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## Recovery from acidification in European surface waters

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**Abstract.** Water quality data for 56 long-term monitoring sites in eight European countries are used to assess freshwater responses to reductions in acid deposition at a large spatial scale. In a consistent analysis of trends from 1980 onwards, the majority of surface waters (38 of 56) showed significant ( $p \leq 0.05$ ) decreasing trends in pollution-derived sulphate. Only two sites showed a significant increase. Nitrate, on the other hand, had a much weaker and more varied pattern, with no significant trend at 35 of 56 sites, decreases at some sites in Scandinavia and Central Europe, and increases at some sites in Italy and the UK. The general reduction in surface water acid anion concentrations has led to increases in acid neutralising capacity (significant at 27 of 56 sites) but has also been offset in part by decreases in base cations, particularly calcium (significant at 26 of 56 sites), indicating that much of the improvement in runoff quality to date has been the result of decreasing ionic strength. Increases in acid neutralising capacity have been accompanied by increases in pH and decreases in aluminium, although fewer trends were significant (pH 19 of 56, aluminium 13 of 53). Increases in pH appear to have been limited in some areas by rising concentrations of organic acids. Within a general trend towards recovery, some inter-regional variation is evident, with recovery strongest in the Czech Republic and Slovakia, moderate in Scandinavia and the United Kingdom, and apparently weakest in Germany.

**Keywords:** acidification, recovery, European trends, sulphate, nitrate, acid neutralising capacity

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