

ICE JAM FLOODING:

CAUSES, RISKS AND CONSERVATION AUTHORITY ROLES



The Toronto and Region Conservation Authority's Flood Forecasting and Warning Program team monitor and assess weather forecasts and watershed conditions such as river and creek water levels, flows and rainfall amounts and then communicate the potential risk of flooding to the public, municipalities, and media. Ice jams are one of the potential mechanisms leading to flooding on a watercourse system.

What is an ice jam?

River ice can form along watercourses during long cold spells in the winter months. This ice cover on rivers can either gradually melt away with steadily increasing air temperatures or break up into pieces if air temperatures or water levels change quickly. An ice jam occurs when those ice pieces are carried downstream along a watercourse and become stuck, blocking the flow of rivers and streams.

Why do ice jams happen?

Ice jams can form anywhere in a river or stream and can be caused by a variety of different factors, including:

- A rapid change in air temperatures, typically in the spring or during mid-winter warm spells, resulting in melting ice blocks that can pile up when they start to move downstream.
- Fast changes in the water level underneath ice-covered rivers, caused by melting snow or rainfall added to the river system (ie. runoff), causing ice to break up and potentially pile up when they start to move downstream.

Where do ice jams occur?

Some natural characteristics of a watercourse channel may increase the risk of ice piling up in certain locations. These may include:

- bends, meanders, and mouths of rivers, where water may slow down,
- locations where the river bed becomes shallower or the channel becomes narrow or bends tightly, where ice may get stuck,
- areas where anchor ice (river ice freezing to the bottom of the river channel) can occur, which can block the flow of ice and force water to redirect to other areas, and
- at man-made obstacles or structures along a watercourse such as bridges/culverts, dams, reservoir entrances, fencing, construction materials, etc., where they may block the passage of ice in rivers.

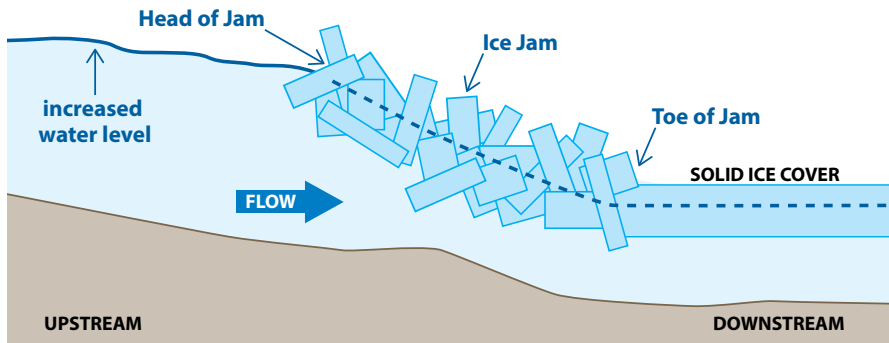
Considerations for mitigating flood risk due to an ice jam

RECOMMENDED

- Ice jam intervention should only be considered and executed if it will successfully resolve the risk and not create another risk elsewhere.
- Municipalities could consider hiring contractors to use heavy equipment such as excavators to mechanically remove ice from the river.

NOT RECOMMENDED

- Ice jam prevention including river modifications such as channel straightening or ice control structures –Ice jams can still form behind crossings, etc.
- Pre-emptively breaking ice cover by blasting (using explosives). Blasting is not recommended on ice cover or already formed ice jams. Broken ice can increase the risk of jamming downstream as well as damage surrounding areas. Blasting of ice is only successfully carried out in rare circumstances and conditions.



WHY DO ICE JAMS CAUSE FLOODING?

Ice jams can sometimes block water flow, and cause water levels to rise (sometimes suddenly) behind the jam, increasing the risk of flooding upstream. The speed at which water in the channel will rise depends on how much water is flowing in the river or stream and how much the ice is blocking flow in the area where the water would normally pass. Sometimes multiple ice jams can form and release, causing new jams downstream, similar to a car pile-up on the highway. Flooding can impact areas near the watercourse further downstream as ice pieces continue to move past or release from the existing ice jam.

If an ice jam is posing an immediate risk to life and property, **call 911**.

Contact us

Toronto and Region Conservation Authority (TRCA)

- Sign up for [TRCA's flood messages](#)
- Flood Monitoring [Gauging Website](#)
- If an ice jam is affecting your property or if you see ice accumulation in your area, please report observations to a TRCA Flood Duty Officer by email at Flood.Message@trca.ca or leave a voicemail at 416-661-6514
- Learn more on ice jams and ice safety at [TRCA.ca/flood-winter-safety](https://trca.ca/flood-winter-safety)
- Please report observations to a TRCA Flood Duty Officer by Email at flood.message@trca.ca or leave a voicemail at 416-661-6514.

Can ice jams be predicted?

No, ice jams cannot be predicted accurately. Many factors, such as weather, river channel characteristics and water flow conditions, contribute to ice jam formation. State-of-the-art river ice science does not predict when or where an ice jam will form.

Ice Jam Response

Ice jams can form and dissipate on their own without causing any significant flooding. All risks need to be considered before attempting to remove an ice jam that is posing a risk to public safety. The Toronto and Region Conservation Authority and municipal staff work together to address the specific flood risk due to an ice jam. TRCA can provide enhanced monitoring by using tools such as drones, remote cameras and adding additional stream gauges, to help monitor current conditions and be prepared to provide technical advice to emergency responders, if necessary.

If an ice jam does form along a TRCA watercourse and there is a risk of flooding to nearby areas, options of removing the already formed ice jam are limited and is carried out by the local municipality and emergency responders.

Winter Safety Information

Ice, in and around watercourses and dam reservoirs, is always highly variable and unstable. Warm weather and rainfall can raise levels in reservoirs, rivers and ice jams, making ice conditions even more unstable. Always stay away from frozen water bodies and ice around dams and channels. Remember to keep a safe distance from ice jams because water levels can fluctuate very quickly, and riverbanks can become unstable and eroded. Chunks of ice can jam up and release, without warning, often in a very short period of time.

FREQUENTLY ASKED QUESTION:

Is ice jam flooding covered by insurance?

Overland flood insurance is not covered by most standard policies. Residents are encouraged to talk to their insurance representative to confirm their coverage and options. Learn more from the [Insurance Bureau of Canada](#).