

The Halden river basin

Sub – district



The Halden river basin is an area in southeast Norway, with an over four times the national average of agricultural land, which over time has put a strain on the water quality and is experiencing even higher stressors now with climate change, shown through data sets back to the 1970s. We as an intermunicipal network for local authorities and stakeholders is in high need to look at new solutions to old problems and prepare for new problems with for now unknown solutions. We therefore seek to cooperate broadly with research and development projects going forward.

The Halden river basin sub-district is an intermunicipal cooperation between the municipals of Aurskog-Høland, Aremark, Marker and Halden, in both Østfold county and Akershus county. Marker municipality is host for the cooperation and is therefore the legal entity of the sub-district.

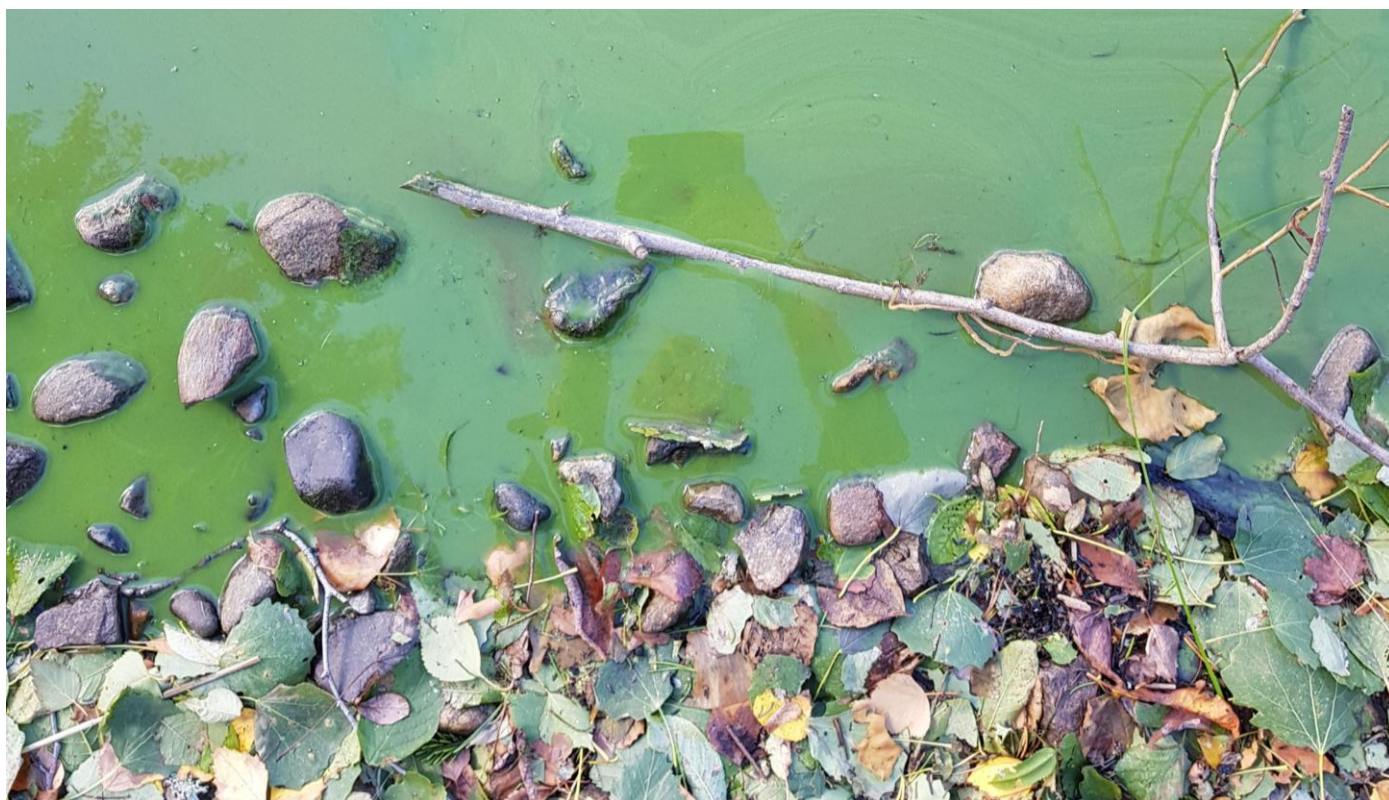
The river basin sub-district was established in 2007 to coordinate and communicate the effort of better water quality and preservation of biodiversity in the region. Through networks and projects, all stakeholders are involved in the efforts of reaching the goal of the water frameworks directive, such as agriculture, industry, infrastructure, wastewater, volunteers and tourism. This will allow to supply the

project with a wide range of active stakeholders and platforms for these to interact with the project and take part.

The coordination also includes decision makers, both locally and regionally, with some meeting points also with national decision makers. The sub-district is run by a board, consisting of mayors or vice majors from all participating municipalities, representatives from administration and politics from the county, and other stakeholders and national agencies related to water.

The river basin sub-district also organizes and finance the surveillance of biodiversity, ecosystem qualities and water quality data. These data and the corresponding modelling of nutrients in the water system, run offs, waste water loss to water bodies and other influences, together with the experience will be valuable to the project as a demonstration site.

Initiating and assisting in mitigations towards improved water quality with different stakeholders, is done through involvement and bridging with researchers, education and development programs. We are therefore looking to partner up in possible research projects to ensure progress towards the goals of the WFD and can supply both datasets and stakeholders in these projects. Further description is on the back of this sheet.



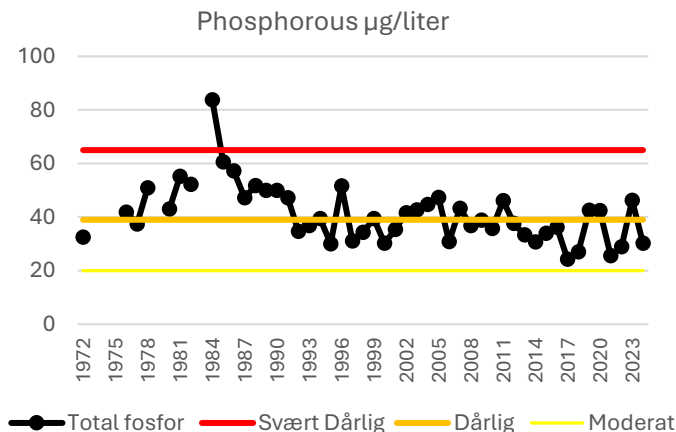
Datasets

The sub district is delegated the task from the municipality and partially from county governor to survey water quality parameters. In the Halden river basin there are six lakes with data on nutrients and physical properties that have been sampled since the 1970s, with an example from Bjørkelangen lake below. This datasets have been complemented with 10 datapoints on phosphorous and particle transport in the main water flow, with a sampling frequency of every other week for at least ten years. Six of these points have been expanded to also include nitrogen in the last years.

In addition to the nutrient surveillance, 54 smaller rivers and streams have been surveyed every three years since 2008 with benthic invertebrates and algae. For benthic invertebrates we have seen in the data series an improvement in results parallel with the work done on reducing spills and untreated wastewater. Recently a drop observed might be caused by climate or an increase in logging activities.

Another goal is to further include new and more extensive more datasets with sensors where available. Lierelva is for example part of a project to look at temperature and pH gradient in regard to riparian cover and to ditched peatland influence.

Norway has been advised by ESA to do more to ensure more data on chemical pollution, which has been difficult to obtain due to costs and had a lower priority than nutrients.



Stakeholders

The area consist of marine clay and is naturally high in nutrients. Since the last half of the 1900s shown a high increase due to a shift towards cereal production and the introduction of inorganic fertilizer shown high levels of algae blooms and a periodically dominance of cyano-bacterias. This resulted in the regional cooperation as firstly an agricultural project, then an environmental project, resulting in the river basin as a sub-district in line with the water framework directive in 2007.

Farmers and landowners has been the most important stakeholder and has been involved since the beginning of the first joint inter-municipal project to reduce nutrients in the late 1980s. Next was the wastewater treatment, both in municipal treatment plants and private small installments. With the development of villages and especially efforts to increase tourism, the water quality for swimming, experience and fishing has also become more involved as a stakeholder.

Through other projects the volunteers and stakeholder groups who talk on behalf of biodiversity has had a stronger voice in the water quality work.

All these groups of interests are already involved and can be of value to projects through e.g. workshops or interview.



A river basin in southeast Norway along the Swedish border

Possible partnerships

Taking an active part in projects and development of new knowledge is central in the work to both find the correct measures at the correct place, and making sure the stakeholder in charge can understand the effect and the importance of the measure. As such, the sub-district is both a part in developing knowledge and collecting experience, but also a stakeholder in research as much as a deliverer of information to other stakeholders.

Important topics we aim to review and do development in has a wide range. Examples where we have experience are mitigation measures in agriculture and wastewater treatment or policy and regulations made to improve water quality. Emerging topics such as climate adaptation, soil health, forestry and wetlands has become more important during the last decade, and we are eager to contribute as a living lab for such topics. Affiliated topics such as food production, user interests, biodiversity, restoration and nature-based solutions are also of interest to us.

