

Ice Jams & Flooding

1. What is an ice jam?

Pieces of floating ice carried with a stream's current can accumulate at any obstruction to the stream flow. These ice jams can develop near river bends, mouths of tributaries, points where the river slope decreases, downstream of dams and upstream of bridges or obstructions. The water that is held back may cause flooding or flash flooding upstream. If the obstruction suddenly breaks then flash flooding may occur downstream.

2. When was the last time ice jam flooding occurred in Iowa?

Minor flooding from ice jams occurs almost every year in Iowa. Minor to moderate flooding caused by ice jams occurred along the Des Moines River in the Fort Dodge area—as well as along the Raccoon River in the Des Moines area—in February 2011. Over the years ice jams have been especially problematic along portions of the Des Moines, Raccoon, Skunk, South Skunk, Iowa and Wapsipinicon Rivers.

3. When is an ice jam likely to occur?

An ice jam can occur anytime from early winter to late spring in Iowa depending upon changes in temperatures which can cause alternate freezing and melting of water surfaces. The most likely times are freeze-up jams in early winter and break-up jams early spring. Freeze-up jams typically result in minimal if any flooding. Break-up jams usually cause the most damage and flooding. In addition to flooding, break-up ice jams can cause significant property damage. They have been known to push entire houses off their foundations and rip wooden decks from other homes.

4. What effect does snow have on flooding potential?

When the snow melts it adds water to the ground that drains away in the same way as water from rainfall. On average in Iowa, one inch of fresh snowfall contains slightly less than a tenth of an inch of water. As snow accumulates and becomes compacted during the winter the ratio of snow to water decreases. Thus 10 inches of snow remaining on the ground into early spring may contain as much as five inches of water.

5. How fast do the snow and ice melt?

Three to five consecutive days with daily maximum temperatures in the 40s typically create enough melting to cause ice breakup on streams.

6. What happens when rain falls on top of snow?

Air temperature is still an important factor in melting snow. Rain will usually not add much heat to the process. At 40 degrees, one inch of rain will only produce a tenth of an inch of added water from snow melt. At the same time frozen ground will result in more of the available water running off directly to streams. If rain does fall then three to five consecutive days with daily maximum temperatures only in the middle 30s around the same time may result in ice breakup. Ice jams may occur within a day or two after the rain begins.

7. What are the main factors that contribute to snowmelt flooding?

The main factors contributing to spring snowmelt flooding are:

- High water content of existing snow cover
- High soil moisture in the preceding Fall season
- Deep frost depths in the ground
- Elevated stream levels
- Moderate to heavy rain during melting
- Rapid, continuous melting of the snow
- Ice jams

For more information visit the National Weather Service in Des Moines, Iowa at <http://www.weather.gov/desmoines>