



PHOTO: KAI WIDELL / SYKE

# The role of the Finnish Environment Institute under the Ministry of the Environment



Finnish Environment Institute (Syke) is a research and expert organisation under the Ministry of the Environment.



Syke also carries out tasks related to water resources management under the Ministry of Agriculture and Forestry.



Syke's tasks and responsibilities are laid down in the Act on the Finnish Environment Institute (1069/2009) and the Government Decree on the Finnish Environment Institute (1828/2009).



Syke also carries out reporting and expert tasks required by EU legislation and international agreements and is responsible for environmental monitoring and other official duties.



Many of our duties are based on legislation, such as the Environmental Protection Act and Decree, the Nature Conservation Act, the Land Extraction Act, the Act and Decree on the Organisation of River Basin Management and the Marine Strategy, the Chemicals Act, the Waste Act and Decree, and the Act and Decree on the Infrastructure of Spatial Information.



# Syke's mission is to support the building of a sustainable society with research, information, and services. Syke's vision from our 2021 strategy is **sustainability transformation!**

**Sustainability transformation is about rapidly fitting housing, energy, transport, and food chain systems to match the carrying capacity of ecosystems. The transformation allows Finland to be an international pioneer in defining the green transition and to implement it in Finland.**

We focus on:

- Climate change mitigation and adaptation, particularly in related governance, as well as monitoring and assessing the impact of actions taken.
- Promoting the protection, management, and sustainable use of the Baltic Sea, freshwater bodies, and groundwaters. Monitoring the status of the Baltic Sea and inland waters, and the pressures they face. Developing governance and tools related to the bodies of water.
- Promoting and assessing the sustainability of circular economy and bioeconomy, increasing material and energy efficiency.
- Development and impact assessment of the sustainable use of natural resources. Searching for new solutions and identifying risks.
- Protecting and restoring biodiversity, promoting sustainable use of nature, maintaining ecosystem services, and promoting well-being through nature-based solutions.
- Generating and sharing knowledge on sustainable land use, built environment, and transport systems. Developing and maintaining information systems for the built environment that add value for customers. Assessing and developing policies and measures to help supply meet demand.

Syke supports the sustainability transformation of the systems affecting the above focus areas through systemic analysis and co-creation. Syke develops, assesses, and adapts different methods of knowledge production to meet the needs of society. Syke's extensive governance development and assessment work supports environmental policy formulation and implementation. Syke focuses on equity and supports societal actors in the process of sustainability transformation. Societal change is analysed and developed in a dialogue between research, policy, and practice.



## Syke's research and development under the Ministry of the Environment

Syke contributes to the sustainability of societal development by generating and sharing new knowledge and by developing new, effective, and cost-efficient solutions based on this knowledge. Knowledge and solutions are produced in cooperation with other key actors and the users of the knowledge. The key users of Syke's knowledge are the Government, regional authorities, municipalities, regional councils, the European Union, the business industry, the media, researchers, and civil society.

### Climate change mitigation and air pollution

Syke contributes to climate change mitigation by exploring new policy measures and assessing the impact of different manufacturing and consumption solutions on emissions. We support climate work in municipalities and regions by conducting emission trend assessments and sharing information on good practices. **The goal is a low-carbon society that uses natural resources sustainably and easily adapts to change.** We take part in several national and international research projects and communicate on climate issues, for example through the [Carbon Neutral Finland](#) and [Climate Guide](#) web services.

#### Our key tasks:

- policy analyses related to climate change mitigation and adaptation
- lifecycle-based greenhouse gas emission estimates and mitigation policy analyses
- research on sustainability and equity in energy economy and energy solutions
- climate change impact scenario analysis, vulnerability and adaptation assessments and policy analysis
- emission inventories of air pollution, scenarios, and impact assessments
- national and regional greenhouse gas emission calculations.

### Reliable information about nature

Syke monitors and predicts changes in the state of nature and ecosystem services and develops solutions to enhance natural ecosystems and human well-being. We produce knowledge for the implementation and monitoring of the EU's Birds and Habitats Directives, the Water Framework Directive, and the Marine Strategy Framework Directive. **Together with organisations that produce and use nature information, we contribute to a national nature information development programme to improve the collection, distribution, and use of information.** We coordinate the reform of national environmental monitoring. We introduce modern automated monitoring methods and process the data for decision-making.

Our key expertise relates to the obligations under international agreements such as the biodiversity agreement and CITES, as well as the obligations for the conservation and sustainable use of the marine environment. We use the latest knowledge to develop methods for the restoration, rehabilitation and management of species and habitats through our networks.

Our cutting-edge international research addresses carbon and nutrient cycling, and the impacts of climate change, air pollution and land use on ecosystems, biodiversity, and ecosystem services. We also study the mechanisms for changing societal systems and human behaviour to protect ecosystem services.

#### Our key tasks:

- the monitoring and assessment of the endangerment and the conservation needs of species and habitats
- expert support for nature conservation policy and legislation
- implementation of the UN Convention on Biological Diversity and the EU Biodiversity Strategy 2020 targets
- research on biodiversity, conservation, and sustainable use of terrestrial and aquatic environments
- research on the links between nature and health
- research and development of nature-based solutions
- research on ecosystem services management, green economy, and sustainable bioeconomy
- research on the changes of climate and land use
- stakeholder cooperation.

## Supporting the good status of water and marine environments

Syke has a long history of water expertise. We monitor the quantity and status of water, and any changes to these. We develop solutions for the use, management, and protection of water resources. We make societal and economic assessments. We increase ecological understanding of the functioning and biodiversity of marine and inland water habitats.

Syke is the only research institute in Finland that **examines the Baltic Sea, inland waters, and groundwaters as a whole**. We provide knowledge on effective ways to restore water bodies and reduce nutrient loads and pollutants. We produce real-time water status forecasts using a national watershed model. We develop tools for flood management and for assessing the impacts and cost-effectiveness of water management measures.

**Syke is also Finland's leading Baltic Sea research and monitoring organisation.** We coordinate and implement national long-term monitoring of the state of the sea and conduct multidisciplinary research on marine activity. These include modelling, measurements, and observations. In Europe, Syke is a leader in the development and implementation of automated observation methods and in the management of environmental data sets. Syke also coordinates the Finnish inventory programme for underwater marine diversity. We act as an expert in the implementation of Finnish marine environment management, EU marine legislation and the Convention on the Protection

of the Marine Environment of the Baltic Sea. Syke collects, analyses and shares information on national and international exceptional circumstances (such as blue-green algae, floods, and environmental damage). **The research vessel Aranda is a modern, ice-strengthened research vessel** owned by the Finnish government and operated by Syke for demanding biological, physical and chemical research in the open sea.

### Our key tasks:

- hydrological monitoring and watershed models
- monitoring the status of the surface waters and the Baltic Sea
- generating and analysing automated environmental data (including satellite observations)
- support in water resources management and marine environment management
- flood management
- support in the decision-making of water management projects
- water resources and environmental assessments
- coordination of Finland's marine research infrastructure
- development and application of methods for surveying, modelling, and data processing of marine environments
- multidisciplinary and interactive research for the protection and sustainable use of marine environments.





## Sustainable urban areas and the built environment

Syke provides new and up-to-date knowledge on the built environment, urban structure, and flood risks, and evaluates the effectiveness of policies. We develop new tools for analysing the built environment and predict future development paths. We maintain and develop the national database of construction emissions required by the Building Act. The work we do serves planners, designers, consultants, researchers, regulators, and policy makers. **Our strengths lie in our extensive data resources and services, that we have developed and utilised for the long-term.**

### Our key tasks:

- geospatial analysis of changes in urban structure
- analysis of the geography and interaction related to land use, housing, traffic, services, and businesses
- analysis of the building stock and infrastructure
- modelling the energy consumption and emissions of the building stock for country reporting (UN and EU)
- research and development work on urban green areas and waters, flood risks and ecosystem services
- research on land use and building planning and management
- analysis of energy consumption and resource use in the built environment
- developing and supporting communities' adaptation to climate change
- research on the quality of the living environment and social sustainability
- research and development of stormwater and wastewater treatment and nutrient recovery from wastewater
- expert work on groundwater use and protection and the sustainable use of extractable land resources.

## Sustainable circular economy and bioeconomy

Syke assesses the sustainability of circular economy and explores the opportunities, challenges, governance, and policy implications of the transition to circular economy. We support the development and implementation of sustainable circular economy solutions. **New solutions contribute to the emergence of new markets and sustainable production and consumption.** We study the use of natural resources and its impact throughout the life cycle of products and services. We explore the potential of the circular economy in different sectors of the economy.

**Syke works extensively to promote a sustainable circular economy in society.** We are involved in numerous national and international research projects and co-operation networks. We communicate on circular economy matters on the [Circular waste website](#).

### Our key tasks:

- research, development, and innovation to promote the sustainability of circular economy
- identification of the links between the circular economy and different aspects of sustainability (e.g., climate, biodiversity, economy), reduction of negative impacts and development of a comprehensive approach.
- development of governance for the circular economy, including expertise, evaluation, and indicators for major regulatory reform projects
- circular economy solutions and experiments regarding plastics and textiles, water and agricultural nutrients, management of harmful substances, industrial processes, and business models
- exploration of new business opportunities, empowerment of consumers, and work towards new solutions to address societal challenges.

## Syke's services under the Ministry of the Environment

### Producing and sharing open environmental information

Syke is committed to the national Declaration for Open Science and Research and policies of open science and research. The research and expert knowledge we produce is promptly published in open publishing channels, for example as scientific articles and reports.

We provide open environmental data, which can be utilised by using geospatial and satellite observation data, data stored in environmental information systems or other various interface services. We also offer a range of mapping services to make environmental data easily accessible. Examples of our mapping services include the habitat information and analysis service [Liiteri](#), the [Water Map](#) service showing ecological and chemical status of water, and the open satellite observation service [Tarkka+](#).

We develop and implement new methods for collecting and analysing environmental data. These new methods include deep learning and artificial intelligence, which make the utilisation of data more effective. We also support citizen science by enabling better use of citizen-generated information in the society.

As the responsible authority, we are currently developing a national information system on the built environment, which will bring together information on planning and construction.

### Laboratory services

Syke has been the designated national reference laboratory for the environmental sector since 2001, supporting environmental operators by producing monitoring, research, and surveillance data. Our laboratory provides accredited reference measurements for testing and sampling activities. Our expert and research services cover a wide range of environmental measurements both in the laboratory and in the field.

### Authority services

Syke handles export declarations for the most hazardous chemicals and is responsible for market surveillance of the EU Ecolabel, transport fuel quality, ozone depleting substances (ODS) and fluorinated greenhouse gases (F-gases). We are responsible for F-gas reporting in Finland and for regulation on ODS and F-gases. We also offer information and advice on ODS and F-gases. Syke also acts as a permit authority, issuing a number of special permits: CITES export and import permits, EU certificates for endangered animals and plants, and international shipments of waste. From 2023, the authority for transboundary environmental impact assessments was transferred from the Ministry of the Environment to Syke. As a new responsibility, we are also responsible for monitoring and clearing Baltic Sea wrecks.

### International services

Syke exports expertise abroad in the fields of environmental research and monitoring, as well as management and governance. This cooperation mainly focuses on developing countries and is funded by development cooperation funds. For instance, in Central Asia Syke's experts have been working long-term to strengthen the capacity of the environmental administration by developing tools and expertise to provide reliable information on the status of water bodies. We also provide expertise and research services to European Commission departments, institutions, and agencies. Our projects support policy formulation and evaluation, European environmental information production and methodological development. The projects are customer-funded and strengthen the internationalisation and skills of our employees.



# Syke in figures 2022

**88**

expert hearings in parliament

**207**

statements

**53**

expert blog posts

**1 321**

participants at Syke's trainings

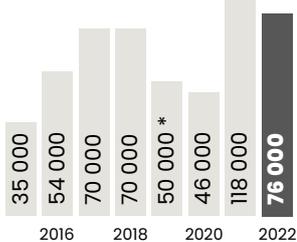
**35 800**

Twitter followers (10 accounts)

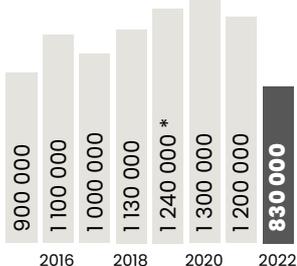
**24 500**

Facebook followers (5 accounts)

Downloads of spatial datasets



Downloads of syke.fi

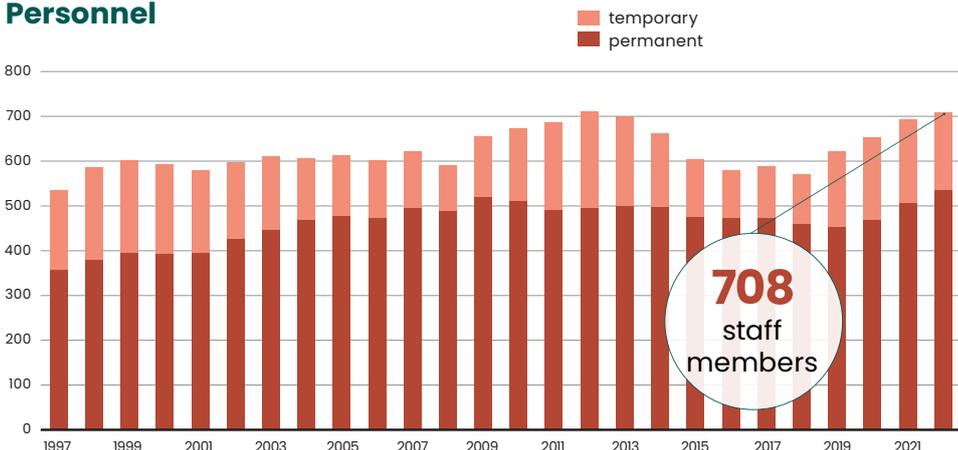


\* 2019 The decrease in download volumes is due to the fact that instead of downloadable materials, customers have switched to using constantly updated materials via the interface service.

## Funding



## Personnel



## Publications

