



Beware - thin ice

There is no such thing as 100% safe ice

Many municipalities have lakes and other bodies of water that may be used for cold weather activities such as ice-skating, ice-fishing and snowmobiling. While prolonged periods of low temperatures can be a good indication that ice may be safe, the truth is that there are many factors that affect ice thickness. Different combinations of environmental and load factors do not allow for an absolute standard to be developed.

Supervision for an activity such as ice-skating is labor intensive and presents significant liability exposure to the municipality. The following are options available to municipalities regarding ice activities.

- 1. Post "No Trespassing" Signs:** Significantly reduces your liability exposures so long as the signs are maintained and properly worded. Most governing bodies, however, would find this unacceptable since this is public land and should be open for public use. *You should consult your Solicitor for wording that is appropriate to your situation.*
- 2. Post warning signs with language like this:** "This Lake is not monitored or patrolled. Swimming, Boating, Fishing and Ice Skating are at your own risk." This sign does not prohibit the activity, but does considerably reduce your responsibility to patrol and monitor the activity. Skaters should not go near partially submerged obstacles such as stumps and rocks where ice is weaker, and these dangerous areas should be clearly identified and avoided. You must maintain the signs if you use this option. *Consult your Solicitor for wording that is appropriate to your situation.*
- 3. Active Supervision:** This requires a great deal of time and effort. Not only must conditions be monitored on weekends, but also employees must regularly test ice thickness, thus risking them falling through the ice. If you elect to provide the supervision, the following guidelines should be considered.

Conditions and Standards

According to the Cold Regions Research and Engineering Lab in Hanover, New Hampshire, ice is a material capable of supporting weight (a load), but ice is also affected by temperature, water quality, and other elements. Ice varies in thickness depending on flow/current conditions below. The following are a few of the more significant fluctuations that should be considered when making a decision about the safety of a specific site:

- Generally, the *deeper the water*, less ice is formed.
- **Cold ice:** (or clear ice) is the first ice that forms; it has large columnar grains and is transparent. It is maintained at approximately 20° Fahrenheit (F) to 25°F or colder.
- **Black ice:** Newly-formed ice that is thin enough for the dark water to be visible through it.
- Ice forms at 32°F and is always close to its melting point.
- During warm periods, ice can melt from both the top and from the bottom. In fact, the water temperature below the surface can be warmer.

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- Snow ice may form from saturating snow on top of cold ice; it has small grains. Snow ice is only about half as strong and melts quicker
- Ice over moving water is probably unsafe and should be avoided.
- Ice "creeps" or deforms over time even without an increase in load.
- Ice clouded with air bubbles should be avoided
- Continuous walking (or skating) over ice will cause it to fatigue.

Ice-skating areas that operate safely, at minimum, **must have at least 4” of cold ice or at least 6” of snow ice** at temperatures of 30-40⁰ Fahrenheit. The depth of the ice should be checked daily by the Parks and Recreation Department or Public Works. Multiple readings are needed to define the safe areas. In the event slushy or hazardous conditions exist, the areas should be kept closed to the public until conditions improve. The following figures are based on U.S. Army Corp of Engineers guidelines:

30-40 Degree Temperature

5” cold ice	Group skating	7” snow ice	Group skating
7” cold ice	Equipment up to 2500 lbs	9” snow ice	Equipment up to 2500 lbs

0-30 Degree Temperature

5” cold ice	Equipment up to 2500 lbs	7” snow ice	Equipment up to 2500 lbs
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Consider the weight of any snow on the ice in addition to the weight of the equipment. If possible, skating areas with water depths less than 12” should be provided for ice-skating. That way, if the ice should fail, exposure from possible drowning is minimized.

“**Equipment**” is a lawn tractor equipped with a plow to move snow from the surface of the ice.

Testing Procedures

Several holes should be installed throughout designated skating areas, especially in high-hazard areas, such as (inlet, dams or springs). Testing should be completed in the presence of two individuals on safety lines. Testing should be documented in a log. This procedure should be done **on** Saturdays, Sundays and holidays, as well as weekdays. The establishment of a land-based *safety post* at all ponds and lakes where the public may gather for ice skating or ice fishing is recommended.

“**Safety Post**” refers to a 6 foot 2X4, painted yellow set about two feet into the ground with a spike or arm to hold a coiled rope and water jug for throwing to victims. Also, a 10-12 foot bamboo pole, secured to the post.

Snow Removal Procedures

Following heavy snowfalls, it might be necessary to clear snow from the ice for ice skating activity. Be sure to follow the recommendations pertaining to ice depth for equipment usage.

Summary

Even as we do our best to provide ice related recreation, using open-water venues is still a judgment call and must be decided by local management. Agencies should formulate a policy for determining safe ice thickness, taking into account the particular conditions and uses of open-water areas. If your town chooses to allow cold weather recreational water activities; consider forming a cold water rescue team. Contact the Safety Director’s office for additional guidance on rescue teams and cold water rescue.