

TITLE: ASSESSMENT OF THE EXTENT TO WHICH INTENSIVELY-STUDIED LAKES ARE REPRESENTATIVE OF THE ADIRONDACK REGION AND RESPONSE TO FUTURE CHANGES IN ACIDIC DEPOSITION

Authors: SULLIVAN T. J.; COSBY B. J.; HERLIHY A. T.; ET AL.

Source: WATER AIR AND SOIL POLLUTION, October 2007: Volume:185 Issue: 1-4 Pages: 279-291

Abstract: Many lakes in the Adirondack Mountains, New York, have acidified over the past century due to acidic atmospheric deposition. More recently, most monitored lakes have shown signs of chemical recovery (increase in acid neutralizing capacity) as sulfur deposition levels have declined in response to the Clean Air Act and other emissions control legislation. We used measured and modeled trends in past lakewater acidification and projections of future recovery from acidification to extrapolate results from judgment samples of intensively studied lakes to the population of acid-sensitive Adirondack lakes. Simulations were developed for 70 watersheds using the Model of Acidification of Groundwater in Catchments (MAGIC) to classify lakes according to their sensitivity to change in atmospheric S and N deposition. MAGIC simulations suggested that the modeled Adirondack Long-Term Monitoring Project (ALTM) and Adirondack Effects Assessment Project (AEAP) lakes were largely among the lakes in the population that had acidified most between 1850 and 1990. Most of the modeled ALTM/AEAP lakes were within the top 36% of acid sensitivity, based on model projections of past acidification and future chemical recovery, compared with the 1,829 Adirondack lakes in EPA's Environmental Monitoring and Assessment Program (EMAP) statistical frame. Results of this research will allow fuller utilization of data from on-going chemical and biological monitoring and process-level studies by providing a basis for regionalization of findings and developing/refining relationships among watershed characteristics, chemical change, and biological responses to changing levels of acidic deposition.

Full article can be found at: <http://dx.doi.org/doi:10.1007/s11270-007-9449-2>