Introduction & Key Benefits

What is Base Level Engineering?

Base Level Engineering (BLE) generates watershed-wide flood hazard information built from foundation level hydrologic and hydraulic engineering models – providing floodplain boundaries, flood depth and water surface elevation grids.

BLE is developed using high resolution ground elevation, using the latest modeling software to create modeling in agreement with FEMA's Standards for Flood Risk Projects. These results agree with a Zone A mapping designation.

While this data does not immediately replace a community's Flood Insurance Rate Map (FIRM), the analysis provides information to support for local communities to determination Base Flood Elevations (BFEs) for Zone A and newly identified flood prone areas identified by the BLE analysis.

Local insights from these datasets can inform decisions of floodplain administrators, emergency managers, residents, business owners, insurance agents, and surveyors.

Key Benefits:

- Comprehensive picture of flood risk across a watershed area.
- Provides modeling to support flood mitigation strategies and projects.
- Information to support local planning and development decisions for multiple community departments.
- Advises local and regional emergency planning and response operations.
- Expand and enhance local flood risk communication initiatives.

Important Information

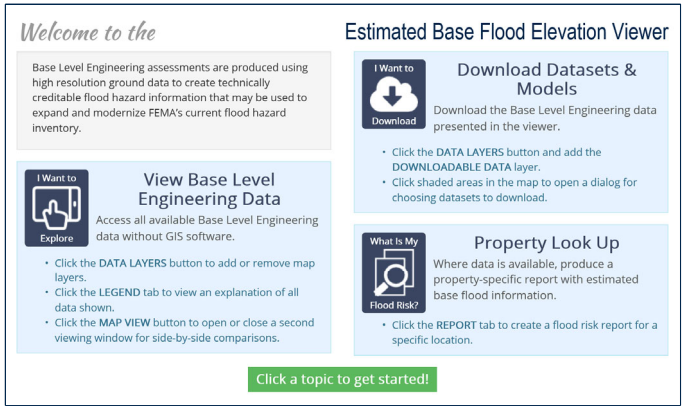
While BLE flood information **does not** replace data shown on your community's current FIRM panels, the data complements current Zone A areas and provides additional coverage where streams have not yet been included in the FIRM data coverage.

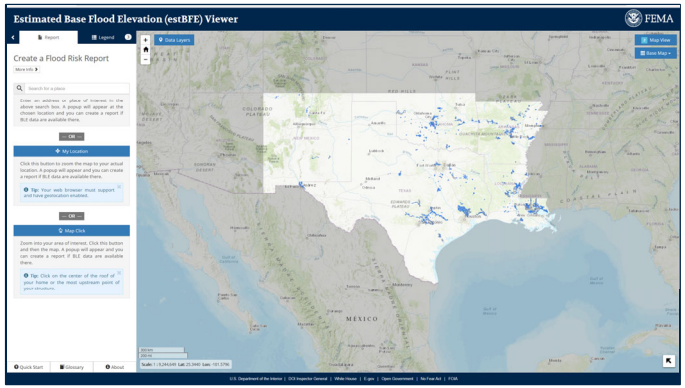
Communities may adopt BLE data for local development with an update to the ordinance language.

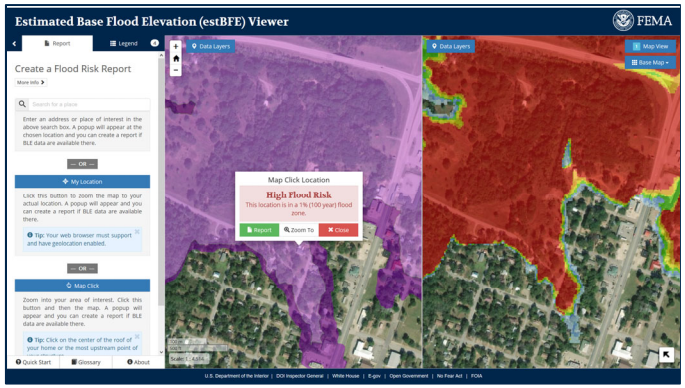
Using BLE to Support FIRMs

- Determine BFEs for streams shown as a Zone A when the floodplains are similar.
- Determine flood potential and BFEs for streams not included on the current flood map.
- In Zone AE areas, BFEs should be taken from the effective flood map (FIRM).

The Estimated Base Flood Elevation (estBFE) Viewer







How can I access BLE data?

Base Level Engineering (BLE) data is freely available to the public on the interactive viewer at: https://webapps.usgs.gov/infrm/EstBFE. Through the viewer, users can:

- Access all BLE data without GIS software. Connect with the viewer through the internet – open your browser and enter the address above.
- Interact with BLE results – zoom, pan, access data layers and review the floodplains where available with ease. Access is free to those with a computer and internet access.
- Determine a base flood elevations and run site specific reports by entering a street address.
- Download engineering models, model inputs (cross-sections, stream centerlines) and results (floodplains, water surface and flood depth grids.

To access the Estimated Base Flood Elevation Viewer, go to: https://webapps.usgs.gov/infrm/estBFE/.

For more information on using the estBFE viewer, data uses, tools and templates, visit www.fema.gov/media-library/assets/documents/160060.

The estBFE viewer interactive applications work best on Firefox and Chrome.

Using Base Level Engineering Data

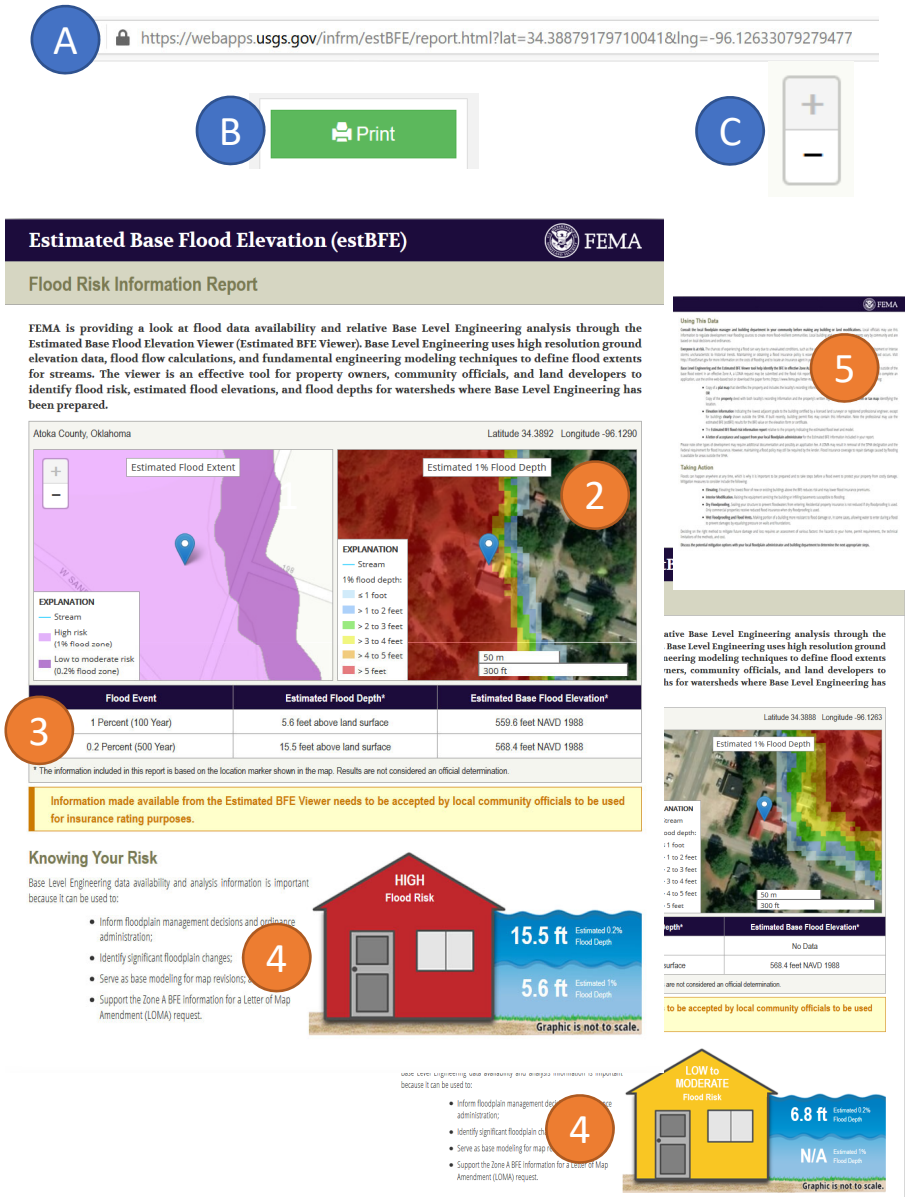
BLE datasets can be used to inform a host of planning decisions and activities that can lead to a stronger and more resilient community, including:

- **Hazard Mitigation Planning** – At the center of community mitigation planning is the Hazard Mitigation Plan. BLE can be an integral dataset for performing a risk assessment, developing a mitigation strategy, and identifying and prioritizing mitigation projects.
- **Floodplain Management, Development Review, and Permitting** – BLE data can be used as best available information in Zone A, and guide regulation in areas where no Special Flood Hazard Area was previously mapped. BLE-generated water surface elevation data can guide new building construction, substantial improvements, and repairs to substantially damaged buildings.
- **Community Planning, Land Use, and Zoning** – BLE can help identify and enact stricter land-use regulations and ordinances to prevent development in floodprone areas. It can be used for transportation planning and critical and emergency facility siting, as well as access planning.
- **Emergency Management** – BLE can help inform emergency response/ recovery planning, such as: evacuation route mapping, signage, and locating emergency shelters.
- **Flood Insurance Rating** – Using estimated BFEs from the EstBFE Viewer, a flood insurance policy in Zone A can result in lower premiums.
- **Letter of Map Change (LOMC)** – The BFE generated from EstBFE Viewer can be used when applying for a Letter of Map Amendment (LOMA), Letter of Map Revision Based on Fill (LOMR-F) in Zone A. Engineering models may be used to develop required modeling for Letters of Map Revision (LOMR) and Conditional Letters of Map Revision (CLOMR) for development projects that add crossings (bridges/culverts) or alter a flood source location.
- **Risk Communications** – BLE data enables better communication by making flood hazards more relatable to the public through production of flood depth grids and by making the data publicly available on a web viewer platform. View BLE data at: (https://webapps.usgs.gov/infrm/estBFE/).

The estBFE Report

When a site specific report is produced by the estBFE Viewer a new page opens for the user. This screen has a few tools, to include:

- **A** Each report screen is locked to a Latitude and Longitude, this URL can be copied and sent via email to others, they will get the same report.
- **B** Reports can be printed with Print button.
- **C** Users can zoom into a property with the (+) and (-) in the upper left hand side of the results window on the left side of the report.

The report presented has a few special features, described below:

1. Left window shows estimated flood extents for the 1% and 0.2% annual chance event
2. Right window shows 1% annual chance flood depth grid
3. Estimated Base Flood Elevations and flood depths for the 1% and 0.2% annual chance events are tabulated for user
4. Red home indicates location is inside the estimated 1% annual chance floodplain, Yellow home indicates location is inside the 0.2% annual chance floodplain. Flood depths are also provided
5. Page 2 provides instruction on how to use the report to support a LOMA submittal