

## Acid Sulfate Soils in Finland – mapping and environmental risks

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Sulfidic sediments have been developing in parts of the Baltic Sea during the last 8000 years. Post-glacial isostatic land uplift has brought the sediments above sea level. When these soils are drained by human activities (agriculture and forest drainage, peat mining, dredging and building), the sulfidic material will oxidise, leading to **formation of sulfuric acid, leaching of acidity and metals from the soil, subsequent deterioration of watercourses and corrosion of infrastructure**. The sulfidic sediments have turned into acid sulfate soils (ASS), which are a big environmental problem along the coast of Finland and worldwide. ASS also cause lots of trouble and costs in land-use related to construction and infrastructure. Dent and Pons (1995) concluded that in a global perspective **“Acid Sulfate Soils are the nastiest soils in the World”**.

The problems related to ASS in Finland have been known for centuries, but not until 2009 did systematic mapping and (risk) classification commence on the responsibility of the Geological Survey of Finland (GTK). Until 2015 62% of the total potential 5 million hectares has been mapped. At this stage we can say that there are more acid sulfate soils in Finland than the earlier estimated maximum of 336 000 ha.

The results are published in GTK’s Map services as probability maps including site descriptions and results: <http://gtkdata.gtk.fi/Hasu/index.html>.

In Finland, and also in the beginning of this mapping campaign, we have assumed that acid sulfate soils are fine-grained sediments occurring along the coast. During the mapping process it has become evident that in many places, also inland above the area once covered by the Baltic, there are also coarse-grained soils and till with low S-content (~0.01-0.1%), which are strongly acidified when oxidised in the laboratory. There are examples where acid water from “acid sand”-pits has escaped and caused large fish kills in receiving streams. Sulfidic peat with S-contents up to 9% is also quite common. These “new findings” have raised a lot of questions and new research has to be initiated. Especially the role of black schist should be clarified.

### References:

Dent, D.L. and Pons, L.J., 1995. A world perspective on acid sulphate soils. *Geoderma* 67: 263-276.