Nordic Bioeconomy Programme Final Event, Helsinki 2023

Presentation for the Program Committee on 1 June 2023 (Shortened version)

BIOWATER

Integrating land and water management for a sustainable Nordic bioeconomy

Quantifying combined effects of land use, due to bioeconomy, and climate change, on water resources and the society.

NordForsk

www.biowater.info

WHAT IS BIOWATER?

- ✓ 8 INSTITUTES
- ✓ 4 COUNTRIES
- ✓ 9 PhDs (5 finished)
- ✓ 3 SUPPORTING INSTITUTES (ADVISORS)
- ✓ STAKEHOLDERS
- ✓ 5 YEARS (2017-22)

NordForsk

NIBIO
NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH

NMBU Norwegian University of Life Sciences

NIVA Norwegian Institute for Water Research

SLU Swedish University of Agricultural Sciences

AARHUS UNIVERSITY

SYKE

Luke NATURAL RESOURCES INSTITUTE FINLAND

UNIVERSITY OF OULU

08.06.2023

WILL OUR WATERS SUSTAIN A FUTURE WITH BIOECONOMY?

1. Sustainability first
2. Continuing current path
3. Isolation, trade borders
4. Elitism, cities first
5. Max growth, technology

We have shown: The importance of Nordic choices for a future bioeconomy

- Scientists and stakeholders produced 5 Nordic Bioeconomy Pathways -> land use scenarios.
- We modelled these pathways in Nordic catchments in 4 countries, to understand the impacts on freshwater resources until 2050.

Freshwaters in the Nordics can be threatened by the green shift.

Go sustainable: From 5 pathways – only the sustainable pathway can be recommended. This means maximum implementation of mitigation measures and conservation land use practices.

- We also added two climate scenarios (RCP4.5 and RCP8.5).
  We found that **land use is more important** for nutrient losses than climate change (until 2050).
  => Acting local will give effect.

Summarised in Vermaat et al 2023

THE VALUE OF WATER
(AND OF WATER MONITORING)

- A sustainable pathway does not need to be at the expense of welfare. Total income – also for rural landowners – in a sustainable pathway was found similar to a pathway focusing on maximum growth.
- Well-functioning aquatic ecosystems provide services to people: The recreational value of landscapes with clean waters is high.
- Long-term data series help us quantify the value of water. BUT: Except for Finland, there is a lack of systematic monitoring data of Nordic catchments dominated by forestry.

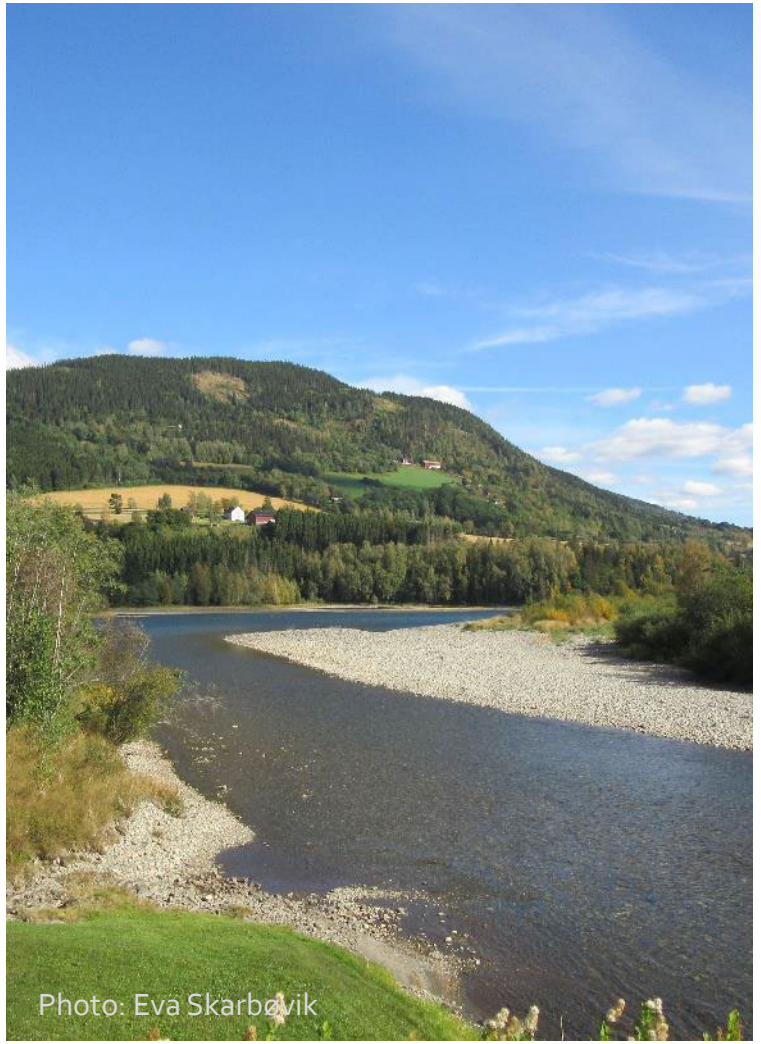
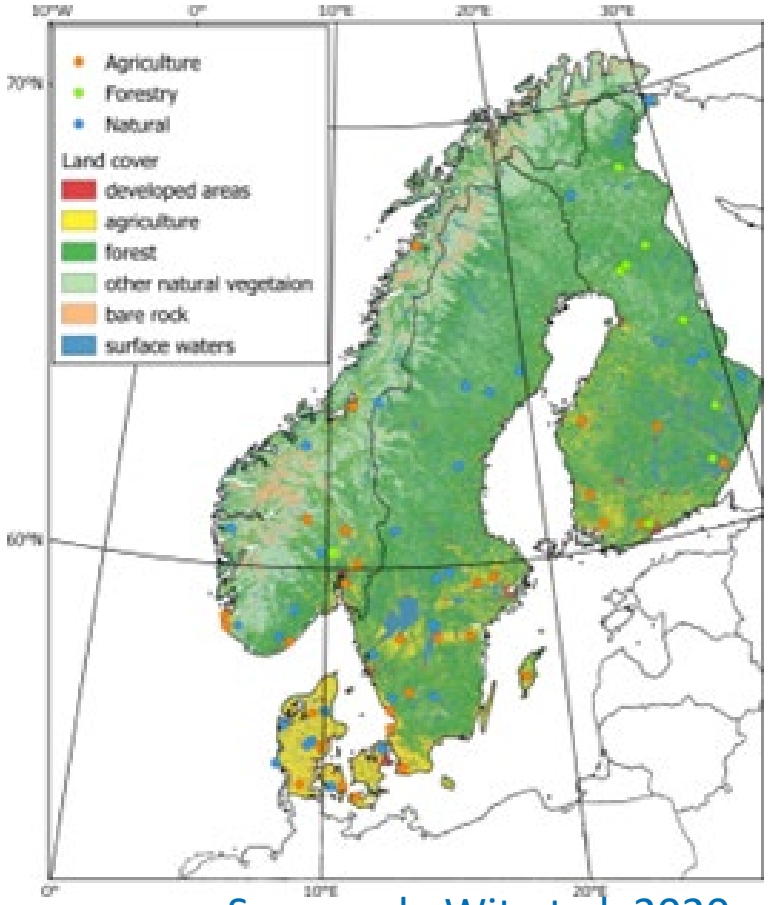


Photo: Eva Skarbøvik

BUSINESS AS USUAL IS NOT ENOUGH

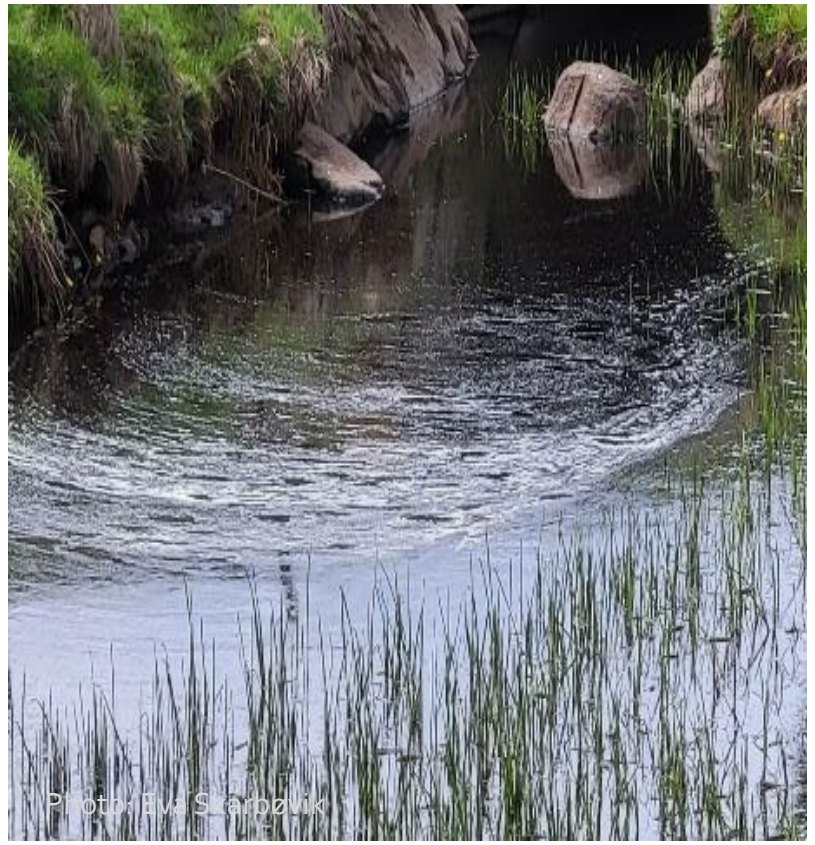
- 69 small Nordic streams showed little effect from two decades with mitigation measures.
- Need more implementation and better economical and regulatory incentives.
- On the other hand: Best-case experiences show that measures work, if implemented!
- Example: Maintaining natural vegetation with trees and bushes along water courses is a low-cost and highly effective way to safeguard waters and their ecology against negative effects from agriculture or forestry. Can improve the water ecology almost one status class!



Source: de Wit et al. 2020

MAIN MESSAGES

- Bioeconomy combined with climate change can give environmental costs to Nordic water resources.
- The current level of environmental mitigation measures is not enough to ensure safe water quality. Policy- and lawmakers have a responsibility to ensure the necessary economic and regulatory instruments.
- A sustainable option can be combined with high welfare, also in the countryside.
- Until 2050 land use and management is more important than climate change, so local actions matter, and mitigation measures can make a difference



ADDED VALUE OF NORDIC CO-OPERATION

- Mitigation measures to reduce nutrient losses work differently in cold climates than in warm.
- “Traditional” mitigation measures vary among countries. We can learn from each other: Danish measures are now tested in Norway.
- Finnish water quality data on impacts from forestry is extremely important for the other countries.
- Monitoring in cold climates, winter operation
- Different methods for finding reference conditions is being tested -> followed up by new project on comparing good-moderate boundaries
- Not all is similar: National interpretations of the Nordic Bioeconomy Pathways differed.

FUTURE PERSPECTIVES

- Continued focus on cost-efficient mitigation measures, and environmental-friendly agricultural and forestry practices.
- Environmental mitigation measures and nature-based solutions have multiple functionalities, so keep a look-out for all of these: Water quality, aquatic biology/ecology; emission of climate gasses, climate adaptation.
- Reduce administrative barriers, and enhance economic and regulatory incentives to implement conservation practices and mitigation measures.
- Improve the knowledge on the effects of intensified forestry on water resources, including water quantity, quality and aquatic ecology.
- Ensure effective information platforms and arenas for scientists, managers and policy makers to meet, on all levels (local, regional, national).

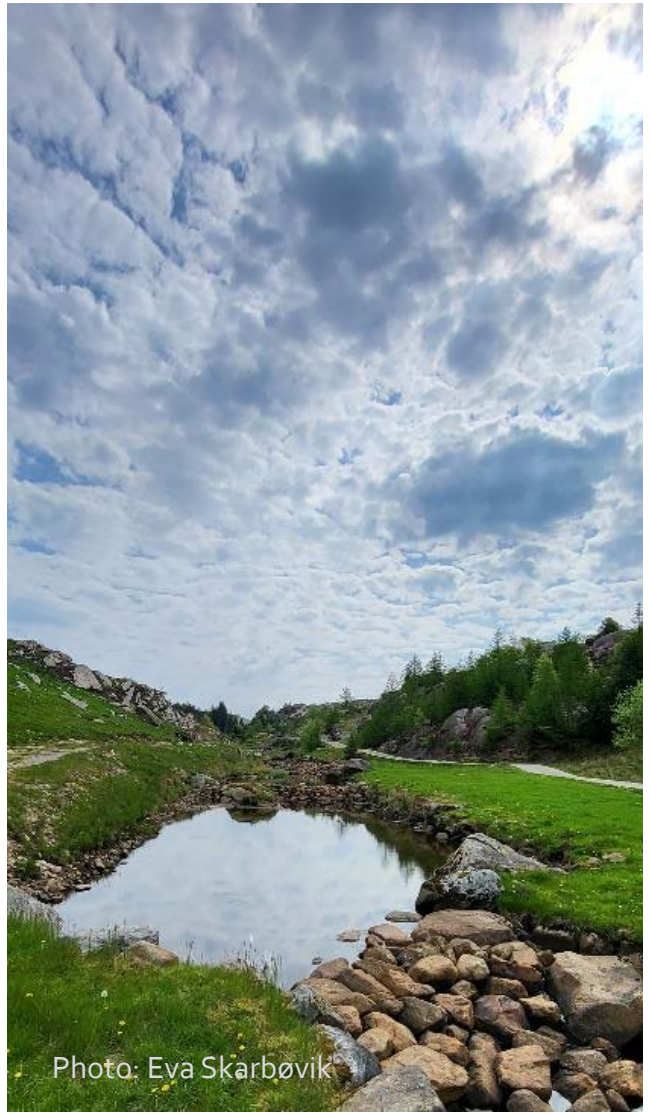
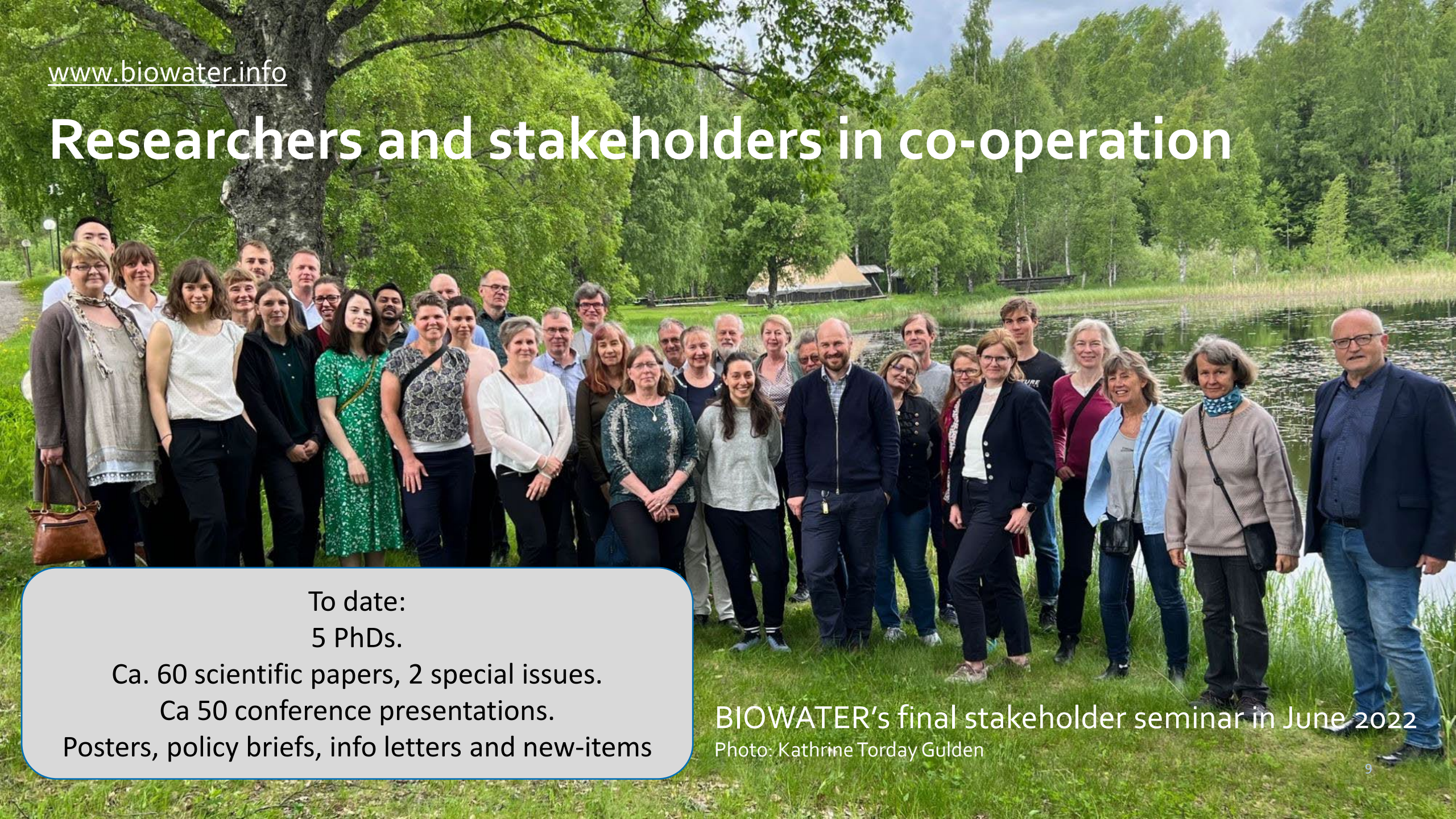


Photo: Eva Skarbøvik

www.biowater.info

Researchers and stakeholders in co-operation



To date:
5 PhDs.
Ca. 60 scientific papers, 2 special issues.
Ca 50 conference presentations.
Posters, policy briefs, info letters and new-items

BIOWATER's final stakeholder seminar in June 2022
Photo: Kathrine Torday Gulden