



Spring Ice Tips:

Staying Safe As
The Ice Begins To Melt

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One March morning I woke up at the crack of dawn and went skating on a 90 acre pond. It was 30 degrees out, the air was still, and the ice was six inches thick. After skating I went to work. When I came home at the end of the day, I went back to the pond to check the ice; it was gone. The entire pond was open water. How could this have happened?

What happened was the sun came up, the wind started blowing, the temperature hit 60 degrees and the sun, wind and waves ripped out six inches of ice in a matter of hours.



March is the month when winter and spring are locked in battle. The sun is high in the sky, the days are lengthening rapidly, and yet there are vast reservoirs of frigid air in the Arctic, poised to spill south into New York and New England. Ice still clings to lakes and rivers, but the seesawing temperatures can make it difficult to safely take advantage of the skating season's closing days. Here are some tips to help you enjoy spring skating.

1. Skate early in the day. On sunny days, the safest time to skate is before the sun comes up. Even just an hour after sunrise, with temperatures still below freezing, the sun is already attacking the surface. Spring sun is so destructive because it rises more steeply into the sky than it does in

midwinter, and the higher it gets, the deeper it penetrates the ice, instead of reflecting or glancing off the surface. Here's what happens when the sun attacks the ice:

(a) Gray ice contains a lot of air bubbles which give it an opaque appearance. It reflects a lot of sunlight back into space, which is a good thing, but the rest is absorbed by the air bubbles, which become tiny ovens that melt the bits of ice surrounding them. Each air bubble then merges with its neighbors until the ice becomes mostly air and it can no longer support your weight. You'll see the surface slowly change color from gray (solid ice) to white (air bubbles). That should set off alarm bells in your head.

(b) 'Black' ice has few if any air bubbles and it's virtually transparent. The spring sun shines right through it and heats up the water underneath. Think greenhouse effect. That heat rises up and destroys the ice's crystalline structure until it falls apart into tiny pencil shaped shards. When the sun climbs high in the sky, black ice can collapse suddenly and catastrophically.

(c) Snow-covered ice is actually the safest to skate on, because the snow reflects almost 100% of solar radiation. If you wake up in the morning to find that you picked up an inch of fresh snow overnight, that's a good thing, because you'll have more time to skate.

(d) Even on a cloudy day, solar radiation is still penetrating the clouds and melting the ice. It just happens more slowly than on a sunny day.

2. Know when it's time to quit. As soon as you launch, use your testing pole to make sure there's plenty of solid ice underneath the surface layer. (Sometimes only the top layer is firm, and underneath it is nothing but mush.) Then use your smartphone to monitor the local temperature, and plan to quit skating before it warms up

above 32 degrees. If the surface gets soft, and your blades lose their glide and start digging in, it may already be too late. You may end up walking home, or even worse, taking a swim.

How Does Lake Ice Melt?

- In the fall, lakes lose heat to the atmosphere, and on a day or night when the wind is not blowing, ice begins to form. The ice gets thicker as long as the lake can continue to lose heat.
- During most of winter, the snow both reflects sunlight and insulates the lake. With a thick snow layer, the lake neither gains nor loses heat. The bottom sediment warms the lake water slightly over the winter, from stored summer heat.
- Around March, as the air warms and the sun gets more intense, the snow melts, allowing light to penetrate the ice. Because the ice acts like the glass in a greenhouse, the water beneath it begins to warm, and the ice begins to melt from the bottom up.
- When the ice thickness erodes to between 4 and 12 inches, it transforms into long vertical crystals called “candles.” These conduct light even better, so the ice starts to look black, because it is not reflecting much sunlight.
- Warming continues because the light energy is being transferred to the water below the ice. Meltwater fills in between the crystals, which begin breaking apart. The surface appears grayish as the ice reflects a bit more light than before.
- The wind breaks the surface apart.

3. After an extended warm spell, allow extra time before you venture out again. Warm temperatures turn ice surfaces to puddles and slush. If there is a large volume of water, it will take time to refreeze, and it's unlikely to happen in just one night. If the wind comes up, there may end up with a lot of shell ice, as water will evaporate from the puddles before it has time to freeze. The other potential hazard is an unpredictable sandwich made up of two layers of ice with water or slush in between.

4. Avoid rivers and anywhere there's a current. In addition to the effects of sun, wind, rain and warm temperatures, the water moving under the ice is constantly eroding it from below, 24/7. The appearance of random black circles in otherwise gray ice, especially in mid-channel, indicates that the ice has thinned to the point where it's no longer safe, and you should abort your mission.

5. Even on a chilly morning, late-season ice may consist of only a couple inches of solid ice on top of a much thicker

layer of mush. Those couple inches on top will support you, but only until the sun hits them. Beware of the ice fisherman who tells you the ice is still a foot thick, because sometimes the bottom ten inches don't even count. This is why ice testing poles are so much better than drilling a hole and measuring the thickness. With a testing pole you can quickly determine whether the bottom layer of ice is solid or not. I've been surprised many times - not by taking a swim, but by probing with my pole and discovering that the ice in front of me had no solid foundation whatsoever. If that happens, do an immediate U-turn.

Getting on and off the ice can be a problem in the late season, because lake ice typically melts away from the shore before it melts in the middle. As a result, your favorite launch spot may become unusable. The main culprits are dark objects such as rocks that soak up the sun's heat and melt the surrounding ice. Of particular concern are submerged rocks that you may be unaware of until they melt their way up through the ice from underneath. Ice usually melts the soonest along the north shore of a lake, where it gets the most sun. Ice also melts early near stream inflows. Look for a new launch spot along the south shore, or in a sheltered cove, where the ice is going to be shaded by trees for most if not all of your skating session. Some skaters bring along an 8-foot plank to get out onto the ice, but this could backfire if you return from skating to find that more ice melted and your plank just floated away.

If you skate on a machine-groomed trail, be aware that the trail itself may become unsafe sooner than the surrounding ice. That's because the trail has had its protective layer of snow repeatedly scraped off, exposing the ice to more damaging solar radiation.

How long does the season last? In recent memory, in Northern New England, the last day of skating has ranged anywhere from March 12th (in 2016) to April 24th (in 2018). The untimely end in 2016 was the result of a warm, snowless winter that got off to such a slow start that the ice never had time to thicken. The unusually late season in 2018 was caused by a period of intense below-zero cold in December and January that formed unusually thick black ice, which was then buried under deep snow that didn't melt off until mid-April.

On unmaintained ice, never skate alone. Carry ice safety gear: ice claws, ice testing poles, and a throw bag. Skate safely and have fun!