



FEMA



# Flood Depth Grids

The Federal Emergency Management Agency (FEMA) has broadened its delivery of flood hazard data to include a number of non-regulatory datasets. These non-regulatory datasets depict and describe the variability of flood risk in the vicinity of the 1-percent annual chance floodplains designated on the Flood Insurance Rate Maps (FIRMs). Flood Depth Grids are delivered to local officials during either the Flood Risk Review or Resilience Meetings as a part of the Flood Risk Database, prior to the preparation of the preliminary FIRMs. Flood Depth Grids allow local community officials to use technological and software advances to view and analyze hazards in their community with a new perspective.

## Elevation Data and Gridded Data Sets

At the start of a study, elevation data is collected through a number of different approaches, from on-the-ground field survey to satellite data collection. Elevation data sets are generally made up of millions of data points that describe the x-, y- and z-coordinates within the project study area. The x- and y-coordinate describe a point's location in space through a coordinate system that is globally defined and widely accepted. The z-coordinate describes the elevation (or height) of the ground surface at that location.

A Digital Elevation Model (DEM) is a data set is made up of equally sized grid cells that have unique elevations established for each grid cell. DEMs allow large data sets to be converted to a more concise data format by calculating an average elevation of all data points which fall within a grid cell area. Figure one depicts the features of a grid as the cell describes the x- and y-location and the elevation is depicted by the height of each cell.

These DEMs are the basis of the hydraulic modeling prepared and resultant floodplain extent mapped during a FEMA study. DEMs are produced to describe the ground surface and the water surface. GIS software is used to calculate the difference between the water surface and the ground to estimate the average depth of flooding expected during a range of flood events.

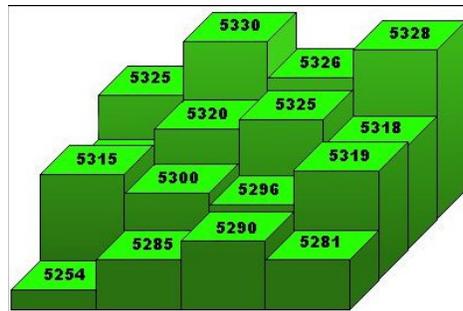


Figure 1: Representation of a DEM

## Flood Risk Tools and Datasets Promote Understanding

In an effort to assist community officials in building a support base for hazard mitigation, sustainability and resiliency discussions within their communities, FEMA developed a variety of Flood Risk Tools. These tools are being prepared with the latest technology and provide a clearer picture of flood risk within a community.

These Flood Risk Tools will allow communities to better understand and plan for the natural hazard risks that they face. The information can be used to enhance mitigation plan content, increase risk communications capability and support mitigation activities to increase community resilience.

The mission of FEMA is to support communities in becoming more disaster resilient by *knowing* their risk, *planning* for that risk, *mitigating and communicating* these risks. Everyone can take steps to reduce their risk. Families, business owners and local economies benefit from hazard mitigation activities and may transfer their risk by obtaining flood insurance.

For more information on the natural hazard risk in your community, visit [www.riskmap6.com](http://www.riskmap6.com)

## Flood Depth Grids

A Flood Depth Grid can help your community better understand, communicate and relay the variability and severity of flooding at any given location of the study area. This dataset is made available to communities in the Flood Risk Database,

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prior to the preparation of the preliminary FIRMs. The Flood Depth Grid may be produced for a range of flood events (most commonly the 0.2-percent, 1-percent, 2-percent, 4-percent, and 10-percent-annual-chances) which depicts variable flood depths throughout the determined flood extent for each event. At a minimum, the 1-percent annual chance flood depth grid will be produced. See figure 2 for an example overlaid on an aerial photograph.

The Flood Depth grid allows community officials to better understand and communicate the flood risks within their community. This dataset equips community officials with data that is easier to convey to the public at large, communicating a depth of possible flooding versus an obscure water surface elevation that is related to sea level. Speaking in measurements that are relatable to residents will allow community officials to discuss the possibility of an area being inundated or flooded in a storm event.

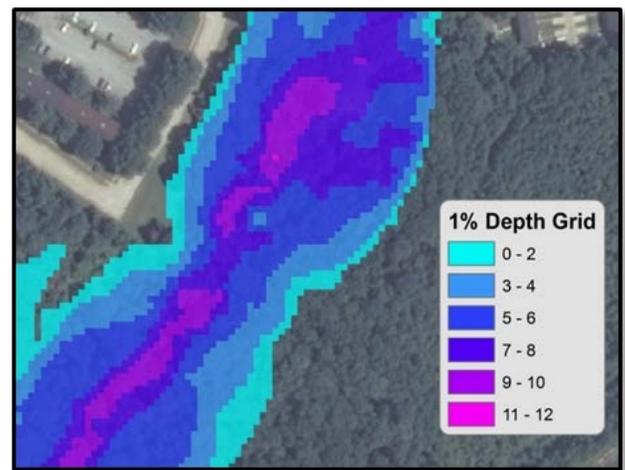


Figure 2: Flood Depth Grid

### How Else Can You Use This Data?

<p>Elected Officials and Community Staff</p>	<ul style="list-style-type: none"> <li>• Prepare flood risk communication materials for discussions with citizens &amp; business owners.</li> <li>• Relay variability of flood risk within the identified Special Flood Hazard Areas on FIRMs.</li> <li>• Identify population and areas within community at risk during multiple storm events.</li> <li>• Plan for potential road closure(s) due to anticipated flood depth.</li> <li>• Depth information is useful for cost-benefit depth-damage calculations.</li> <li>• Allows communities to review more stringent building codes/standards and develop elevation requirements for specific sites which may change over time due to increased floodplain development.</li> <li>• Assists Local Permitting Staff in identifying areas of high flood possibility.</li> <li>• Supporting information for community requirements for the adoption of enhanced ordinances with mitigation building practices.</li> <li>• Highlights area of a community for concentrated outreach &amp; education effort.</li> </ul>
<p>Community/Regional Planning Staff</p>	<ul style="list-style-type: none"> <li>• Resource to enlist support of elected officials and key local leaders from mitigation projects that reduce flood risk by identifying areas of highest flood risk (flood frequency and depths).</li> <li>• Assist with mitigation prioritization activities and projects based on flood risk.</li> <li>• Assist with advanced recovery planning and disaster preparedness.</li> <li>• Depicts high flood risk areas for future planning needs and updates.</li> <li>• Assist with land use and comprehensive planning decisions to guide development to areas with lower flood risks.</li> <li>• Assist Capital Improvement Planning efforts by guiding strategic infrastructure investment and resulting future land use in rapidly growing areas.</li> </ul>
<p>Engineering &amp; Technical Staff</p>	<ul style="list-style-type: none"> <li>• Data point for use in prioritization of projects for mitigation within the community.</li> <li>• Identify road crossings that may be impassable during a storm event.</li> <li>• Provides data to help screen potential projects for cost effectiveness.</li> <li>• Informs development decision making of risk-prone infrastructure and areas.</li> </ul>
<p>Insurance Agents, Lenders, Real Estate Agents</p>	<ul style="list-style-type: none"> <li>• Assist with explaining flood risk to existing and potential customers when discussing flood insurance.</li> <li>• Assist with agents selling flood insurance outside the high hazard floodplain by illustrating that the risk or depth is not zero as soon as the property is outside the floodplain.</li> </ul>
<p>Citizens</p>	<ul style="list-style-type: none"> <li>• Provides information about variability and possibility of flooding in terms that are easily understood.</li> </ul>