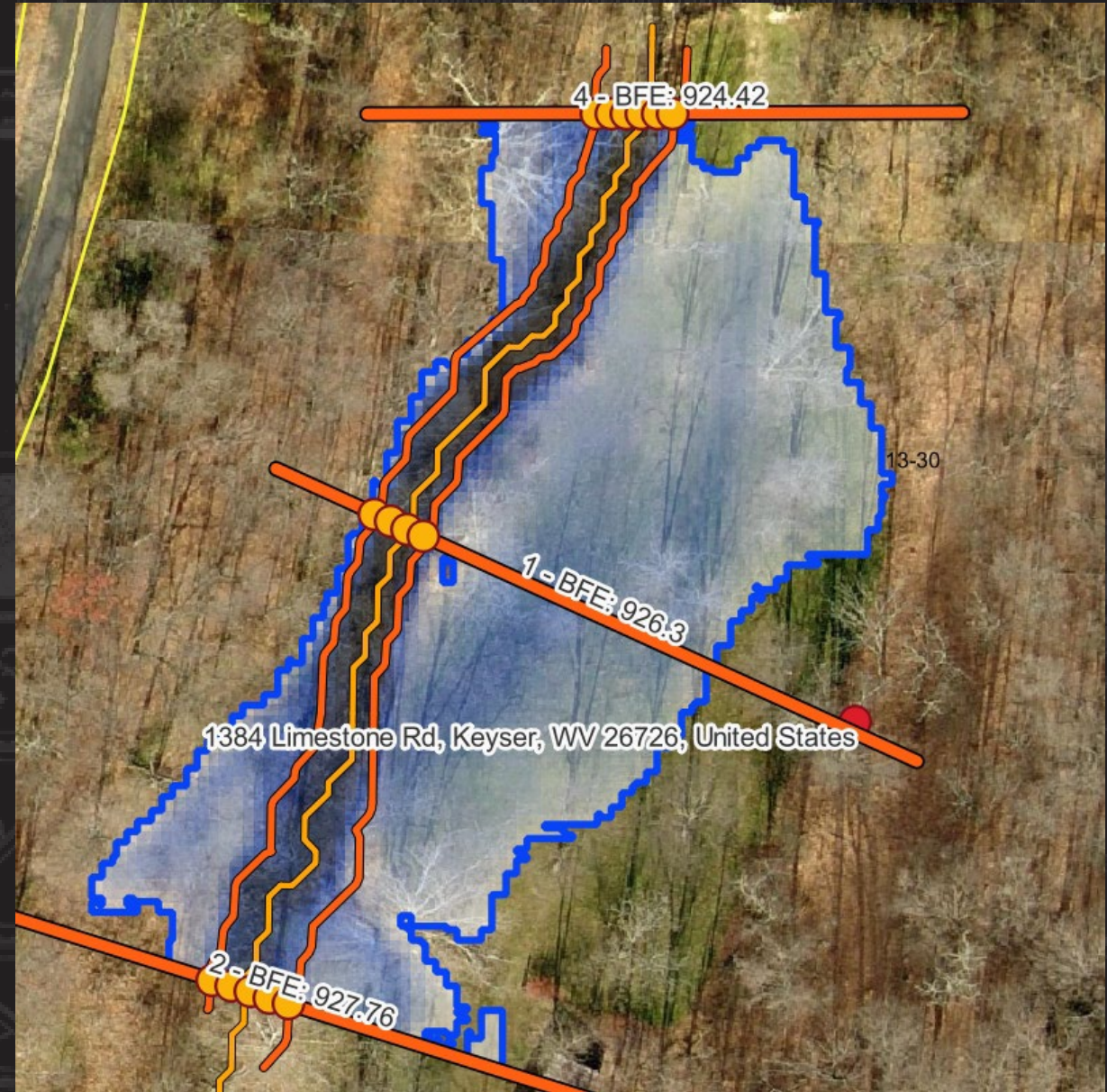


GIS IN SUPPORT OF DIGITAL FLOOD RISK MAPPING

15 MAY 2023

Joe Trimboli, MSc, GIS-SME
Huntington District
Planning Branch
Plan Formulation



U.S. ARMY



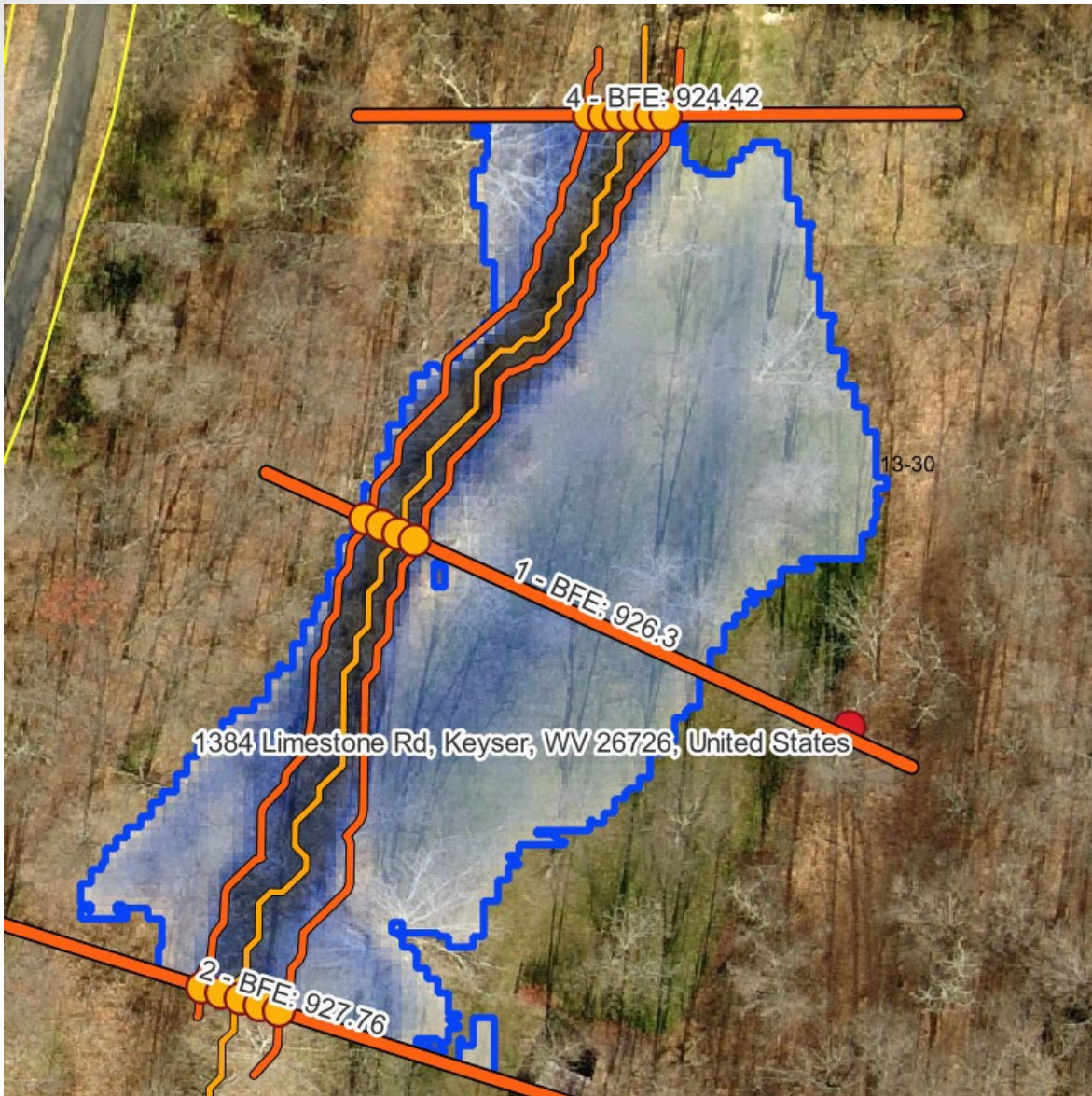
US Army Corps
of Engineers®



HUNTINGTON DISTRICT BFE PROGRAM

- The Huntington District Base Flood Elevation (BFE) program has developed over time in Planning Branch and resulted from outreach in support of the State of West Virginia. The earliest BFE request database is dated **May 2006** and represents 17 years of development in a multi-agency environment. The **West Virginia NFIP Coordinator** requested a Zone A BFE solution meeting NFIP requirements. A previous study comparing **FEMA Quick2 and HEC-RAS** conducted by the state and used in initial discussions.
- **FEMA 265** – “Managing Floodplain Development in approximate Zone A Areas (April 1995)” documents a FEMA approved process as well as a user manual for the associated DOS based version of **Quick2**
- A review of FEMA 265 shows **manual methods of mapping**, explains, different methods of determining risk, and describes a minimum acceptable method of determining BFE’s in Zone A’s using Quick2.
 1. Floodplain **Geometry** (topography/DEM/LiDAR)
 2. Flood **Discharge** and/or volume (hydrology)
 3. Flood **Height** (hydraulics)

CURRENT STATUS



Current Status

- BFE requests are part of a Huntington District outreach program authorized under **Floodplain Management Services (FPMS)**
- There is a **charge to private entities** based on a program table of charges for compiling information that takes less than a day (\$125, unless additional work is required)
- Floodplain Managers (FPM) and other public entities are **coordinating partners** and are not charged for services
- The **example graphic** shows an FPM request for new construction that includes a floodway, depth grid, inundation limit, and cross sections with BFE results. Not shown is an interpolated raster layer of the BFE surface.

PROGRAM IMPROVEMENT

Process Validation and Review

- Establishing an **annual review** with District H&H Section
 - Overall process **approval**
 - Annual check of **random locations**
- Planning Branch review done when the invoice is emailed to requesting individual
 - **Integrated** into database process
 - Includes initial training for **GIS mentoring** (data review)

Database Transition

- Microsoft Access **database conversion** to SQL/React (java based)
- Current status: Pre-Production
- **No BFE process** without Quick Response Database

FEMA 256 - Managing Floodplains | FPMS

https://fpms-staging.lrh.usace.army.mil/requests

FPMSdb

Requests + ADD

Request Contacts

Office POCs

URL Maps

Seed Files

Seed Folders



Contact Types

Request Types


Settings

Requests

Search

GUID	Date in ↓	Date out	Contact	Office Contact	Type	Reviewed	Map Image
2304-1808-5415	4/18/2023		Hafer, Joshua R	Trimboli, Joseph K	BFE-GIS	×	
2304-1713-4630	4/17/2023		Converse, Ed	Trimboli, Joseph K	BFE-GIS	×	
2304-1314-0942	4/13/2023		Converse, Ed	Trimboli, Joseph K	BFE-GIS	×	
2303-3015-0454	3/30/2023		Gunnoe, William	Trimboli, Joseph K	BFE-GIS	×	
2303-3014-0039	3/30/2023		Comee, Kelly	Trimboli, Joseph K	BFE-GIS	×	
2301-2409-5640	1/24/2023	1/24/2023	Shepp, Philip	Trimboli, Joseph K	BFE-GIS	×	
2301-2412-4002	1/24/2023	1/31/2023	Converse, Ed	Trimboli, Joseph K	BFE-GIS	×	
2301-2013-3331	1/20/2023		Martin, Evelin	Trimboli, Joseph K	BFE-GIS	×	
2301-0907-4609	1/9/2023	1/9/2023	Rawe, Aaron	Trimboli, Joseph K	BFE-GIS	×	
2301-0409-0129	1/4/2023	1/4/2023	Eastham, Jeff	Trimboli, Joseph K	BFE-GIS	×	
2210-2707-5940	10/27/2022	10/27/2022	Christian, Donnie	Trimboli, Joseph K	BFE-GIS	×	

1-11 of 11



Windows Taskbar: Type here to search | 61°F Cloudy | 1:42 PM 4/27/2023

FPMSdb

- Requests
- Request Contacts
- Office POCs
- URL Maps
- Seed Files
- Seed Folders
- Contact Types
- Request Types
- Settings

← REQUESTS
ACTIONS

2304-1808-5415

CALL LOG
MAP REFERENCE
STATUS NOTES
REFERENCES

ID: 2304-1808-5415

Office POC: **Trimboli, Joseph K**

Contact Name: **Hafer, Joshua R**

Contact Type: Private

Location: 435 13th Ave, Huntington, WV 25701, United States

Latitude (Y): 38.40683651736896

Address: 435 13th Ave

Date In: 04/18/2023

Date Out:

Phone: 304-710-7627

Request Type: BFE-GIS

Longitude (X): -82.44824943547742

City: Southside

Exception: None noted

State: WV

Zip: 25701

County: Cabell Co.

Letter Requested
 Invoice Sent
 Check Received
 Reviewed
 Complete

Amount: \$ 125

GOOGLE REPORT
DAY REPORT
EXAMPLES

Request Notes

BFE 598.84
GND 589.69

waiting on survey

Response

Windows taskbar: Type here to search | 63°F Cloudy | 1:44 PM 4/27/2023

FEMA 256 - Managing Floodplains | FPMS

https://fpms-staging.lrh.usace.army.mil/requests/4357

FPMSdb

- Requests
- Request Contacts
- Office POCs
- URL Maps
- Seed Files
- Seed Folders
- Contact Types
- Request Types
- Settings

← REQUESTS

2304-1808-5415 ACTIONS

CALL LOG MAP REFERENCE STATUS NOTES REFERENCES

ID: 2304-1808-5415 | Date In: 04/18/2023 | Date Out: []

Office POC: Trimboli, Joseph K

Seed Files and Path Copy

Letter Requested Invoice Sent Check Received Reviewed Complete | Amount: \$ 125

Contact Name: Hafer, Joshua R | Phone: 304-710-7627 | Ext: [] | Contact Email: Joshua.R.Hafer@usace.army.mil

Contact Type: Private | Request Type: BFE-GIS

Location: 435 13th Ave, Huntington, WV 25701, United States | Exception: None noted

Latitude (Y): 38.40683651736896 | Longitude (X): -82.44824943547742

Address: 435 13th Ave | City: Southside | State: WV | Zip: 25701 | County: Cabell Co.

Request Notes: BFE 598.84
GND 589.69
waiting on survey

Response

GOOGLE REPORT DAY REPORT EXAMPLES

Windows Taskbar: Type here to search | 63°F Cloudy | 1:44 PM 4/27/2023

FPMSdb

- Requests
- Request Contacts
- Office POCs
- URL Maps
- Seed Files
- Seed Folders
- Contact Types
- Request Types
- Settings

← REQUESTS
ACTIONS

2304-1808-5415

CALL LOG
MAP REFERENCE
STATUS NOTES
REFERENCES

ID: 2304-1808-5415

Office POC: **Trimboli, Joseph K**

Contact Name: **Hafer, Joshua R**

Contact Type: Private

Location: 435 13th Ave, Huntington, WV 25701, United States

Latitude (Y): 38.40683651736896

Address: 435 13th Ave

Request Notes:
BFE 598.84
GND 589.69
waiting on survey

Date In: 04/18/2023

Phone: 304-710-7627

Request Type: BFE-GIS

Longitude (X): -82.44824943547742

City: Southside

Response

Date Out:

Ext:

Contact Email: Joshua.R.Hafer@usace.army.mil

Exception: None noted

State: WV

Zip: 25701

County: Cabell Co.

Generate Report

Letter Requested
 Invoice Sent
 Check Received
 Reviewed
 Complete
 Amount: \$ 125

[GOOGLE REPORT](#)

[DAY REPORT](#)

[EXA](#)

- Official FEMA Hazard Map
- FEMA Map Service Center
- ArcGIS Online FPMS
- WV Flood Tool
- KY Flood Tool
- USGS Elevation Data
- USGS StreamStats
- NOAA Normal Depth Calculator
- GRID Geospatial Repository
- NRCS Bounding GIS Order
- US Fish & Wildlife - Wetlands
- National Geodetic Survey Data Explorer
- Google Maps
- Bing Maps
- USGS DEM Download
- WVDEP Lidar
- OH DEM Download
- KY DEM Download
- Huntington District Fact Sheets

Windows taskbar: Type here to search | 63°F Cloudy | 1:47 PM 4/27/2023



FEMA 256 - Managing Floodplains | FPMS | <https://fpms-staging.lrh.usace.army.mil/url-maps>

FPMSdb

- Requests
- Request Contacts
- Office POCs
- URL Maps**
- Seed Files
- Seed Folders
- Contact Types
- Request Types
- Settings

URL Maps

[+ ADD](#)

Name	Description	Url	Position ↑
Offical FEMA Hazard Map	Passes coordinates from request for location reference	https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb...	1
FEMA Map Service Center	Passes coordinates from request for location reference	https://msc.fema.gov/portal/search?AddressQuery=(LONGITUDE),(LATITUDE)	2
ArcGIS Online FPMS	Passes coordinates - maintained by LRH-PMD	http://www.arcgis.com/home/webmap/viewer.html?webmap=ec9b704cd4774170a...	3
WV Flood Tool	Passes coordinates from request for location reference	http://www.mapwv.gov/flood/map/?wkid=4326&x=(LONGITUDE)&y=(LATITUDE)&l...	4
KY Flood Tool	Geospatial reference	https://watermaps.ky.gov/RiskPortal/	5
USGS Elevation Data	Passes coordinates from request for location reference	http://viewer.nationalmap.gov/viewer/?p=default&b=base1&q=(LATITUDE)%2C(LON...	6
USGS StreamStats	Geospatial reference for discharge information	https://streamstats.usgs.gov/ss/	7
NOAA Normal Depth Calculator	Online BFE style calculator and reference	https://www.weather.gov/aprfo/NormalDepthCalc	8
GRID Geospatial Repository	Maintained by National Geospatial - Intelligence Agency	https://rsgis.erdc.dren.mil/griduc/export/coord/add/	9
NRCS Bounding GIS Order	Watershed data download	https://datagateway.nrcs.usda.gov/GDGOOrder.aspx?order=MBROrder	10
US Fish & Wildlife - Wetlands	Geospatial reference	http://www.arcgis.com/home/webmap/viewer.html?url=http%3A%2F%2F107.20.22...	11
National Geodetic Survey Data Explorer	Geospatial reference	http://www.ngs.noaa.gov/NGSDataExplorer/	12
Google Maps	Passes coordinates from request for location reference	http://maps.google.com/maps?f=q=https%2F%2Fhazards.fema.gov%2Ffemaportal...	13
Bing Maps	Passes coordinates from request for location reference	http://www.bing.com/maps/?lvi=18&style=h&cp=(LATITUDE)~(LONGITUDE)&where...	14
USGS DEM Download	Geospatial reference	https://apps.nationalmap.gov/downloader/	15
WVDEP Lidar	WV LIDAR	ftp://ftp.wvgis.wvu.edu/pub/Clearinghouse/Elevation/QL2Lidar/2_CountyBundles_Q...	16
OH DEM Download	Web app to download DEM data in Ohio	http://gis5.oit.ohio.gov/geodatadownload/	17
KY DEM Download	Web app to download DEM data in Kentucky	http://kyfromabove.ky.gov/datasets/kentucky-elevation-data-5ft-dem	18
Huntington District Fact Sheets	Internal link to District projects	https://myko.lrh.usace.army.mil/teams/pcr/district_fact_sheet/	19

Rows per page: 25 | 1-19 of 19



REPORT EXAMPLE



US Army Corps
of Engineers.

HUNTINGTON DISTRICT, US ARMY CORPS OF ENGINEERS FLOODPLAIN MANAGEMENT SERVICES

502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701
1-866-401-3980 Email: fpms-lrh@usace.army.mil
01 November 2022 12:59:14 PM

ID:	2211-0108-1243	DATE IN:	11/1/2022	DATE OUT:	11/1/2022
CONTACT:	Michael Ash	STATE:	WV		
INTEREST:	Professional Surveyor	COUNTY:	Upshur		
PHONE:	(304) 476-8668	LAT:	39.06515		
REQUEST:	Base Flood Elevation - GIS	LON:	-80.19508		
LOCATION:	83 Hackers Creek Rd, Buckhannon, WV 26201				
EXCEPTION:	Large Area Zone A BFE				

RESPONSE

ISSUED BFE:
1416.8 EL FT (NAVD88)

CALCULATIONS:

Digital Elevation Models: When a digital elevation model (DEM) is used to calculate a BFE, it is typically downloaded from a state or federal web site. The most current DEM data is used to insure it matches the accuracy of the current regulatory DFRM. If the file is in meters it is converted to feet by multiplying the DEM values by 3.2808399.

DEM Source - WVGISTC: WV -
DEM_Mosaic_WV_Statewide_1m_UTM17_p2021

Two cross sections were used to create a BFE surface across the property. USGS NSS peak flow statistics were used and were referenced from the Central Mountain Region with the following values:

ID	Basin Area	Slope	MN-L	MN-C	MN-R	Discharge	WS_EL
1	3.88	0.0073	0.080	0.040	0.080	879	1416.91
2	0.38	0.0116	0.080	0.040	0.120	137	1421.23

This request fell between cross sections 1 and 2 at the coordinates referenced above with a BFE of 1416.84

This information meets FEMA minimum requirements for Zone A's but can be more accurate if a ground survey is performed and/or an engineer consulted.

This letter reflects FEMA National Flood Insurance Program standards. It is



US Army Corps
of Engineers.

HUNTINGTON DISTRICT, US ARMY CORPS OF ENGINEERS FLOODPLAIN MANAGEMENT SERVICES

502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701
1-866-401-3980 Email: fpms-lrh@usace.army.mil
01 November 2022 12:59:14 PM



Measured results based on cross section calculations at the requested site. The heavy orange lines show the calculated BFE elevation references while the lighter orange lines are interpolated at one foot increments. The red dot is the coordinate location for the issued BFE.



GIS PROJECT TEMPLATE

qGIS_Seed - QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh MMQGIS Processing Help

Layers

- BEE
- Location
 - XS_points_US
 - XS_points
 - interpolation
 - depth
- Inundation_Contours
 - XS2
- Inundation
 - globalwatershed
 - globalwatershed
- FPMSLog
- NRCS_DEM_Index
 - DEM_Index
 - contours
 - WVParcels
 - spcsz83
- Administrative Boundaries
 - WVCA_713(a)_Current
 - Counties_WV
 - Counties_KY
 - Counties_OH
 - Counties_VA
 - Projects_201909060843-Projects
 - Projects_20140122
 - Projects_20180619
 - USACE_Civil_Works_Districts
 - WV_DATUM_Conversion
 - WV_DATUM_by_County
- Hydro References
 - FPMS_MN
 - Crippen and Bue Regions
 - WV_NSS_Map_QGIS_20180627
 - WV_Landslide_Hazard_Susceptibility
 - WV Flood Depth (HEC_RAS)
- FEMA NFHL
 - Flood Hazard Boundaries
 - Flood Hazard Zones
- DEM Download
 - VA - Download Tile Grid
 - KY - KYAPED 5 Foot DEM Tile Index
 - WV - DEM_Mosaic_WV_Statewide_1m_UTM17_p2021
 - DEM_FT
- Base Maps
 - WV Statewide 4"
 - OSM Standard
 - Wikimedia Map
 - ESRI Topo
 - OpenTopoMap
 - USGS Topo
 - Google Terrain
 - Google Maps
 - Google Satellite
 - Google Satellite Hybrid
 - Bing maps

Processing Toolbox

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL
- GRASS
- Lat Lon tools
- Models
 - BFE
 - Basin SQ MI
 - Contours
 - DEM M -> FT Ext + Contours
 - Interpolate XS
 - Inundation
 - Point Z Values
 - XS_40pts
 - NOAA
 - QNEAT3
 - QNEAT3 - Qgis Network
 - SAGA
 - WhiteboxTools

88 Maskers Creek Rd, Burkhannon, WV 26201

Coordinate: -80.1946, 39.0649 | Scale: 1:606 | Magnifier: 100% | Rotation: 0.0° | Render: EPSG:5070

Type here to search

3:18 PM 4/27/2023

QGIS DWG EXAMPLE

The screenshot displays the QGIS desktop environment. The main window shows a map of an area with flood hazard overlays. A red area is labeled "Zone AE BFE=1415" and a blue area is labeled "63 Brushy Fork Rd, Buckhannon, WV 26201". The map is overlaid with a grid of elevation values. The interface includes a menu bar at the top, a toolbar with various icons, a Layers panel on the left, and a Processing Toolbox on the right. The status bar at the bottom shows the coordinate (-80.2541, 38.9968), scale (1:2053), and date (4/27/2023).

Layers Panel:

- Elevation_Calc_Results_vector2
- Elevation_Calc_Results_vector
- Basin01
- Elevations_Calc_Results
- Elevations
- spot_elevations_3d
- spot_elevations
- XS
- Cantours2
- Cantours
- Location
- FPMSLogBFES
- NRCS_DEM_Index
- DEM Index
- Administrative Boundaries
 - Counties_WV
 - Counties_KY
 - Counties_OH
 - Counties_VA
- Projects_201909060843-Projects
- Projects_20140122
- Projects_20180619
- USACE_Civil_Works_Districts
- Hydro References
- ManningsN
- NLCD_2016_Land_Cover_L48
- Crippen and Bue Regions
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)
- WV_NISS_Map_QGIS_20180627
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)
- WV_flood_Depth (HEC_RAS)
- DEM
- ned19_n39x00_w080x25_wv_statewide_2003f1
- ned19_n39x00_w080x50_wv_statewide_2003f1
- ned19_n39x25_w080x25_wv_statewide_2003f1
- ned19_n39x25_w080x50_wv_statewide_2003f1
- S_BFE
- S_XS
- S_FLD_HAZ_AR
 - A
 - AE
 - X
- Buckhannon_HH_83wvs
- Buckhannon_HH_83wvs SPOT_TEXT
- Upshur_Flood_Plan_Fill_2016_83wvs
- Upshur_Flood_Plan_Fill_2016_83wvs CONTOUR_TEXT
- Upshur_Flood_Plan_Fill_2016_83wvs SPOT_TEXT
- Base Maps
 - WV Statewide 4"
 - OSM Standard
 - Wikimedia Map
 - ESRI Topo
 - OpenTopoMap
 - USGS Topo
 - Google Terrain
 - Google Maps
 - Google Satellite
 - Google Satellite Hybrid
 - Bing maps

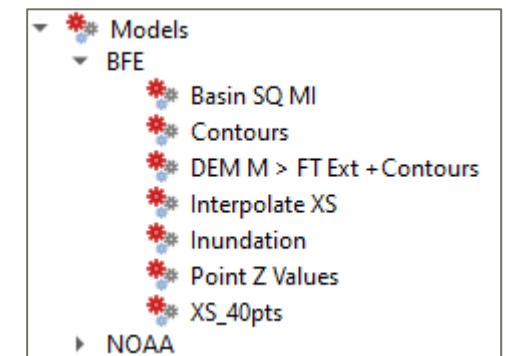
Processing Toolbox:

- Recently used
- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GOAL
- GRASS
- Lat Lon tools
- Models
- QNEAT3 - Qgis Network Analysis Toolbox
- SAGA
- Whitebox Tools

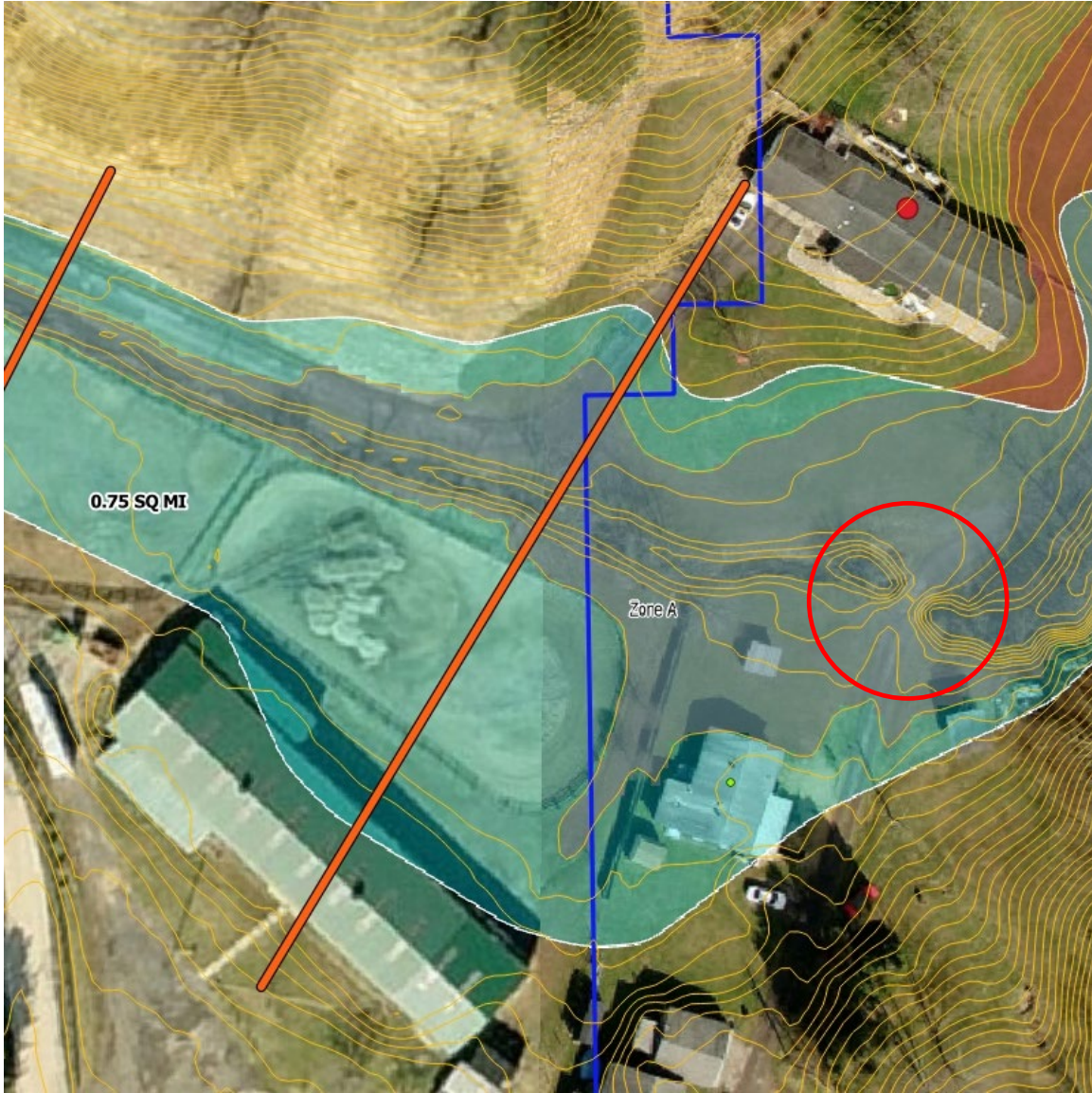
 **GIS TOOLS**

GIS Functionality not software specific

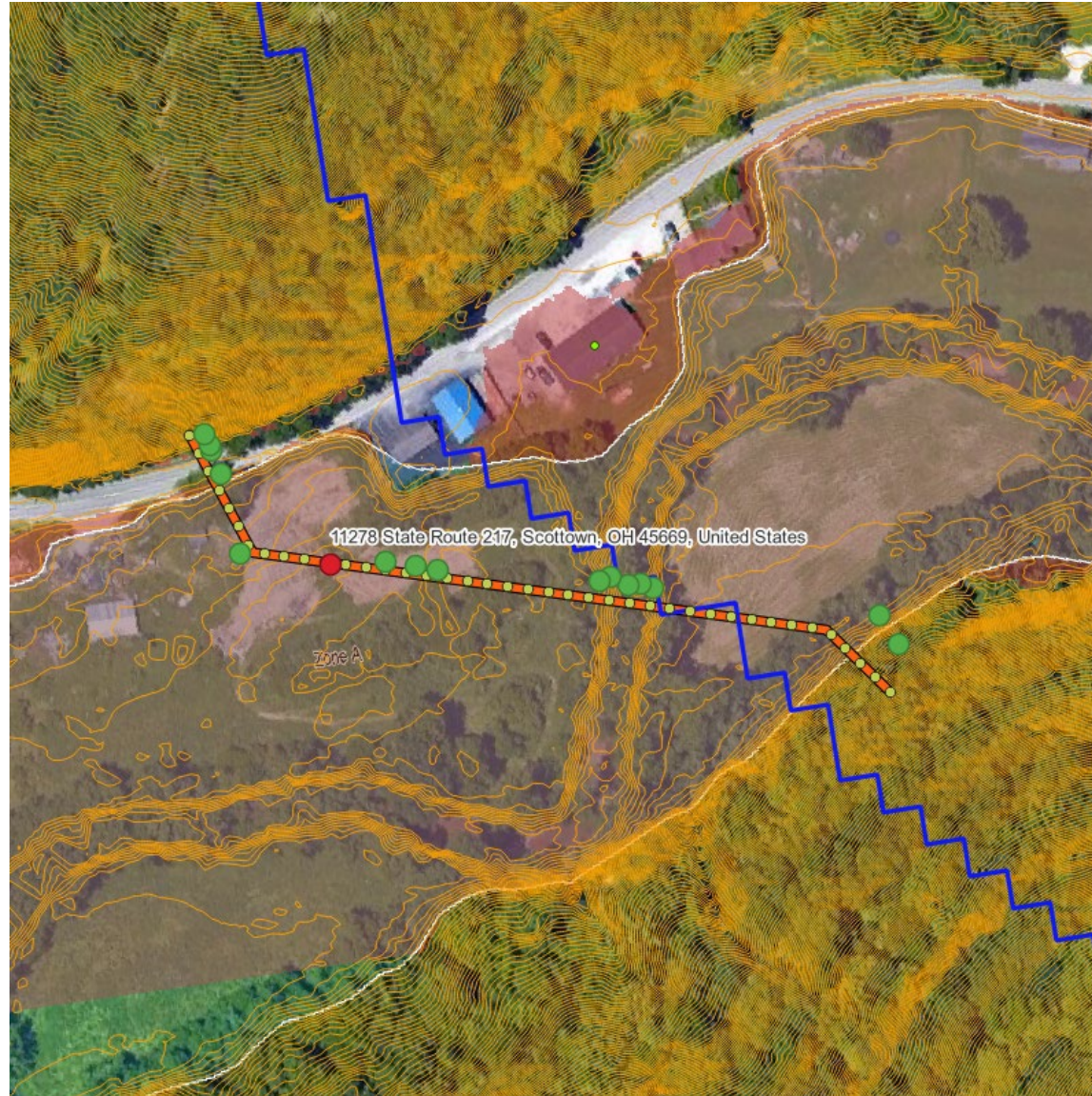
- Process has been used in training with
 - ESRI ArcMap – 3 day, 4 hours a day workshop
 - AutoCAD – QA with surveyor interested in duplicating the process
- **Tools developed** specifically for QGIS
 - Contours, Interpolate XS, Inundation, Point Z Values, and XS_40pts
 - Tools automate repetitive GIS functionality – easily created
 - Fayette County, OH, used an ESRI Toolbox designed for Biologist



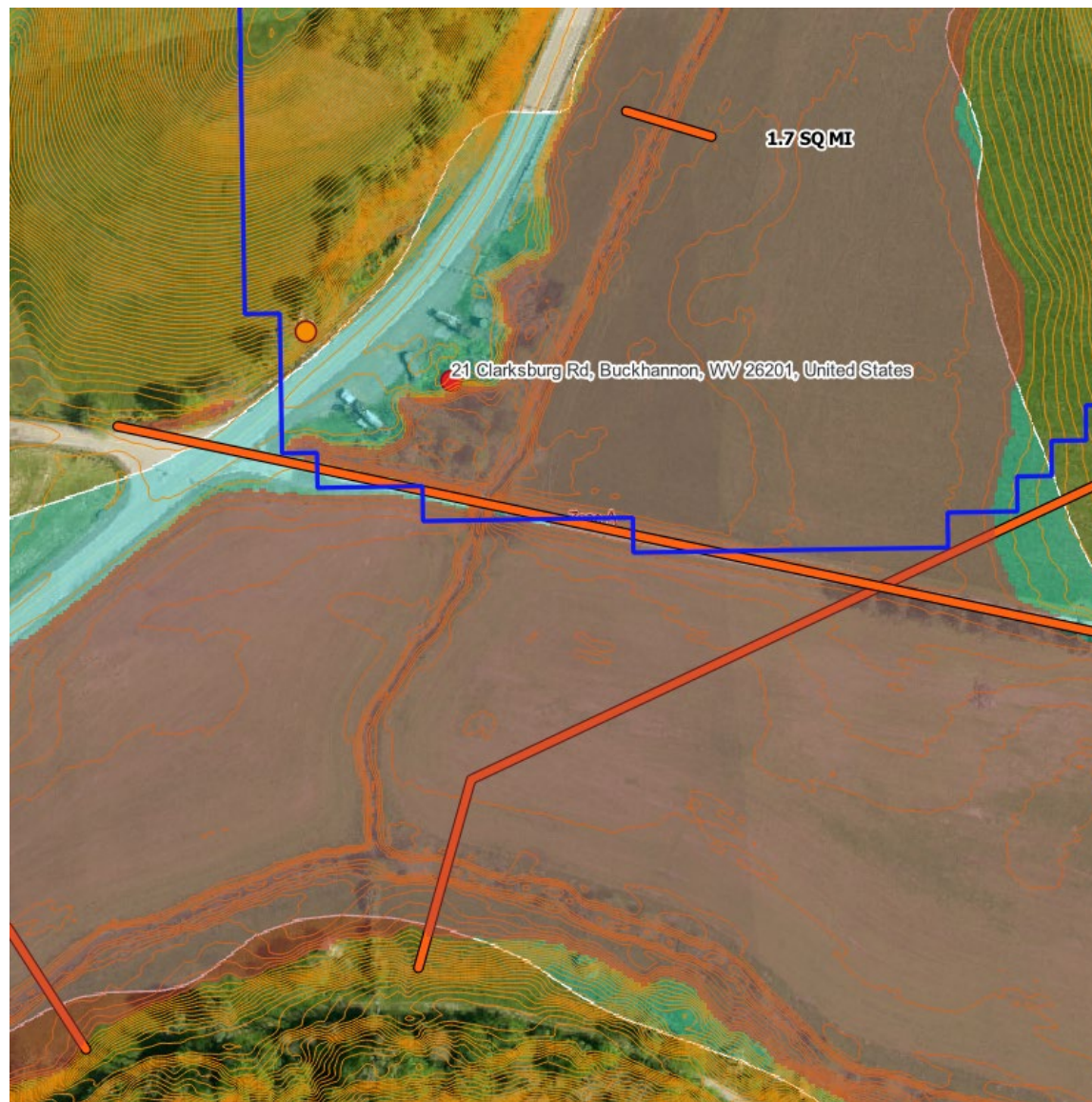
CONTOURS (DEM ASSESSMENT)



CONTOURS (CROSS SECTION PLACEMENT)



CONTOURS (BACKWATER ID)



INTERPOLATE XS & INUNDATION



POINT Z VALUES & XS_40PTS





WV STATEWIDE 1M DEM

Model Designer - DEM M > FT Ext +Contours

Model Edit View

Algorithms

Search...

- Cartography
- Database
- File tools
- GPS
- Interpolation
- Layer tools
- Mesh
- Modeler tools
- Network analysis
- Plots
- Raster analysis
- Raster creation
- Raster terrain analysis
- Raster tools
- Vector analysis
- Vector creation
- Vector general
- Vector geometry
- Vector overlay
- Vector selection
- Vector table
- Vector tiles
- GDAL

Inputs Algorithms

Model Properties

Name: DEM M > FT Ext +Contours

Group: BFE

Variables Model Properties

Models

- BFE
 - Basin SQ MI
 - Contours
 - DEM M > FT Ext +Contours
 - Interpolate XS
 - Inundation
 - Point Z Values
 - XS_40pts
- NOAA
- QNEAT3
- QNEAT3 - Qgis Network Analysis Toolbox
- SAGA
- Whitebox Tools
 - Data Tools
 - Geomorphometric Analysis
 - GIS Analysis
 - GIS Analysis - Distance Tools
 - GIS Analysis - Overlay Tools
 - GIS Analysis - Patch Shape Tools
 - Hydrological Analysis
 - Image Processing Tools
 - Image Processing Tools - Classification
 - Image Processing Tools - Filters
 - Image Processing Tools - Image Enhancement
 - LiDAR Tools
 - Machine Learning
 - Math and Stats Tools
 - Precision Agriculture
 - Stream Network Analysis
 - Whitebox Utilities

DEM

Extent

Clip raster by extent

Raster calculator

DEM_FT

Contour

Contours

```

graph TD
    DEM[DEM] --> In1((In))
    Extent[Extent] --> In1
    In1 --> Clip[Clip raster by extent]
    Clip --> Out1((Out))
    Out1 --> In2((In))
    In2 --> Calc[Raster calculator]
    Calc --> Out2((Out))
    Out2 --> DEM_FT[DEM_FT]
    Out2 --> In3((In))
    In3 --> Contour[Contour]
    Contour --> Out3((Out))
    Out3 --> Contours[Contours]
  
```



WV STATEWIDE 1M DEM

Browser

Vector

Raster

Mesh

Point Cloud

- FPMS_MN**
- Crippen and Bue Regions**
- WV_NSS_Map_QGIS_20180627**
- WV_Landslide_Hazard_Susceptibility**
- WV Flood Depth (HEC_RAS)**
- FEMA NFHL**
 - Flood Hazard Boundaries**
 - Flood Hazard Zones**
- DEM Download**
 - VA - Download Tile Grid**
 - KY - KYAPED 5 Foot DEM Tile Index**
 - WV - DEM Mosaic WV Statewide 1m UTM17 p2021**
- DEM_FT**
 - DEM_FT - 646.4**
 - DEM_FT - 641.5**
- Base Maps**
 - Google Satellite**
 - WV Statewide 4"**
 - OSM Standard**
 - Wikimedia Map**
 - ESRI Topo**
 - OpenTopoMap**
 - USGS Topo**
 - Google Terrain**

Source Type

File Protocol: HTTP(S), cloud, etc.

Protocol

Type: HTTP/HTTPS/FTP

URI: use/Elevation/QL2Lidar/3_DEM_Mosaics/Statewide_DEM/Statewide_1m_Lidar_2021_mosaic/DEM_Mosaic_WV_Statewide_1m_UTM17_p2021.tif

DEM M > FT Ext + Contours

Parameters Log

DEM: WV - DEM_Mosaic_WV_Statewide_1m_UTM17_p2021 [EPSG:26917]

Extent: 1701329.7863,1701777.0384,538985.7027,539311.0973 [ESRI:102751]

Contours: [Save to temporary file]

Open output file after running algorithm

DEM_FT: [Save to temporary file]

Open output file after running algorithm

0%

Run as Batch Process... Run Close

Calculate from Layer

Use Map Canvas Extent

Draw on Canvas

 **SUMMARY**

Micro GIS projects in support of flood risk management using open-source GIS and nonproprietary request database.

 **QUESTIONS**

Joe Trimboli, MSc GIS-SME
Community Planner (Geographer)
Floodplain Management Services (FPMS)
Technical Lead

fpms-lrh@usace.army.mil
866.401.3980 (toll-free)

<https://www.lrh.usace.army.mil/Missions/Flood-Plain-Management-Services/>