

# SYKE – water expertise with 100 years of experience

We monitor the water volume, condition, and changes in them.

We develop solutions for the use, maintenance, and protection of water resources.

We produce water-related assessments for social decision-making.

We develop methods to reconcile the somewhat contradictory goals in the use and management of water resources.

Our high level of water expertise also has international demand.

citizens, companies and authorities

## WARNINGS OF FLOODING OF WATERWAYS PREVENT FLOODING DAMAGES



The waterway model system developed by SYKE, covering the whole of Finland, predicts real time water levels and flows of waterways as well as groundwater heights, based on hydrological observations and weather forecasts. The Flood Center operated jointly by SYKE and the Finnish Meteorological Institute, maintains a continuous online review of the situation and warns about flooding of waterways. The system has been of great benefit for example in Kittilä, northern Finland, on the Ounasjoki River, where floods occur regularly. Early warnings have benefited both local authorities and residents and businesses.

citizens, companies, authorities

## MULTI-CRITERIA EVALUATIONS HELP DECREASE DISPUTES RELATED TO WATER RESOURCES MANAGEMENT



Multi-criteria evaluation or multi-criteria decision analysis is an approach in which stakeholders actively engage in determining the objectives of water resources management projects and analysing the different courses of action. As a result, stakeholders learn to better understand each other's perspectives and commit themselves more strongly to the best option for the project as a whole. SYKE has applied this approach for a long time, for example, in the development projects for watercourse regulation and in the assessment of options for the rehabilitation of salmon stocks. The results have been very positive.

citizens

## SCHOOL STUDENTS OBSERVE THE CONDITION OF THE WATERWAYS



Courses offered by SYKE, together with educational institutions and students, have caused students of Rauma in Western Finland to become enthusiastic about observing and exploring the condition of waterways. The students have been taught how to make use of open data monitoring systems provided by SYKE, and how to construct simple digital monitoring devices. Environmental monitoring is already in the teaching programs of many schools and a new educational model based on digital gaming is intended to be phased in throughout the country. Phenomenon-based learning is also subject to international interest.

**WATER ACCOUNTING ENCOURAGES WATER EFFICIENCY**

Detailed water accounting prepared together with decision-makers, companies, authorities, researchers and other experts under SYKE's guidance, explains how much surface and groundwater is being used in Finland for different purposes and how the use of water is divided among the different functions of the national economy. The description is internationally unique in its precision. It encourages users to save water and supports decision makers in developing controls to promote water-smart circular economy. Accounting-based innovations can also help in finding solutions to global problems of sufficient supply of clean fresh water.

**RESEARCHERS DEMONSTRATED A CONNECTION BETWEEN CLIMATE CHANGE AND FLOODING**

A large international team of researchers, in which SYKE was represented as well, demonstrated a connection between flooding and climate change for the first time across Europe. Floods in recent decades have clearly occurred earlier in certain regions in Europe due to global warming and, on the other hand, have been delayed in certain areas. A study conducted by the Vienna University of Technology analyzed data from more than 4000 hydrological observation stations in 38 European countries from 1960 to 2010. The article, which also utilized records from long and continuous hydrological observations in Finland, was published in August 2017 in the Science journal.





**THE COOPERATION WITH KYRGYZSTAN IMPROVES THE CONDITION OF THEIR WATERWAYS**

Supported by SYKE's water expertise, Kyrgyzstan is currently developing an assessment of the condition and sustainable use of the Son-Kul lake, significant for mountainous and hiking tourism in the country, but is currently polluted by environmental toxins. Evaluated at the same time are the lake's restoration potential and a possible environmental impact of the restoration work. Supported by SYKE, Kyrgyzstan is also creating a new, open-source digital environmental information system, where companies and organizations of citizens will have a key role in sustaining and utilizing the system.

Photos: Stig Hägglund, Henrik Kettunen, Petri Jauhiainen / Plugfi, Unsplash.com, Ari Andersin, Anssi Karppinen.



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The Finnish Environment Institute SYKE is a national research institute that provides wide-ranging expertise.

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