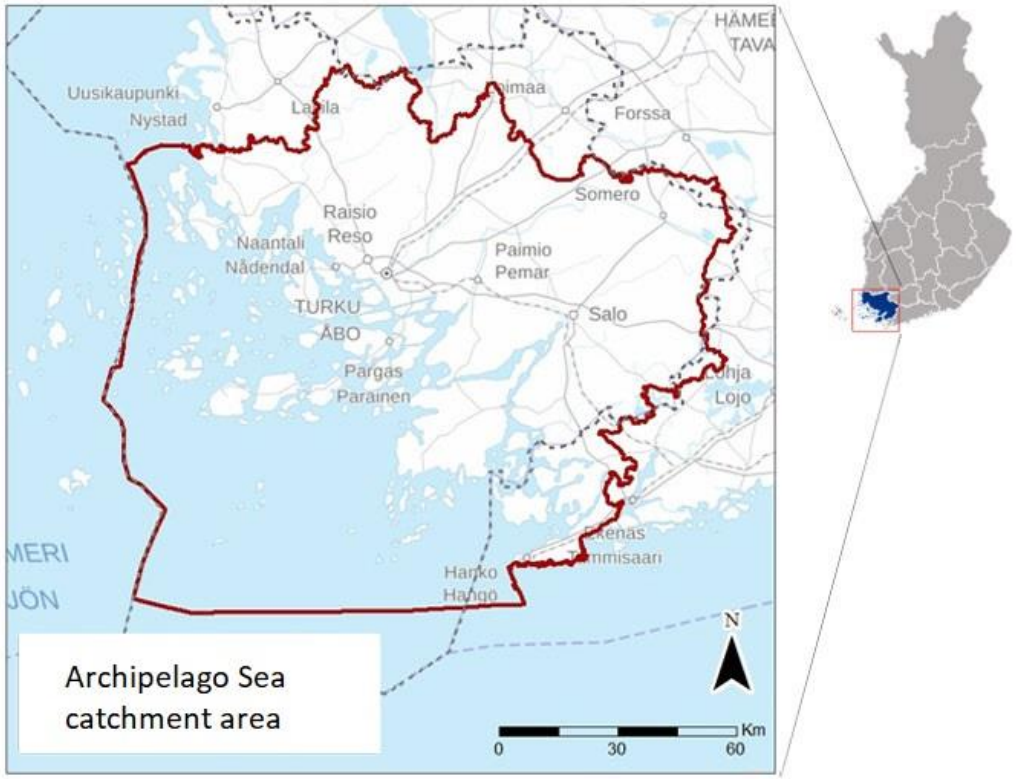
Elinkeino-, liikenne- ja ympäristökeskus

Challenges in nutrient recycling in HELCOM hot spot area - Archipelago Sea Programme

Essi Hillgren, Centre for Economic Development, Transportation and the Environment of South-West Finland

23.9.2024

Finland’s last remaining HELCOM Hot Spot



- The agricultural runoff to the Archipelago Sea is Finland’s last remaining HELCOM Hot Spot.
- The aim of the Archipelago Sea programme is **to reduce diffuse pollution in the Archipelago Sea catchment area** so that the area can be removed from the HELCOM’s hot spot list by 2027 at the latest.
- **In long run, good status of water in Archipelago sea.**

Elinkeino-, liikenne- ja ympäristökeskus

Catchment area of Archipelago Sea as a pilot area of nutrient cycling

- Archipelago Sea programme launched 2021 (previous Government)

  First step: Archipelago Sea Hot Spot Road Map project

  - The aim was to find the way and measures to remove the catchment area (nutrient loads from agriculture) of Archipelago Sea from the HELCOM Hot Spot list.
  - The main result from this first phase was the Road Map of the Water Protection in Agriculture

- The programme continues at least ongoing Governmental period until 2027

  Second step: Implement the Road Map of the Water Protection in Agriculture

  - Implement the efficient measures and resolve bottlenecks identified in the road map of the water protection in agriculture
  - Make the catchment area of Archipelago Sea as a pilot area of nutrient cycling
  - Remove the Archipelago Sea catchment area from the HELCOM Hot Spot list latest in 2027

Multi-effect measures in the Archipelago Sea catchment area

Based on the Government Programme, actions in Archipelago Sea catchment area focus on measures which leads to significant improvements in the nutrient cycle

- circulation of nutrients of animal origin
- improving the retention capacity and growth condition of soil
- removing nutrients from waters

Circulation of nutrients of animal origin

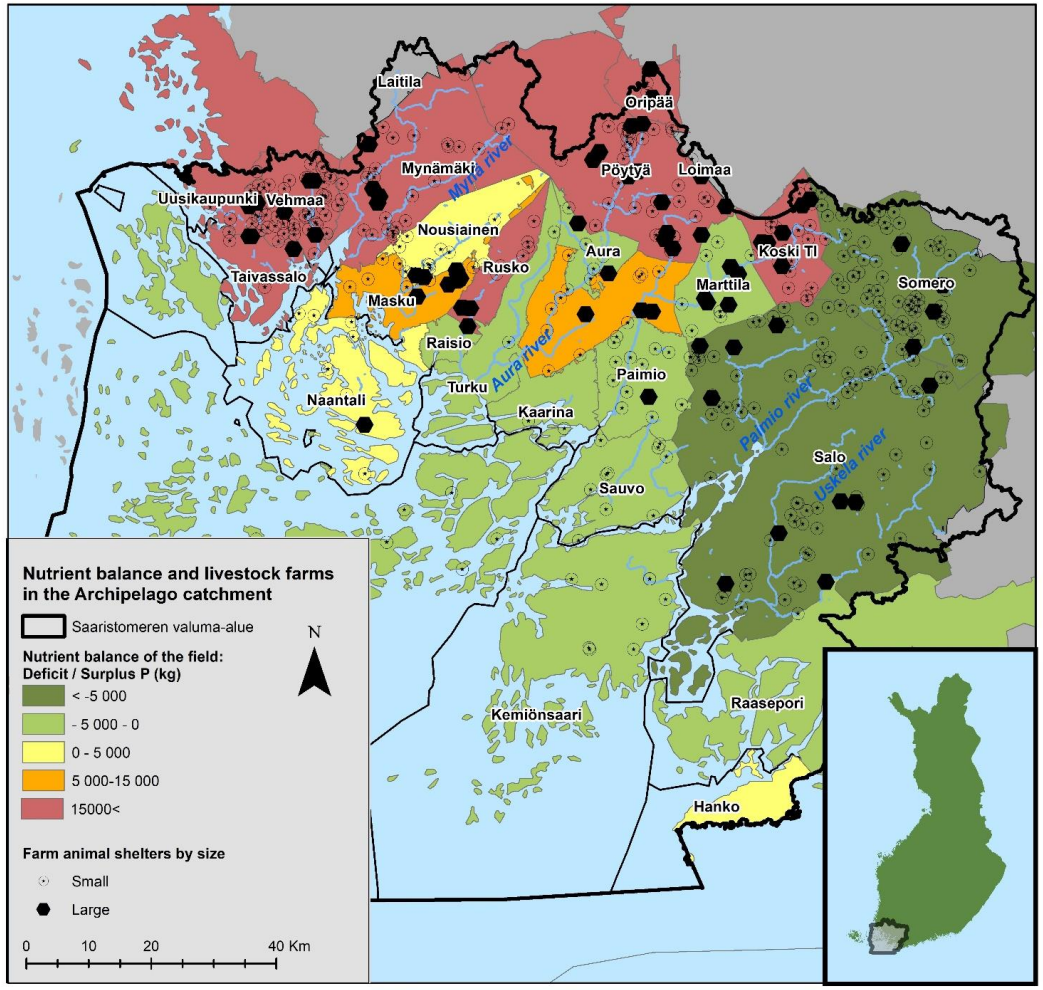
The greatest recycling potential in agriculture is in manure nutrients.

Challenge is how to spread manure more evenly inside the catchment area and beyond?

- Livestock intensity is high in certain areas → phosphorous is stored in the soil in certain areas and lacking in other areas.
- Manure processing into fertilizer is not (yet) profitable
- Transportation costs, especially sludge, are high

→ Manure is utilized quite close of the origin, risk of over fertilization grows

- Need to find cost-effective way to process manure into fertilizer and transfer manure out from the area of it's origin
- Need to increase the interest in using organic fertilizers instead of mineral fertilizer



Picture: Luke, 2021

Improving the retention capacity and growth condition of soil

- The soil in Archipelago sea catchment area is largely clay soil
- Quite often the challenge is compacted soil which weakens growth condition and retention capacity → nutrients flows from the field to the water
  - Reasons: Poor crop rotation, heavy machines and bad timing with the measures
- Improving the growth conditions and water economy of soil requires resources, both time and money (e.g. sub-surface drains, well maintained diches, the crumb structure of the field)
- With soil conditioner (gypsum, pulp mill fibre and structural lime) can quickly and effectively decrease the amount of phosphorous leaching from the fields.
- The effects are quick, but not long-lasting (3–5 years)
- Gypsum in now free of charge and still we have problems to get it to the field
- Gypsum project continues until 2025, it can’t be the only solution, we need to increase the amount of other measures at the same time

Removing nutrients from waters

- The challenge is that removing nutrients from the waters is not effective enough if we are not at the same time decreasing the amount of nutrient leaching from the catchment area.

- Water restoration project in sea, water bodies (lakes, rivers) and catchment area
- Removal of nutrient-rich biomasses from the sea e.g. removal fishing and dredging masses which contains organic biomass
- Reducing nutrient emissions from aquaculture

Increase of know-how and enhance advising services

- The challenge is that we need find the way to ensure existing knowledge and know-how find the way into concrete actions

- Increase of knowledge and knowhow in grassroot level
  - encouraging farmers to use existing advisory services
  - encouraging farmers to implement environmental measures financed from agricultural subsidies (CAP)
  - providing seminars, training and materials related nutrient recycling, soil growth condition, soil conditioners etc (for farmers as well as advisers offering services for farmers)
  - Research results need to be presented understandable and accessible form and place

Activities related to water protection in agriculture are voluntary for farmers

- We have political will, we have resource for project work etc. but many effective measures are voluntary for the farmers
- In case we want to really make significant change, we need to
  - force to take certain action (changes in politics)
  - offer compensation → many farmers are balancing between profitability and measures they should be taken. Benefits for the farmers from measures might take time.
  - calculate and demonstrate the (financial) benefit for the farmers now and in future (note the climate change and other challenge we are facing)
  - cut of the rumors and misinformation related water protection measures
  - find the way to motivate → Changes in status of waters condition takes time, motivation might be hard to find.

How to…?

- We have forerunners and now we try to make this mainstream, **how to motivate farmers?**
- We have different kind of funding instruments but no earmarked funding for the Archipelago sea programme, **how to ensure enough resources?**
- Water protection is based on the project work which make it kind of short-termed and it challenge to get concrete and effective activities done. **How to ensure long-term continuation?**
- Public money is for public benefits, we can’t promote activities which benefits certain entrepreneur / farmer. **How to motivate if the benefit need to be nonprofitable / public good?**
- New knowledge need to get in use in grassroot level. We are lacking the chain from research to the concrete activities in the field. **How to make sure that research results find way to concrete action?**

How would you advice us?

Is there something crucial we haven’t given an attention enough?

Are you facing the same kind of challenges?

Thank you!

Essi Hillgren
essi.hillgren@ely-keskus.fi

Elinkeino-, liikenne- ja ympäristökeskus