



Chemistry of soils and sediments in areas in northern Sweden affected by acid sulfate soils

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The leaching of elements from active acid sulfate soils (AS-soils) and accumulation of elements in sediments deposited outside areas with such soils have been studied in three small coastal drainage areas situated in northern Sweden. Earlier studies from Finland and Sweden have shown that many elements are mobilised from AS-soils and studies from Finland show that sediments deposited close to streams affected by such soils are characterized by high contents (possibly toxic) of several elements. This implies that elements leached from AS-soils to a large extent are deposited in coastal sediments. The aim of this study was to: 1) Quantify the leaching of elements from AS-soils, 2) Determine to which extent elements leached from AS-soils are deposited in lake and coastal sediments.

The results show that active AS-soils are significant contributors to surrounding waters of several elements such as Cd, Ni, Y and Co. It has been possible to get an estimate of the amounts of elements leached from the soils by comparing the contents of element in the active AS-soil with the contents in the potential AS-soil. However, to some extent these elements have accumulated in the soil at the transition zone between active and potential AS-soil. In the future, elements accumulating in this zone are likely to be mobilised to surrounding waters. Sediments deposited in a lake during the last hundred years were found to be characterised by peaks with high contents of organic material, Al, Fe and some other elements. The drainage area upstream the lake has AS-soils that have been formed due to artificial lowering of the groundwater table. The high sediment contents of certain elements are interpreted as the results of periods with low pH and high concentrations of metals in the water. These occasions probably occurred during periods of high water flow due to rainfall or snow melting. Some elements leached from AS-soils, such as Cd, are not enriched in the lake sediment, nor does the sediments deposited in coastal areas downstream the lake show high contents of these elements. Further studies of the fate of metals in coastal areas are therefore needed.