Water Surface Elevation (WSE) Grids

Summary

The Federal Emergency Management Agency (FEMA) has broadened its delivery of flood hazard data to include a number of flood risk datasets. These flood risk datasets compliment the 1-percent annual chance floodplains designated on the Flood Insurance Rate Maps (FIRMs). Water Surface Elevation 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. Water Surface Elevation Grids allow local community officials to examine the variability of flood risk in the vicinity of the designated special flood hazard areas and leverage technological and software advances to more easily interact with flood hazard study analysis results.

How do I find out more about WSE Grids?

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For all inquiries regarding FIRMs and Flood Risk Products, as well as general inquiries, please contact the FEMA Map Information eXchange (FMIX):
1-877-FEMA-MAP
(1-877-336-2627)
Monday - Friday, 8:00 a.m. - 6:30 p.m. Eastern Standard Time (EST)

For flood insurance inquiries, please contact FloodSmart:
1-888-379-9531

Digital Elevation Models

At the start of a study, elevation data is collected through a number of different approaches, from on-the-ground field survey, aerial survey and 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. Digital Elevation Models (DEMs) are prepared to describe large datasets into a more concise format.

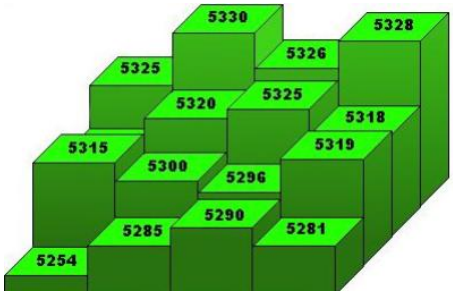

Figure 1: Representation of a DEM

Figure 1 shows how these millions of data points may be generalized into a gridded or raster depiction. This figure depicts an array of equally sized grid cells that have unique elevations established for each grid cell. DEMs allow large datasets 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.

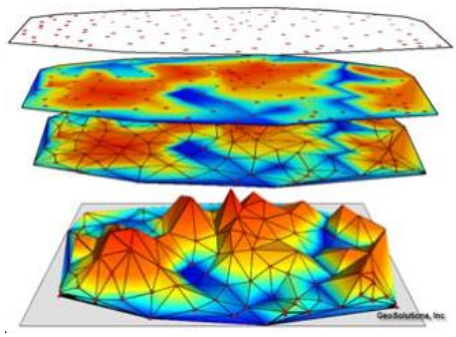

Figure 2: Representation of a DEM

DEMs may also be produced in a vector format. Digital Elevation Models using a vector format are also referred to as a Triangular Irregular Network (or TIN) that transforms the elevational points into a series of triangles to describe the ground or water surface. Figure 2 shows a graphical representation of how elevation points are processed with GIS software to create a TIN.

DEMs are used to prepare terrain surfaces and water surface elevation datasets during a Flood Risk study.

Water Surface Elevation Grids

A Water Surface Elevation Grid will assist local community officials responsible for floodplain management and permitting by making the calculated Water Surface Elevation Results more readily available. The Water Surface Elevation Grid will be prepared for the 1-percent annual chance storm event allowing community officials to generate an estimated Base Flood Elevation (BFE) for interested residents and land developers. It may be produced for a range of flood events (most commonly the 0.2-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.

Colorado Water Conservation Board (CWCB) has also made wse grids available on a web portal to quickly view the depth elevations. To use the CWCB portal

- Enter www.coloradohazardmapping.com in your web browser's address bar
- Select the Flood Hazard window
- Click your county from the County Flood Information box
- Click the WSEL Grid tab and enter your property address

*See Figure 3 display of the depth grid on the portal.

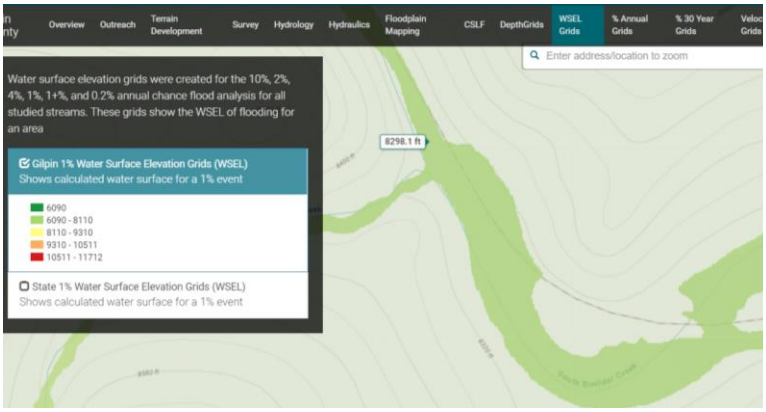

Figure 3: WSE Grid on CWCB portal

How Else Can You Use This Data?

Elected Officials and Community Staff	• Prepare flood risk communication materials for discussions with citizens & developers. • Relay variability of flood risk within the identified Special Flood Hazard Areas on FIRMs. • 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. • Assists Local Permitting Staff in identifying site specific Base Flood Elevations • Supporting information for community requirements for the adoption of enhanced ordinances with mitigation building practices.
Community/ Regional Planning Staff	• 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 water surface elevations). • Assist with land use and comprehensive planning decisions to guide development to areas with lower flood risks. • Assist Capital Improvement Planning efforts by guiding strategic infrastructure investment and resulting future land use in rapidly growing areas.
Engineering & Technical Staff	• Assists Local Staff in identifying site specific Base Flood Elevations • Informs development decision making of risk-prone infrastructure and areas.
Insurance, Lenders, Real Estate Agents	• Assists in review of flood risk and expected flood elevation at site specific locations throughout communities served. • Allows better insurance rate quotes to be provided in areas where Base Flood Elevations have been calculated.
Citizens	• Provides water surface elevation information at site specific locations • Provides required data for completion of an Elevation Certificate • Allows for rating of insurance based on site specific data required to rate structures for coverage.