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Syracuse University Magazine (USPS 009-049, ISSN 1065-884X) Volume 19, Number 2, is an official bulletin of Syracuse University and is published four times yearly: spring, summer, fall, and winter by Syracuse University, Syracuse NY 13244. It is distributed free of charge to alumni, friends, faculty, and staff. Periodical postage paid at Syracuse, NY, and additional mailing offices.

CHANGE OF ADDRESS ONLY: Advancement Services, 820 Comstock Avenue, Room 009, Syracuse NY 13244-5040. Telephone: 315-443-3904. Fax: 315-443-5169. E-mail: *alafranc@syr.edu.* For duplicate mailings, send both mailing labels to the address above.

OTHER MAGAZINE BUSINESS: *Syracuse University Magazine,* 820 Comstock Avenue, Room 308, Syracuse NY 13244-5040. Telephone: 315-443-2233; Fax: 315-443-5425. E-mail: *jacox@syr.edu.* Web site: *sumagazine.syr.edu.*

POSTMASTER: Send address corrections to 820 Comstock Avenue, Room 009, Syracuse NY 13244-5040.

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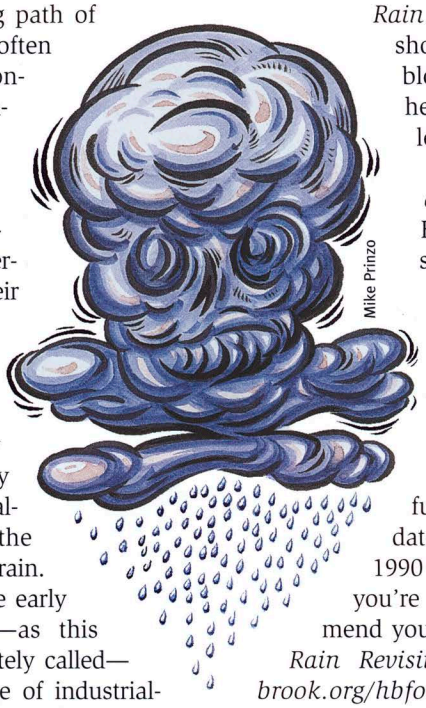
Opening Remarks

Combating Acid Rain

Like many anglers, I love hiking along remote streams in search of brook trout. It's never easy slogging through brush and trudging over rocks while following the meandering path of running water, but it's often essential if I want to connect with a feisty brookie. For me, the experience counts among life's simple pleasures.


Mike Prinzo

Brook trout are beautiful creatures, but understandably wary in their instinctive struggle for survival. In the Adirondacks—as well as other regions of the country, but particularly in the Northeast—they face the additional challenge of enduring the insidious effects of acid rain. First documented in the early '70s, acid deposition—as this scourge is more accurately called—remains a major plague of industrialized society. Our growing demand for energy leads to the release of sulfur dioxide into the atmosphere by electric utilities. As we transport ourselves here, there, and yonder, our vehicles discharge nitrogen oxides. Even modern agriculture contributes to the problem by emitting ammonia. Once aloft, these chemical compounds react with water, oxygen, and oxidants in the atmosphere and create sulfuric acid, nitric acid, and ammonium, which ride the winds until they're returned to Earth through precipitation, clouds, fog, vapor, gases, and particles.

That is when the havoc begins. Not only does acid deposition drop pH levels in bodies of water to create inhospitable conditions for aquatic life, but it also depletes the soil of such elements as calcium and magnesium, which can help neutralize acidity levels. In addition, it enhances the movement of inorganic aluminum from bedrock and soil to ponds, lakes, and streams. Here is the endgame for the brook trout, though it actually has a high tolerance level for acidity compared to many other species: "High acidity and aluminum levels disrupt the salt and water balance in fish, causing red blood cells to rupture and blood viscosity to increase," reads the publication *Acid Rain Revisited*. "Studies show that the viscous blood strains the fish's heart, resulting in a lethal heart attack."

Acid Rain Revisited, issued by the Hubbard Brook Research Foundation in New Hampshire, reports how acid deposition continues to distress ecosystems in the Northeast, despite reductions in fossil-fuel emissions mandated by the 1970 and 1990 Clean Air acts. If you're interested, I recommend you take a look at *Acid Rain Revisited* (*www.hubbardbrook.org/hbfound/hbfound.htm*). The report shows that acid deposition is an incredibly complex issue that reflects the interconnectedness of our environment and the consequences of our actions.

The report's project leader is Syracuse University professor Charles T. Driscoll, one of the world's leading authorities on acid deposition. In this issue, associate editor Christine Yackel profiles Driscoll and writes about his involvement in acid-deposition research (page 22).

While it is sobering to learn how devastating the effects of acid deposition have been on the environment, it is encouraging to know that scientists like Driscoll continue to develop a greater understanding of the issue, providing lawmakers with solid research that can help combat the problem. We, after all, should not ignore warning signs that point to the destruction of our natural resources. If we do, there will be more to worry about than locating brook trout in a secluded Adirondack stream.

JAY COX
Editor