

Factsheet

Nutrient loading in Sweden and the European Union

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About Soils2Sea

Current levels of nutrient loading pose risks for water quality and ecosystem health in the Baltic Sea. Soils2Sea studies the retention of nitrogen and phosphorous between the soils/sewage outlets and the coast, including transport pathways such as overland flow and flows in macropores, subsurface tile drains, shallow and deep groundwater, rivers, wetlands and lakes.

Soils2Sea will run from 2014-2017. It brings together eight organisations from Denmark, Germany, Poland, Russia and Sweden. The project is funded by BONUS, the joint Baltic Sea research and development programme, and national funding institutions.

Tullstorp Brook

Tullstorp brook is a 30 km long stream located in the south of Sweden. The stream drains an area of 63 km² into the Baltic Sea, close to the small town of Skateholm. The watershed consists predominantly of glacial clays and till, and is intensively farmed with around 85% of the watershed area being agricultural land. Due to the climatic and geological conditions, a majority of the agricultural land is tile drained to increase the runoff from the soil and provide optimal conditions for agriculture.

Case Study focus within Soils2Sea

An extensive field study will be performed along a stretch of Tullstorp Brook, including investigations of geophysical, topographical and hydraulic properties. Key features in the campaign, starting in 2014 include tracer tests where species with properties similar to those of dissolved nitrogen and phosphorous will be injected into the stream during different stream flow conditions. These experiments are not dangerous to humans or the environment and provide information on transmission rates, dispersion, dilution and delay of substances within the water course. Soils2Sea will focus on surface water but also on the potential to reduce nutrients from groundwater.

The EU Regulatory Framework

Within the EU there are several regulatory frameworks and initiatives addressed directly or indirectly to the issue of eutrophication. These frameworks, accompanied by non-binding initiatives, have an effect on all of the Soils2Sea case studies. Some key policies are detailed here with general aspects and implications specific to Tullstorp brook.

Water Framework Directive (2000)

Summary: The Water Framework Directive (WFD) sets the objectives for water protection in the EU. The directive aims to achieve a 'good status' for all ground and surface waters by 2015. It is complemented by the Groundwater Directive (2006) which sets a concentration limit of 50 mg/l Nitrate.

Key Requirements: Nitrate and phosphate are identified as main contributors to eutrophication. In this context, Member States must establish national River Basin Management Plans (RBMP) with concrete programmes. The Directive is complemented by other, more specific, EU laws e.g. the Groundwater or Nitrate Directive (see below).

Local aspects: Coordination of the WFD in Sweden is done by the Swedish Agency for Marine and Water Management. For Tullstorp Brook, local coordination is done by the County administrative board of Skåne, who have set the following targets to reach good ecological status:

- 30% reduction of nitrogen (75 t/yr)
- 52% phosphorous (2,08 t/yr) reduction for good ecological status.

The current loads of nitrogen and phosphorous are 250 ton/year and 4 ton/year respectively.

Nitrates Directive (1991)

Summary: The Nitrates Directive has the goal of reducing and preventing water pollution from nitrates from agricultural sources. It primarily focuses on livestock manure and other fertilisers that could pollute ground and surface waters. The Nitrates Directive is an important component of the Water Framework Directive.

Key Requirements: Nitrate pollution is defined as 50 mg/l. Member States must identify surface or groundwater that is polluted or vulnerable to pollution and designate vulnerable zones where stricter monitoring is implemented. Member States must implement Action Programmes, including the following mandatory measures:

- Rules for fertilizer application must be implemented that are in accordance with Good Agricultural Practices
- A maximum fertilizer allowance of 170 kg/ha/yr of nitrate for each farm or livestock unit (with 210 kg/ha allowance in the first 4 years and possibilities of adjustment of the maximum allowance according to objective criteria).
- This indirectly regulates phosphorous to 25 kg/ha/yr (depending on type of manure).

Local aspects: National and local implementation of the Nitrate directive is done by the Swedish Board of Agriculture. The following national fertiliser application rules are set:

- Max. 170 kg/ha/yr nitrogen and 22 kg/ha/yr phosphorus
- Soil coverage or tillage 4h after fertilization,
- Even fertilizer distribution,

Fertiliser application prohibited on saturated, flooded, snow covered or frozen land,

Tullstorp Brook lies within a Nitrate Vulnerable Zone (NVZ) exceeding pollution class 5 (N>10mg/l) but not exceeding the NVZ criteria of 50 mg/l nitrate. Local rules include:

- From August to October soil with clay content below 15% can only be fertilized when crop is growing on this area. If clay content is above 15% the bare soil can be fertilized prior seeding,
- In October solid manure application is allowed,
- From November to February no manure fertilization is allowed,
- Seeding and harvesting time restrictions to allow max. ground cover.

HELCOM and Baltic Sea Action Plan (2007)

Summary: HELCOM Baltic Sea Action Plan (BSAP) is a programme to restore the good ecological status of the Baltic marine environment by 2021. The BSAP was adopted by all the coastal states and the EU in 2007.

Key Requirements:

- Maximum Allowable Inputs to the Baltic Sea ~ 21,000t P and 600,000t N:
- Country Allocated Reduction Targets (CARTs): to reduce the nutrient load from waterborne and airborne inputs by 2016 aiming at reaching good ecological and environmental status by 2021

Recommendation:

- "Criteria and measures concerning the prevention of pollution from land based sources": max. livestock manure application of 170 kg/ha nitrogen and 25 kg/ha phosphorus.
- Usage of Best Environmental Practice (BEP) and Best Available Technology (BAT).

Outreach: The BSAP lists examples for measures reducing phosphorus and nitrogen losses from agriculture on animal feeding, fertilizer and manure management and soil management, e.g. through plant cover in winter, wet feed and fermentation. It also lists Hot Spots of intensive rearing of cattle, poultry and pigs not fulfilling the convention requirements (Annex III).

Local aspects: Under HELCOM, a number of initiatives have been undertaken in Sweden, including:

- Sweden's Country Allocated Reduction Targets (2013) are 9.240t nitrogen and 530t phosphorus.
- Baltic Sea Action Plan proposal by Swedish Environmental Ministry: Swedish reduction targets (2010): 20.800 t nitrogen and 290 t phosphorus. This includes reduction for the Baltic sub-regions of the Danish Straits: of 1.700 t nitrogen.
- The Rural Development Program (non binding) provides financial support for:
 - o Relevant environmental protection measures (crop production plan, nutrient balance, soil mapping, determination of nitrogen content in liquid manure)
 - o Reduced nitrogen leaching (catch crops, spring tillage),

Non-binding initiatives:

The EU has established a set of standards for Good Agricultural and Environmental Conditions, including:

- E.g. through protection and management of water, combating soil erosion, managing soil organic matter and structure (2m buffer zones, no heavy machinery on very wet soils to keep soil structure, crop rotation, fallows, keeping slopes under plant cover or as a terraces).
- EU cross compliance– direct payments or through Rural Development Programme

For more information on the Soils2Sea project, including the latest research results, visit: www.soils2sea.eu

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