Percent Annual Chance 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 can help users to better understand the chances that a given structure located within the mapped floodplain may flood in any given year or over an extended period of time. The Percent Annual Chance data is 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 preliminary FIRMs.

The Percent Annual Chance data identifies the probability of flooding by comparing the water surface elevation, flood frequency, and ground elevation. The result is the percent chance in any given year that the location will be flooded. Additionally, the Percent 30-year Chance flood data identifies the likelihood that a given location will flood during a 30-year period, or roughly the average length of a home mortgage in the United States.

These products are available on the Colorado Water Conservation Board (CWCB) on-line web portal. 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 % Annual Grids and % 30 Year Grids tabs and enter your property address

Understanding Probability

While it is impossible to predict when the next flood will happen, or how severe it will be, engineers and scientists can utilize statistical data from past flooding events to estimate the probability or chance that a flood of a certain size will occur in the future. Probability is the extent to which it is likely to occur, however probability cannot determine with certainty when something will actually take place. For instance, flipping a coin has a 50% chance of coming up heads or tails. Flipping the coin twice would, according to the probability of potential outcomes, end up heads once and tails once. In reality though flipping a coin twice can end up heads twice or tails twice.

The percent annual chance data is generated by using multiple water surface elevations and their associated percent annual chance of exceedance (e.g. 0.2%, 1%, 2%, 4%, and 10%) and interpolating the percent annual chance of flooding at each cell based on that input coupled with the ground elevation at that point. The actual computation is done by interpolating the log-linear relationship between associated flood elevations at each point and the ground elevation (linear interpolation of the water surface elevation, log interpolation of the percent annual chance).
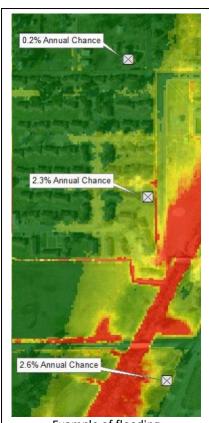
Essential Information for Communities

Community officials and staff will find the Percent Annual Chance and Percent 30-year Chance datasets to be a valuable tool. Local community officials can utilize the information to enhance their mitigation planning, floodplain management, and flood risk awareness activities by zeroing in the areas most at risk. Furthermore, by incorporating this information into the processes and workflows used by officials and staff, new development can be located and designed to not exacerbate flooding. Meanwhile, existing development can be reexamined with an eye towards mitigation to reduce the risk. For homeowners, understanding the likelihood of flooding during the length of a home mortgage can help them make informed choices about financially protecting their property.

Example of flooding probability for three structures in any given year (Percent Annual Chance) The red to green color ramp shows areas of higher

How Else Can You Use This Data?

Elected Officials and Community Staff	• Provide a visualization tool to help building permits and inspections staff explain flood risk to developers. • Assist with developing more stringent development/building codes. • Assist emergency response staff identify high risk areas. • Highlights areas of the community for outreach and education efforts.
Community/Regional Planning Staff	• Assist with mitigation prioritization activities and projects. • Assist with advanced recovery planning and disaster preparedness. Depict high flood risk areas for future planning needs. • Assist with Capital Improvements planning by guiding infrastructure investment away from high risk areas.
Engineering & Technical Staff	• Data point for use in prioritizing mitigation projects. • Informs development decision making for risk prone infrastructure.