



Frequently Asked Questions About Base Level Engineering

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FEMA

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1. What is Base Level Engineering?

Base Level Engineering (BLE) creates flood data through an automated process. It combines high-resolution ground elevation data and the latest flood models. The results give communities a basic understanding of their flood hazards. Engineering models from a BLE analysis produce data that meet FEMA's standards for flood risk analysis and mapping.

BLE analyses can be cost-effectively done on a large scale, for a county or a watershed. They can also target a portion of a single stream. The results of BLE analyses—including flood elevations—help communities learn more about their floodprone areas.

2. What are the benefits of Base Level Engineering?

BLE analyses support a more complete picture of flood hazards. They produce data for areas that have not yet been studied for a Flood Insurance Rate Map (FIRM). They can also provide Base Flood Elevation (BFE) information for a FIRM's Zone A areas that are not supported by an existing hydraulic model. FEMA also uses BLE data to help communities identify areas where the FIRM needs to be updated.

It's important to note that BLE analyses are scalable, and their results can be published on FIRMs. Users can refine BLE modeling to assess the impacts of changes in a watershed. This is useful for development reviews, permitting, Letters of Map Change, and planning FIRM updates.

3. What is my community's role in the BLE process?

Communities work with FEMA to review the BLE data. They discuss ways to use it. It can increase local awareness of flood risk, aid emergency response, and inform planning or economic development.

4. What data will my community receive?

The datasets below will be available for all studied streams. Additional datasets may be produced. BLE results meet all of FEMA's technical, engineering and mapping standards. They can be used to help update FIRMs.

- **Hydrologic Analysis** – Each assessment estimates the peak flows for multiple storm events. At a minimum, the 10%, 4%, 2%, 1%, and 0.2%-annual-chance events are included.
- **Hydraulic Modeling** – Either 1- or 2-dimensional models are developed. Models are typically generated from a terrain surface. They may include channel surveys and hydraulic structures.
- **Flood Extents** –The 1%- and 0.2%- annual-chance events have seamless floodplain boundaries.
- **Estimated Water Surface Elevation Grids** – Grids are made for the 1%- and 0.2%- annual-chance events. Grids for other events may also be available. They report a water-surface elevation for each grid cell.

- **Flood Depth Grids** – These are prepared for the 1%- and 0.2%-annual-chance events. Grids for other events may also be available. They report the depth of water expected during a flood for each grid cell.

5. How can my community use Base Level Engineering data?

BLE datasets can inform planning decisions and activities that lead to a stronger community:

- **Hazard Mitigation Planning:** Mitigation planners need high-quality hazard data to properly assess risk. This helps them build a mitigation strategy for their community. BLE data show the limits of flood hazard areas, which can be used to quantify potential losses. Using BLE results in FEMA’s Hazus program can help users prioritize flood mitigation projects.
- **Floodplain Management, Community Planning and Permitting:** Data from BLE analyses can help a community identify its flood-prone areas. The data can be used to guide development. A community can also use the flood elevations for building permits and elevation certificates, where BFEs are not available. See [Floodplain Management Bulletin 1-98, Use of Flood Insurance Study \(FIS Data\) as Available Data](#). This explains how to use draft or preliminary FIS data to regulate floodplain development.
- **Emergency Management:** The results of BLE analyses can be used in many phases of emergency management. These include planning, preparedness, response, and recovery. They can help identify routes for evacuations and first responders, and locations for shelters.
- **Letters of Map Change:** Estimated BFEs from BLE analyses can be used to request a Letter of Map Amendment (LOMA) or Letter of Map Revision Based on Fill (LOMR-F) in Zone A.
- **Risk Communication:** BLE data can help users understand their community’s flood hazards. It can help them focus evacuation plan messaging on the most at-risk locations.

6. Does Base Level Engineering data replace the effective FIRM in my community?

No, not immediately. BLE data supplements the flood hazard data you are already using. It gives you more data to use for permitting and development decisions.

If your community’s risk level is high and the current FIRM data is shown to be inadequate, FEMA may develop or update a FIRM using the BLE information. Another option would be to select areas to prioritize for an enhanced (Zone AE) study based on the BLE information. This may be appropriate for communities with an ordinance that requires the use of adopted FIRMs for local development regulation and floodplain management.

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

Yes. In most cases, you can use the results from a BLE analysis in local BFE determinations. It can be used for areas mapped as Zone A or D. It is also useful in areas where the effective FIRM has no mapped Special Flood Hazard Area (SFHA). If the area has been studied by more enhanced methods (Zone AE), use the effective FIRM and the flood profiles in the FIS report instead.

8. Can I use Base Level Engineering information to support a Letter of Map Change?

BLE data can be used to determine a BFE in Zone A. It can also support a request to remove the SFHA designation from a lot or structure. Submit the BLE results to FEMA with your LOMA or LOMR-F application. FEMA will see if it meets the technical and accuracy requirements for this kind of request.

You can also use a draft BLE analysis for a Letter of Map Revision (LOMR) request. If the data comes from a source other than the agency, FEMA will check whether it meets the technical and accuracy requirements for regulatory information. If additional data is needed, FEMA will ask you or your community to submit it.

9. Can my community adopt Base Level Engineering information through my local floodplain ordinance?

Yes. In general, communities may use BLE results as best available information if it is stricter than the effective data. They can also use it in areas with no data. Check your community bylaws, ordinances, and codes to find the appropriate way to adopt BLE information before using it to make decisions.

10. How does BLE data help during and after Discovery?

When it is available, communities can use BLE data for communication during the Discovery phase of Risk MAP. BLE data and mapping can be effective in the following ways. It can be used to:

- Address stakeholder interests when new flood hazard information becomes available.
- Identify areas at risk that may not have been mapped previously.
- Inform floodplain management and disaster recovery.
- Show where floodplain boundaries or BFEs may change and what areas would be affected.
- Identify streams where an enhanced analysis may be needed.