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 held back can cause flooding upstream, and if the obstruction suddenly breaks, flash flooding can then occur downstream as well.

2. When was the last time ice jam flooding occurred in Michigan?
Record flooding from backwater caused by ice jams occurred along the Grand River in Robinson Township during January 2005. Ice jams also caused flooding on the Muskegon, Flat, Thornapple, and Kalamazoo Rivers last year.

3. When is an ice jam likely to occur?
An ice jam can occur anytime from early winter to late spring in Michigan, depending upon changes in temperatures that cause alternate freezing and melting of water surfaces. The most likely times are early winter before the surfaces are completely frozen and early spring when the ice cover begins to break up due to melting.

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, one inch of fresh snowfall contains about a tenth of an inch of water. However, as snow accumulates and becomes compacted during the winter, the ratio of snow to water decreases. Thus, ten 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 days with the maximum temperature of about 50 degrees would create enough melting to cause ice breakup on small streams. That amount of warming would also melt two inches of snow.

6. What happens when rain falls on top of snow?
Air temperature is still the most 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.

7. What is a Hydrologic Outlook?
A Hydrologic Outlook issued by the National Weather Service provides information on hydro meteorological conditions that could cause flooding or impact water supply. This product will typically be issued if precipitation forecasts and/or snowmelt potential indicate the possibility of flooding beyond 36 hours. The National Weather Service also issues a monthly probabilistic hydrologic outlook that provides the probability of the river reaching a given height over the next 90 days. The Hydrologic Outlook for the spring snowmelt flood potential defines the flood potential from snowmelt based on normal precipitation and rate of melt projected through the normal snowmelt period.

If the actual conditions bring more rapid melt or heavier rains than normal, or if ice jams occur, the flood threat would increase substantially. On the other hand, a gradual or intermittent melt, with minimal additional precipitation, would decrease the flood threat.

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Outlooks are based on calculation of existing conditions (snow cover, soil conditions, and stream flow) together with predicted future weather conditions. Normal precipitation and snowmelt rates for the future period are presumed in making these projections. An earlier melt than expected may reduce flood potential. Alternatively, if snow persists into late March, the flood potential increases.

The river crest stage values given in the outlooks are only an indication of potential stream crests rather than specific forecasts. An increase in the potential can be expected if above normal precipitation and/or rapid melting develops. Likewise, the potential will decrease if below normal precipitation and/or more gradual melting occurs.

The main factors contributing to spring snowmelt flooding are:

- High soil moisture in the fall
- Significant frost in the ground
- High water content of existing snow cover
- Rapid, continuous melting
- Moderate to heavy rain during melting
- Ice jams

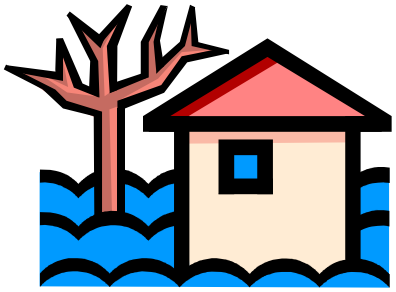
Flood Potential Categories (assume normal precipitation and melt rates):

Minor snowmelt flood potential - A general term indicating minimal or no property damage but possibly some public inconvenience.

Moderate snowmelt flood potential - The inundation of secondary roads; transfer to higher elevation necessary to save property, some evacuation may be required.

Major snowmelt flood potential - A general term including extensive inundation and property damage (usually characterized by the evacuation of people and livestock and the closure of both primary and secondary roads).

Severe snowmelt flood potential - Large-scale inundation, requiring substantial resources from outside the local communities; record or near record flooding.



The 2006 Hydrologic Outlooks for the spring snowmelt flood potential will be issued in February and March.

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How to prevent flood damage in your home.

Are you at Risk?
Your local floodplain manager, building official, city engineer, or planning and zoning administrator can typically tell you whether you are in a flood or other hazard area. Your local community official is also a good source of information on how to protect yourself, your house and property from flooding and other hazards

Ways to protect your house and property.
Basement flood protection can involve a variety of changes to your house and property—changes that can vary in complexity and cost. You may be able to make some types of changes yourself. Complicated or large scale changes or those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city. Below are some examples of flood protection.

- **Install Sewer Backflow Values.** In some flood prone areas, flooding can cause sewage from sanitary sewer lines to back up into houses through drainpipes. Sewage backup not only causes damage, but also creates health hazards. Backflow valves have a variety of designs ranging from simple to complex. This is something that only a licensed plumber or contractor should do.

- **Raise or Flood Proof Heating, Ventilating, and Air Conditioning Equipment**. In flood prone houses, a good way to protect HVAC equipment is to elevate it above the areas that flood. Another method is to leave the equipment where it is and build a concrete or masonry block flood wall around it.

- **Anchor Fuel Tanks.** Unanchored fuel tanks can be easily moved by floodwaters. One way to anchor a tank is to attach it to a large concrete slab whose weight is great enough to resist the force of floodwaters. Elevate tanks to a minimum of at least one foot above the base flood elevation (BFE). Floating and/or damaged tanks pose serious threats not only to you, your family, and your house, but also to public safety and the environment.

- **Raise Electrical System Components.** Any electrical system component, including service panels (fuse and circuit boxes), meters, switches, and outlets, are easily damaged by floodwaters. All components of the electrical system, including the wiring, should be raised at least one foot above the base flood elevation (BFE).

- **Raise Washers and Driers.** Washers and driers can easily be damaged in a flood. In order to prevent this from happening, utilities can be placed on cinder blocks one foot above the base flood elevation (BFE).

- **Add a sump pump in your basement.** Sump pumps can help keep groundwater from entering your home's interior.

- **Cut drywall so that it is one-half to 1-inch off the floor**. This is especially important in basements. Concrete floors commonly absorb ground moisture—especially in winter months. That moisture can wick up the wallboard if it's touching the floor, allowing mold to grow out-of-sight within the walls. (You can hide the gap with wood or rubberized floor trim.)

- **Don't forget to buy flood insurance.** Flood insurance provides year-round financial protection and improves your ability to quickly recover when severe storms strike and cause unexpected flooding. Call your local insurance agent or 1-800-720-1090 to reach National Flood Insurance Program specialists.

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