

567—75.2(455B) Flooding characteristics. Flood plain regulations for a specific stream reach established pursuant to this chapter shall be based upon an analysis of the relevant flooding characteristics of the stream for which regulations are being established. The flooding characteristics of a stream include: flood magnitudes and frequencies; flood elevations, velocities and inundation limits; rate of rise of the flood waters and the related flood warning time; and characteristics related to changes in stream equilibrium over time. The following subrules identify standard methods for determining specific flooding characteristics.

75.2(1) *Flood frequencies and magnitudes.*

a. Discharge frequency relationship. In determining the discharge frequency relationship for the relevant flood the following frequency analysis methods shall be considered:

1. Log-Pearson Type III distribution where available records are adequate to warrant statistical analysis of the data.
2. Regional flood frequency methods such as department Bulletin No. 11 which are applicable to the stream and watershed.
3. Rainfall-runoff watershed modeling techniques.
4. Other hydrologic techniques which are consistent with accepted scientific practices.

b. Regional flood magnitude. In determining the magnitude of the regional flood as defined in these rules the following methods should be considered:

1. An enveloping curve of experienced Iowa flood discharges as plotted in relation to the drainage area of the stream where they occurred.
2. The Standard Project Flood as computed by the U.S. Army Corps of Engineers.
3. Flood frequency methods outlined in paragraph “a” of this subrule.

75.2(2) *Flood stages and inundation limits.* Standard engineering methods and experienced flood information shall be used to determine flood heights and inundation limits. Consideration shall be given to the following:

- a.* The Manning formula or equivalent uniform-flow formula where stream geometry and slope are reasonably uniform.
- b.* Steady, gradually varied flow analysis using such surface water hydraulic models as one-dimensional, fixed-bed models.
- c.* For areas upstream and adjacent to a dam or impounding structure, a reservoir routing shall be made to determine maximum flood pool levels.
- d.* Experienced flood information including high water marks, flood profiles, and aerial or other photographs.
- e.* Other hydraulic methods which are consistent with standard engineering practices.

75.2(3) *Flood warning and response time.* Where the effectiveness of flood protection methods depends on timely human intervention to activate flood protection works or to evacuate people or property from flood-prone areas, the available flood warning time shall be determined. In estimating flood warning time and determining the reliability of a flood warning system, consideration shall be given to the following:

- a.* The general flooding history of the area including information on the flood warning provided during past floods.
- b.* Various hydrologic methods which permit calculation of basin rainfall/runoff response, travel time of a flood wave, rate of rise of flood waters and other pertinent data.
- c.* Meteorologic information such as weather forecasting methods.
- d.* Reliability of methods proposed for providing flood warning within the available time.
- e.* Response time for implementing flood protection measures once the flood warning has been given.
- f.* Seriousness of the hazard to life and property if the warning system fails, considering flood depths, velocities, and duration.