

results from the mid-1950s show decreases in pH and concurrent increases in excess sulphate loads. At present, there are 9 rivers in this province with a pH of 4.7 which no longer support salmon or trout reproduction; 11 rivers are in the pH range 4.7-5.0 where some juvenile salmon mortality is probably occurring; and 7 rivers are in the pH range 5.1-5.3, which is considered borderline for Atlantic salmon. If current acid loadings continue, it appears probable that more of the inland and Atlantic salmon fisheries in Canada will be lost.

A similar 17-year trend toward acidification of some headwater streams has been observed in New Jersey. In addition, high elevation lakes in the Adirondacks have shown a marked pH decline over a 40 year period. This is one of the most sensitive lake districts in the eastern United States. A recent inventory has indicated that at least 180 former brook trout ponds will no longer support trout because of acidification.

A summary of several Canadian lake studies supports the conclusion that acidic precipitation has reduced the alkalinity of surface water in many lakes, thus increasing their vulnerability to continued acid deposition. Many of the affected lakes are not technically acidified (in the sense of depressed pH), but the long-term biological consequences of the altered water chemistry are unknown at this time. Although naturally acid lakes do occur, the significant number of seriously acidified lakes appears to be a recent response of low alkalinity systems to the continuing addition of H^+ and SO_4^{2-} .

Concurrent with negative impacts on the fishery, there have been changes in other components of the aquatic ecosystem. Acidification results in changes in the makeup, size and metabolism of plankton communities. These alterations hold important implications for other organisms higher in the food chain.

Many species of frogs, toads and salamanders breed in temporary pools which are susceptible to pH depression due to the rapid flushing of accumulated acid during spring snowmelt.

Field surveys in North America and Europe have documented the sensitivity of amphibians to depressed pH and the decreases in their numbers, especially those inhabiting temporary pools. The danger that they may become locally extinct, and their significance in the food chain, hold important implications for other wildlife.

Health Effects

Although available information gives little cause for concern over direct health effects from acid deposition, there are at least two indirect effects of concern: (1) contamination of edible fish by toxic materials, principally mercury; and (2) leaching and corrosion of watersheds and water storage and distribution systems, leading to elevated levels of toxic elements in drinking water supplies.