Catchment scale approach and sustainable water management to mitigate environmental effects and to adapt to climate change in boreal cultivated peatlands – NorPeat

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In Finland 10 % of the fields are cultivated peatlands but they produce over half of the agricultural greenhouse gas (GHG) emissions and cause high loading to recipient waters.

At NorPeat (The Nordic Experimental Peat Agroecosystem) platform water management in catchment scale level is used to study possibilities to mitigate environmental effects of cultivated peatlands but also the adaption to climate change e.g. by storing water.

NorPeat is a 26 ha cultivated peatland near coastal city of Oulu. The field is divided into eight plots with peat depth of 15-75 cm. Water storage reservoir (10 000 m^3) is connected to controlled subsurface drainage system allowing subsurface irrigation and manipulation of water table level (WTL). The reservoir is filled with runoff water from the upper catchment area.

The NorPeat platform is designed to monitor GHGs and loading to recipient waters. Environmental parameters (WTL, soil moisture etc.) are monitored continuously. In growing seasons 2023 and 2024 the target WTL was 50 cm from the soil surface, but during both summers the water was the limiting factor.

Water management can be used to mitigate environmental effects of cultivated peatlands but also to adapt to climate change, e.g. dry periods. However, the amount of available water can be the limiting factor for effective GHG mitigation during the growing season.

At NorPeat platform the goal is to store runoff water from the upper catchment area. The water is not pumped in any point. Instead, the subirrigation system is built based on gravitational water flow to have the costs and energy need as small as possible.

References

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