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Erosion studies at Lake Pyhäjärvi catchment (SW Finland)

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Lake Säkylän Pyhäjärvi is a large and shallow lake located in the centre of an intensive agricultural area in southwest Finland and it suffering from eutrophication. The nutrient load to Pyhäjärvi comes from diffuse agricultural sources in the catchment. The dominant land cover in the catchment area (22%) is made by cultivated fields, the rest comprising forests, peat lands and built-up areas. The soils of the Pyhäjärvi catchment are erosion sensitive clay, silt, till and peat.
The suspended solid and nutrient transport of the main rivers flowing to the lake has been monitored since 1980's. Most part (over 70 %) of phosphorus load is particulate and erosion originated. In recent years the climate change has changed runoff patterns. In winter, mean air temperature is about -2.1 ºC and the catchment is also normally covered by snow in winter. However, in recent years there have been many years with higher winter time temperature and precipitation. In winter the fields are usually without vegetation cover and rainfalls increase erosion. There are already clear long term changes observed in runoff patterns and suspended solid load patterns.
The erosion risk invention has been made to Yläneenjoki catchment in order to allocate erosion preventing measures. Sedimentation ponds, wetlands, buffer zones and filters have been used to catch the suspended solids from runoff but these methods are inadequate. In order to efficiently reduce nutrient load to the lake, the focus of the restoration measures should be in the soil, especially erosion preventing. Therefore more deep understanding and studying of erosion processes are needed. Runoff and erosion amounts and patterns should be measured in different types of fields should be done and combined to GIS-analysis.