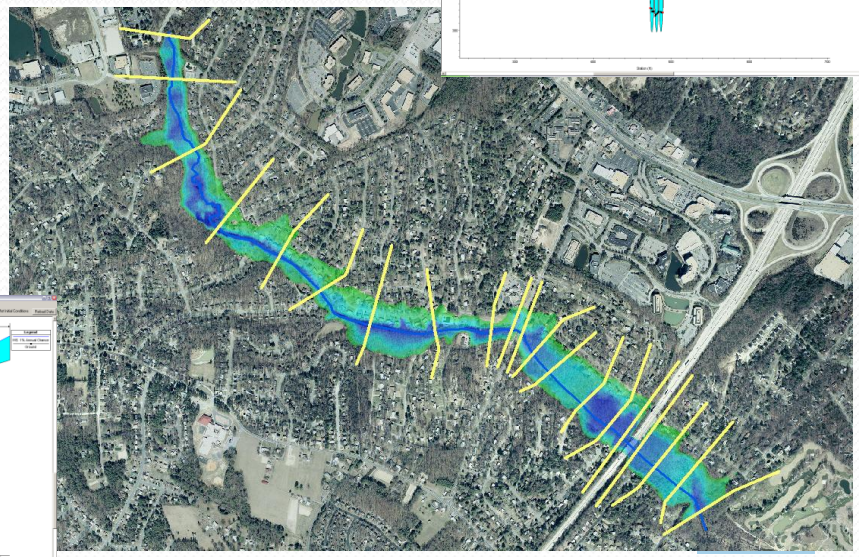


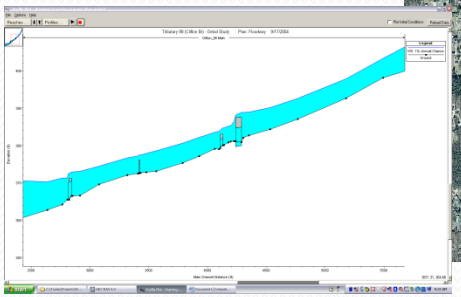


Enhanced Approximate / Maryland Zone A 's

- Upgrade to Automated Approximate floodplain methodology with basic structures included
  - **Bridges/culverts modeled based on plans or field verification**
- Increased flood elevation accuracy near hydraulic structures
- Limited model refinement of hydraulic parameters
- **WSEL/flood models file data supports MD LOMR's**
- Models enable depth/elevation grid development
- No Channel or Bathymetric data
- No BFEs depicted on DFIRM
- **XS Attributed with BFE Elevations**
- Cost dependent on density of bridges

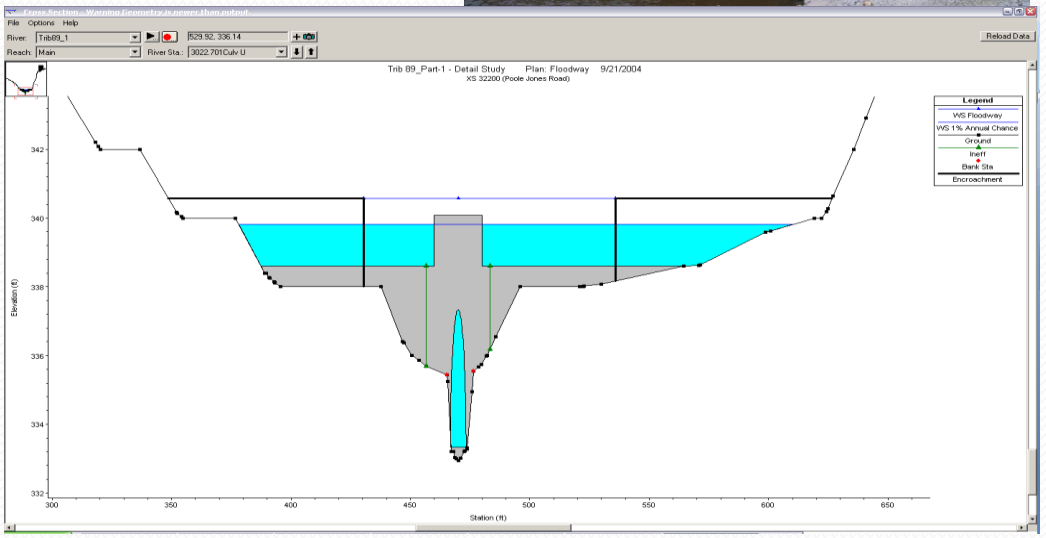




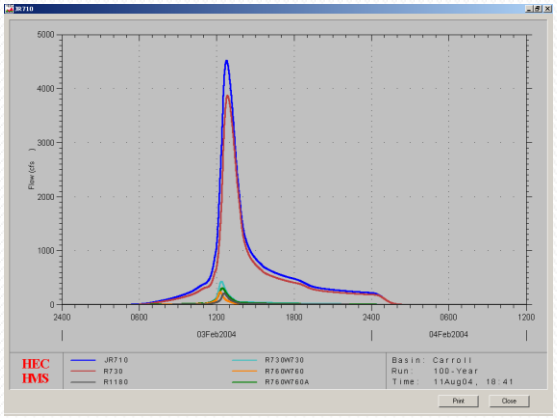


Maryland (Limited) Detailed Floodplains

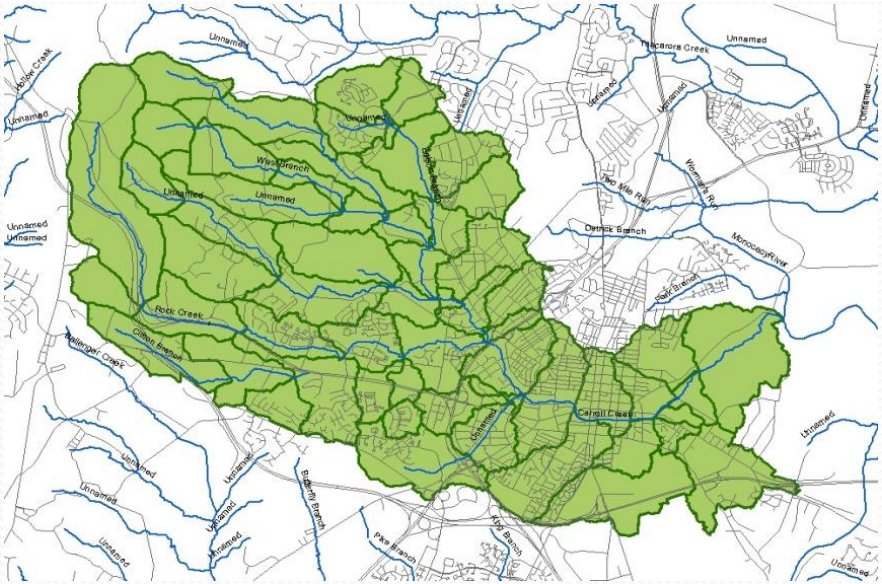
- **Regression Equations** /Gage Hydrologic Analyses
- Stream channel data incorporated in model
  - Field surveyed or other source (effective model, plans, etc.)
- **All Structures modeled [Not traditional Survey]**
  - **Field verified or incorporated from plans**
- Increased accuracy of hydraulic model parameters (i.e. manning's 'n' values for channels/ overbanks)
- Floodway modeling dropped in some limited cases
- Supports BFE depiction on DFIRM
- Cost highly variable based on:
  - Method of bridge and channel survey
  - Channel incorporation methodology
  - Frequency of structures
  - Inclusion of floodway modeling
  - Scale of study



FEMA Detailed FPs



- Regression/Gage/HEC-HMS Hydrologic Analyses
- Steady or Unsteady HEC-RAS modeling
- Stream channel data incorporated in model
  - **Typically field surveyed at 500' or less interval**
- **Structures modeled in detail based on field survey**
- Increased accuracy of hydraulic model parameters and calibration
- Detailed floodway modeling included
- 500-year floodplain delineation included
- Supports BFEs and floodways on FIRM
- Most expensive option/ cost depends on:
  - **Traditional Field survey level of detail**
  - Hydraulic and Hydrologic methodology
  - Frequency of structures
  - Scale of study



Mdfloodmaps.com

- **Started as Outreach Information for Communities and Property Owners with Links to**
  - Current (Paper) FIRM-ettes
  - Proposed DFIRM (pdf)
  - Displayed Preliminary DFIRM as Digital Layer
  - Later Included Effective DFIRM and Layers after Adoption
  - Used (Aerial) Georeferenced GIS Map for Base Imagery
  - **Data Download Tool Recently Added ….**

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Maryland Data Download Tool

- Moving toward "Clearinghouse" of Back-Up Data and Models (via shapefiles) Used in Mapping Process
  - Hydrology Points
  - Structure Info
  - Georeferenced Cross-Section Locations
  - BFE's
  - Detailed (Riverine) Models
  - Approximate (Riverine) Models
- Cross-Sections Cut from LiDAR
- Working on Upload Site …

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Maryland Data Download Tool

- **Next Steps (tipping point)**
  - Integrating State Agencies into Process (SHA)
  - Updating Local Engineering Companies of Data
  - Local Colleges and Universities
  - Integrating Digital Submissions into State Permit Process
  - Educating Staff and Local Communities on Info and Data Tools …
  - Working Prototype of email chain to Community and Staff when State Application is Received
- Working on Upload Tool

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Maryland Bridge Tool Summary

Note: US Fish and Wildlife Service has asked for Maryland's Bridge data to Prioritize their Fish Passage Surveys

MDE

Live Demo …

Questions?

- **Dave Guignet, State NFIP Coordinator**
  Chief, Regulatory Services Division
  Maryland Department of the Environment
  dave.guignet@maryland.gov

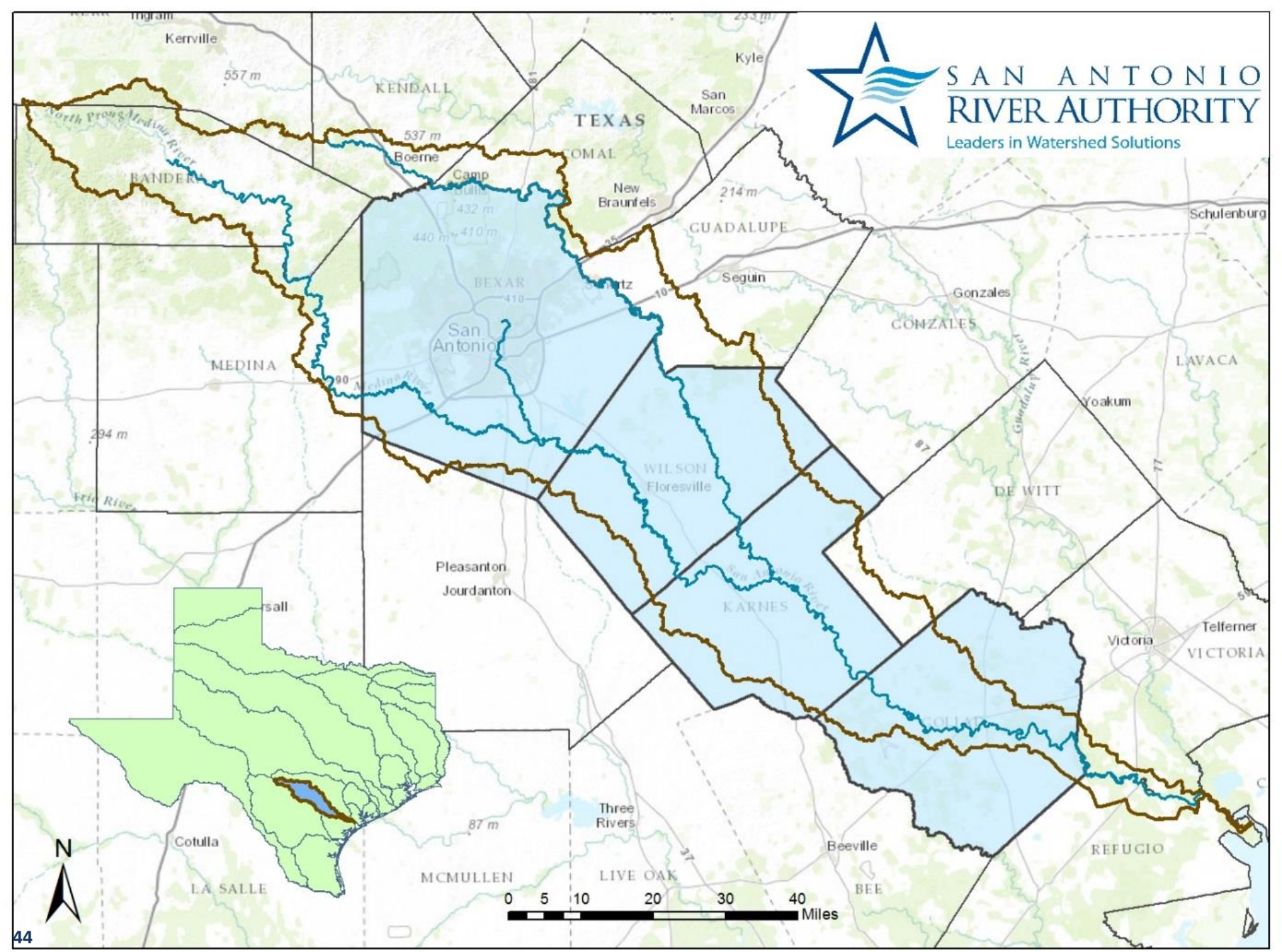
Additional CTPs that provide public access to download engineering models:

- Harris County Flood Control District
- Wisconsin
- Indiana
- North Carolina
- **Your community?**

SAN ANTONIO
RIVER AUTHORITY
Leaders in Watershed Solutions

Digital Data & Modeling Repository

ASFPM CTP Information Exchange
February 17, 2016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Leaders in Watershed Solutions
Kerrville
Kyle
San Marcos
KENDALL
TEXAS
Boerne
Camp
New Braunfels
BANDERA
GUADALUPE
Schulenburg
Seguin
Gonzales
BEXAR
San Antonio
GONZALES
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Three Rivers
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REFUGIO
MCMULLEN
LIVE OAK
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San Antonio River Authority

- **Vision**: Inspiring Actions for Healthy Creeks & Rivers
- **Mission**: Protect and enhance our creeks and rivers through service, leadership and expertise.

SAN ANTONIO RIVER AUTHORITY
Leaders in Watershed Solutions

Agency Goals

- Reduce **flood** risk
- Improve **stormwater** mgmt. and reduce runoff, using an LID approach
- Improve **water quality**
- Increase **nature-based recreation** and encourage watershed **stewardship**
- Protect, restore and/or improve natural watershed ecological **functions**

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Flood of 1998

Leon Creek – IH-10 near Camp Bullis & La Cantera Road

Flood of 1998 cont.

Broadway at 50/50 Club

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Flood of 2002

Olmos Creek – Hwy 281/Basse Road & Olmos Basin Golf Course

Flood of 2013

A bus is submerged on McCullough north of Basse after heavy rains in San Antonio on Saturday morning, May 25, 2013. Photo: Billy Calzada, San Antonio Express-News

A portion of U.S. 281 is underwater at Basse after heavy rains in San Antonio on Saturday morning, May 25, 2013.Photo: Billy Calzada, San Antonio Express-News

The Olmos Dam after heavy rains in San Antonio on Saturday morning, May 25, 2013. Photo: Billy Calzada, San Antonio Express-News

Olmos Creek – Hwy 281/Basse Road & Olmos Basin Golf Course

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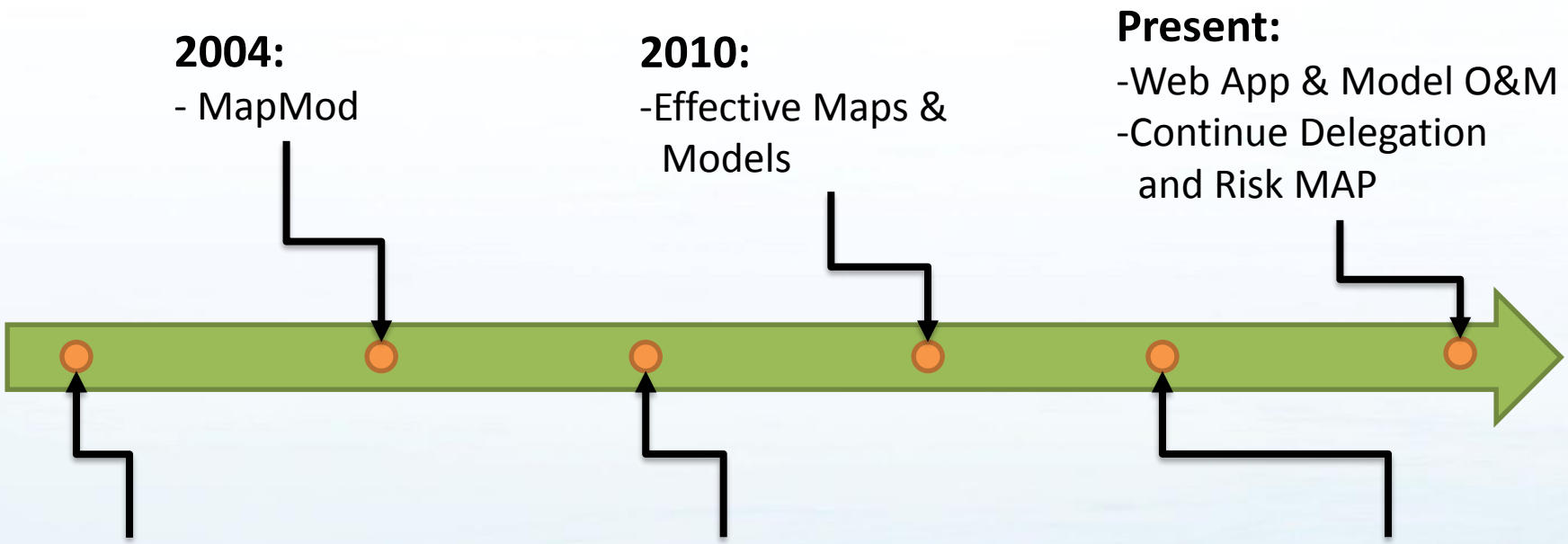
FEMA Cooperating Technical Partnership

- CTP since 2003
- Map Modernization
  - Duration: 2004-2010
  - SARA's Contribution: $14 Million
- LOMR Delegation
  - October 2012 – present
  - 108 CLOMR/LOMR
- Risk MAP
  - November 2012 – present
  - 4 active projects

Timeline



2003:
- FEMA CTP

2004:
- MapMod

2007:
-Preliminary Maps
-Initial Model Download Web App

2010:
-Effective Maps & Models

2012:
-LOMR Delegation
-Risk MAP
-Digital Data & Modeling Repository

Present:
-Web App & Model O&M
-Continue Delegation and Risk MAP

Model Management Goals

- Increase accessibility
- Optimize distribution
- Facilitate LOMC process
- Track and communicate change
- Protect investment
- Act as stewards of our regional modeling data and as a technical resource for our communities

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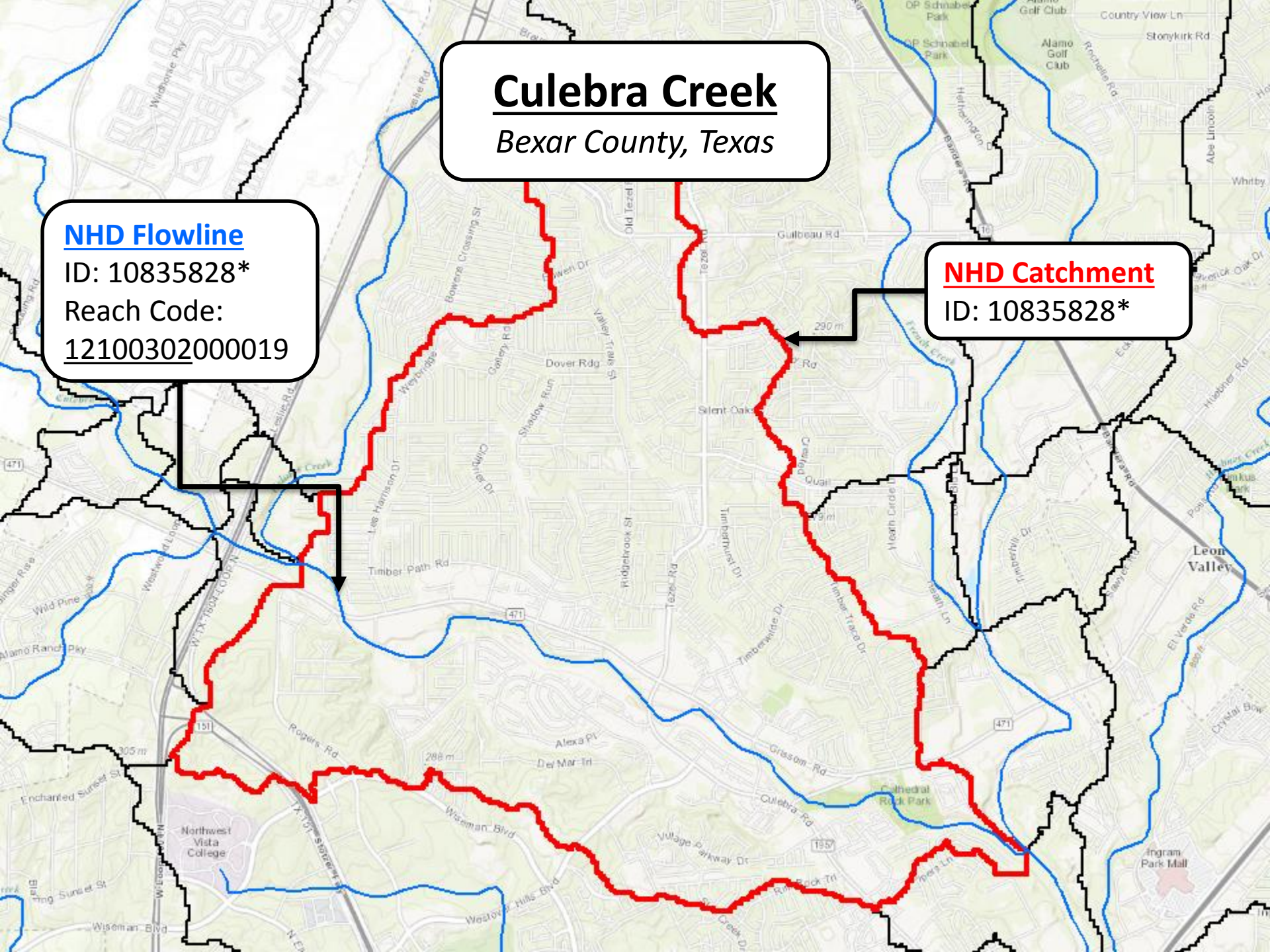
DEMO

Moving Forward

- Potential expansion of library throughout the San Antonio River Basin
- Revisit modeling library structure & cataloging system
- Explore other platforms to facilitate system management
- Enhance system functionality and user experience
- Reference/Integration with other national datasets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Reach Code:
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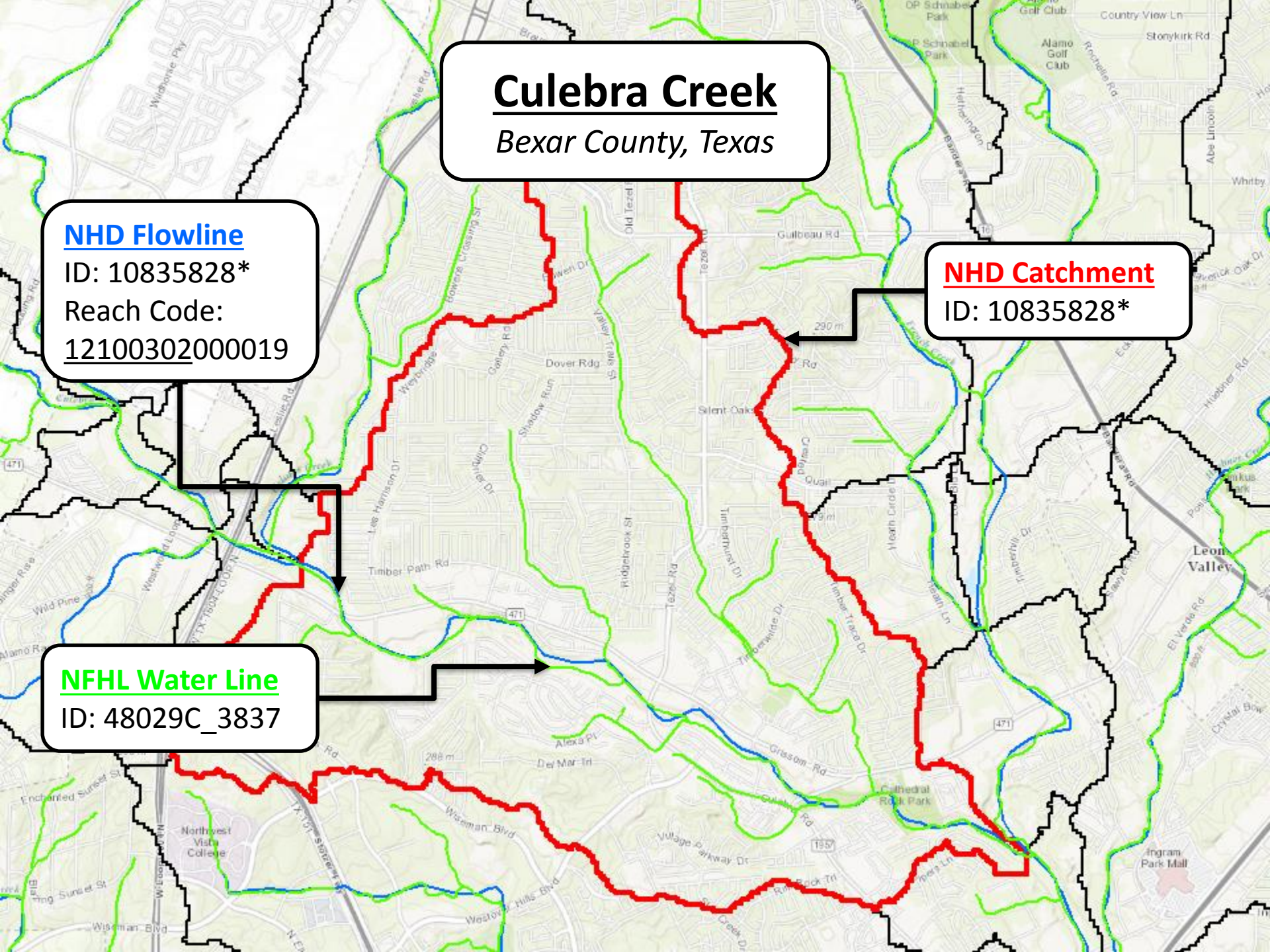
NHD Catchment
ID: 10835828*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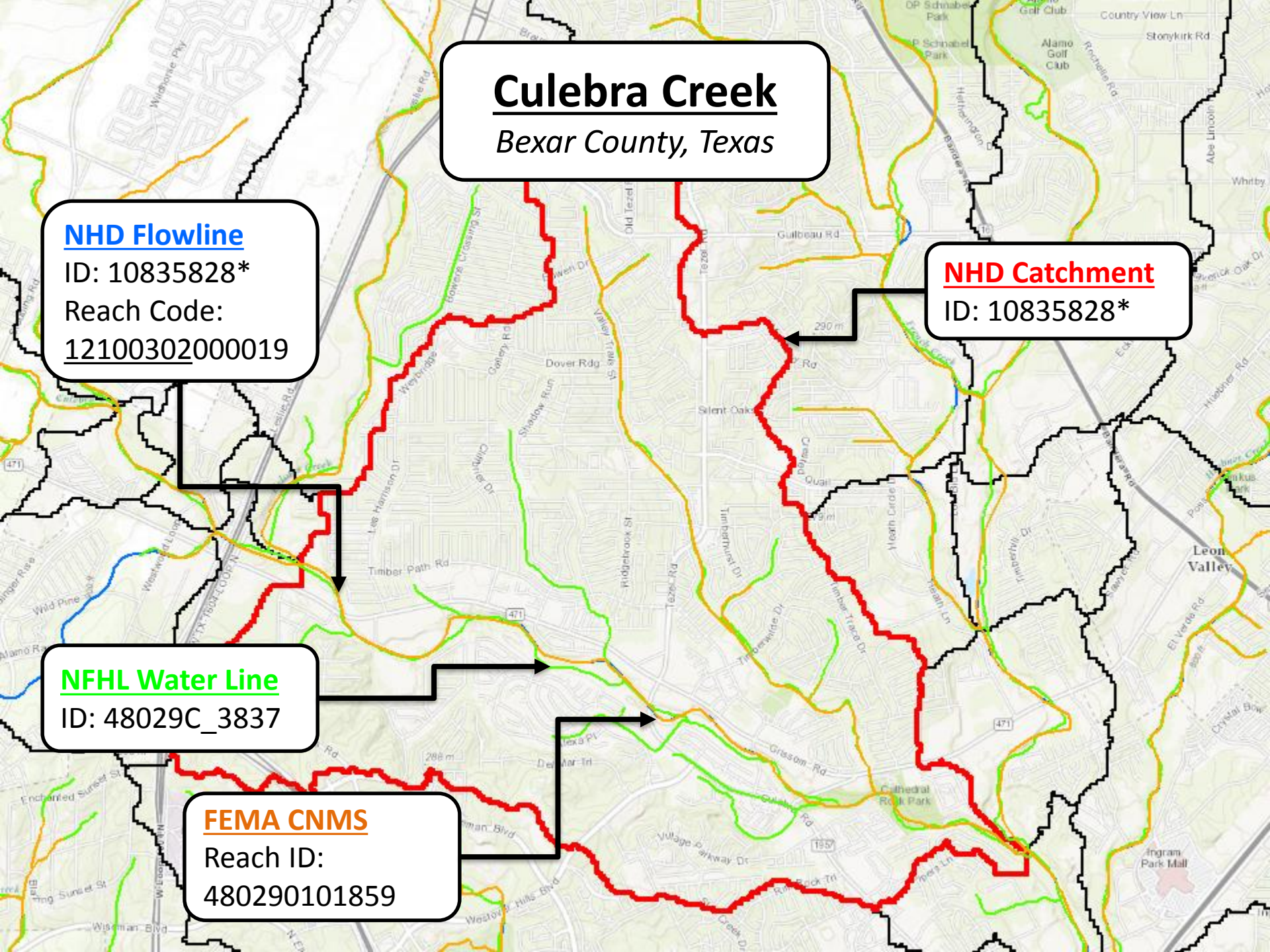
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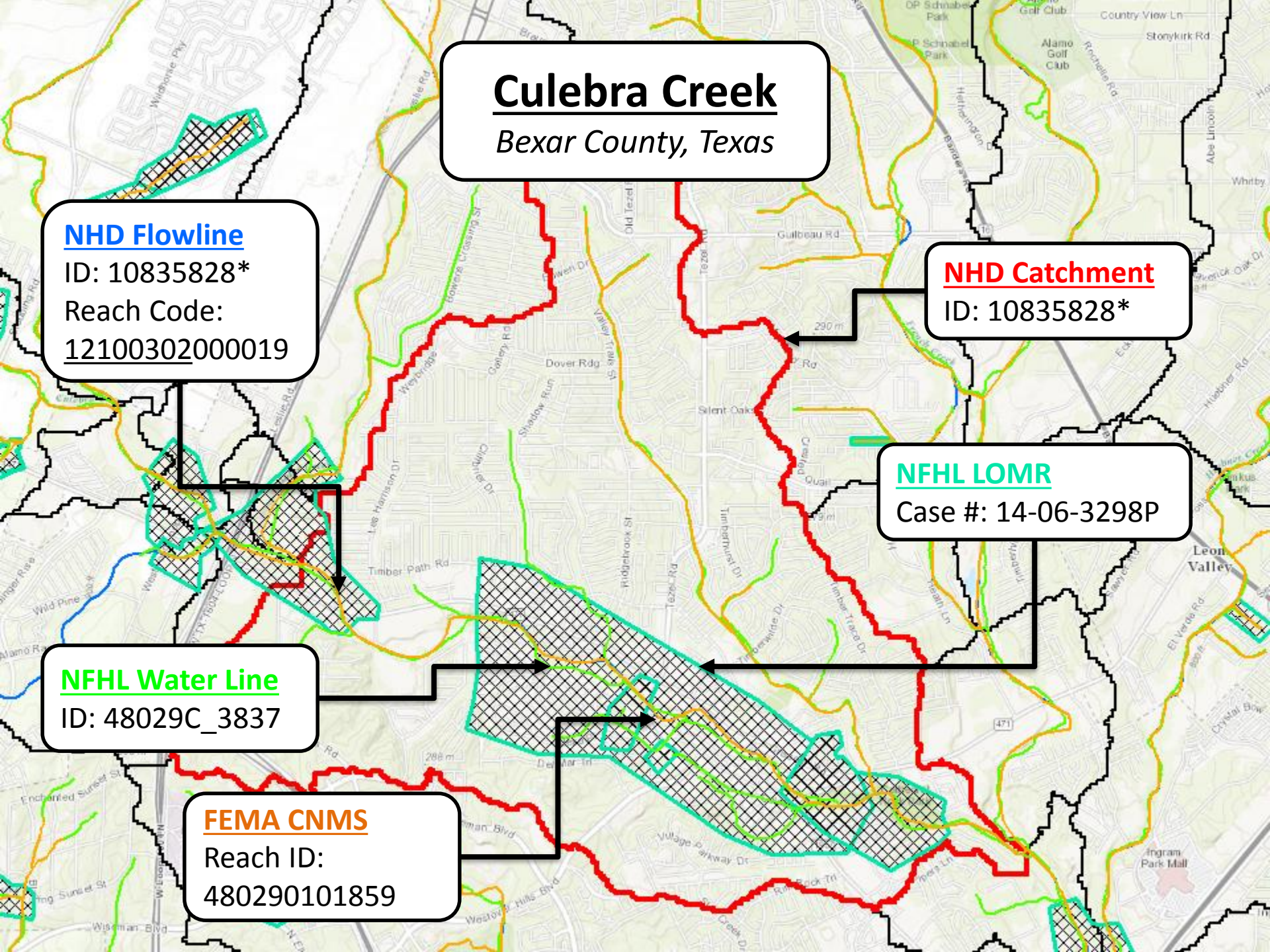
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NFHL Water Line
ID: 48029C_3837
FEMA CNMS
Reach ID:
480290101859

Questions?

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