

metals in the water column, where they can be flushed out of the system before being deposited in the sediments. Diatom data are less complete, but they also indicate a pH decline since the early 1900s.

There are few historical records of chemistry of low alkalinity waters not influenced by local urban or industrial discharges (i.e., 6 rivers in Nova Scotia; 7 lakes in Nova Scotia and 3 in New Brunswick; 40 lakes in Adirondack Park, New York; 250 lakes in New England; 2 streams in the New Jersey Pine Barrens; 270 lakes in Wisconsin). The above locations are exposed to various levels of acidic deposition. Some surface waters in these areas have shown a decrease in alkalinity and/or pH. In Wisconsin, however, most lakes surveyed had increased in alkalinity and pH.

The total number of lakes and rivers in eastern North America that are thought to have been acidified by acidic deposition is a very small percentage of the total aquatic resource. In the absence of effects from mine drainage and industrial waste water, the symptoms of acidification (e.g., long-term pH declines and/or short-term pH depressions of surface waters with loss of fish populations) have been observed only in clearwater lakes and streams with accompanying elevated concentrations of sulphate and/or nitrate. Natural acidification processes do occur but their effects appear greatest in coloured surface waters. Land use changes, such as fires, logging, and housing developments, have taken place in many areas with low alkalinity surface waters. However, the symptoms of acidification have not been observed in clearwater lakes and streams except in areas receiving high levels of acidic deposition.

Lakes in the Adirondack Mountain range exhibit some of the lowest alkalinity values found in the eastern United States and are located in a zone presently receiving high acidic deposition (30-40 kg/ha.yr of sulphate in precipitation). In this area, 52% of the 214 high elevation lakes sampled in 1975 had pH values less than 5.0. Seven percent had pH values between 5.0 and 6.0. The New York Department of Environmental Conservation has concluded that at least 180 former brook trout ponds are acidic and no longer support brook trout. The factors causing these population extinctions have not been demonstrated.

New England currently receives wet sulphate deposition loadings of 17-40 kg/ha.yr. A study of 95 relatively small low alkalinity lakes in New England for which historical data were available showed that 64% had decreased in pH. However, accompanying historical deposition data are not available. A comparison of present alkalinity values with historical values for 56 lakes indicated that 70% had decreased in alkalinity. Two other studies have indicated pH declines in some lakes surveyed in Maine. The relative contributions of natural and anthropogenic sources to acidification of these lakes is not known.