

Fire in the Sky, Smoke in the Water: Queen of American Lakes Under Siege from Fireworks Displays?

A few Sundays from now, Americans across the nation will look skyward, awed by Fourth of July fireworks displays. If those fireworks explode over lakes, rivers, and other waterways, the scene might not be so pretty.

What goes up must come down. And it's coming down laden with chemicals like perchlorate, a propellant used in fireworks. While most of the perchlorate combusts, all of it does not, with perchlorate raining over the land—and water. The water may be where the problem lies.

"Health and environmental concerns have been linked to perchlorate and other chemicals used in fireworks," says Walter Lender, executive director of the Lake George Association (LGA) in Lake George, New York.

Lake George is a 32-mile-long glacial lake in New York's Adirondack Mountains. Thanks to its pristine waters, the lake has been known for more than a century as the "Queen of American Lakes."

The Queen, however, is under siege from several water-quality threats; among the newest, perhaps, is perchlorate. Her waters are sprinkled with the substance every July 4th. But the potential harm doesn't end with Independence Day. Every Thursday night in summer, fireworks burst into color above the lake. The result may affect not only Lake George itself, but humans in the area.

"Perchlorate is absorbed by the thyroid gland in place of iodine," says Emily DeBolt, a scientist at LGA. It can interfere with the production of thyroid hormone, essential to metabolism and brain function.

There are no federal or New York State drinking water standards for perchlorate, however, a particular concern for Lake George. Residents of nearby towns and villages get water straight from the lake for drinking, bathing, cooking, and other uses.

"Part of the problem," says DeBolt, "is that there isn't much agreement on what is or isn't a safe amount of perchlorate."

In January, LGA issued a report on preliminary research it conducted in Lake George: *An Initial Study Into the Effects of Fireworks on the Water Quality of Lake George*.

LGA scientists collected sediment and water samples at six sites in the lake, three near Lake George Village where fireworks had rocketed into the sky. Although DeBolt and Lender expected that perchlorate concentrations would be higher immediately following a fireworks display, baseline water samples as well as weekly post-fireworks samples showed no measurable perchlorate. "Since there wasn't evidence of perchlorate in the water," says DeBolt, "we tested sediment to see if it was settling out." Concentrations of the chemical were present there, but at low levels.

"Research conducted in other lakes, however," says DeBolt, "has found significant changes in perchlorate levels associated with fireworks."

Perchlorate-free fireworks are available, but at a higher cost than traditional fireworks. "Since perchlorate has implications for human health, a switch to perchlorate-free fireworks could be considered," says Lender.

An e-mail message to the LGA from Todd Earl, president of the Adirondack School Counselor Association, reflects a growing concern among Lake George residents. "I understand and appreciate the tourism-driven economy of our community," he writes, "but I've long felt that this is an overlooked burden on our beautiful resource, and that the impact should be evaluated."

While more research takes place, LGA suggests that the region develop a registration form for fireworks companies producing a show anywhere in the Lake George watershed. Jeff Alonzo, owner of Alonzo Fireworks, which puts on most of Lake George's large fireworks displays, agrees that such a form seems reasonable, according to the LGA report.

"Lake George is far from the only water body dealing with balancing fireworks for entertainment with water-quality concerns," says DeBolt. A recent study, for example, of a lake near Ada, Oklahoma, found that the perchlorate concentration after a fireworks display increased by a factor of 1,000. For the lake's water to return to normal, it took 20 to 80 days.

The 80-plus days between Memorial Day and Labor Day are Lake George's busiest time of year. For the Queen of American Lakes, if fireworks turn out to be an issue, her summer season may go up in smoke.

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