

Green-Digi-Basin Leveraging river basin models for sustainable water quality management in boreal river basins

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Three years research towards digital twins for river basin management

- Driving global debate
- Fostering shared understanding
- Engaged across 10+ countries
- Digital Twin roadmap created
- EU-level integration interest







Optimized locations for nature-based solutions

- Nature-Based Solutions Suitability Assessment: A Watershed-Scale Modeling Approach
- Optimized scenario generation for peatland restoration using digital tools and numerical modelling



Oulankajoki



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Key achievements in catchment-scale water quality modelling

- Advanced carbon and nutrient modelling
- Identified carbon loading hotspots
- Proved impacts of gypsum treatment
- Improved carbon retention and emission simulations
- Scenario building for sustainable land use

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Revealing impact of climate change on river winter hydrology and morphology

- New insights into ice-covered river flow dynamics
- Earlier and weaker spring floods

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- Stronger and more frequent winter floods
- Over 70% of significant hydroclimatic changes have occurred in the past 10 years.
- Publications: https://doi.org/10.1016/j.geomorph.2024.1016/j.ejrh.2024.101749, https://doi.org/10.1016/j.jhydrol.2024.130935, https://doi.org/10.1016/j.jhydrol.2024.130935, https://doi.org/10.1016/j.jhydrol.2024.130935, https://doi.org/10.1002/esp.5809



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