



Mapping of Acid Sulfate Soils in Finland: determining of areas of risks and compiling guidelines for environmental protection and safe land use

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Acid sulfate soils (ASS), also referred to as the “nastiest soils in the world”, are soils that contain or have contained metal sulfides that oxidize under aerobic conditions and, subsequently, typically produce very severe acidity and metal pollution. In Finland, for example, the discharge of several metals to water courses from ASS is greater than that from the entire Finnish industry, and due to the acidity these metals largely occur in a soluble toxic form. In Europe, the largest occurrences of acid sulfate soils are located in Finland. It has been estimated that coverage of these harmful soils is approximately 1000 - 1500 km² along the coastal areas of Finland. Sulfide-bearing fine-grained sediments were deposited in the sea between Finland and Sweden after the melting of the latest continental ice sheet, about 10,000 years ago. In places, the formation of such sediments is still going on today. The rapid isostatic land uplift (more than 200 m after the latest glacial period, currently up to 8 mm/year) after the retreat of the continental ice sheet has lifted these sediments above sea level.

In Finland, systematic mapping and classification of acid sulfate soils started in 2009 with Geological Survey of Finland (GTK) as the leading partner, together with Åbo Akademi University and University of Helsinki. The definition of a risk classification of Finnish acid sulfate soils has been developed during the project. The observations, measurements and analyses have been used to produce e.g. probability maps of integrated catchment areas (at the scale 1:250 000), reports of the areas and guides for the identification of ASS and their environments. The main users of the results have been authorities at governmental, regional and local levels, organizations and actors in agriculture and forestry, peat production and earthwork companies and consultants concerned with soil and construction. The mapping project carried out by GTK is still in process and should be completed by the end of 2015 according to the agreement with the Ministry of Employment and the Economy.