ROOSEVELT COUNTY BLE FINDINGS MEETING

Portales, New Mexico April 26, 2018

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EDAC | EARTH DATA ANALYSIS CENTER

FEMA

WHAT IS RISK MAP?

- Mapping – Identification of areas of natural hazard risk
- Assessment – Review and analysis of hazard areas
- Planning – Mitigation activities to reduce risk

Base Level Engineering

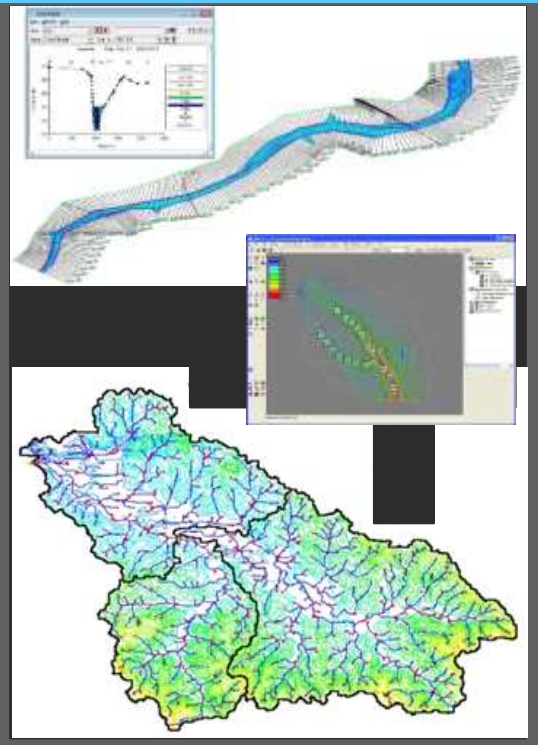
an Evolution in Flood Mapping

FEMA

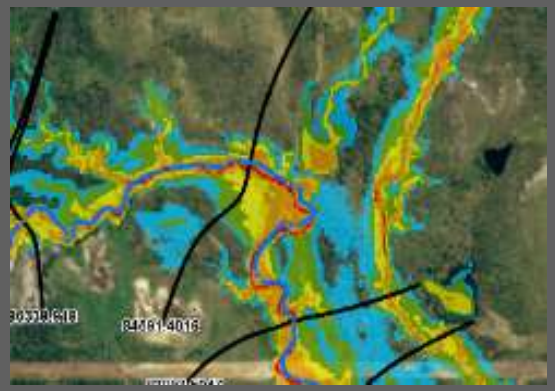
WHY BASE LEVEL ENGINEERING

- Will move forward a number of TMAC recommendations
- Enables FEMA to meet legal requirements to assess existing flood hazards and identified mapping
- Provides engineering information for use in updating FIRMs
- More technical creditability than Zone A modeling of the past
- Provides a basis and network of information for initiatives like:
  - Risk Rating 2.0
  - Future Conditions Modeling
  - Community MT2 activities

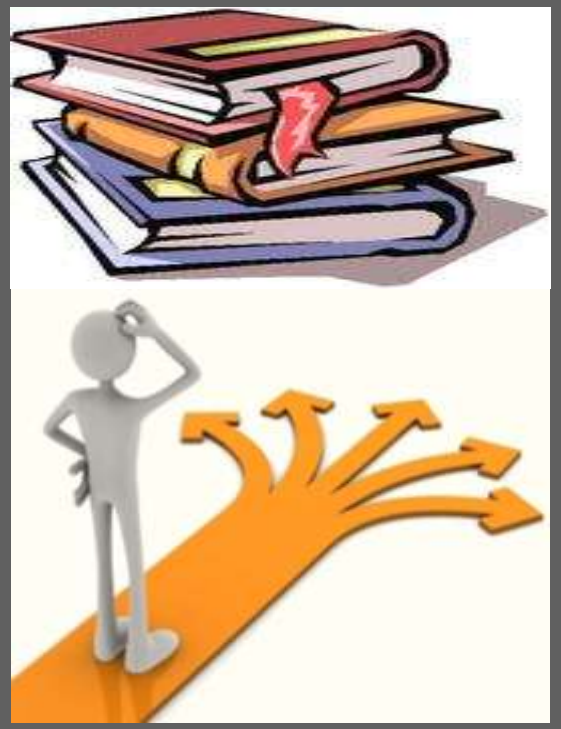
BASE LEVEL ENGINEERING IS A PROGRAMMATIC EVOLUTIONARY STEP WHICH PROVIDES:



Credible engineering analysis and modeling for local communities and developers.



Estimation of flood extents, water surface elevations and flood depths



May be adopted as Best Available Information (BAI) by communities & inform development decisions.

FOCUS AREAS FOR BLE ASSESSMENTS

Unverified Miles

- Stream miles currently on FIRM panel
- Historic information used to determine flood data not readily available or based on other approaches (soils mapping)

Unmapped Miles

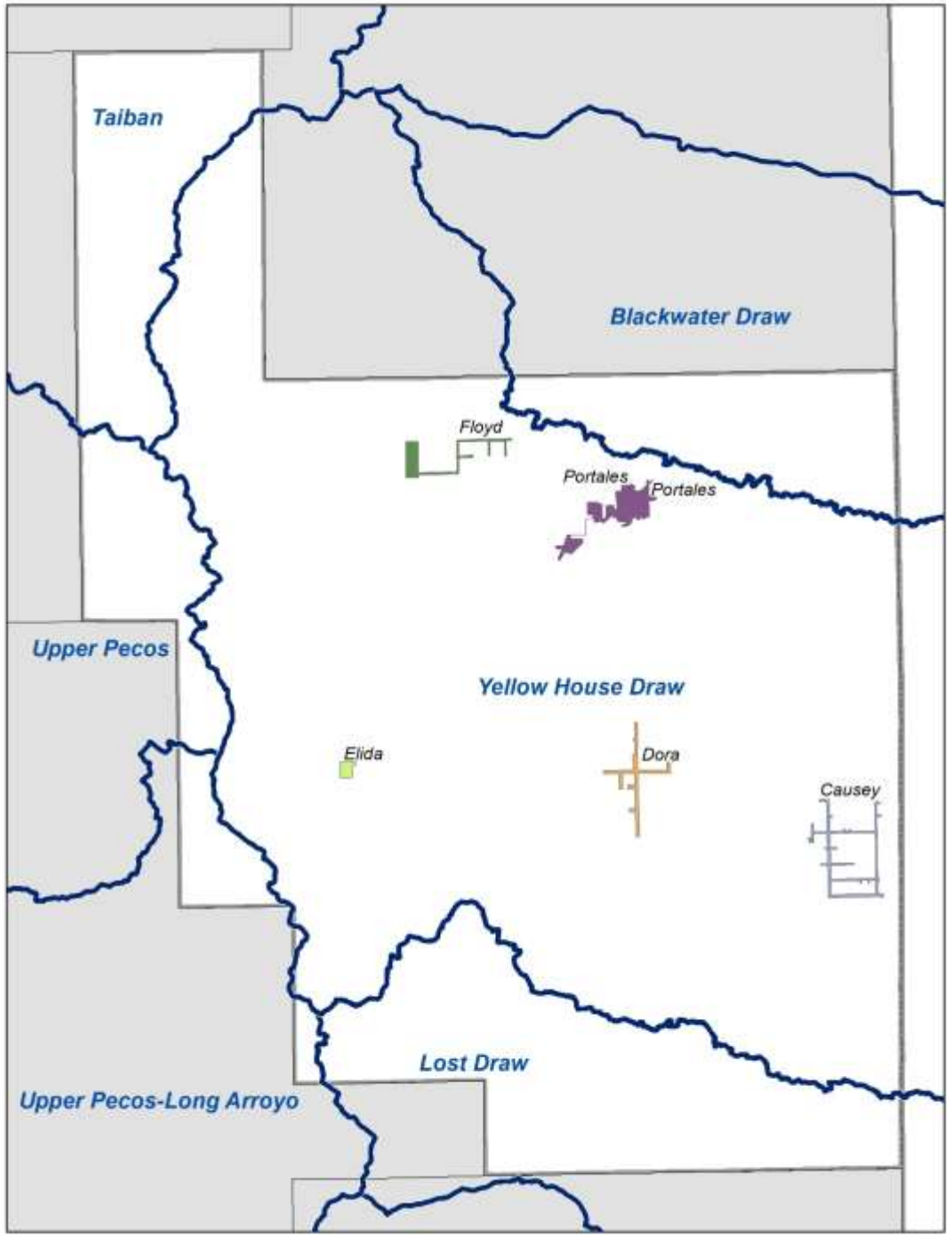
- Natural streams or drainage systems not included in FIRM panel
- FIRMs only included 1.3M of the 4+M stream miles shown in the National Hydrography dataset

Unmodernized Communities

- Currently shown on community based FIRM panel(s)
- Communities not previously modernized

ROOSEVELT COUNTY- BLE ASSESSMENT

Base Level Engineering Watersheds

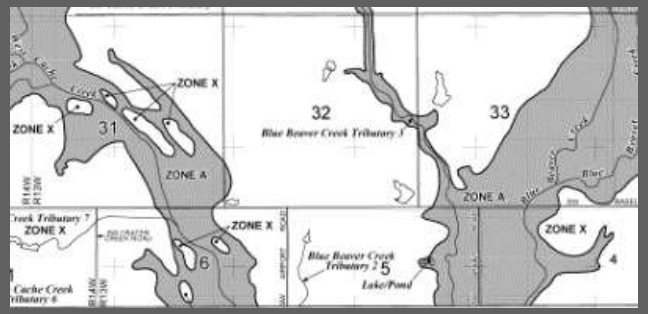


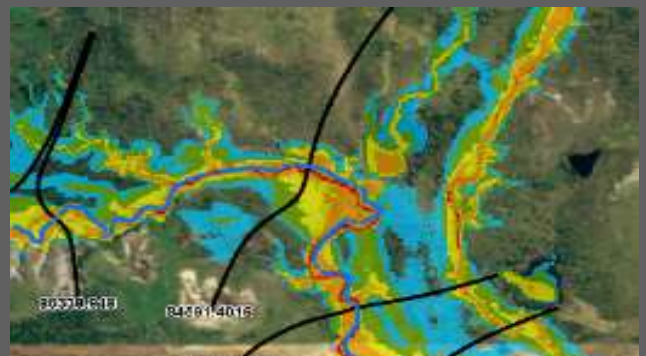
APPROACH

- FEMA has devised both a 1D and 2D modeling approach
- High Resolution Ground Data required
- Manual revisions to input cross-sections or grids during modeling
- Cross-sections added near structures
- Human Investigation of results prior to FIRM mapping

DELIVERABLES

- Hydraulic Engineering Models (10%, 4%, 2%, 1%, 1%+, 1%-, and 0.2%)
- Estimated Flood Extents (10%, 1% and 0.2%)
- Estimated Water Surface Grids (1% and 0.2%)
- Estimated Flood Depth Grids (1% and 0.2%)
- Optional Layers also possible (Hazus Run, Point file for update potential, freeboard grids)





BLE Increases Collaboration & Transparency

Current Mapping Challenges

- FIRM updates take 3-5 years to update through regulatory process
- FIRMs include a subset of streams within a watershed based on current and historic updates
- FIRMs depict 1% and 0.2% annual chance events
- Insurance and In versus Out discussions
- Detailed study areas require significant resources to prepare a model communities can review

Base Level Engineering Solutions

- BLE data can be produced and delivered to communities within 9-12 months
- BLE assessments performed at a watershed scale producing stream network of data
- Flexibility in how results are exhibited
- Discussions related to flood risks and development decisions
- Community may test drive and refine data prior to moving to a map update

MOVING BASE LEVEL ENGINEERING TO FIRMS

Modernized FIRMs, Countywide Format

- County and all Cities/Towns are participating in the NFIP
- Animas Watershed, NM is modernized and can proceed forward to production of FIRM panels
- Zone Ds may be removed and replaced with BLE findings

Unmodernized FIRMs, Incomplete Study Coverage

- X Counties have partial study coverage (BLE Assessment)
- X requires updated study for any detailed stream
- Additional study areas are necessary to modernize FIRMs

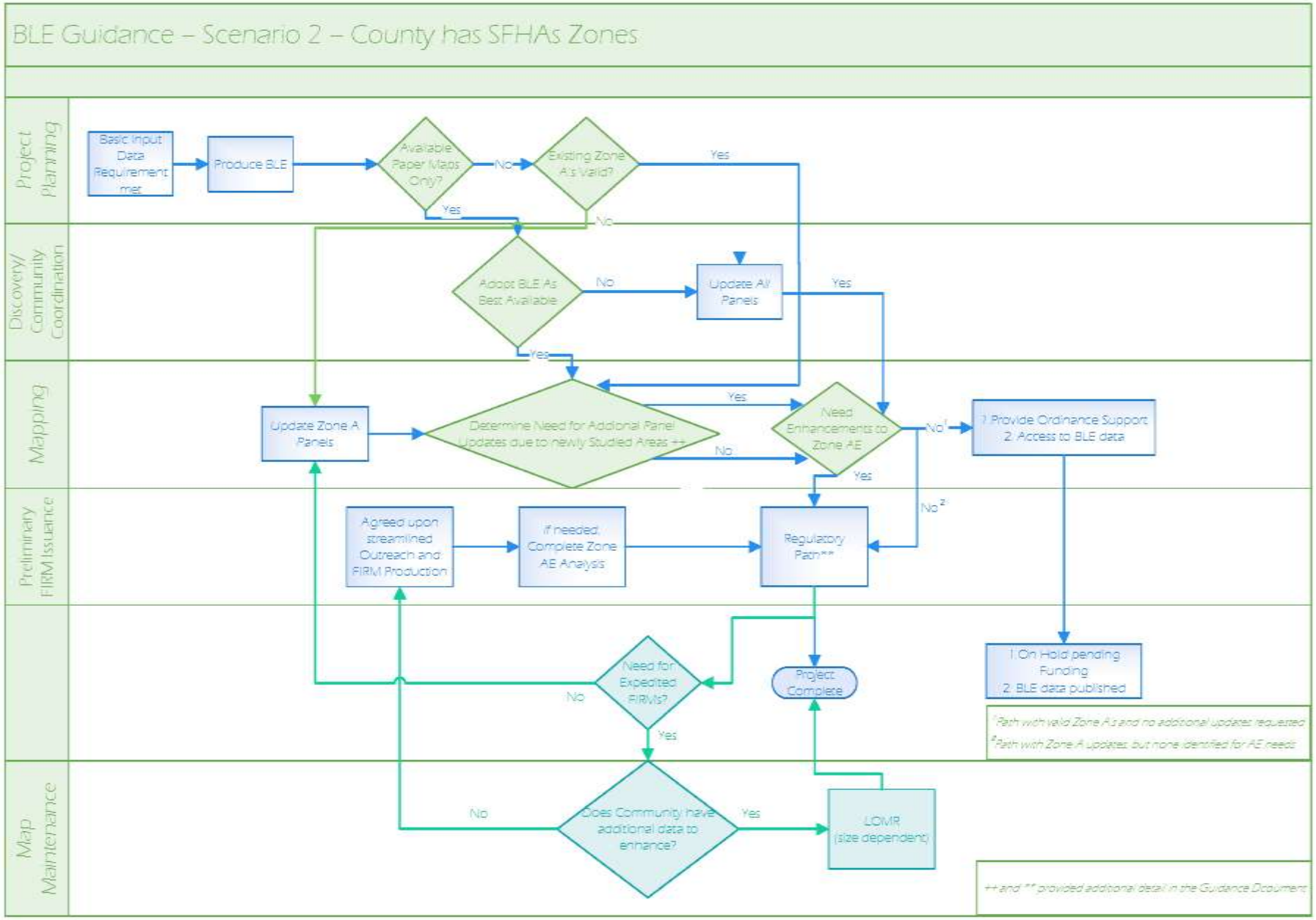
Unstudied Communities, Incomplete Study Coverage

- Additional study is required to prepare analysis to update FIRMs in your vicinity

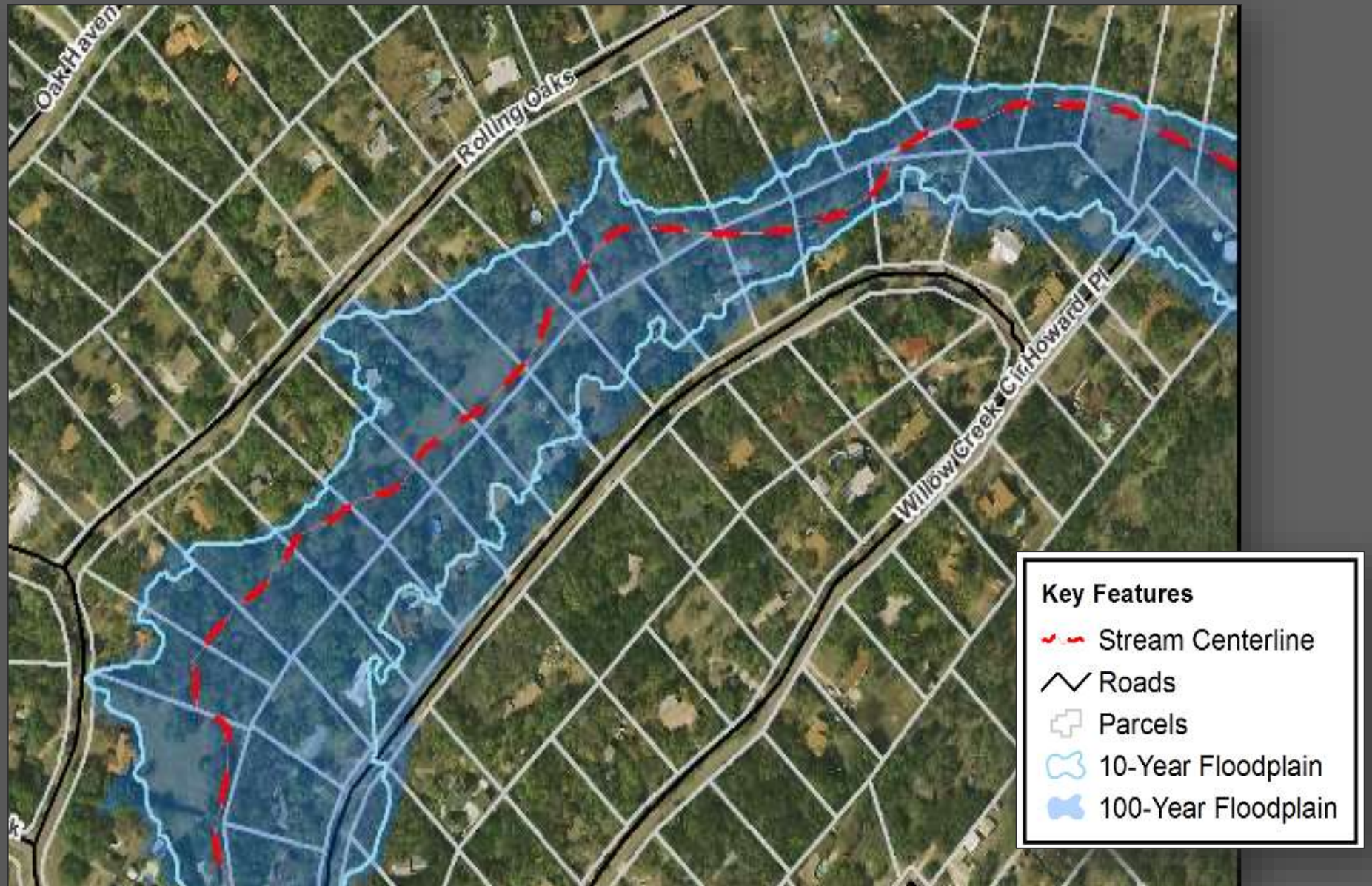
Numerous Communities Not Participating in the NFIP

- FEMA will only expend additional funds to create FIRMs were communities are participating

BLE Guidance – Scenario 2 – County has SFHAs Zones



Practical Uses for BLE Data



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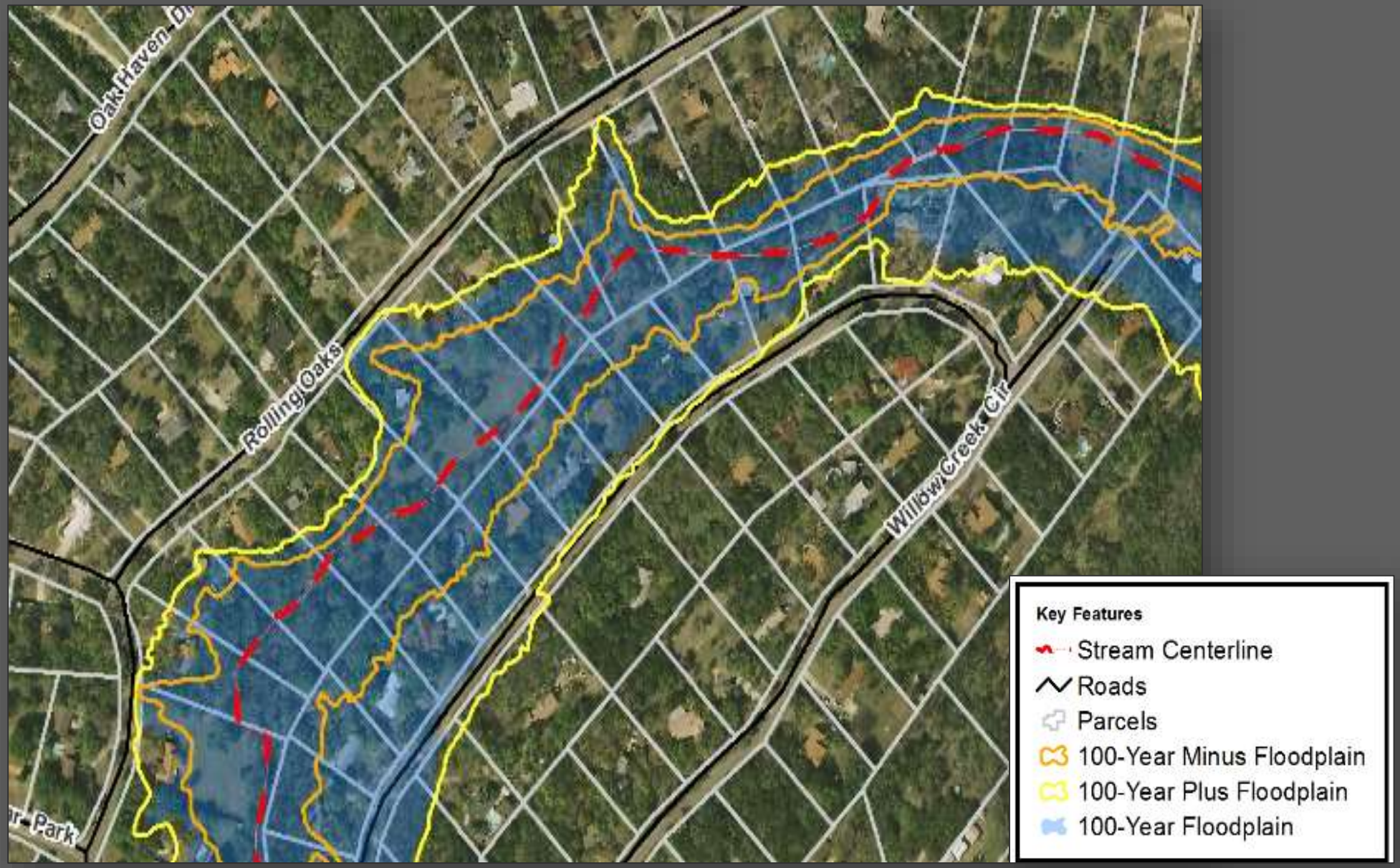

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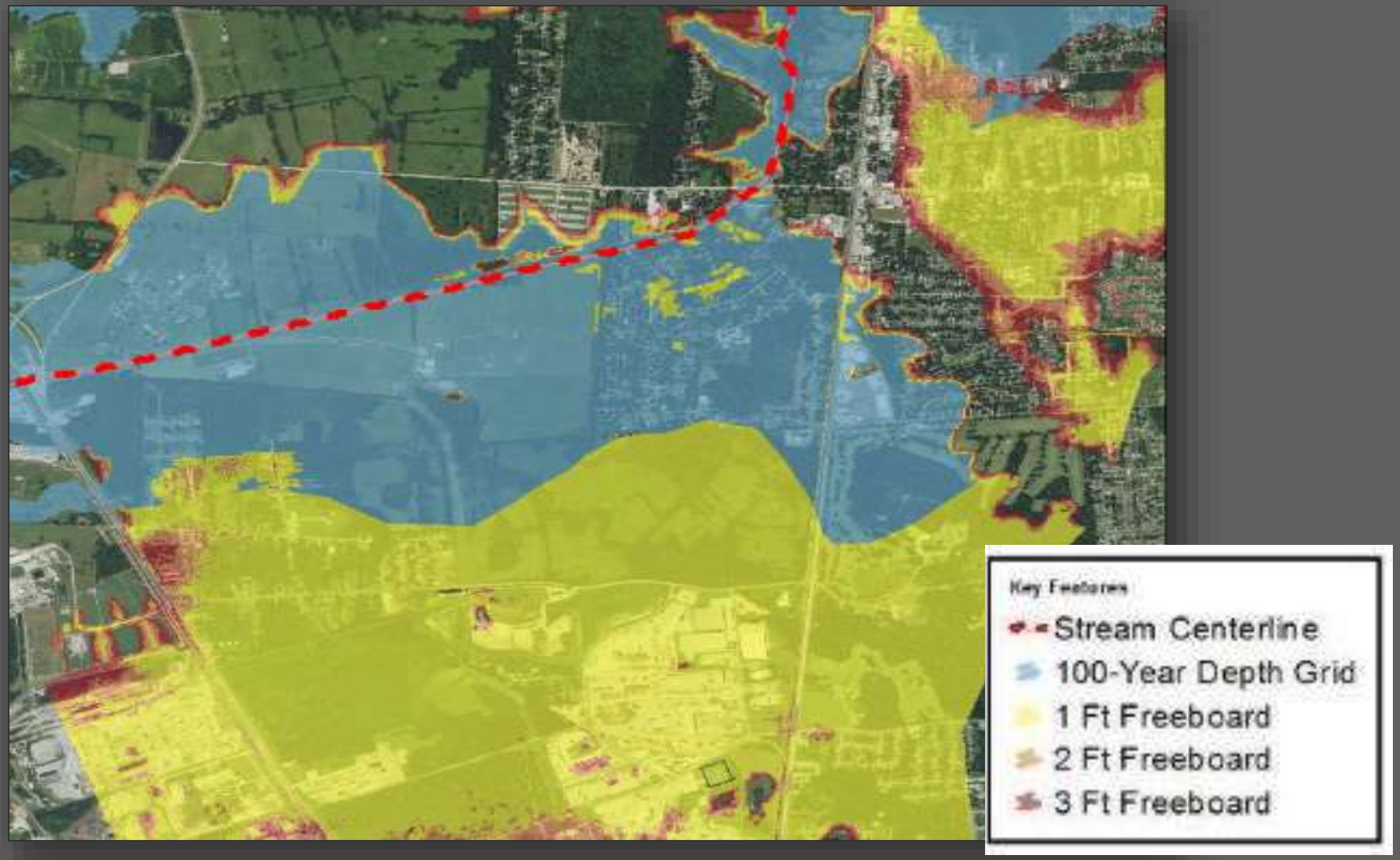

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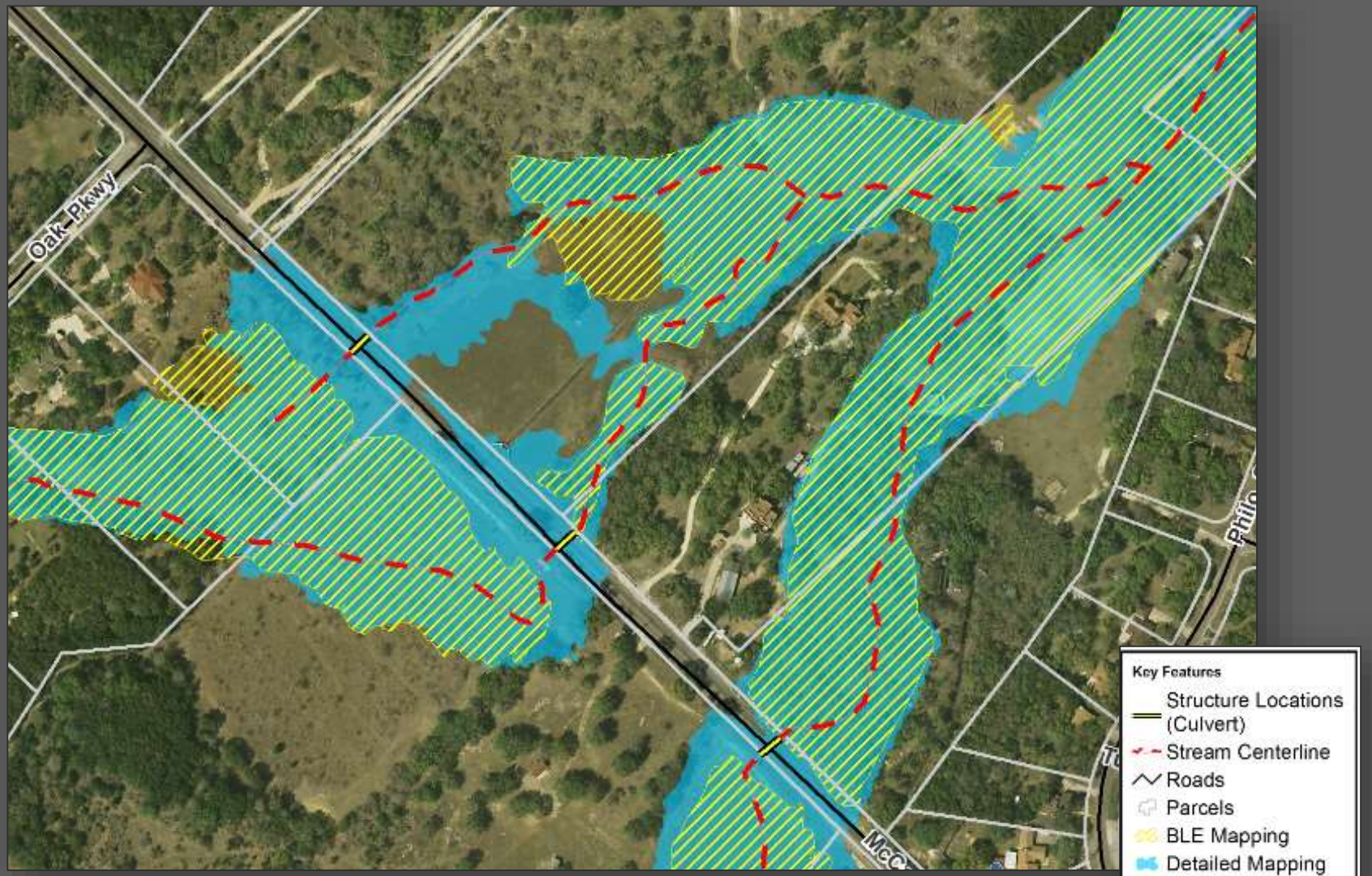


Estimated Base Flood Elevation Viewer

Estimated BFE Viewer Purpose:

- Provide engineering data in a format that allows immediate use by public.
- Federal, State and local officials to estimate a Base Flood Elevation consistently.

Engineering Models

↓

Water Surface Elevation Grid

Estimated Flood Depth Grid

↓

GIS features without software

Public interaction with Results

Site Specific Reports

Data & Model Downloads

Consistent BFE Estimation

Estimated Base Flood Elevation Viewer

Welcome to the **Estimated Base Flood Elevation Viewer**

Base Level Engineering assessments are produced using high resolution ground data to create technically creditable flood hazard information that may be used to expand and modernize FEMA's the current flood hazard inventory.

The Estimated Base Flood Elevation Viewer allows users to:

View Base Level Engineering Data

Access all Base Level Engineering available without GIS software.

Click **LEGEND** tab to view an explanation of all dat shown in the viewer.

Click **MAP VIEW** button to open or close a second viewing window, for side by side comparison.

Click **DATA LAYERS** to add or remove layers from the map.

Download Dataset & Models

Our Data Download feature makes all of our Base Level Engineering data available to you for download.

Click **DATA LAYERS** and add the **DOWNLOADABLE DATA** layer. Once loaded, users can choose which datasets to save.

Property Look Up

Where data is available, users can produce a property specific report with estimated Base Flood Elevation and Flood depth information.

Click **TOOLS** tab to create a property specific flood risk report with details in your vicinity.

Estimated Base Flood Elevation Viewer

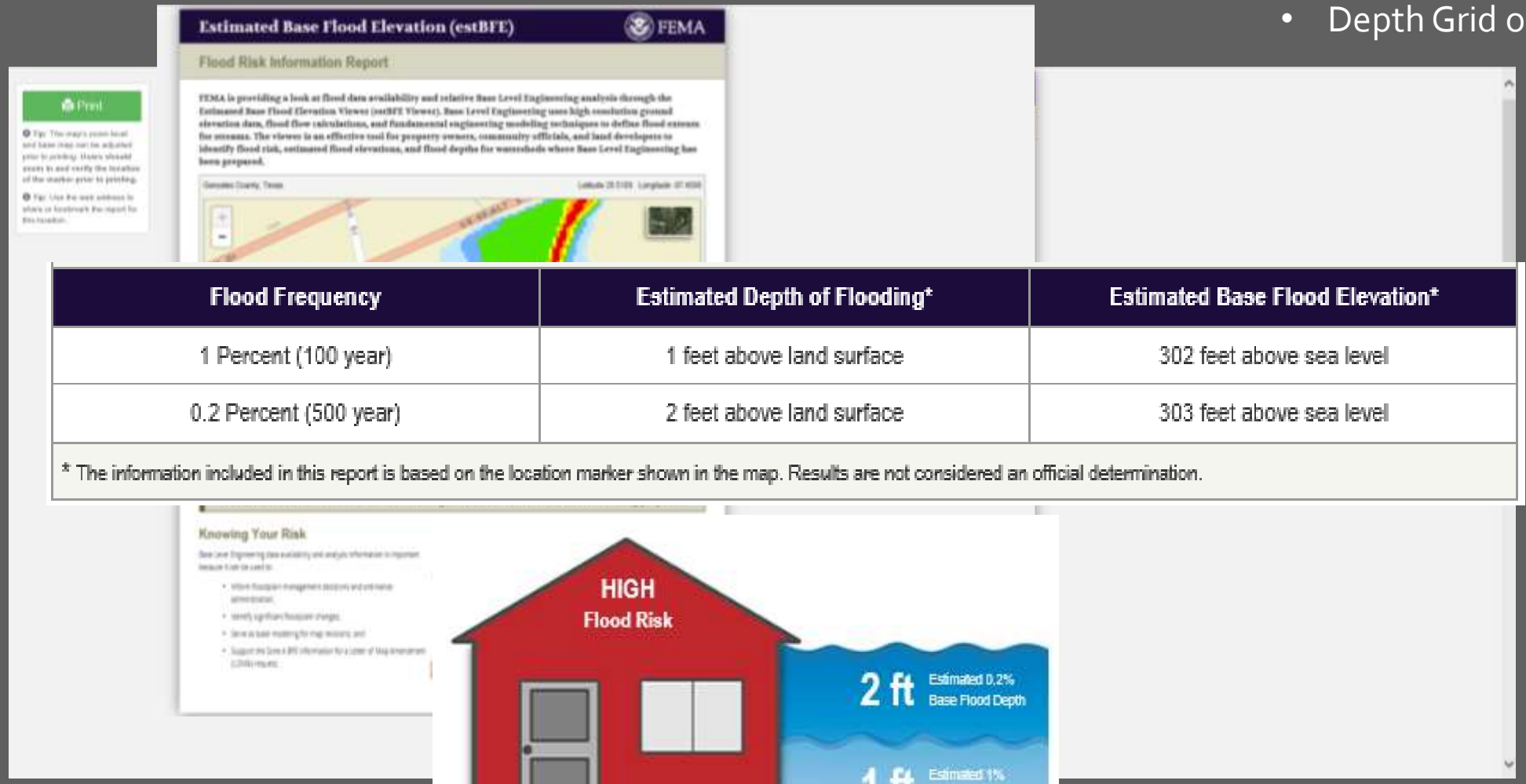
1% and 0.2%
Estimated Flood Extent

1%
Estimated Flood Depth

Estimated Base Flood Elevation Viewer

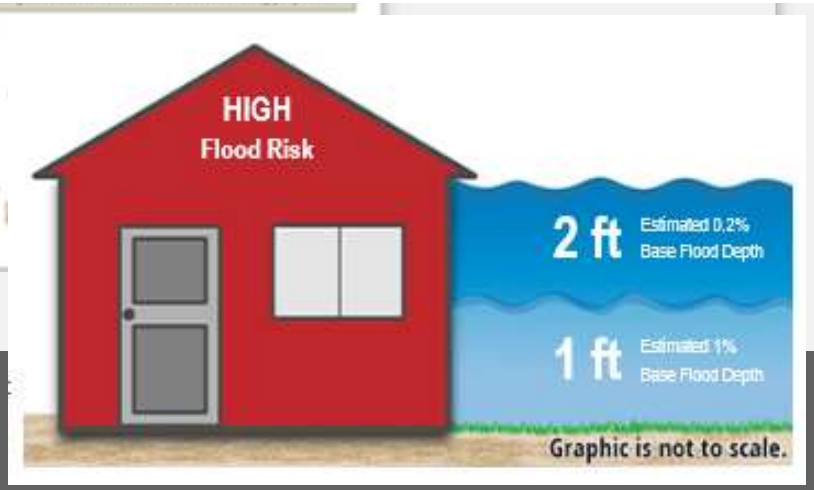
Report is being updated to include a side by side map:

- Floodplains on the Left
- Depth Grid on the Right



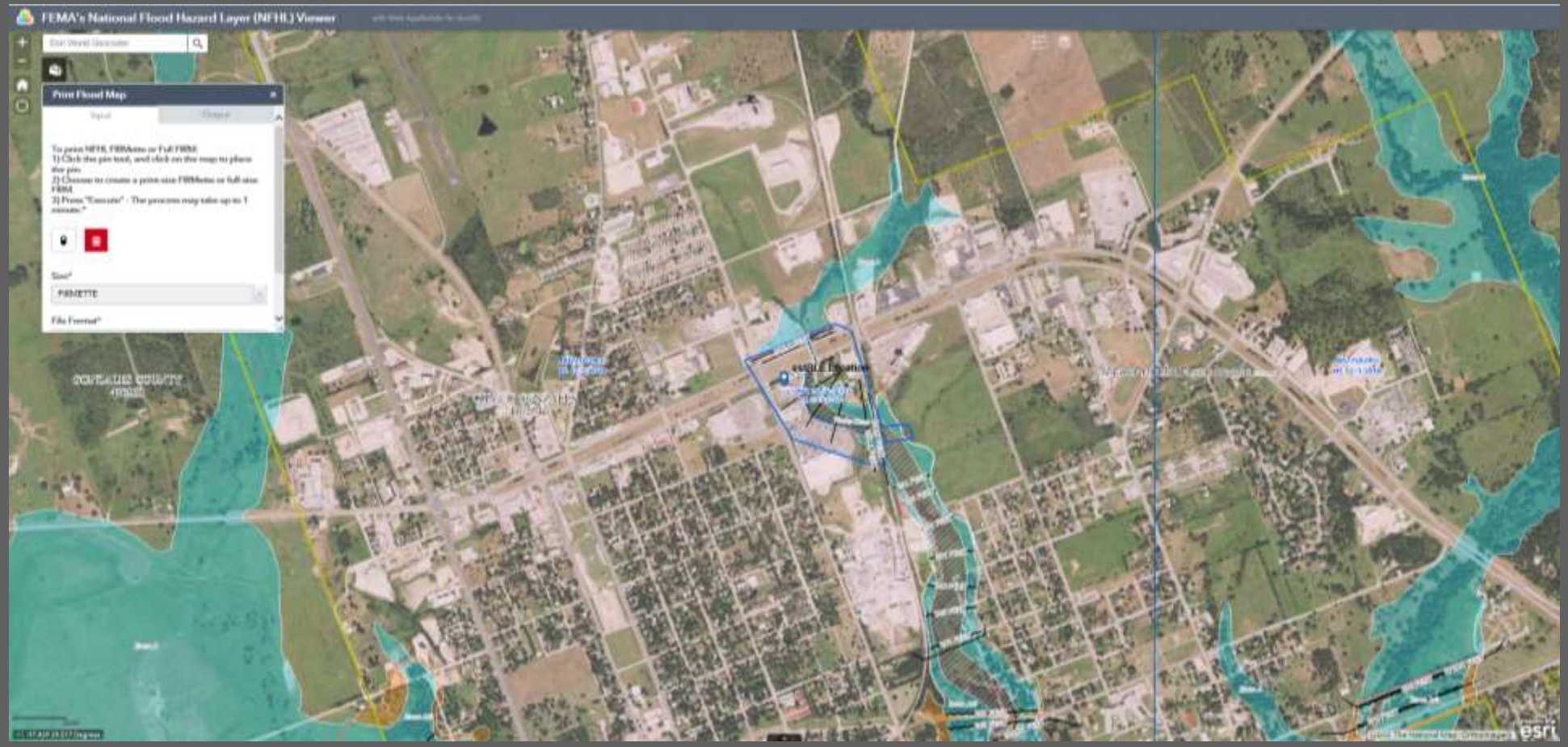
Flood Frequency	Estimated Depth of Flooding*	Estimated Base Flood Elevation*
1 Percent (100 year)	1 feet above land surface	302 feet above sea level
0.2 Percent (500 year)	2 feet above land surface	303 feet above sea level

* The information included in this report is based on the location marker shown in the map. Results are not considered an official determination.



Estimated Base Flood Elevation Viewer

If detailed information is available on the current effective FIRM,
The viewer will alert you and offer you the option to open the National Flood Hazard Layer (NFHL)



Opportunities for More BLE Information

Monthly Virtual Brown Bag Sessions

https://r6virtualbrownbag.eventbrite.com

04/24/2018	New Online Tools: Interacting with Base Level Engineering Data
06/26/2018	Base Level Engineering (BLE) for Local Officials
07/31/2018	Base Level Engineering (BLE) for Engineering Practitioners
08/28/2018	Community Planning with Base Level Engineering (BLE)
09/25/2018	Using Base Level Engineering (BLE) for Insurance Rating

ASFPM 2018 Workshop – Phoenix, Arizona

Monday, June 18 8:00am – Noon

HELP WANTED: BLE Ambassador

Products Support Local Decision Making

Educate your Community and Make a Plan

Public awareness campaigns

Map and publicize potential inundation areas

Training for local staff

Community Emergency Response Teams

Community preparedness exercises

Evacuation signage

Encourage Smart Land Use and Development Decisions

Determine and enforce acceptable land uses in downstream areas

Increase permeability and infiltration

Maintain open space downstream

Encourage stream and wetland restoration

Enact Management Best Practices

Develop a dam failure study and emergency action plan

Manage stormwater regionally

Implement an inspection, maintenance, and enforcement program to ensure structural integrity

Conduct Mitigation Projects Downstream

Acquisition

Elevation

Detention and/or drainage projects

Strengthen Local Codes

Local inspection and enforcement

Enact higher floodplain management standards

Require green infrastructure

NFIP COMPLIANCE FOR ZONE A

- Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source… [44CFR60.3(b)(4)]

Sometimes, usable data is available in the DFIRM database.

ESTIMATED BFES – NOTES

- FEMA engineers call these:
  - First Order Approximation (FOA), or
  - Base Level Engineering (BLE)

- In the DFIRM database, the layer is "S_XS"
  - If you see the cross sections in Zone A, then you have Estimated BFEs!

- ArcMap can export and convert the S_XS data into a "KMZ" file

- KMZ file can be opened in Google Earth
  - Click on the cross section, info box appears
  - "WSEL_REG" is the item of interest

ESTIMATED BFES – MORE NOTES

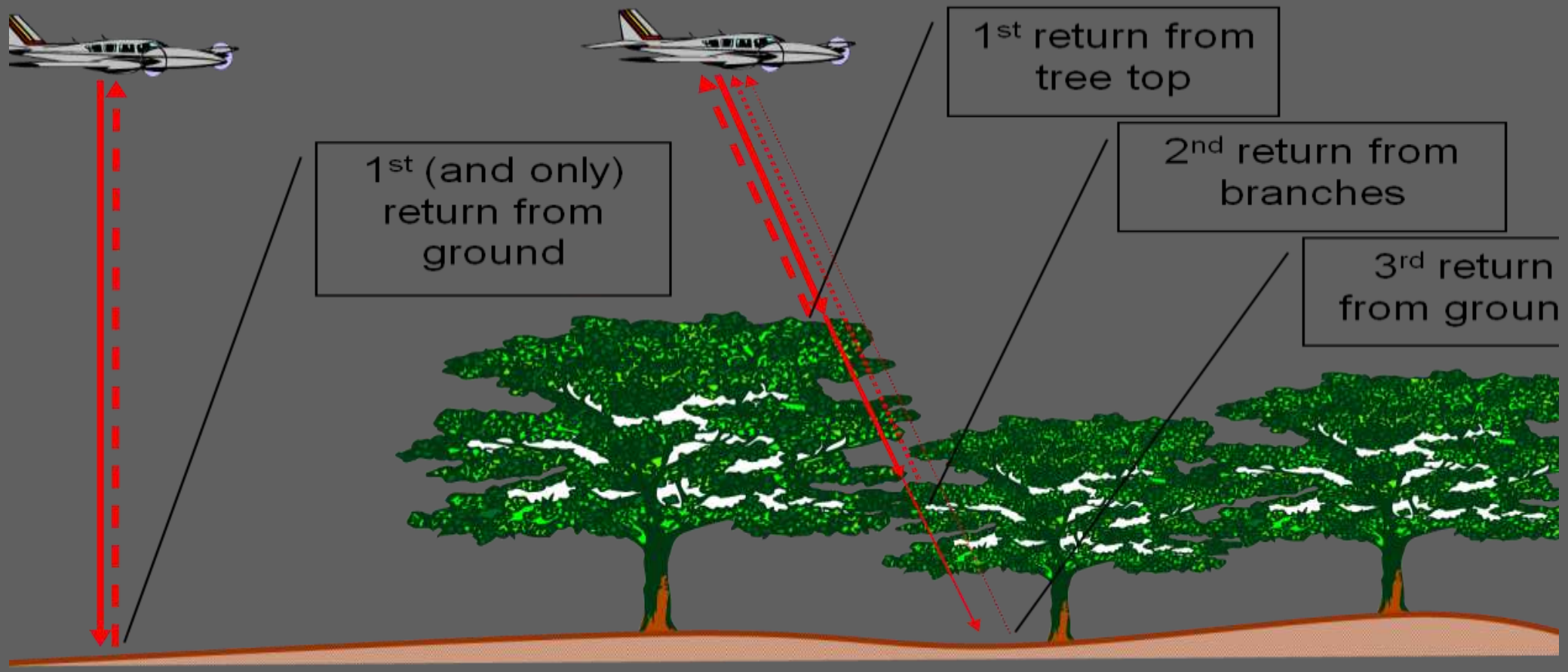
- On the EC, enter as "Community Determined BFE"

- Think twice, carefully consider implications of:
  - estimated BFE
  - community determined BFE *(EC item B9)*
  - freeboard
  - premium savings when built with freeboard
  - Design Flood Elevation (DFE) can be BFE + freeboard
    - (DFE often is the LFE requirement on permit)
    - (personally, mine would be another two feet higher)
  - LOMA requirements for BFE and LAG (call 877-FEMA-MAP)

- Reality check is important. Known high water marks? Other H&H studies available? Info from USACoE? Floodplain changes since DFIRM publication? Stream Obstructions? Etc.

LIDAR

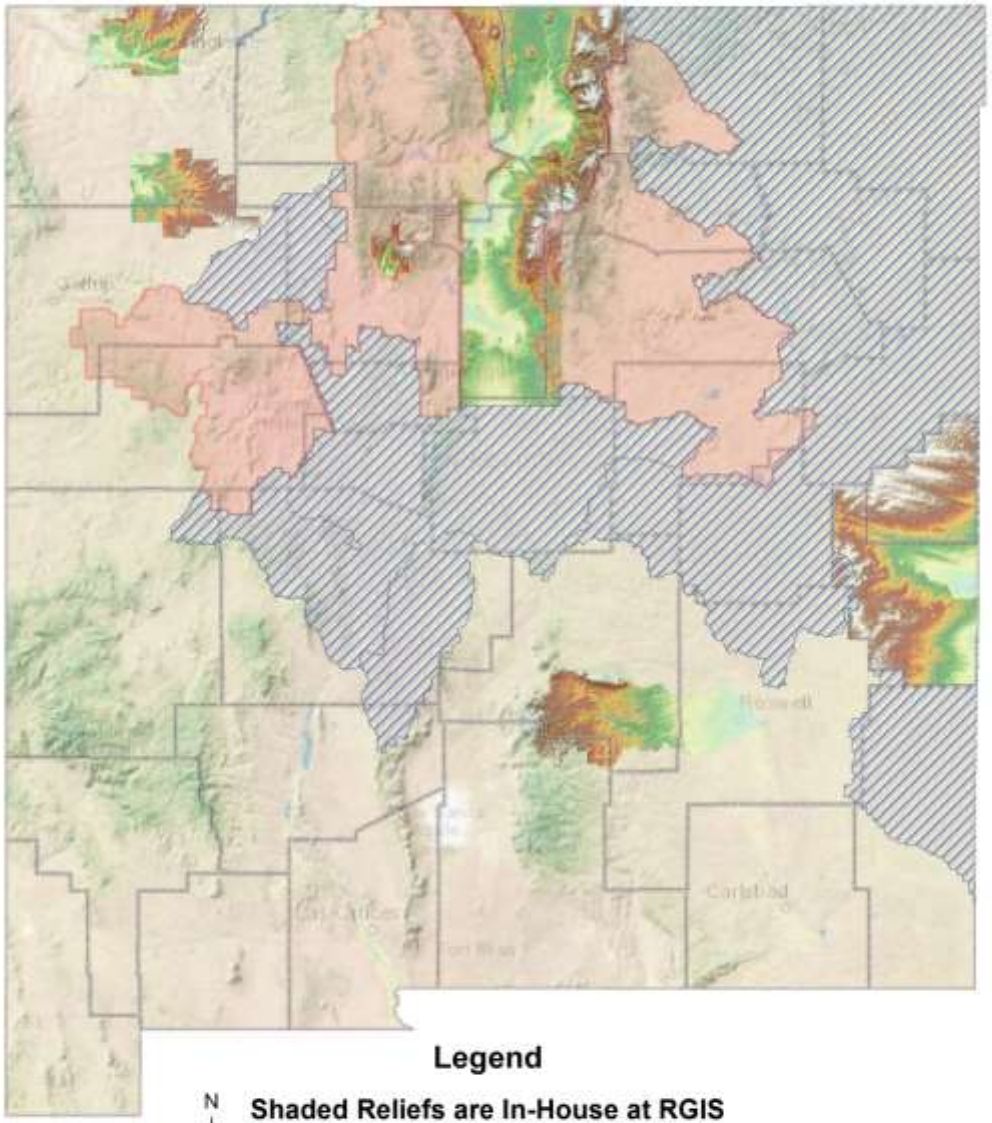
LIDAR RETURNS



Forest Resource Assessment Nepal

CURRENT 10 METER DEM VS USGS QL2 LIDAR

LiDAR Footprints as of February 2018



Legend

Shaded Reliefs are In-House at RGIS

LiDAR Available in Spring 2018

LiDAR Available in Spring 2019

Miles

0 25 50 100 150 200

EDAC

LIDAR PRODUCTS

LIDAR PRODUCTS

Delivered Elevation Products

- DEM
- Classified LAS Files
- Break lines
- Intensity Image

EDAC Produced

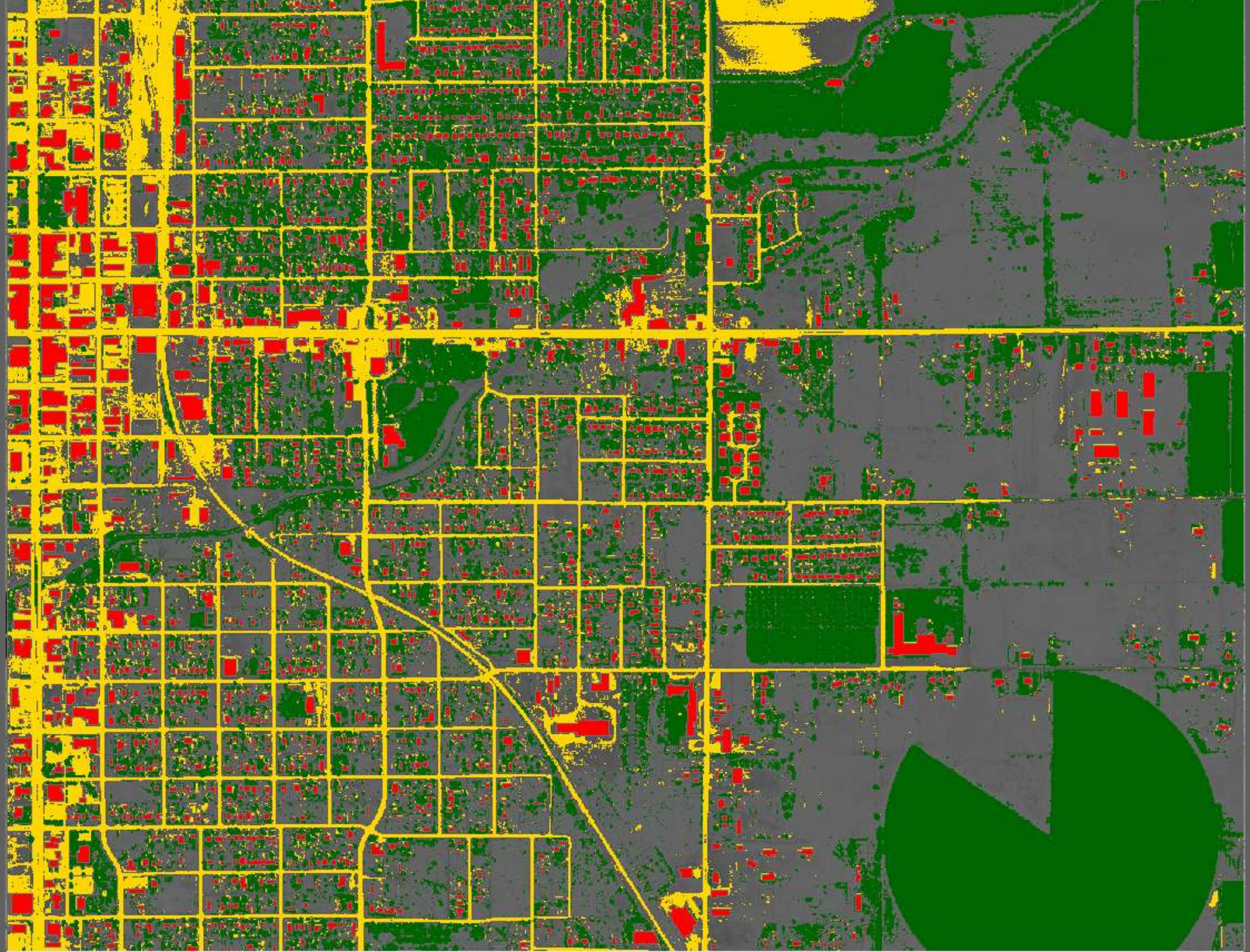
Elevation Products

- DSM
- DTM
- Hillshade
- Contours
- Slope
- Aspect

Feature Extraction

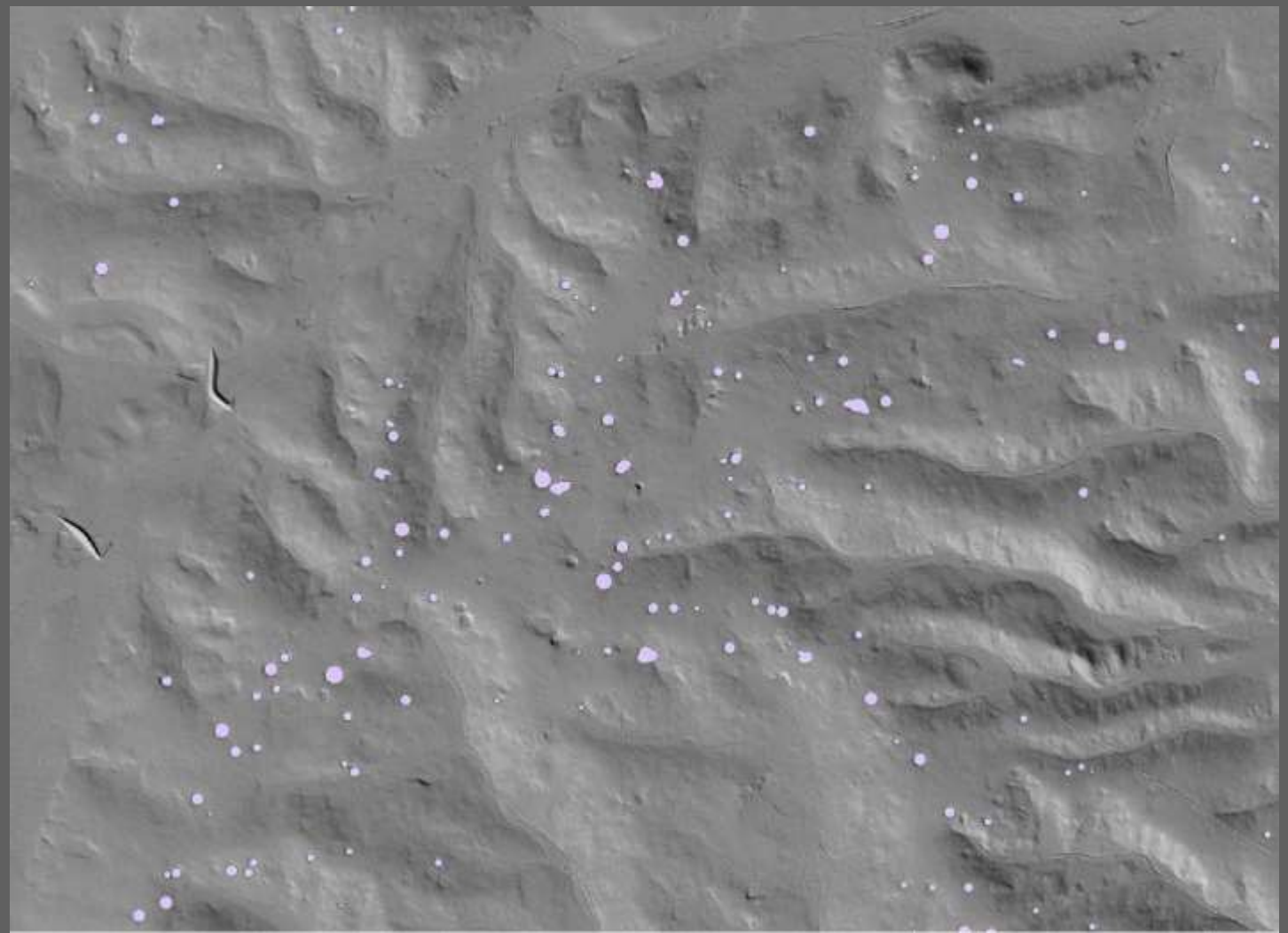
- Building Footprints
- Impervious Surface
- Streams
- Acequias
- Vegetation
- Roads
- Sinkholes
- Playas (ephemeral lakes)

LIDAR DERIVED PRODUCTS



SINKHOLES

3007 sinkholes identified



QUESTIONS

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FEMA

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