

Collaboration with stakeholders on water supply, sanitation and environmental research in Northern Finland

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Content



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Water, Energy and Environmental Engineering research unit



Working towards better understanding of the Water-Land-Energy Nexus

Because the way we use our land, produce our energy and manage our water resources put enormous pressure on the environment which we depend upon.

Total of 45 researchers

2 prof. Leader Björn Klöve and Eva Pongracz
10 senior researchers (docent and assistant prof. Level)
5 post-docs,
≈20 PhD candidates,
2 technical staff,
≈5 MSc workers and trainees

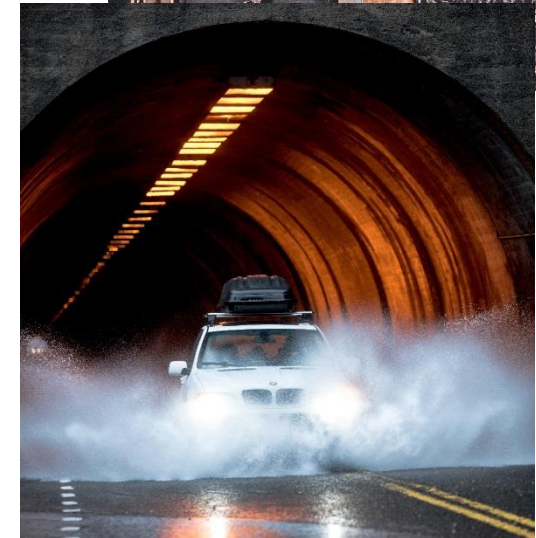




Water Supply, Sanitation and Urban Water Management

Current research focus

- ✓ **Development of tools and methodology to address water supply challenges**
Groundwater extraction, source water quality, network integrity, monitoring technology, flow and water quality modelling, etc.
- ✓ **Evaluation of new and optimization of existing methods, products and technologies for sewage treatment and resources recovery in cold climate regions**
New generation of precipitation agents, removal of emerging pollutants, performance and impact of decentralized systems, nutrient recovery, bio-solids management, network integrity, monitoring technology, etc.
- ✓ **Development and optimization of integrate water resources management tools and methods**
Remote sensing as monitoring tool, groundwater-surface water interaction, impact of climate and land-use change in urban floods, flow regime and water quality modelling, etc.





Strategy

**OPEN DOORS
HANDS-ON
FACE-TO-FACE
Continuous interaction**



- Researchers are members of important stakeholders groups (associations, foundations, etc.)
- Participation in events organized by stakeholders (communities, associations, etc.) such as meetings and workshops, etc.
- Organization of events for stakeholder interaction (seminars, workshops, etc.).
- Continuous discussion with stakeholders regarding practical issues and inclusion of these to project proposals or creating master thesis projects, etc.
- Identification of stakeholders in early stages of a project preparation and inclusion of topics of common interest;
- Research plans which include high level scientific methods/topics combined with pilot studies, case sites etc.

Years of contact, joint work and continuous collaboration are needed to establish a strong network capable of influencing research, governance and implementation outcomes.



Example of long term collaboration

- **”Pohjois-Suomen vesivaliokunta”**
- 40 different municipal water suppliers/wastewater utilities association
- A representative of the research unit attends annual meetings to exchange ideas and discuss the progress of the sector and related research
- Excellent platform for collaboration between service providers and researchers as well as source of funding
- **”Maa-ja Vesitekniikan tuki ry”**
- Foundation which promotes land and water technology research
- Leader of the research group attends regular meetings with the foundation board to exchange ideas and discuss the progress of research and education in the sector
- Vital supporter of water related topics via scholarships and projects funding

POHJOIS-SUOMEN
VESIVALIOKUNTA



MAA- JA VESITEKNIIKAN TUKI



Past projects

Rokua case on Groundwater management



- Protected Rokua esker aquifer area has a number of groundwater dependent lakes where water level had varied during last decades and long term water level had a declining trend.
- Unit was contacted on possible research on the topic.
- Questions of land use, climate change and water supply on groundwater resources.
- **Outcomes of a vast research:**
 - Case site in several projects (e.g. EU-level GENESIS project)
 - >10 peer-reviewed articles
 - 3 PhD theses



Past projects

Secondary source of water to the city of Oulu



- City of Oulu uses surface water as a potable water source: question of quality in previous decades and safety in recent years as there is no secondary water source;
- As part of Academy of Finland project this water source question was addressed as a “case study”
- Sociology-engineering research collaboration to help on decision making
- **Outcomes**
 - Decision analysis for the decision making process
 - peer-reviewed publications
 - More research continued on possible impacts of groundwater use on surface water ecosystems (key debate question with site selection for secondary source)



On-going projects

NutriSludge

Nutrient availability and losses and risk of micro-pollutant contamination from land spreading of chemically precipitated sewage sludge (2018-2020)



Financed by: Maa- ja vesitekniikan tuki, Lakeuden Keskuspuhdistamo, Pohjois-Suomen Vesivaliokunta, Vesihuoltolaitosten kehittämisrahasto and University of Oulu.

- Result of discussions with Wastewater treatment plant engineers, biogasification companies and agricultural associations.
- Direct involvement of environmental authorities, wastewater treatment plants (Taskila-Oulu, Lakeus-Kempele), water and wastewater utilities association, etc.
- Objectives:
 - to access the effectiveness different coagulants and to investigate the effect used coagulants in the biological stabilization of sludge as well as in the nutrient availability on resulting bio-solids;
 - to identify and quantify the risks of soil and water contamination by nutrients, pathogens and micropollutants
 - to qualitatively assess the acceptance of land spreading of sludge by farmers and general public in Finland.



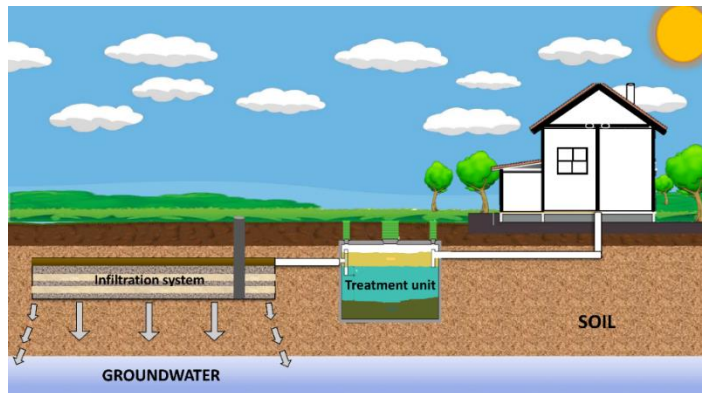
On-going projects

Interreg
Nord
European Regional Development Fund



ON-SITE

Small-scale wastewater treatment systems: governance, efficiency, resources recovery, environment contamination risks and innovative solutions for processes optimization (2019-2021, 0.75 M€)



- Result of discussions with environmental authorities (SYKE, ELY, etc.) as well as house owners and small communities worried about compliance with new regulations.
- Direct involvement of environmental authorities, municipalities (environmental, construction, sanitation, etc. departments), communities, House owners, systems suppliers, consultancy companies, etc.

Objectives:

- To examine the governing principles of wastewater treatment systems as a means to highlight practices, strategies and regulations with the best outcomes
- To increase our capabilities to estimate purification efficiency of small-scale wastewater treatment systems and the risks of environmental contamination
- To test and develop innovative engineering solutions for improving removal of target substances (N and selected micropollutants)



Take home message

- ✓ **Years of contact, joint work and continuous collaboration are needed to establish a strong network capable of influencing research, governance and implementation outcomes.**
- ✓ **Interesting questions and ideas raised from researchers-stakeholders interactions can and should be included in research projects proposals**
- ✓ **Collaborations lead to projects with outcomes such as high-impact publications, tools and methods for decision making and practical innovative solutions to water supply and sanitation issues.**

THANK YOU!

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