

## 2 Master thesis projects (30 hp):

### Mapping of chemical and physical changes in soil- and surface waters after the forest fire in Västmanland

#### 1. Effects on riparian soils, metals and organic carbon

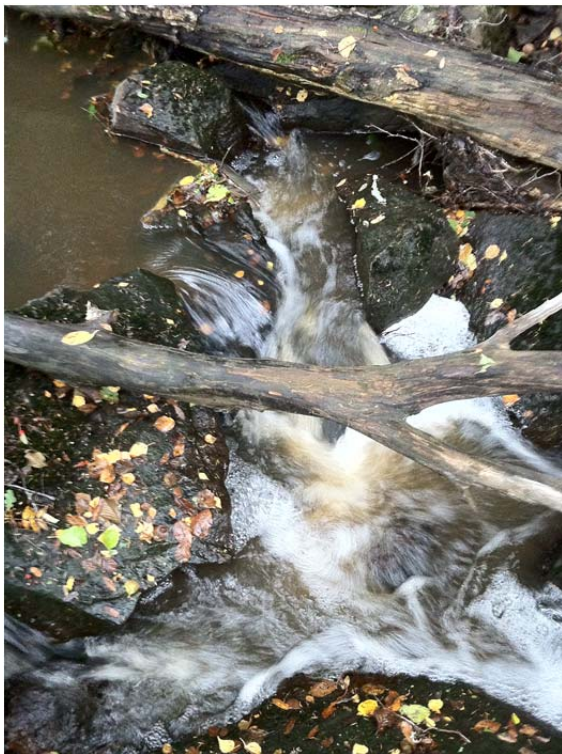
#### 2. Effects on water acidity and nutrients

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#### Background:

Recently the largest uncontrolled forest fire since in modern times (last 150 years) occurred in Sweden with large areas of forested land surface have been heavily affected. From earlier fire events both in Sweden (Tyresö) in other warmer countries (California, Spain) it is known that these types of fires can have a significant impact on water quality (Smith et al. 2011)



and ecosystem functioning. Climate change is predicted to increase temperature and change the pattern of rainfall which will increase the risk of forest fire as a major perturbation of forested ecosystems in Sweden. This has potentially a large number of direct effects on forestry, carbon balance but also ecosystem services such as surface and drinking water quality. The most important known short term effects are increased export of sediments and organic contaminants, acidification and metal and nutrient mobilization. Most of these changes need to be studied very soon after fire extinction. In addition to two existing monitoring sites inside the affected area we have established 7 additional sampling sites including two reference sites that are followed since september. Two of the sites are equipped with data logging devices that measure temperature, conductivity, turbidity, pH and color. Four more sites are even equipped with pressure transducers.

The aim of this project is to characterize changes in water chemistry after the intensive forest fire close to the Sala area and evaluate the downstream effects on water chemistry and drinking water quality. The results of these two projects will be part of a larger environmental monitoring program in cooperation with the Västmanland countyboard and will be reported to the Swedish Agency for marine and water management (HaV). The two projects are tightly linked and require both field and lab work. Background data such as flow, temperature, landcover data etc will be shared and sampling occasions coordinated. It is also planned to map changes in riparian vegetation using airborne drones.

- In the project "Riparian soils" you will be studying changes in water chemistry that are related to organic matter such as variations in organic matter concentration, pH and metals. In addition to surface water you will be installing groundwater tubes and sampling riparian soil water and evaluate related logger data.
- In the project "water acidity and nutrients" you will be studying changes in general water chemistry with focus on acidification and eutrophication. In addition you will be evaluating related logger data and relating the observed temporal and spatial signals to other anthropogenic impacts such as presence of agriculture, forestry and recovery from acidification.

The two project workers will work together and will involve tasks both in the laboratory and field as well as evaluating of existing data.

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