



Methylmercury in water from newly inundated forest landscapes

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Photo: Gunno Kinnman

Large areas of wetlands have been drained by digging ditches in Sweden

Extensively drainage of forest wetlands may have had negative effects on:

- Biodiversity
- Carbon retention and CO₂ emissions
- Risk of droughts and downstream flooding

Will rewetting of drained wetlands recover ecosystem services associated with natural wetlands?

Is rewetting associated with any negative environmental effects?



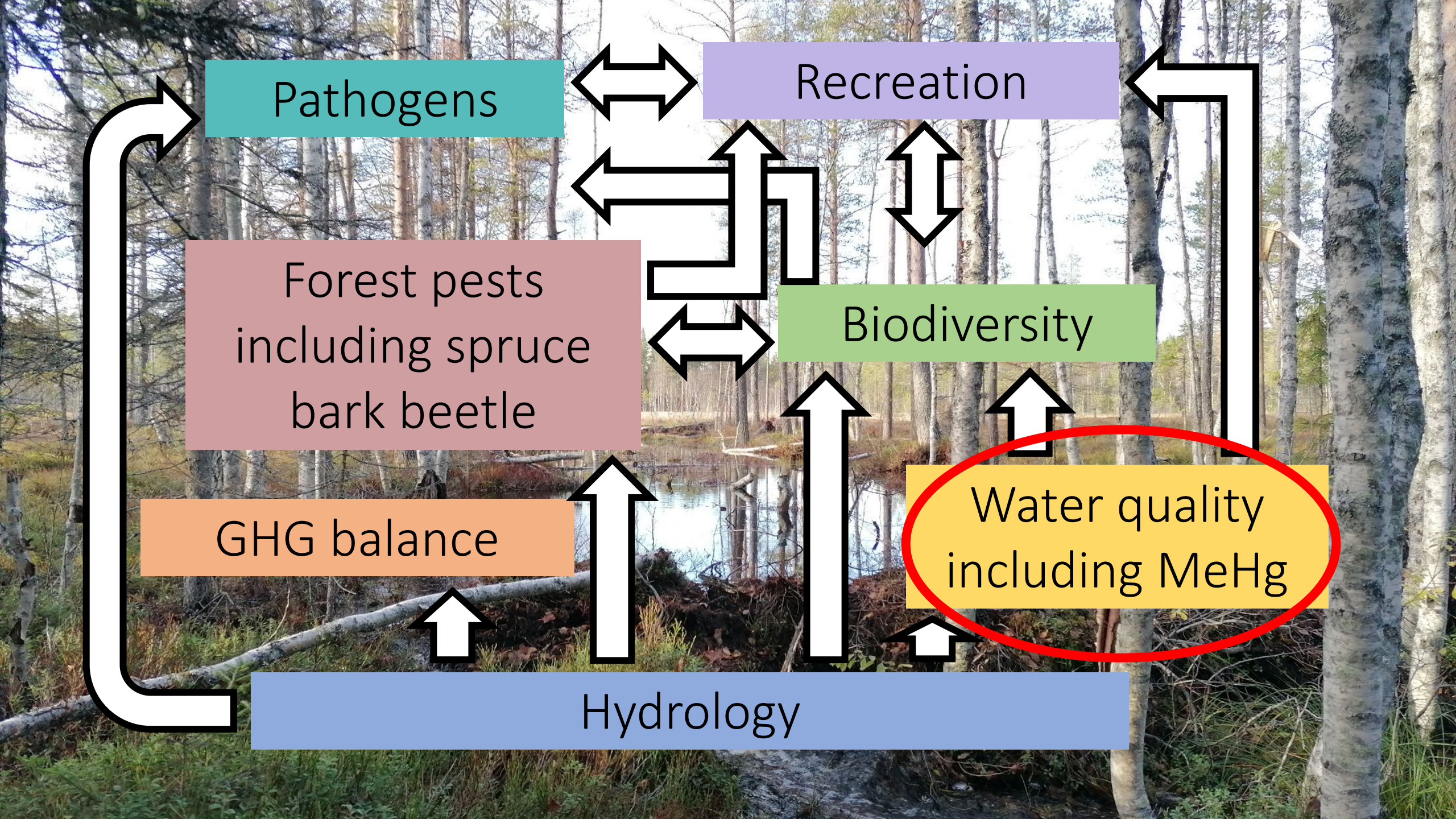
Foto: Alberto Zannella

Rewetting of forest wetlands in Sweden

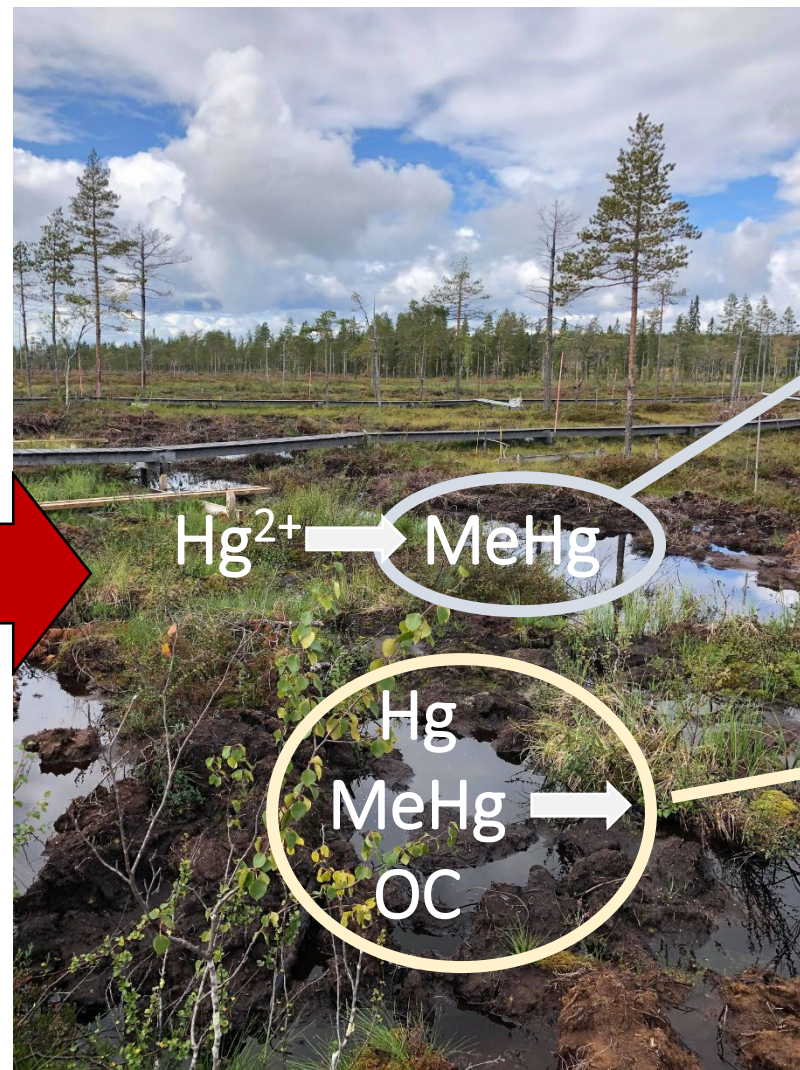
Extensive political efforts since 2018 with the aim to:

- Mitigate drought and floods
- Increase biodiversity
- Retain carbon and decrease CO₂ emissions





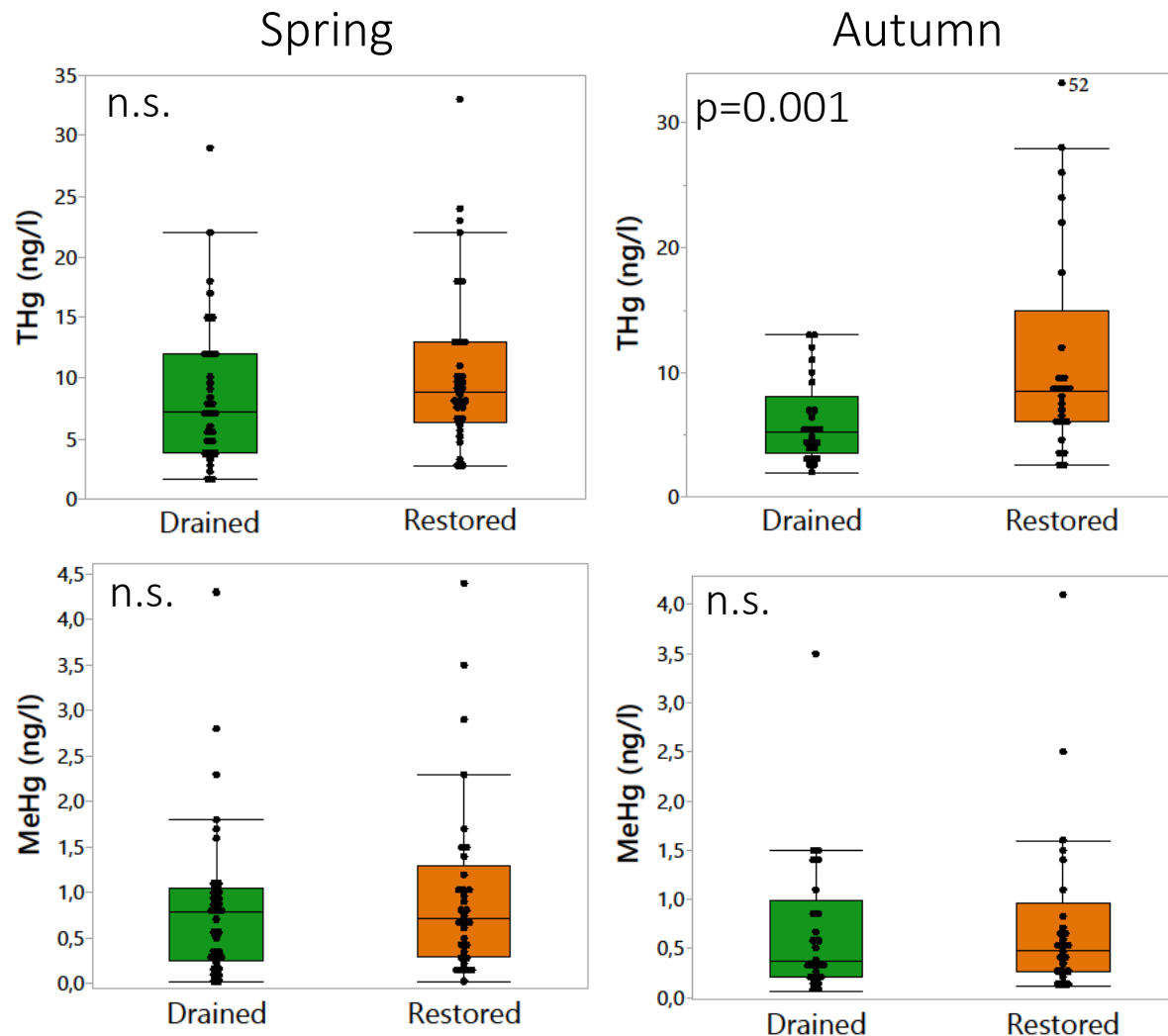
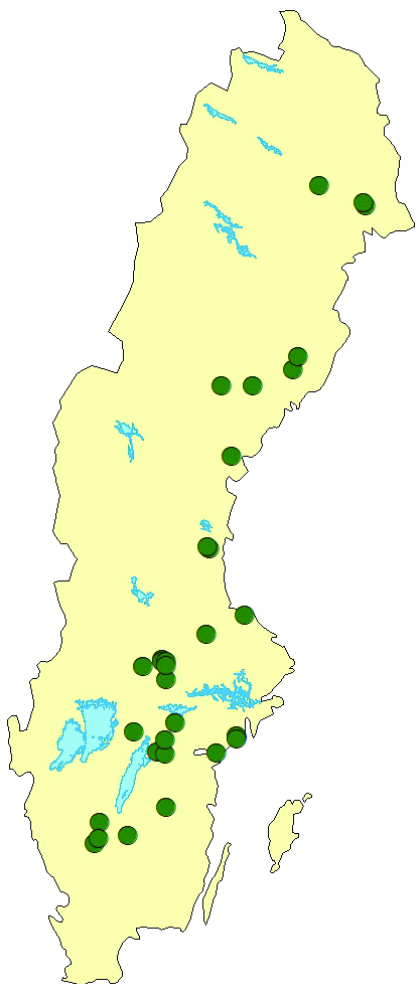
Risks of elevated MeHg after rewetting



Formation of bioavailable methylmercury (MeHg) by anaerobic microorganisms

Mobilization of organic carbon and mercury to downstream surface waters

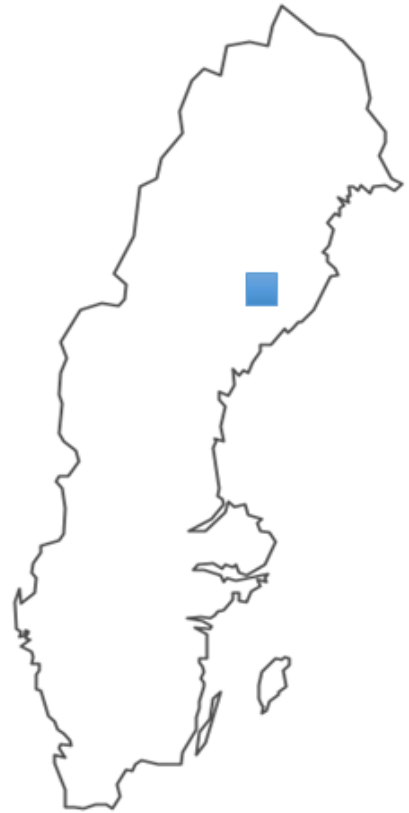
Spatial study of rewetting



Wallin, Zannella & Eklöf,
in preparation

Higher [THg] in water from restored wetlands (n=33) compared to drained reference wetlands (n=33) in autumn sampling. No difference for [MeHg].

Rewetting in Trollberget



Before restoration



After restoration



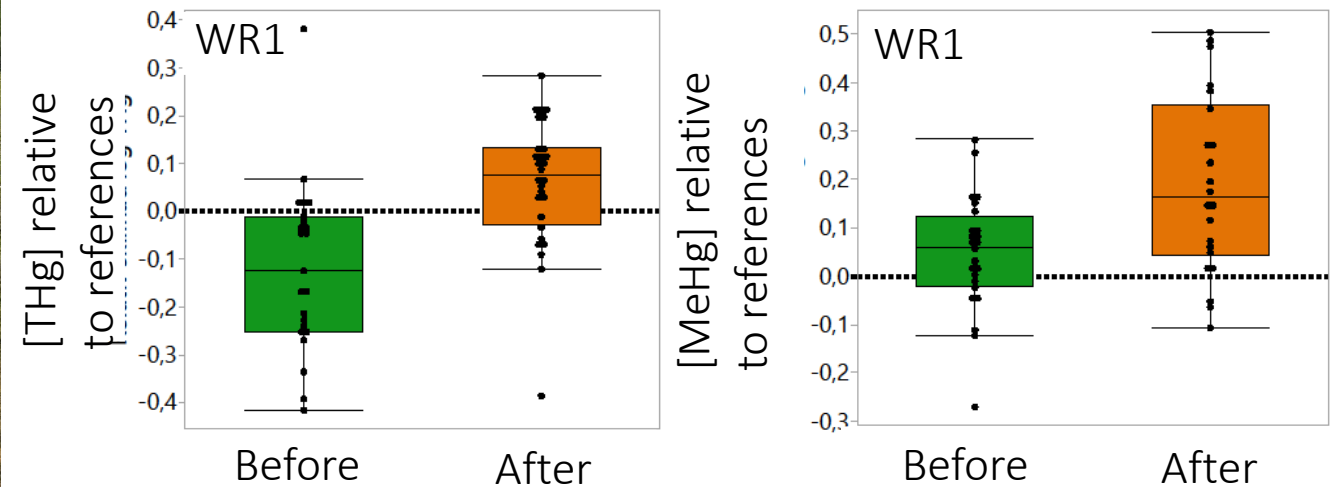
Rewetting in Trollberget



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Runoff water sampling before (>1 y) and after (>2 y) rewetting and related to non restored reference wetland



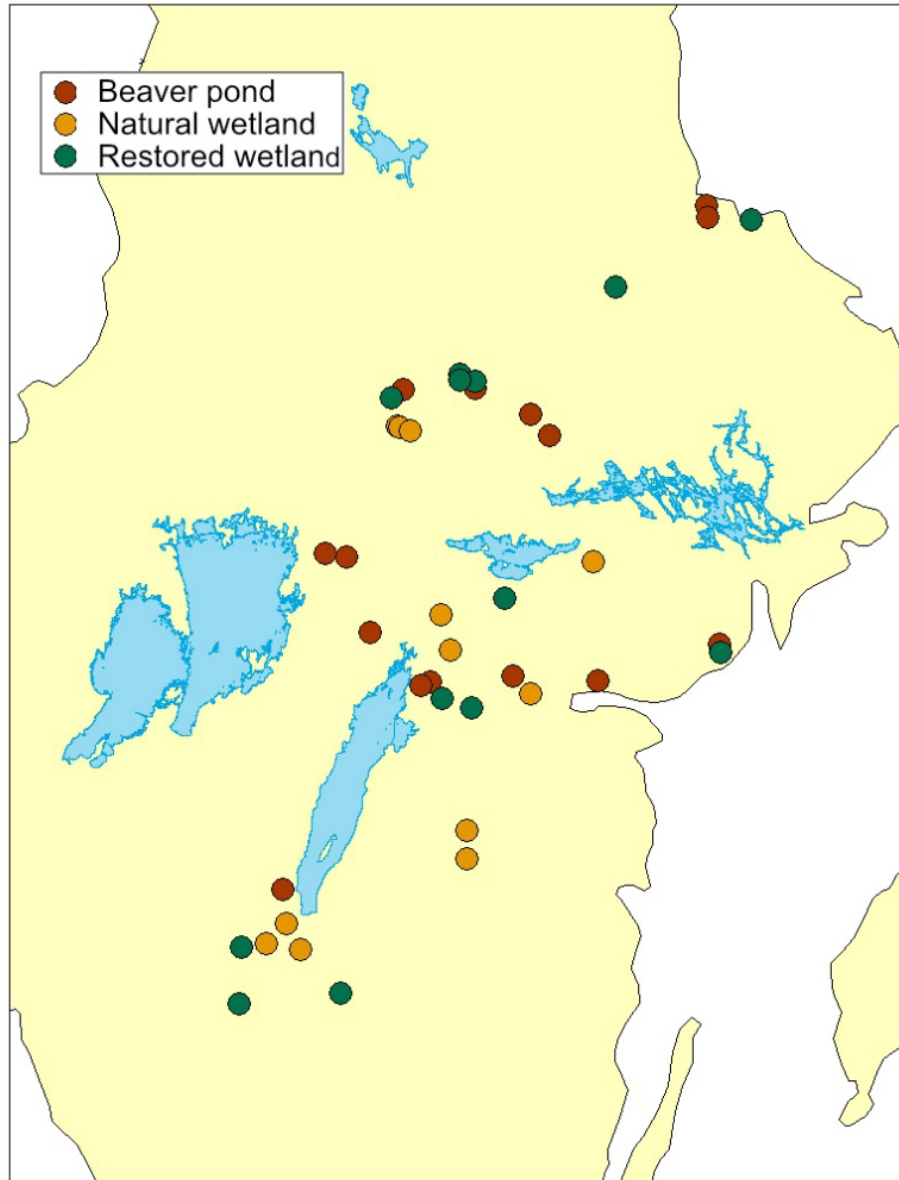
[THg] and [MeHg] increased after rewetting, but only in one of the two wetlands



With the contribution of the LIFE Programme of the European Union

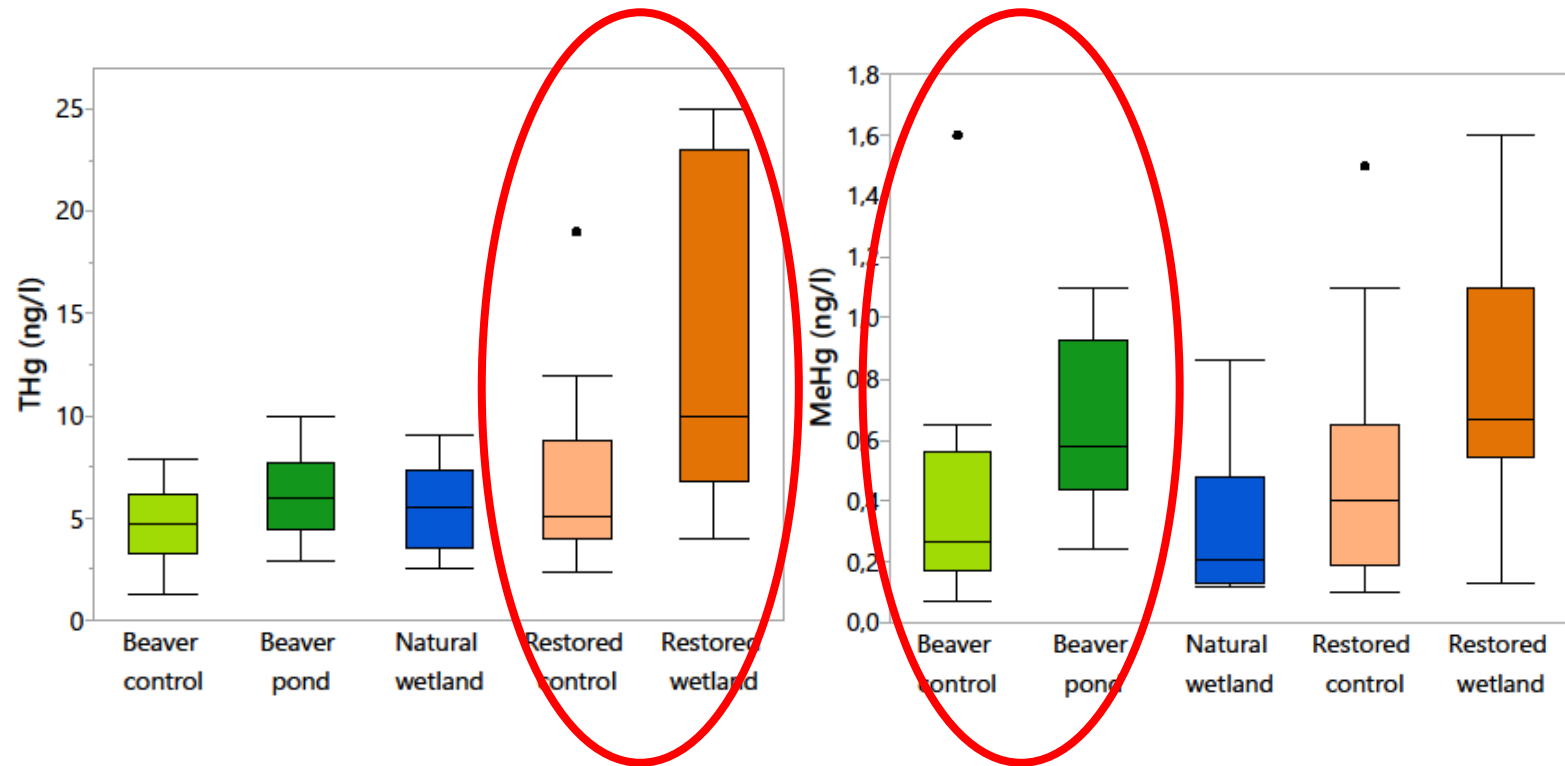
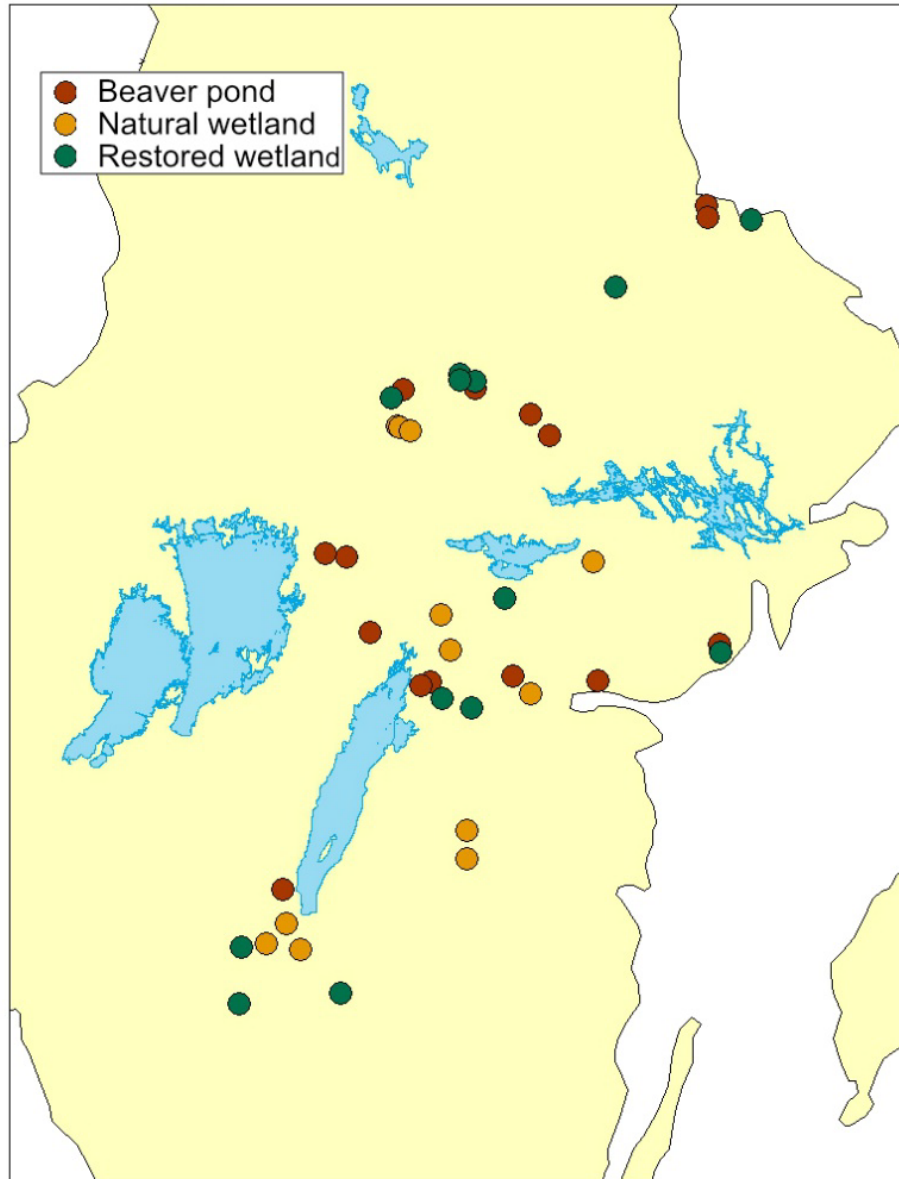


Rewetting versus beaver ponds



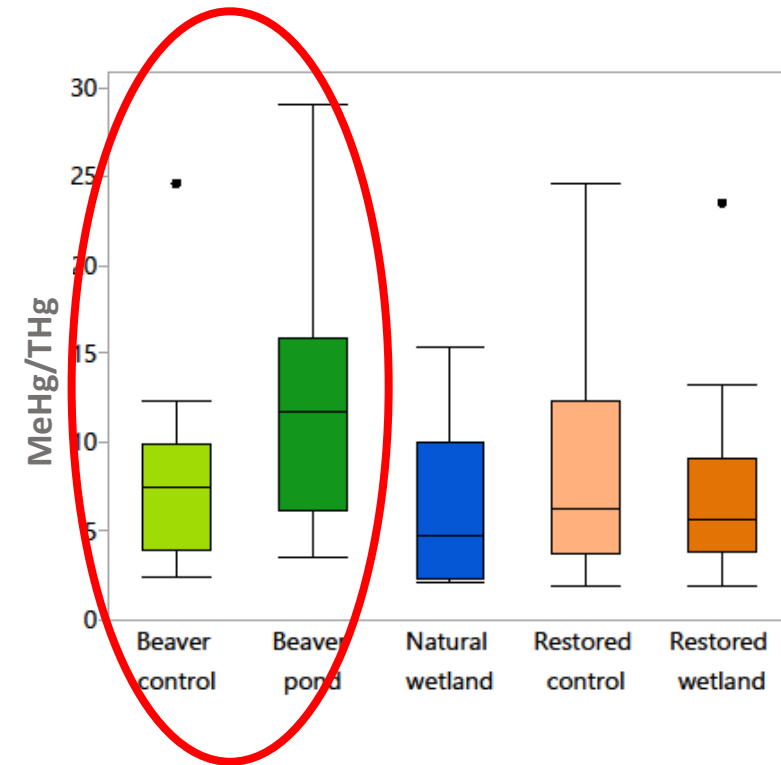
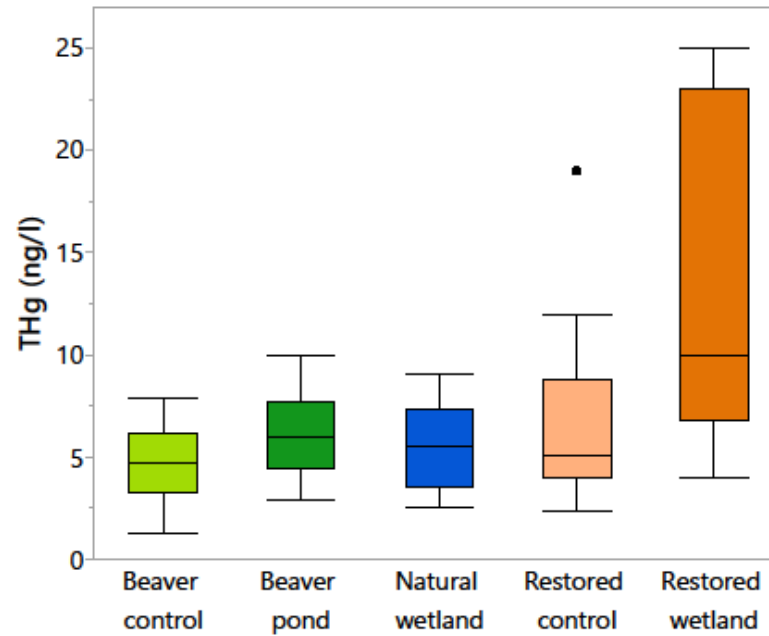
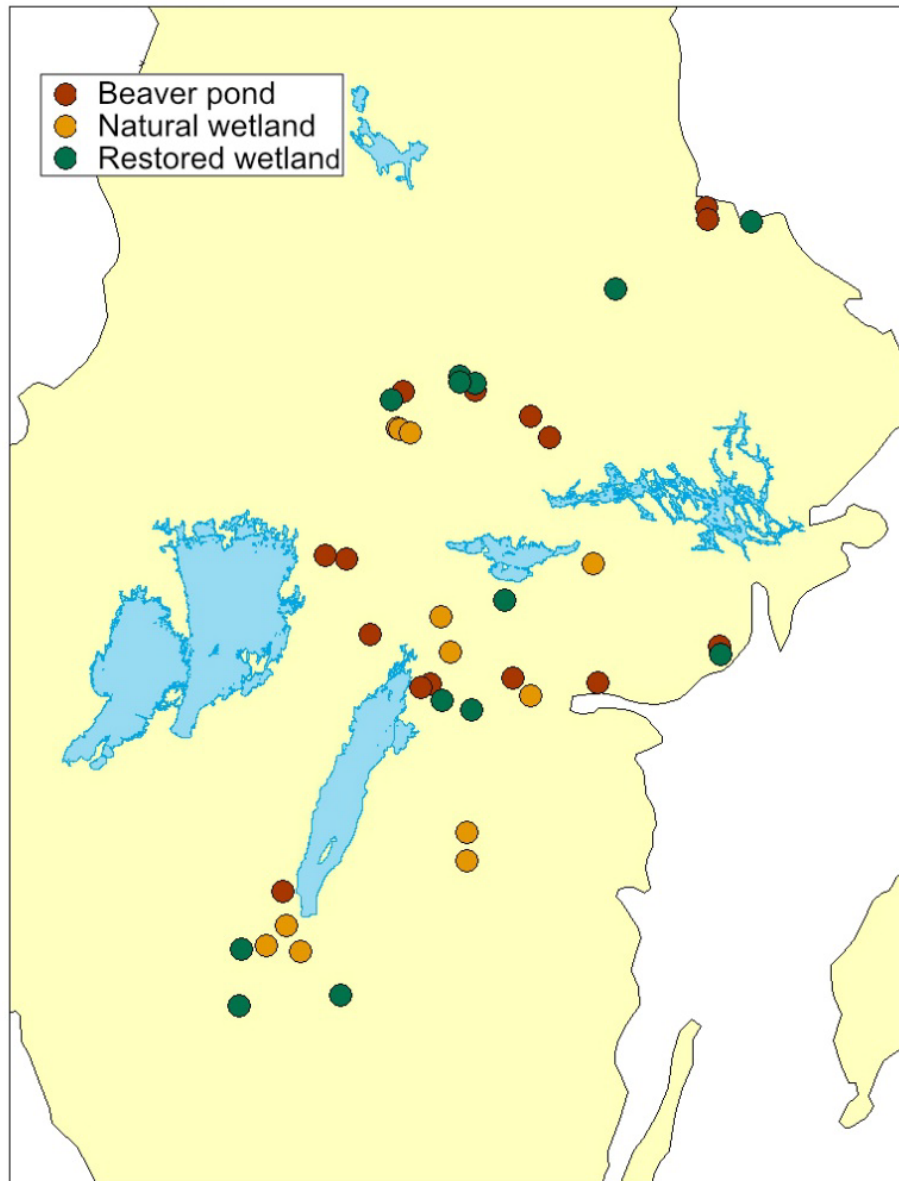
Photos: David Kniha

Rewetting versus beaver ponds



While [THg] were higher in runoff water from rewetted wetlands, [MeHg] increased more in beaver ponds than in controls

Rewetting versus beaver ponds

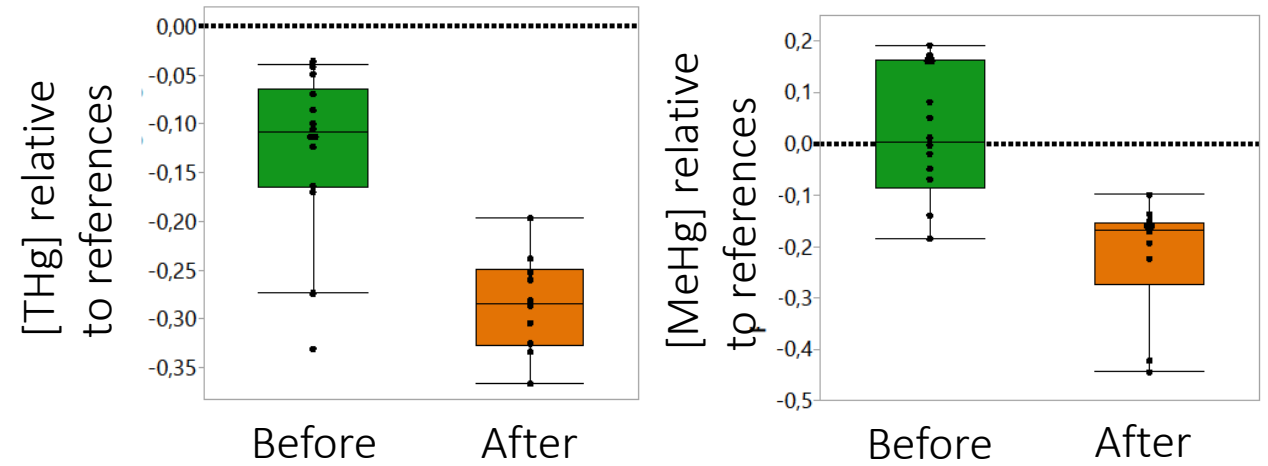


The MeHg to THg ratio were higher in runoff water from beaver ponds, compared to all other sites

If we increase the drainage instead?



Runoff water sampling before (1 y) and after (>2 y) ditch cleaning related to not ditch cleaned ditches



[THg] and [MeHg] decreased after ditch cleaning in relation to uncleaned ditches



If we increase the drainage instead?



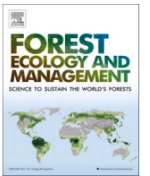
Forest Ecology and Management 569 (2024) 122146



Contents lists available at [ScienceDirect](#)

Forest Ecology and Management

journal homepage: www.elsevier.com/locate/foreco



Ditch cleaning in boreal catchments: Impacts on water chemistry and dissolved greenhouse gases in runoff

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ARTICLE INFO

Keywords:
Sweden
Paired catchment design
Groundwater tables
Carbon
Methylmercury

ABSTRACT

Ditch cleaning (DC) is a forestry practice commonly conducted in boreal regions that aim to lower groundwater tables (GWT) in waterlogged soils, thereby maintaining or improving forest growth. However, there is limited information on the impact of DC on water chemistry and dissolved greenhouse gases (GHG) in draining ditch networks. Based on a repeated synoptic sampling of a paired catchment design we here evaluated water chemistry and GHG data in ditch waters from 25 cleaned sites (being cleaned 1–4 years prior to sampling) and 25

Conclusions

- [MeHg] increased in some wetlands after rewetting
- [THg] increased in more wetlands
- New inundation by beavers increased [MeHg] more than rewetting
- [THg] and [MeHg] decreased after ditch cleaning in some ditches



Thank you!

Feel free to email any
questions to
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