HOW2 Find the Right HEC-RAS Models

HEC-RAS modeling software calculates the hydraulics of water flow through rivers and other channels. The results can help explain flood behavior and floodplain determination. It can guide decisions around a proposed development project's local flood risk impact. You can download HEC-RAS models and results for studied watersheds using the Estimated Base Flood Elevation Viewer (estBFE Viewer). This free online mapping platform offers different ways to view and download Base Level Engineering (BLE) models, outputs, and reports. Please note that while you can view and download the HEC-RAS models without any additional software, you will need HEC-RAS software to open and update the models.

How to Use HEC-RAS Models From the estBFE Viewer for Permitting

Developers need a permit to build in a Special Flood Hazard Area (SFHA). If FEMA has not defined the SFHA in a community, then all proposed construction projects need permits. Community leaders and floodplain administrators can use tools like HEC-RAS models to advise permit applications and permit reviews in flood-prone areas. They can be used to model the course and impact of different flooding scenarios and to guide development decisions to keep potential development reasonably safe from flooding.

BEFORE YOU BEGIN: CHECK THE REGULATORY MAP

Always check the effective Flood Insurance Rate Map (FIRM) in a proposed project area to see if your project falls within the 1%-annual-chance floodplain. If the project area intersects the 1%-annual-chance floodplain (Zones A, AE, AO, AH, V, VE), you may need to provide a review comparing current and post-project conditions. **As a general rule, you should use the regulatory mapping and modeling information in the detailed study areas over the BLE data.** However, BLE data can be used in Zone A areas that are similar in shape and width.

- To access FIRMs, visit FEMA's Map Service Center at https://msc.fema.gov, or the National Flood Hazard Layer Viewer at https://msc.fema.gov/nfhl.

- To download the effective FIRM model for a proposed project area, visit FEMA's Flood Risk Study Engineering Library at https://hazards.fema.gov/wps/portal/frisel. There may be a fee to download the FIRM model.

HOW TO LOCATE AND DOWNLOAD BLE SPATIAL FILES USING THE ESTBFE VIEWER

1 Go to the estBFE Viewer Welcome page at https://webapps.usgs.gov/infrm/estbfe/. Once you have reviewed the disclaimer and selected an area of interest, you will see the Quick Start screen. Select **I Want to Explore** below View Base Level Engineering Data (Fig. 1 center option). Click the **Report** icon in the top-left corner (Fig. 2) and enter the project site address or latitude/longitude coordinates.
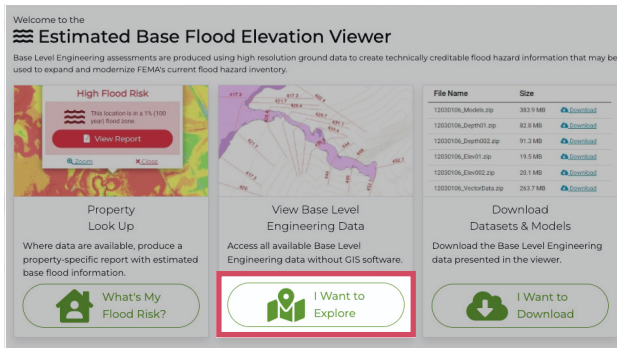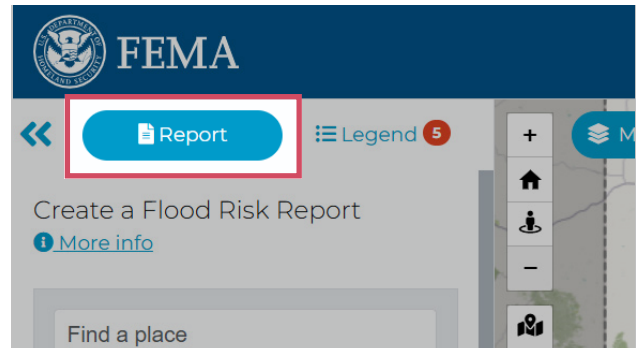

Fig. 1

Fig. 2

2 Click the **Map Layers** icon at the top left of the map (Fig. 3). Under the **Base Level Engineering** tab, turn on the **Stream Center Lines** option (Fig. 4). In the map area, use the Zoom function on the Report pop-up screen to view and note the name of the stream in or near your project area. (This example uses the stream Willbarger 0200 in the Lower Colorado-Cummins watershed.)
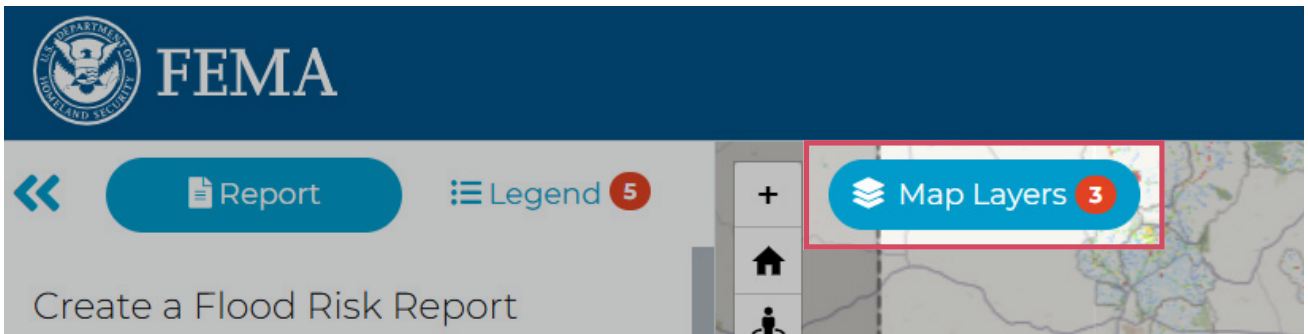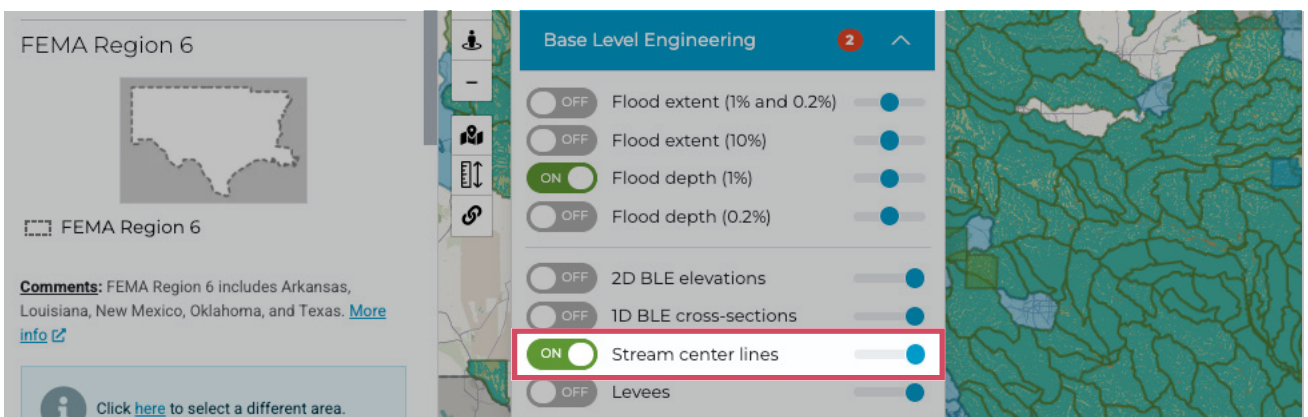

Fig. 3

Fig. 4

3 Under the **Data Availability (BLE)** tab, turn on the **Status & Data Download** option (Fig. 5). This will allow you to download files to your computer. A shaded green map means BLE data exist for a project location. Blue shading means the data development is in progress, but the data are not yet available.
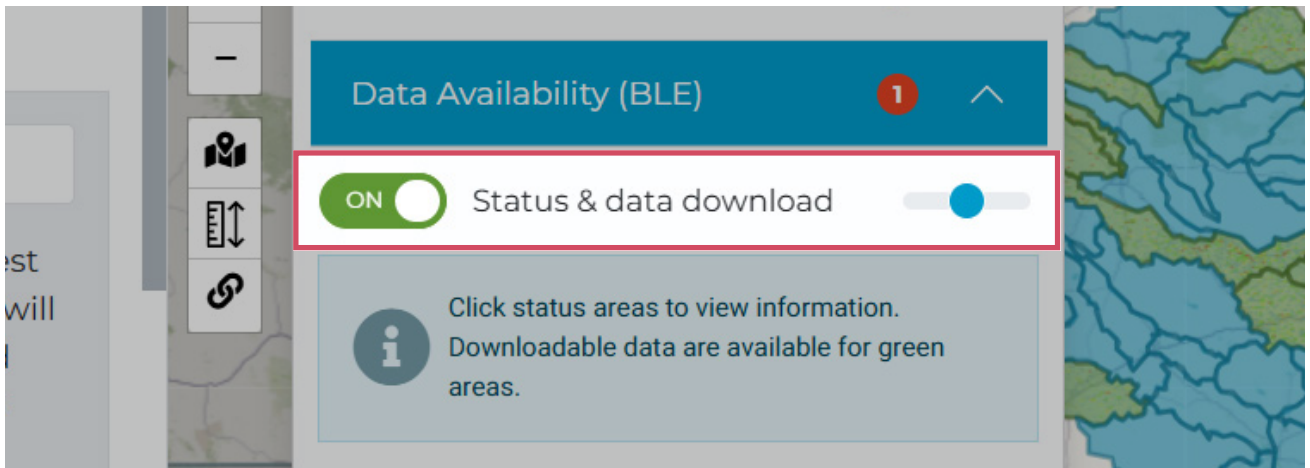

Fig. 5

4 To download the HEC-RAS models, hover your cursor over your project area's watershed and click the **DATA AVAILABLE** pop-up box (Fig. 6). This will open a **Study Area Information** pop-up screen. Click **Download Datasets & Models** (Fig. 7). This leads to a pop-up screen that lets you select and **download HEC-RAS models** (Fig. 8) and other datasets. You can also select the More Info link to learn more about the data available in the download folder.
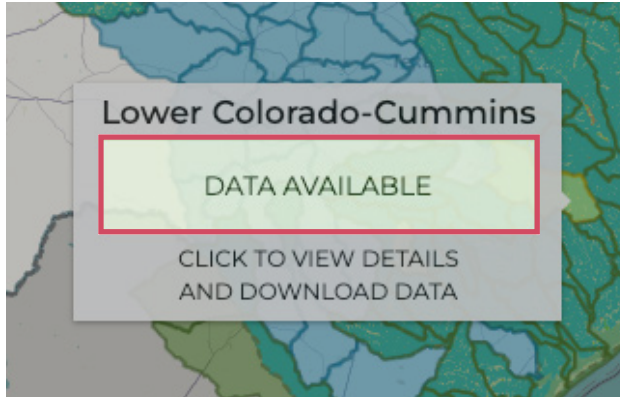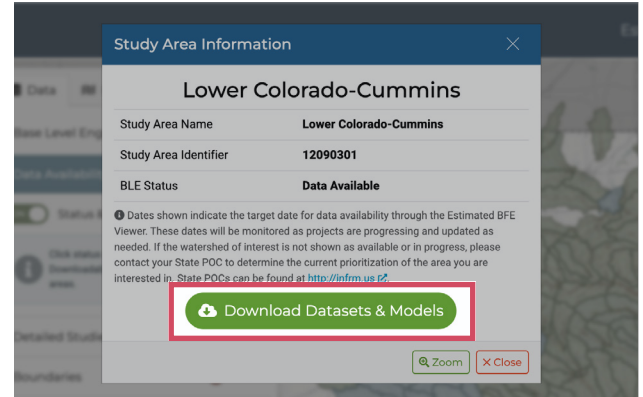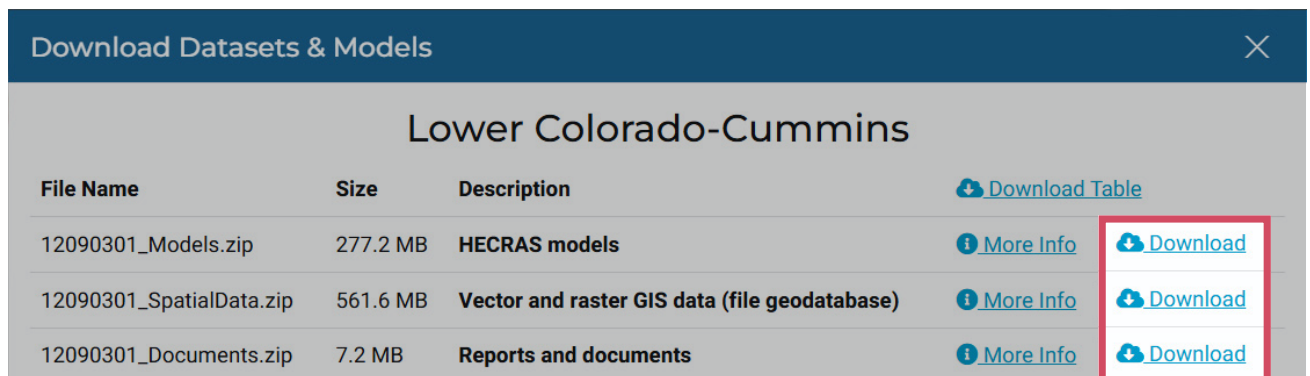

Fig. 6

Fig. 7

Fig. 8

FOR 1D BLE STUDIES:

5

After downloading, unzip the saved **MODEL** folder and open the folder created. The 1D HEC-RAS files available in the folder are organized by stream name* (Fig. 9), so look for the stream in or near your project area that you noted in Step 2.

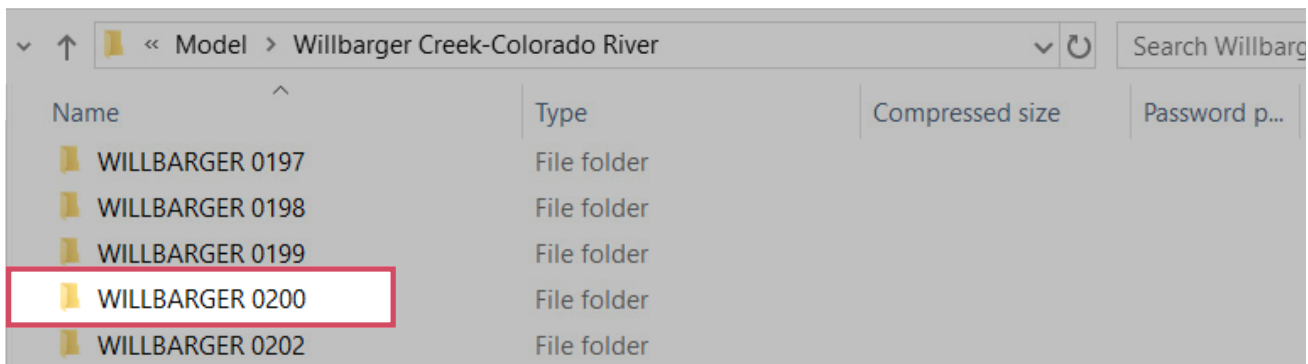*If the files are organized by number, go to the next step.

Name	Type	Compressed size	Password p...
WILLBARGER 0197	File folder		
WILLBARGER 0198	File folder		
WILLBARGER 0199	File folder		
WILLBARGER 0200	File folder		
WILLBARGER 0202	File folder		

Fig. 9

6

Load the **Model Index File**** (shapefile) into a GIS reader and use the identify button to click on the streamline and see the stream model number for the delivery area. Search the downloaded file for this stream number to locate the right HEC-RAS model folder.

**A Model Index file is only available in BLE study areas that use a numbering system in the model folders. For help finding the right model files for your project area, please email the FEMA Region 6 mapping team at fema-r6-mit-ra-team@fema.dhs.gov.

FOR 2D BLE STUDIES:

5

After downloading, unzip the saved **MODEL** folder and open the folder created. There will be two folders containing both the hydraulic models and hydrology (Fig. 10).
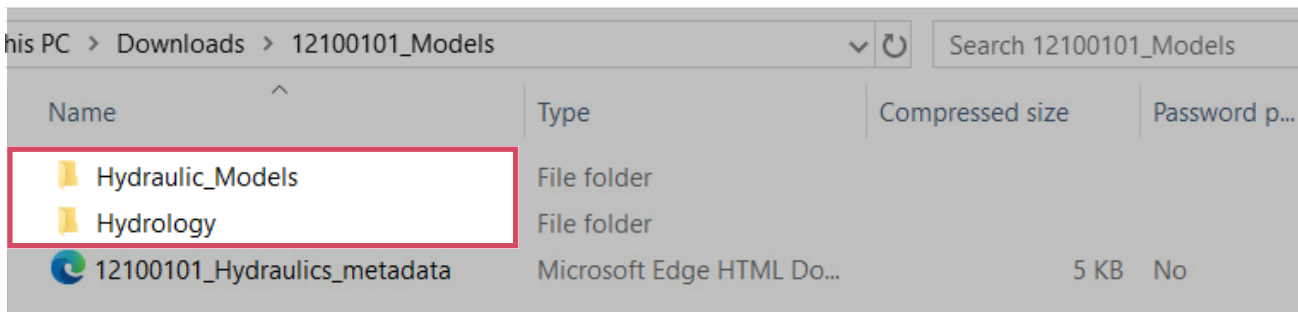

his PC > Downloads > 12100101_Models

Name	Type	Compressed size	Password p...
Hydraulic_Models	File folder		
Hydrology	File folder		
12100101_Hydraulics_metadata	Microsoft Edge HTML Do...	5 KB	No

Fig. 10

6 Open the **Hydraulic_Models** folder and click on the excel file labeled **2D Model Inventory**. Once the inventory is open, you can view the names of the files contained in the RAS_Submittal folder (Fig. 11). These files include all model inputs and outputs.

	Description	Event Description			File Name			Comments	
20	HEC-RAS Project File	Study Area			Input\Lavaca_2D.prj				
21									
22	Terrain				Terrain\Terrain.hdf				
23									
24	Land Use				\Landcover\Landcover.hdf				
25									
26	Plan Files	10% annual chance			Input\Lavaca_2D.p05				
27		4% annual chance			Input\Lavaca_2D.p06				
28		2% annual chance			Input\Lavaca_2D.p08				
29		1% annual chance			Input\Lavaca_2D.p02				
30		0.2% annual chance			Input\Lavaca_2D.p07				
31		1%+ annual chance			Input\Lavaca_2D.p09				
32		1%- annual chance			Input\Lavaca_2D.p10				
33		Other							
34									
35	Geometry Files	10% annual chance			Input\Lavaca_2D.g01				
36		4% annual chance			Input\Lavaca_2D.g01				
37		2% annual chance			Input\Lavaca_2D.g01				
38		1% annual chance			Input\Lavaca_2D.g01				

Sheet1 Sheet2 +

Fig. 11

7 After reviewing the 2D Model Inventory you can access the 2D models in the RAS_Submittal folder (Fig. 12). Unzip these files and load them in a GIS reader to view.

Name	Type	Compressed size
Input	Compressed (zipped) Fol...	6,087 KB
LandCover	Compressed (zipped) Fol...	22,086 KB
Output	Compressed (zipped) Fol...	12,908,481 KB
Terrain	Compressed (zipped) Fol...	740,908 KB

Fig. 12