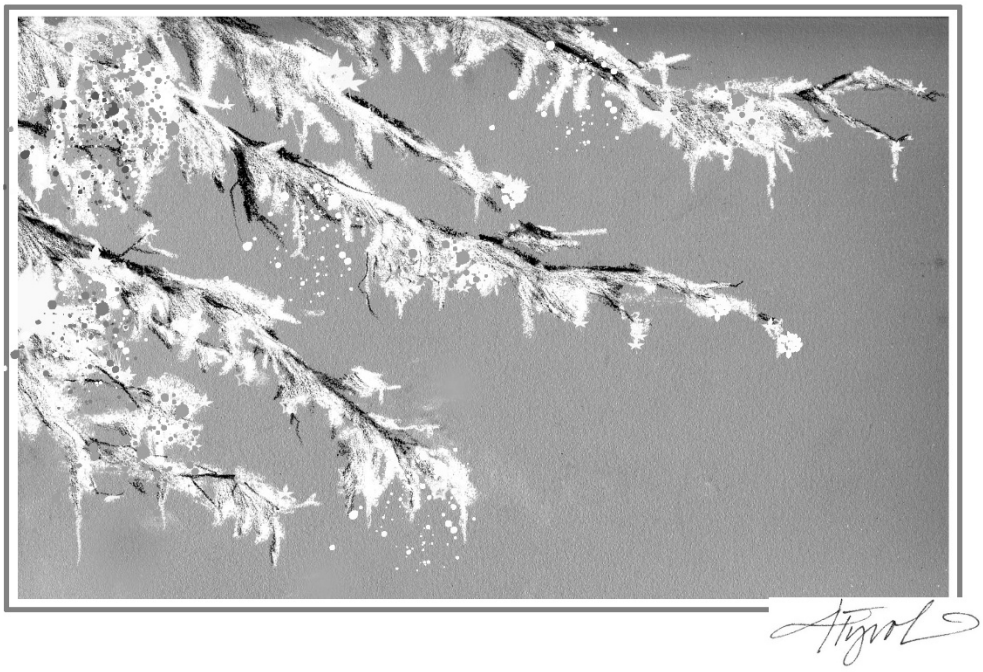
The Outside Story

Ice Ice Maybe: Are We Due for a Major Ice Storm?

By Jen Weimer



The Northeast has experienced significant ice storms throughout history, and we may be due for another one. Though we see icing in many winter storms, including recent ones, major ice storms cause widespread damage to forests and infrastructure, and occur in the northeast every 15 to 25 years. Our most recent one was in 2008. However, warming climate trends are increasing the frequency and intensity of ice storms and shifting the risk to different regions and seasons.

Ice storms occur when rain falls during subfreezing temperatures, freezing to surfaces on contact. Ice accumulation can damage trees by causing branches to bend, crack, or break. The severity of the damage depends on the amount of ice, wind, and the duration of the storm. Ice accumulation between one-quarter and one-half inch can cause small branches and weak limbs to break, while accumulations of one-half to one inch can cause larger branches to break.

Most tree damage from ice storms occurs in hardwood stands. Softwood trees are more adept at bending under the weight of the ice, while hardwood branches break more easily. In the northeast, birch and maple sustain the most damage. Damaged trees are susceptible to rot, which travels slowly from the damaged branches into the stem of the tree. Once injured, trees also become more susceptible to secondary stressors such as insects and disease pathogens. Though physical damage is immediately apparent, these other stressors can take decades to kill the tree. A study at the Hubbard Brook Experimental Forest found changes in forest structure following an ice storm. Researchers found almost five times the number of branches fell to the ground than in a typical year. They also measured an increase in canopy openness, that let two to three times more light into the forest.

The last major ice storm occurred in 2008 and affected southern New Hampshire, northern Massachusetts, Vermont, and parts of Maine. The storm resulted in ice accumulation up to one inch, damaging hundreds of thousands of acres of forests and causing power outages to over one million homes and businesses. Just ten years earlier was one of the most devastating ice storms in New England's history; the 1998 ice storm caused an estimated $1 billion in damage across the region, affecting over seventeen million acres. Ice accumulation in

most areas was over one and a half inches, which caused widespread tree damage and massive power outages that lasted for weeks.

The 1998 storm had a significant impact on forests. Beech trees already weakened by beech bark disease were hit particularly hard. Sugarbushes in northern New York, where between two to four inches of ice accumulated, suffered damage to trees and tubing lines. This decreased the output for maple syrup production the following year. According to the North American Maple Project, sugarbushes in Vermont were less severely affected than non-sugarbush maple stands with much smaller trees. Lower elevation sugarbushes with larger but fewer sugar maple stems were also more resistant to the storm.

The storms of 1998 and 2008 were notable, but not unusual. Early records show severe tree damage across New England from ice storms as early as 1886. The impact on infrastructure at this time was limited, however, due to sparse development and a lack of modern utilities. Significant regional damage also occurred in New England in 1921 with reports of road and rail disruptions. Only 8 years later, in 1929, another storm hit Massachusetts, Vermont, and New Hampshire particularly hard with widespread power outages. In 1951, a multi-region ice storm affected New England, parts of the Midwest, and Canada. This storm heavily impacted forests and rural power, which led to the development of proactive tree trimming and vegetation management programs. In 1973, another major storm affected New England and upstate New York causing significant tree and infrastructure damage, especially in rural areas. These six major storms that occurred since 1921 happened every 17 years on average.

The recurrence of ice storms in the northeast reinforces the need for investment in resilient power grids as well as forests. Forests can be made more resilient to ice storms by maintaining a healthy stand structure with varying tree ages and sizes. Cultivating and selecting single-stem well-formed trees with larger crowns and stronger stems produces trees that are less likely to suffer catastrophic crown loss. Homeowners can also prepare for ice storms by pruning weak or poorly attached branches, removing deadwood, and ensuring trees have a strong central leader. If limbs are above power lines, consult your local power company or a professional arborist for removal. Consider inspecting trees for potential hazards now, before the next ice storm hits. By adequately preparing, we can give our trees and forests the best chance of good health in the coming spring.

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