

and high aluminum concentrations during spring runoff and extensive growth of filamentous green algae, and fish kills have been observed in Plastic Lake.

For those regions currently receiving loadings of sulphate in precipitation of less than 17 kg/ha.yr (Wisconsin, Minnesota and northwestern Ontario), there have been no observed detrimental chemical or biological effects.

For regions currently receiving between 20 and 30 kg/ha.yr sulphate in precipitation there is evidence of chemical alteration and acidification. In Nova Scotia rivers which currently have pH less than 5 there have been salmon population reductions as documented by 40 years of catch records. Fish stocks have remained viable in adjacent rivers with pH values presently greater than 5. Water chemistry records (1954-55 to 1980-81) have indicated a decline in pH to values presently less than 5 for other rivers in the same area. In Maine there is evidence of pH declines over time and loss of alkalinity from surface waters. In Muskoka-Haliburton there is historical evidence of loss of alkalinity for one study lake and there is documentation of pH depressions in all study lakes and streams with low alkalinity. Fish kills were observed in the shore zone of a study lake during spring melt. In the Algoma region there are elevated sulphate and aluminum levels in some headwater lakes.

For regions currently experiencing loading greater than 30 kg/ha.yr there are documented long-term chemical and/or biological effects and short-term chemical effects in sensitive (low alkalinity) surface waters.

In the Adirondack Mountains of New York, comparison of data from the 1930s with recent surveys has shown that some more lakes have been acidified. Fish populations have been lost from 180 lakes. Elevated aluminum concentrations in surface waters have been associated with low pH and survival of stocked trout is reduced by the aluminum.

In the Hubbard Brook study area in New Hampshire where the influx of chemicals is limited principally to precipitation and dry deposition there are pH depressions in streams during snowmelt of 1 to 2 units. Elevated levels of aluminum were observed in headwater streams.

Many species of frogs, toads and salamanders breed in temporary pools formed by the mixture of spring rains and snowmelt. Such pools are subjected to pH depression. Embryonic deformities and mortalities in the yellow spotted salamander which breeds in temporary meltwater pools have been observed in New York State where the acidity of the meltwater pools was 1.5 pH units lower than that of nearby permanent ponds. Population densities of