

BASE LEVEL ENGINEERING

Flood data to expand
local risk awareness



WHAT IS BASE LEVEL ENGINEERING?

Base Level Engineering produces quality data. The Base Level Engineering production approach combines high-resolution ground elevation data, and modeling technology advancements to create engineering models and flood hazard data. These analyses are produced at a large scale, like a watershed, as opposed to targeting individual stream reaches. The flood hazard information prepared is based off engineering models that determine flood elevations along each stream reach studied. The data prepared provides flood hazard information to community officials and allows them to interact with analysis results and review areas identified as prone to flooding.

Base Level Engineering increases public awareness. Producing and sharing this data provides FEMA an opportunity to broaden and expand risk awareness conversations with local communities, ultimately strengthening disaster resilience, and reducing public spending on recovery efforts after a flood event. The Estimated Base Flood Elevation Viewer, an interactive web portal, allows Federal, State, Regional, local entities; industry professionals; and the public at large to interact with the Base Level Engineering results. This tool increases FEMA's ability to present comprehensive flood hazard information to the public, providing additional risk assessment resources where there are currently gaps in the current national flood hazard data inventory.

Base Level Engineering will lead to flood risk reduction. Communities can access and use data prior to updates to their regulatory Flood Insurance Rate Maps (FIRMs). Once a Base Level Engineering assessment is completed, FEMA releases the flood risk information on the Estimated Base Flood Elevation Viewer (www.infrm.us/estBFE), providing flood risk information that may be immediately used for community floodplain management activities, local land use discussions, all-hazard mitigation planning, and identification of mitigation strategies, as well as providing a basis for more informed community development. The datasets may be used to inform future land use decisions, support grant submissions, generate flood vulnerability assessments, prioritize flood risk reduction projects, evaluate; design and prioritize capital improvement projects. The approach ultimately will allow FEMA to build a more robust network of flood risk information, an expedited process to update regulatory products and enable future expansion to risk-based analysis and future risk scenario modeling opportunities.

Base Level Engineering is collaborative. FEMA worked with Federal, State, Regional and Local entities to develop the Base Level Engineering concept. FEMA has interacted with a variety of State and local officials to further refine the concept, and inform the identification of flood risk datasets prepared. Base Level Engineering assessments produce datasets that can be shared publically to broaden conversations about flood risk and inform opportunities for disaster resilient growth and restoration. The data produced by these assessments can be used across a variety of FEMA programs to assist in the identification and prioritization of projects. This effort allows increased transparency and data availability at all levels of government, growing the efficiency and integration of agencies working in the realm of flood risk.



Can I use Base Level Engineering to determine Base Flood Elevations in my community?

Yes, in most cases, the data made available through the Estimated BFE Viewer can be used to inform local community identification of the Base Flood Elevations.

The data on the viewer (www.infrm.us/estBFE) can be used if the stream is shown as a Zone A flood zone and the floodplains are similar in shape and width OR if the stream is not shown on the current effective FIRM.

If the stream has been studied by more detailed methods (Zone AE), then the current effective Flood Insurance Rate Maps (FIRMs) and stream profiles in the Flood Insurance Study (FIS) text should be used to determine the Base Flood Elevation in detailed study areas.

Why is FEMA investing in Base Level Engineering?

Each mile of stream shown on a Flood Insurance Rate Map (FIRM) is required to be reviewed and validated by FEMA every five years. The flood hazard information is reviewed to determine if the built environment or expected flood flows have changed since the previous study was performed. A large portion of the national flood hazard inventory of stream miles is currently unknown or unverified.

How are watersheds selected for Base Level Engineering assessment?

FEMA works with its Federal, State and local partners to determine areas where high resolution ground elevation data (i.e. LiDAR) is available. High resolution ground data allows more accurate results than previous Zone A efforts. Incoming requests are prioritized with help from our State partners.

Does Base Level Engineering replace the Flood Insurance Rate Maps for my community?

Base Level Engineering information **does not** replace the information shown on any current effective FIRM panel in a community. The Base Level Engineering is used to assess the current validity of the existing flood hazard inventory and assists local communities to estimate Base Flood Elevations (BFEs) in Zone A areas.



Using Base Level Engineering to update Flood Insurance Rate Maps (FIRMs)

The engineering approach used to prepare Base Level Engineering meets all modeling and mapping standards outlined in FEMA's Standards for Flood Risk Projects and the results may be used to rapidly update Zone A. The models developed during these assessments can be refined by communities or FEMA to include survey and structure information to efficiently update the detailed study (Zone AE) areas experiencing growth.



Developers can download and refine engineering models to identify the floodplain changes and determine Base Flood Elevations in project areas near streams analyzed with Base Level Engineering.

Community & Public Access to Results

Base Level Engineering results are available for use by the public on the Estimated Base Flood Elevation Viewer at: www.inFRM.us/estBFE.

Users can interact with data through the on-line portal, view data with a singular or side-by-side window.

Users may also point-click and download:

- engineering models,
- floodplain extents, and
- estimated flood depths, and
- water surface elevations.

Users may also run a site specific report to review flood risk in their vicinity at their convenience.

Welcome to the

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



I Want to Explore

Access all available Base Level Engineering data without GIS software.

- Click the **DATA LAYERS** button to add or remove map layers.
- Click the **LEGEND** tab to view an explanation of all data shown.
- Click the **MAP VIEW** button to open or close a second viewing window for side-by-side comparisons.

Estimated Base Flood Elevation Viewer



I Want to Download

Download the Base Level Engineering data presented in the viewer.

- Click the **DATA LAYERS** button and add the **DOWNLOADABLE DATA** layer.
- Click shaded areas in the map to open a dialog for choosing datasets to download.



What Is My Flood Risk?

Where data is available, produce a property-specific report with estimated base flood information.

- Click the **REPORT** tab to create a flood risk report for a specific location.

Click a topic to get started!