

## Abstract

Catchments provide a vital ecosystem service by regulating atmospheric CO<sub>2</sub> globally, a process strongly influenced by water, and therefore closely related to the provisioning of water service. Climate, atmospheric deposition, and land use affect the quantity and quality of water.

This project aims to enhance our understanding of the role of water in headwater catchments' functioning regarding the regulation of atmospheric CO<sub>2</sub>, as well as other climate-relevant gases (CH<sub>4</sub>, N<sub>2</sub>O, BVOC). The project aims to assess the social and economic value of these ecosystem services to inform policy and decision-making.

To achieve this, the project will be organized into five work packages, which aim at:

- Improving the consideration of CO<sub>2</sub> regulation ecosystem services in relevant policies, conducting social and economic valuations, and fostering awareness through co-creation with researchers and stakeholders.
- Reanalyzing, meta-analyzing, and modeling long-term data series to gain insights into the role of catchments in regulating greenhouse gas emissions.
- Developing innovative approaches and cost-effective technology for monitoring greenhouse gas fluxes, with a focus on high-resolution measurements.
- Conducting field measurements throughout the seasonal cycle in a network of headwater catchments across Europe, considering climate, N-P deposition gradients, and local land use effects, to determine the balance of CO<sub>2</sub> and other climate-relevant gases inferred from their fluxes.
- Communicating project results to policy-makers, environmental managers, authorities, the general public, and the scientific community.

The project SERVICO2 aims to influence international policy design, generate new knowledge on the combined effects of deposition, climate, and land use on Greenhouse Gas (GHG) regulation and water quality, improve carbon balance estimates, models, and projections, as well as enhance valuation and monitoring methods for this ecosystem service.

It also intends to have influence within advisory bodies guiding emissions control policies. A policy brief will be prepared and delivered to national and local authorities at the project's conclusion.



### ► Project coordinator

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### ► Project partners

- UNIVERSITY OF EASTERN FINLAND - FINLAND
- DEPARTMENT OF ECOLOGY AND ENVIRONMENTAL SCIENCE, UMEÅ UNIVERSITY - SWEDEN
- UNIVERSITÀ DEGLI STUDI DI PADOVA - ITALY
- CZECH GEOLOGICAL SURVEY - CZECH REPUBLIC
- UNIVERSITAT POLITÈCNICA DE CATALUNYA - SPAIN

### ► Funding organisations

AEI (SPAIN) / AKA (FINLAND) / FORMAS (SWEDEN) / MUR (ITALY) / TA CR (CZECH REPUBLIC)

### ► Duration

3 years

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carbon balance  
water quality  
meta-analysis of long-term data series  
socio-economical valuation  
new sensors development

## KEYWORDS