

Free GIS Tools for Floodplain Management

Michael Couch GISP, CFM - WSB

Substitute Speaker

Oops!



Turbulent Waters: Navigating through FEMA Violations

~~Empowering Communities through GIS: Free Tools for Flood~~

~~Analysis and Planning~~

Local Floodplain management and FEMA

Mitchell Jensen, P.E., CFM, Kimley Horn

~~Miguel Segura, AECOM \ Eduardo Macias, AECOM~~

Rev. Bill Smith, P.E., CFM, HISINC



Michael Couch

GISP, CFM

ESRI Enterprise Administration
Professional

GIS Manager





Forge ahead.

WSB is a design and consulting firm specializing in engineering, community planning, environmental, and construction services. Our staff of over 1250 improve the way people engage with communities, transportation, infrastructure, energy and our environment. We offer services in over 50 complementary areas that seamlessly integrate planning, design and implementation. Our coast-to-coast client base is served from offices across the U.S.

We share a vision to connect your dreams for tomorrow to the needs of today – the future is ours for the making.

1500+
STAFF

50+
SERVICE AREAS

45+
OFFICES

10
STATES

Asset Management Systems | Community Planning | Construction Administration | Design-Build | Economic Development | Energy | Environmental Planning & Natural Resources | Environmental Compliance | Geographic Information Systems | Geohazard Risk Assessments | Geotechnical Engineering | Intelligent Transportation Systems | Landscape Architecture | Land Development | Management Analysis & Development | Municipal Engineering | Pavement Management/Forensics | Project Controls | Project Funding | Right of Way | Site Validation | Structures | Surveying | Transportation/Traffic | Visualization | Water Resources | Wastewater

NORMAN

480 24TH AVENUE NW
SUITE 244
NORMAN, OK 73069

OKLAHOMA CITY

615 N HUDSON AVENUE
SUITE 300
OKLAHOMA CITY, OK 73102

MOORE

201 INDUSTRIAL BLVD
MOORE, OK 73160

TULSA

~~1437 S BOULDER AVENUE~~
~~No. 1550~~
~~TULSA, OK 74119~~

TULSA

416 S UTICA AVENUE
TULSA, OK 74104



20+ GIS Staff
9 in State
6 Survey Crews



180+ Staff in State



4 GISP



3 PLS



3 UAV Pilots

LAWTON

711 SW C AVENUE
LAWTON, OK 73501

ARDMORE

1960 COOPER DRIVE
ARDMORE, OK 73401

DURANT

218 N 3RD AVENUE
DURANT, OK 7470

ANTLERS

709 SW C STREET
ANTLERS, OK 74523



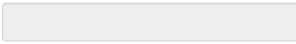
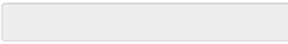




Accessing FEMA Data

- FEMA Map Service Center
 - <https://msc.fema.gov/portal/home>

FEMA Flood Map Service Center: Search All Products

Choose one of the three search options below and optionally enter a posting date range.

Jurisdiction	Jurisdiction Name	Product ID 
State OKLAHOMA 	Jurisdiction Name or FEMA ID  <small>(Ex. Fairfax County-wide or 51059C)</small>	Product ID  <small>(Ex. Panel Number, LOMC Case Number)</small>
County COTTON COUNTY 		
Community WALTERS, CITY OF 		

> Filter By Posting Date Range (Optional)

Search Clear All Fields

Search Results for WALTERS, CITY OF

Click [subscribe](#) to receive email notifications when products are updated.

Click to [download a listing](#) of all products. 

If you are a person with a disability, are blind, or have low vision, and need assistance, please contact a [map specialist](#).

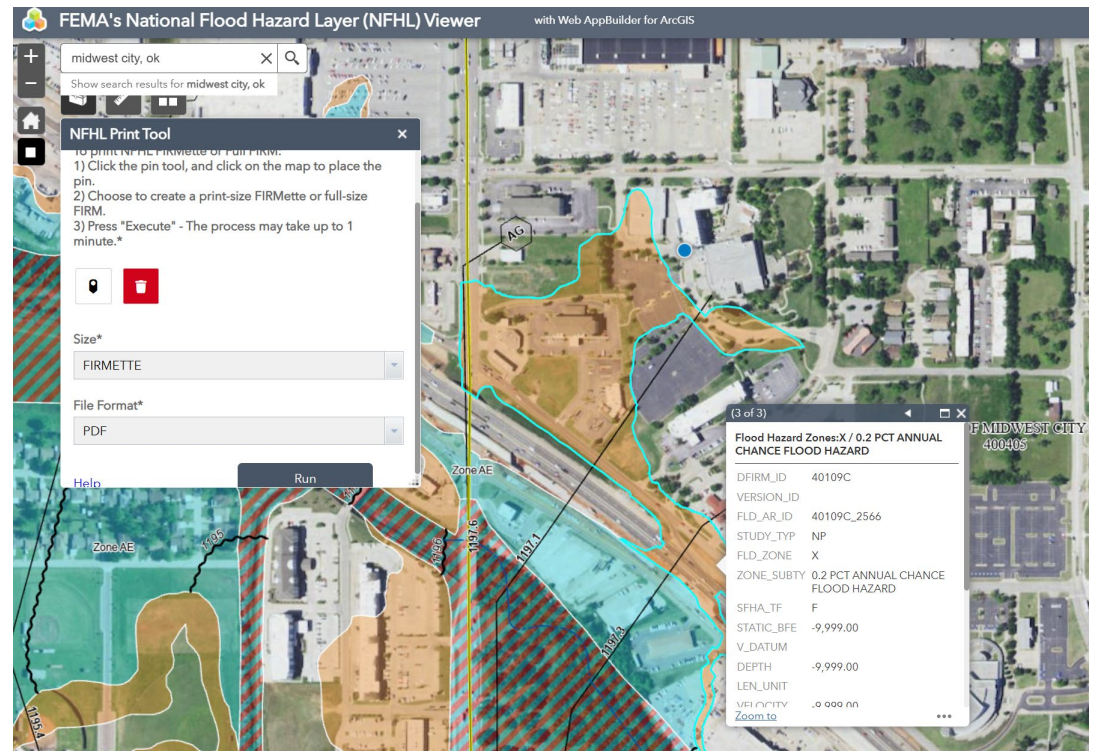
 Expand All 

 Effective Products (7) 
> FIRM Panels (3) 
> FIS Reports (1) 
> LOMC (2)
> NFHL Data-State (1)
> NFHL Data-County (0)
 Preliminary Products (0) 
 Pending Product (0) 
 Historic Products (2) 
 Flood Risk Products (0) 

Accessing FEMA Data

- FEMA National Flood Hazard Layer Viewer
 - <https://msc.fema.gov/nfhl>

*(Clipped downloadable version
also available at the Map Service Center)*



Accessing FEMA Data

- FEMA Mapping REST Services (Direct Data Link)
 - <https://hazards.fema.gov/arcgis/rest/services/public/NFHL/MapServer>
- Click any of the links under Layers, then paste the web address from the page that opens into your ArcGIS Pro (or Online, or Map)

ArcGIS REST Services Directory

[Home](#) > [services](#) > [public](#) > [NFHL \(MapServer\)](#)

[JSON](#) | [SOAP](#) | [WFS](#)

public/NFHL (MapServer)

View In: [ArcGIS JavaScript](#) [ArcGIS Online Map Viewer](#) [ArcGIS Earth](#) [ArcGIS Pro](#)

Service Description:

Map Name: NFHL

[Legend](#)

[All Layers and Tables](#)

[Dynamic Legend](#)

[Dynamic All Layers](#)

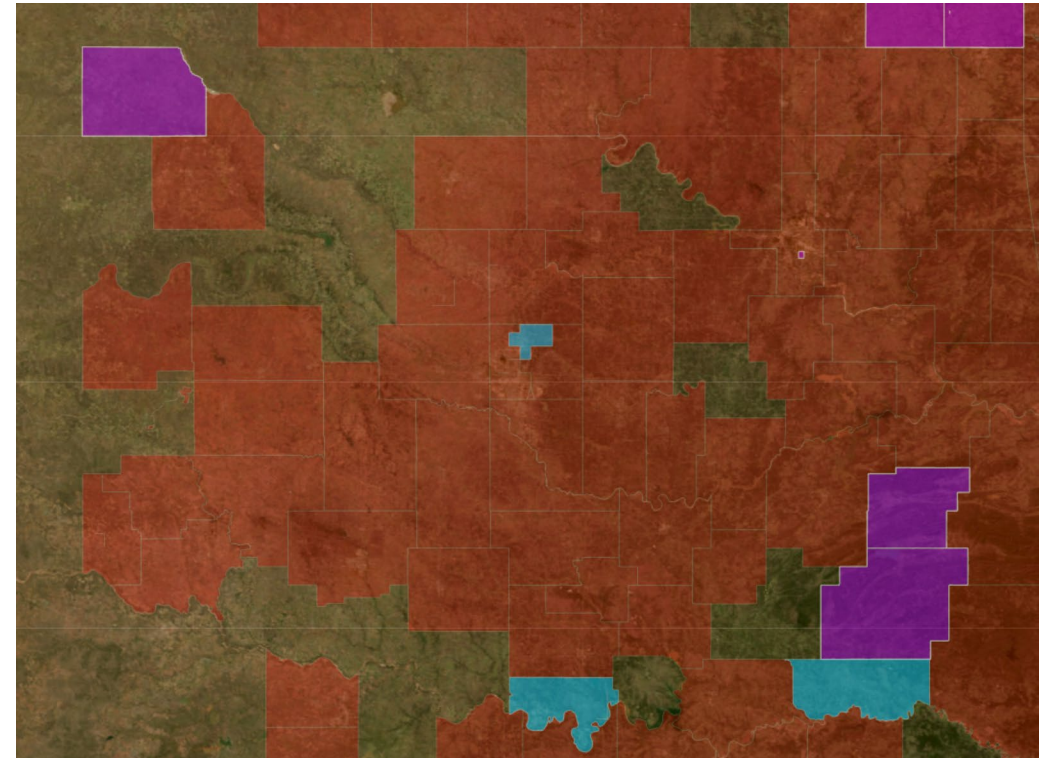
Layers:

- [NFHL Availability](#) (0)
- [FIRM Panels](#) (3)
- [LOMRs](#) (1)
- [LOMAs](#) (34)
- [Political Jurisdictions](#) (22)
- [Profile Baselines](#) (17)
- [Water Lines](#) (20)
- [Cross-Sections](#) (14)
- [Base Flood Elevations](#) (16)
- [Levees](#) (23)
- [Seclusion Boundaries](#) (29)
- [Coastal Transects](#) (15)
- [Transect Baselines](#) (18)
- [General Structures](#) (24)
- [River Mile Markers](#) (7)
- [Water Areas](#) (32)
- [PLSS](#) (5)
- [Limit of Moderate Wave Action](#) (19)
- [Flood Hazard Boundaries](#) (27)
- [Flood Hazard Zones](#) (28)

Accessing FEMA Data

FEMA Pending and Preliminary Map Changes Viewer (just Google it)

- <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=5852ea902db44e55bfce395799315f9c>
- Current Pending:
 - City of Edmond
 - Choctaw County
 - Love County
- Current Preliminary:
 - Harper County
 - Latimer County
 - Pushmataha County



In Other Words, Go Here

All the links above are available (eventually, with some reading and clicking through) via:

- <https://www.fema.gov/flood-maps/national-flood-hazard-layer>

The Only Constant is Change

Bookmark those links!

- But remember, all these can change in any website update

(Several of these have been changed in just the last 2 years)

- Web search by page name/keyword is your friend!
- But ChatGPT may not be... don't try this for floodplain administration

Recent ChatGPT-5 hallucinations of presidents:



**Jimmy
Carter**
1917-1881



**Ronald
Beagan**
1661-1888



**George V.W.
Bxar**
1888-1993



**Bill
Chirten**
1999-2001



**Gearge
W. bush**
2207-1999



**Obrack
Ofuane**
2009-1017



**Donald
Trome**
2017-2431



**Joe
Biden**
2066=

Base Level Engineering Data

- If you're in a zone not mapped as part of the FIRM process, BLE data may be your only option
- Can be reached via:
 - <https://webapps.usgs.gov/infrm/estBFE/>

The screenshot shows the FEMA Estimated Base Flood Elevation Viewer interface. The top navigation bar includes the FEMA logo, a 'Report' button, a 'Legend' button, and a 'Map Layers' button. The main content area is divided into several sections:

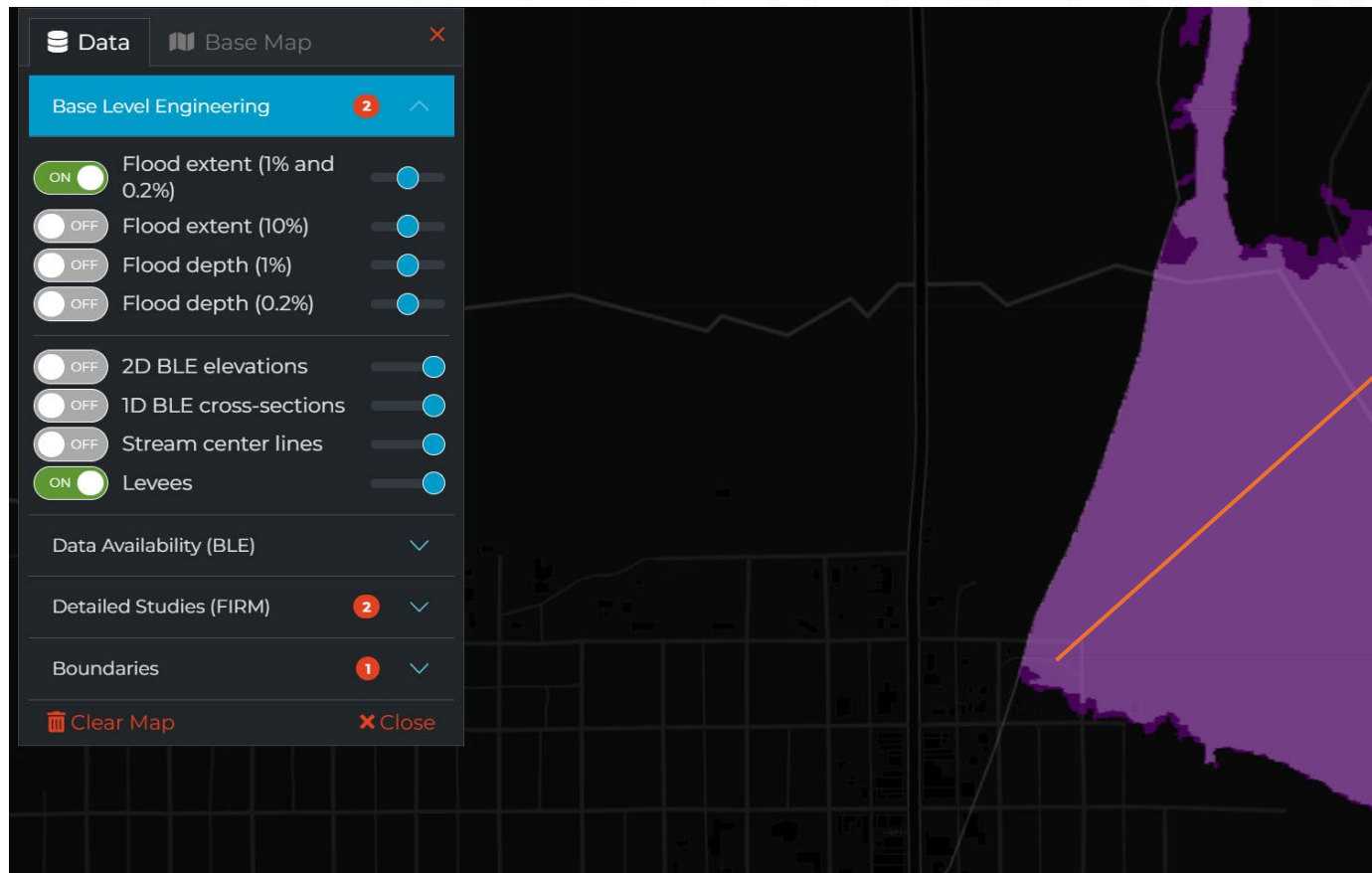
- Left Sidebar:** Contains a map of FEMA Region 6, a 'Dark Base Map' section, and a 'Data Source' link.
- Center Panel:** Displays a 'High Flood Risk' alert with a 'View Report' button and a 'Zoom' button. Below this, there are three main action buttons: 'Property Look Up', 'View Base Level Engineering Data', and 'Download Datasets & Models'.
- Right Panel:** A table listing available data files for download.

File Name	Size	Download
12030106_Models.zip	383.9 MB	Download
12030106_Depth01.zip	82.8 MB	Download
12030106_Depth002.zip	91.3 MB	Download
12030106_Elev01.zip	19.5 MB	Download
12030106_Elev002.zip	20.1 MB	Download
12030106_VectorData.zip	263.7 MB	Download

At the bottom of the interface, there are buttons for 'Quick Start', 'Change Area', 'History', and 'About', along with a 'Dark mode' toggle.

Base Level Engineering Data

- Property Lookup Option (Flood Risk Report)



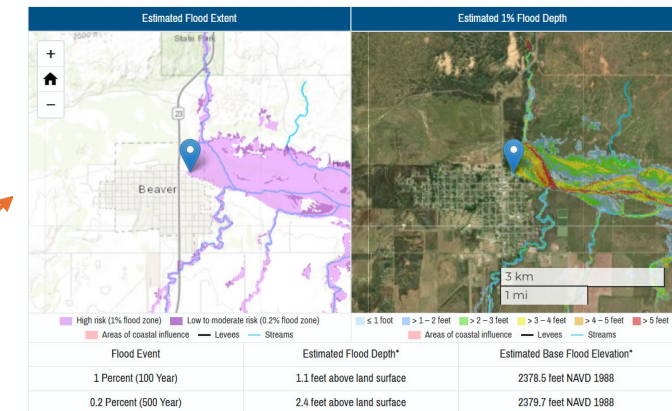
Estimated Base Flood Elevation (estBFE)

Flood Risk Information Report

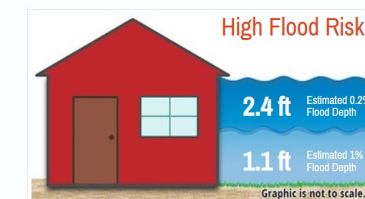


Latitude 36.8180, Longitude -100.5174 (Beaver County, OK)

FEMA is providing a look at flood data availability and relative Base Level Engineering analysis through the Estimated Base Flood Elevation Viewer (Estimated BFE Viewer). Base Level Engineering uses high resolution ground elevation data, flood flow calculations, and fundamental engineering modeling techniques to define flood extents for streams. The viewer is an effective tool for property owners, community officials, and land developers to identify flood risk, estimated flood elevations, and flood depths for watersheds where Base Level Engineering has been prepared.

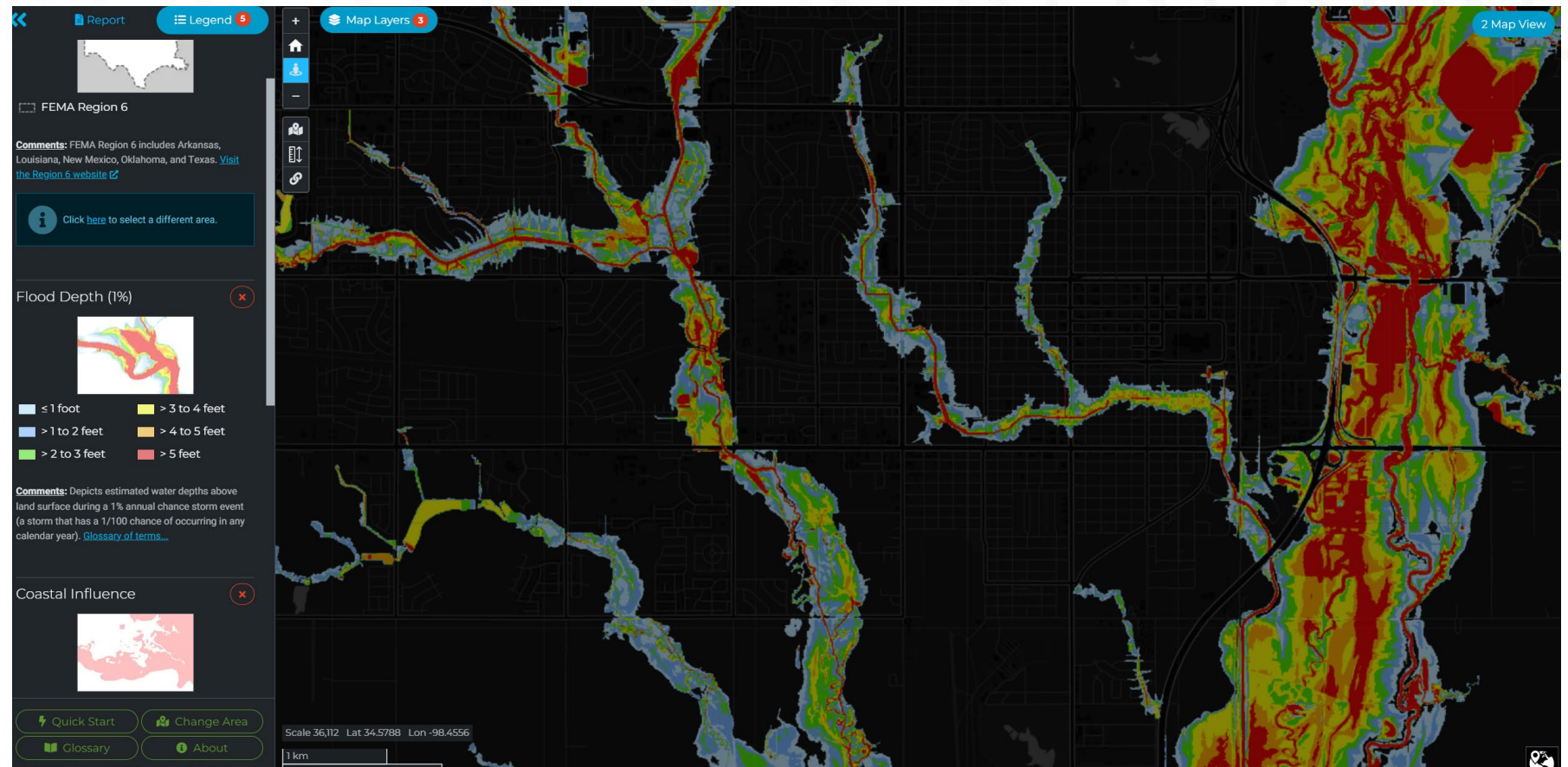


* The information included in this report is based on the location marker shown in the map. Results are not considered an official determination.



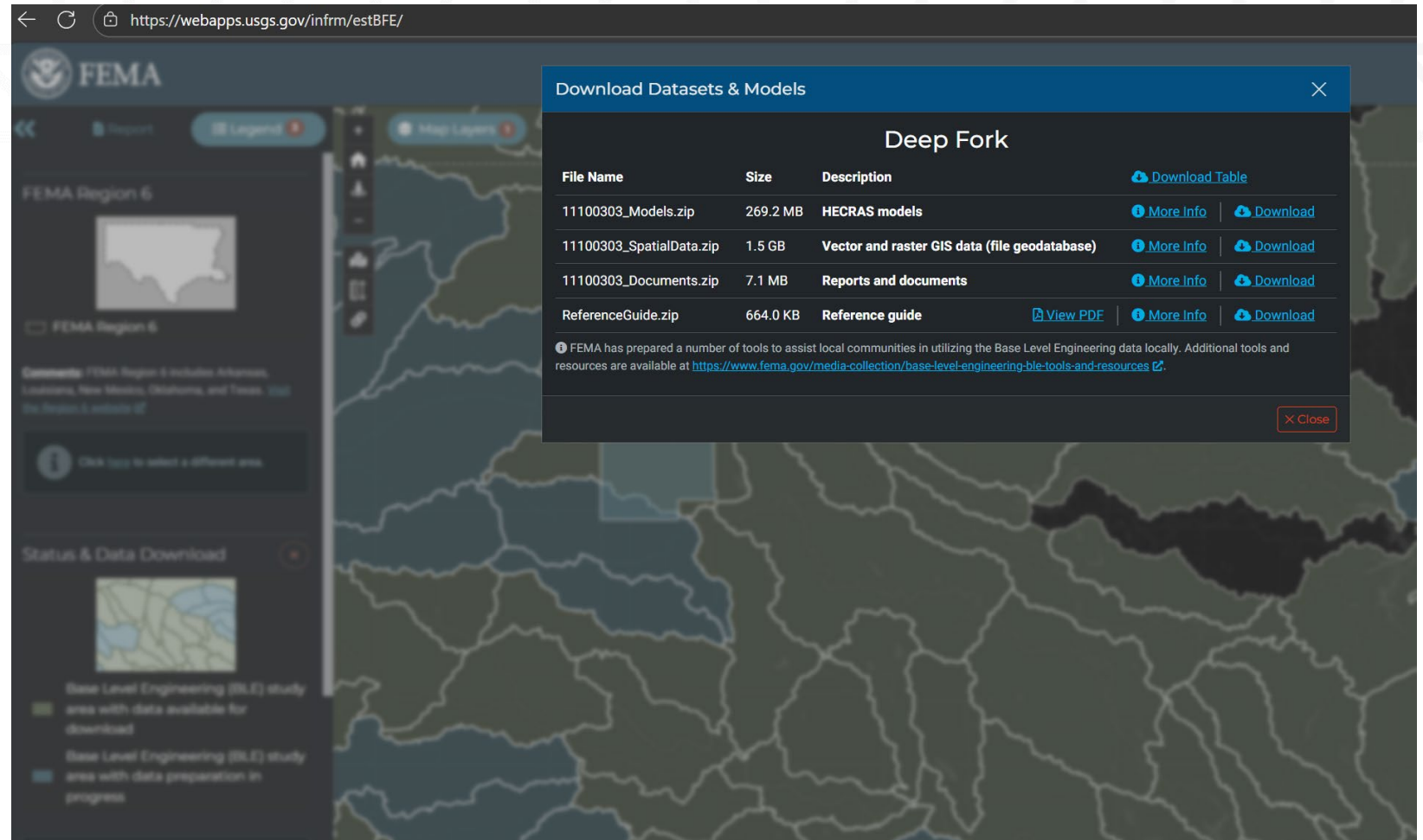
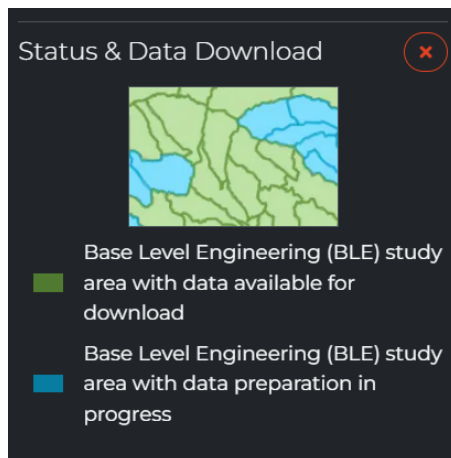
Base Level Engineering Data

- View Option
 - Shows BLE Depths

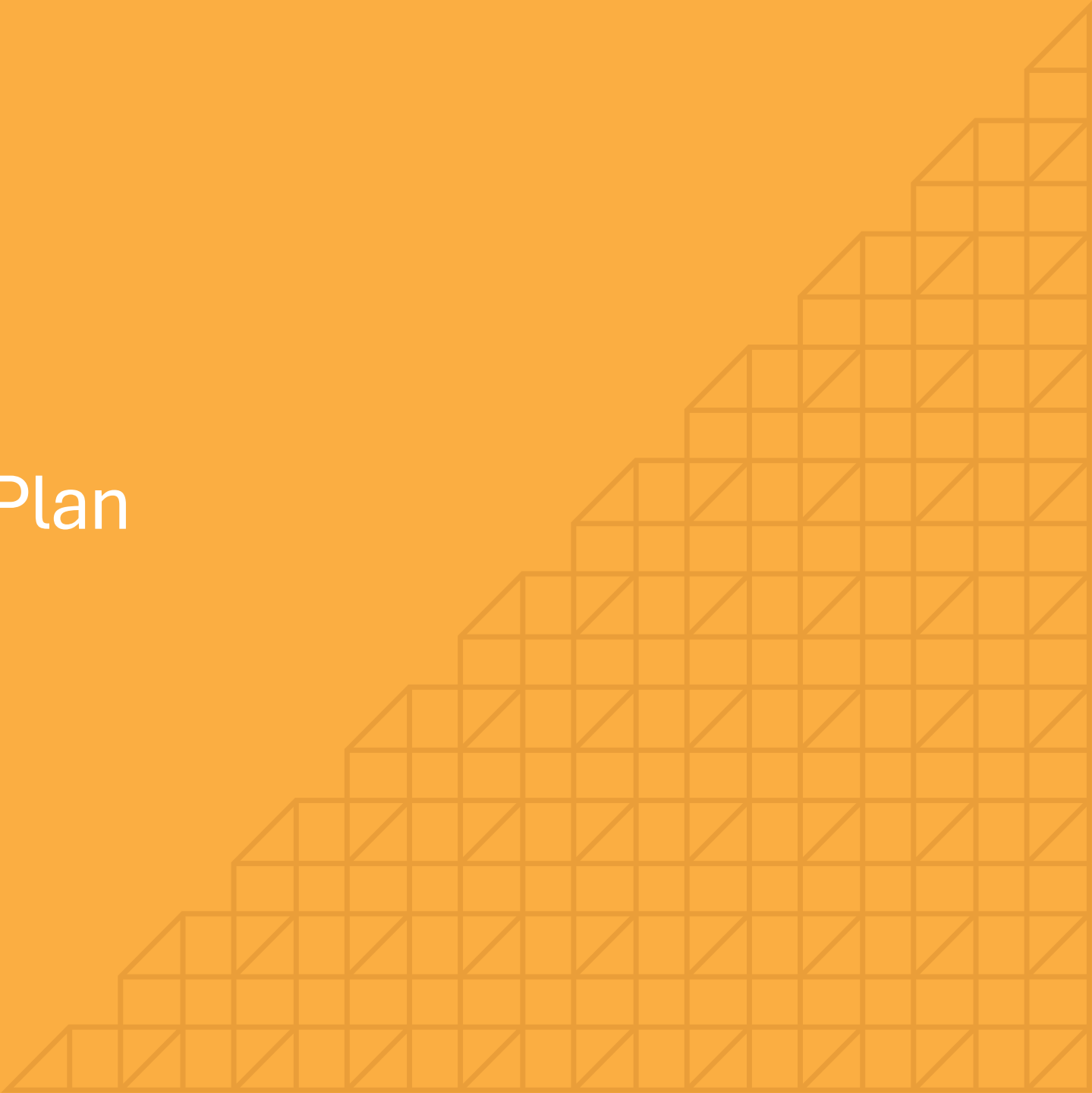


Base Level Engineering Data

- Download Option
 - Direct Download of HEC-RAS models, GIS data, reports
- Organized by HUC basins



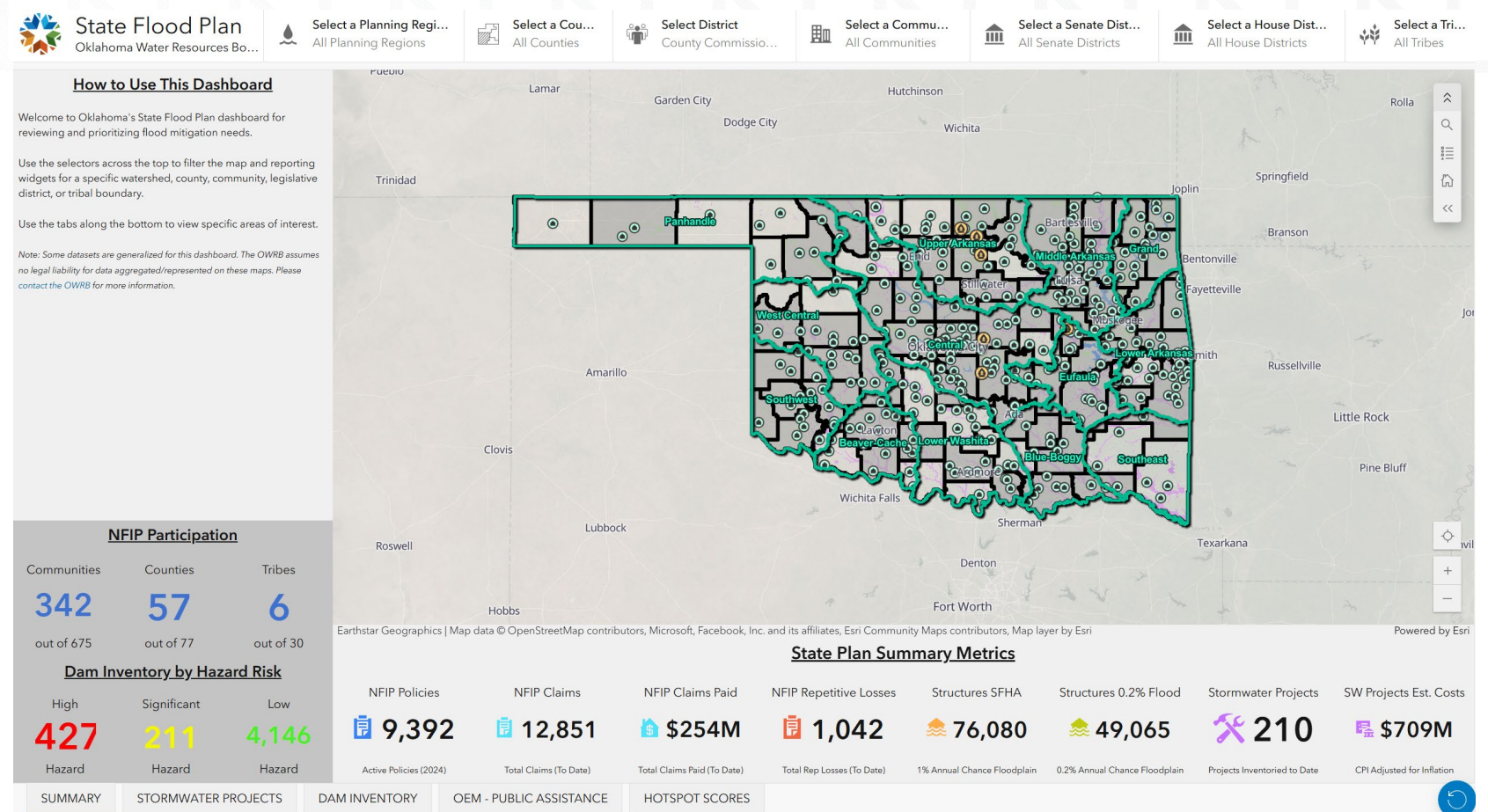
Oklahoma State Flood Plan



Oklahoma State Flood Plan

- Produced by OWRB, FNI, Meshek (now WSB)
 - <https://www.arcgis.com/apps/dashboards/08fca9fea74a4a6a96e14a1caf40c695>

- Includes reporting on NFIP data (claims, policies, repetitive loss) plus structures, projects, dams, and public assistance \$
- Filterable by several community based toggles
- Combines DFIRM and BLE into a single layer



Conclusion

- When in doubt, reach out to OWRB....
- Or other friendly neighborhood FPAs from OFMA



PS

- Nothing is Free!
- All these great “free” datasets are paid for by tax dollars and kept online by government employees





THANK YOU