



NILU's strategy

2018-2022

(short version)



NILU's vision, values and company idea

Vision

Research for a clean atmosphere

Values

Integrity - Competence - Benefit to society

Company idea

NILU will be a research institute with high professional quality and relevant competence in its core research areas: atmospheric composition, climate change, air quality, and environmental contaminants.

We will deliver services closely linked to our research.

We will ensure the knowledge within our core research areas benefits society by making it visible and accessible. Our knowledge will contribute to make society aware of the causes and consequences of climate change and pollution.

We will contribute to the development of the knowledge-based society through innovation.



Atmospheric and climate research - regional and global scale

The atmospheric content of pollutants has impacts on climate, health and the environment. Atmospheric research is important for cost-effective environmental management because it improves understanding of emissions, where emissions are located, and how pollution is converted and deposited. Such knowledge is the basis for all emission control policy agreements. The results are also used to assess exposure and effects on health, ecosystems and materials. NILU aims to provide internationally leading knowledge and services in the following areas in particular:

Atmospheric composition

Occurrence and changes in content over time by climate drivers, air pollution, volcanic ash?, radionuclides and ozone layer / UV are central topics in NILU's atmospheric research.

Climate system

In addition to research on the atmospheric content of climate forcers, NILU will also strengthen its research aimed at the geophysical understanding of the climate system.

Carbon cycle

For the long-lived greenhouse gases CO₂ and methane, there is great uncertainty related to the understanding of the distribution of carbon between the ocean, the biosphere and the atmosphere, respectively.

Micrometeorology / turbulence

Turbulence is a key phenomenon in micrometeorology, and deals with random flows of gas and liquid. These

flows are difficult to predict, but at the same time important for the spread of eg. air pollution. NILU is internationally leading in this field.

Supporting conventions

Measurements in the form of long time series and short-term measurement campaigns, combined with emission inventories through the use of atmospheric dispersion models, supports the evaluation of the effectiveness of existing environmental agreements and provide a basis for developing new and better emission reduction protocols in the future.

Infrastructure

Research infrastructures are considered very important to improve current and enable new research. NILU offers many different types of research infrastructure, and these will be used and strengthened during the next few years.

Urban air quality

Good air quality in Norwegian cities is important for people's health and well-being. Increased urbanization provides environmental benefits, but can also lead to more pollution in our cities. In order to meet these challenges, we need more knowledge about how we ensure sustainable urban development and good air quality. NILU will contribute to green community development by delivering high quality research and services and environmental solutions in the following areas:

Knowledge of sources and emissions

In order to develop climate-friendly cities and towns with clean air, there is a need for a better understanding of how different sources contribute to air pollution and greenhouse gas emissions.

Modeling air quality on a local scale

Modeling is an important tool to gain better understanding of how pollution spreads in the environment, and how many individuals are exposed to harmful air pollution.

Measurements and monitoring

Monitoring of air quality in cities and towns is required to comply with national and international regulations, and is also a solid foundation for air quality research. NILU is in a unique position with its advanced infrastructure and high competence in measurement techniques and development of new measurement methods and instrumentation. Based on this, NILU can advise local and national authorities on questions relevant to the development of measures and regulations to achieve better air quality.

Counseling and research-based services

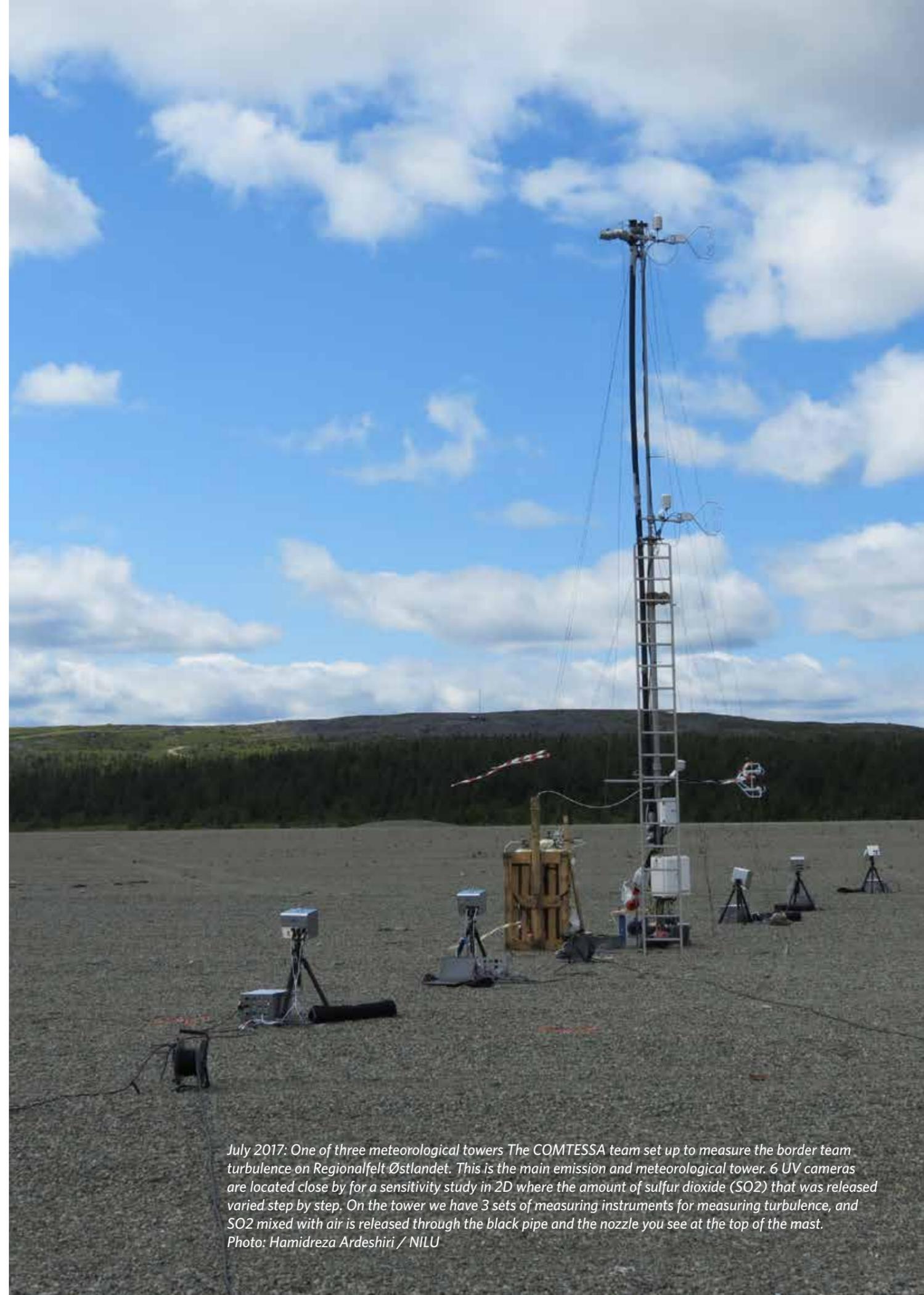
NILU will be a trusted advisor for local and national authorities in matters relevant to the development of measures and regulations to achieve better air quality.

City observatory

Today, approx. 75 per cent of Norway's population lives in cities and towns, and even stronger urbanization is expected in the years to come. How urban areas develop will affect health and welfare to the citizens in these areas. NILU wishes to establish a city observatory to study, among other things, source contributions and composition of air pollution in Norwegian cities and towns, as well as identify new pollution challenges as soon as possible.

Infrastructure

Research infrastructure is considered very important to enable new research. NILU offers many different types of research infrastructure important for urban air quality, and these will be used and strengthened during the next few years.



July 2017: One of three meteorological towers The COMTESSA team set up to measure the border team turbulence on Regionalfelt Østlandet. This is the main emission and meteorological tower. 6 UV cameras are located close by for a sensitivity study in 2D where the amount of sulfur dioxide (SO₂) that was released varied step by step. On the tower we have 3 sets of measuring instruments for measuring turbulence, and SO₂ mixed with air is released through the black pipe and the nozzle you see at the top of the mast. Photo: Hamidreza Ardeshiri / NILU



During the summer of 2016, this UFO-like air sampler was deployed outside Svolvær, to measure old and new organic environmental contaminants in the air, as part of the Research Council's program Ecosystem Impact - Nature's Response to Changes in Climate and Environment (OKOSYSTEM). Photo: Ingjerd Sunde Krogseth / NILU

Environment and health

Various types of pollution through air, water and food affect human health. There is a need for a better understanding of how air quality and environmental pollutants affect the health of individuals and populations. NILU will contribute to a more comprehensive understanding of the environmental and health risks of pollution in connection with:

Environmental exposure and public health

To gain better knowledge of the effects of pollution on health, environment and materials, there is a need to develop new and better methods for calculating exposure (to air pollution).

Health effects of pollution

Combining internationally recognized *in vitro* effect methods with exposure data will provide increased insight into the harmful properties of synthetic chemicals.

Infrastructure

NILU's infrastructure with modern laboratories, databases, models and sensors will produce important exposure and effect data of pollutants.



Environmental contaminants

New chemicals are rapidly introduced to the market and gradually spread in the environment. Many of these compounds have unknown properties, and there is insufficient knowledge about the effects on humans and the environment. NILU cooperates closely with government agencies and other research communities to identify new problem areas and to regulate the use of harmful chemicals. NILU will continue to play a central and international leading role in this work, with particular focus on:

New environmental contaminants

New pollutants and chemicals are introduced into the market and then gradually spread in the environment. Many of these have unknown properties and effects on humans and the environment.

Environmental contaminants in the Arctic

The Arctic is a net recipient of long-ranged transported pollutants, but pollution in the Arctic is also affected by increased human activity in the north. NILU's work on contaminants in the Arctic is strategically secured through the presence and participation in Framcenteret in Tromsø. NILU is also heavily present at the Zeppelin Observatory in Svalbard, where one of the world's longest and most extensive time series on environmental contaminants in air is ongoing.

Modeling of transport of environmental contaminants

Environmental pollutants are transported over long distances as pure chemicals, in products and as waste, through air and ocean currents. Volatile contaminants evaporate in temperate parts of the world and then con-

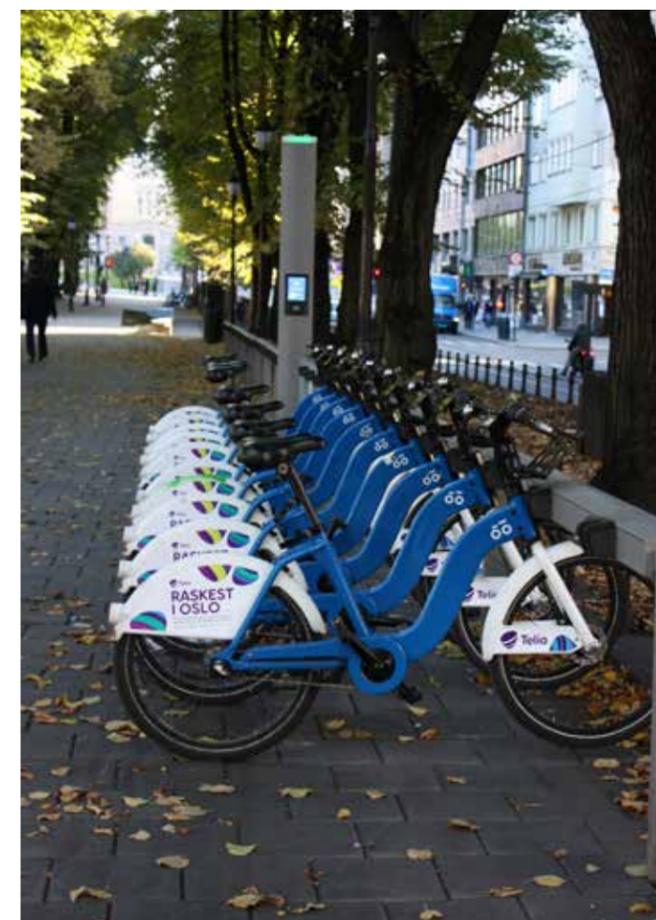
densate in the High North. Environmental contaminants pose a global threat to people and the environment, and thus there is need for more knowledge to understand and predict their behavior across both society and ecosystems.

Environmental contaminants in the circular economy

Recycling of materials is central to efforts to reduce climate impact and to better exploit natural resources. Waste often contain residues of environmental contaminants, and it is necessary to control the content and turnover of chemicals in the recycling processes. Environmental issues and research-based advice National environmental authorities need research-based advice, for instance in international convention work.

Infrastructure

More and more new chemicals are introduced, and new instrumentation and more efficient methods enable research on these new compounds. A minority of the new substances can pose a threat to humans and the environment - the so-called environmental contaminants.



Sustainable environmental and climate solutions

The transition towards a green society requires holistic approaches that ensure environmental and climate sustainability, promote a responsible use of resources and allow for economic growth. NILU will make use of its broad expertise to contribute to this process with competence, research, advice and the development of new services, especially regarding:

Environmental risk

We will contribute with increased knowledge to solutions towards a more sustainable economy and society by identifying risk and vulnerabilities on how these will affect the consumption of resources, air quality, climate change, health and quality of life.

Environmental impacts and resource efficiency

We will work to develop competence-based ecosystem management and bio-economics, which are important focus areas for both the private and public sectors.

Digitalization

Digitalization is a strong international development trend and the number of open and available data sources are rapidly increasing. This leads to the availability of large amounts of information with increasing complexity. NILU's digitalization work will help the institute achieve its goals to be at the forefront of environmental solutions and air quality, atmospheric and environmental research, by offering innovative data services in areas such as:

Big Data

Big Data is information that is characterized by high volume, high speed and/or a high degree of variation. In order to analyze these large and complex data sets quickly and efficiently, specific skills and technology are required over traditional IT systems.

Machine Learning (ML)

Machine Learning uses methods that help us understand and predict events and outcomes based on large and complex data.

Internet of Things (IoT)

More and more sensors are connected to the internet. These include sensors associated with vehicles, air quality, emissions, pollen, meteorology and more.

Visualization

Visualization of data is an important competence in order to develop complete solutions, including analysis and dissemination of results.

Infrastructure

Digitalization provides ever-greater opportunities and it is crucial that NILU's infrastructure is prepared to exploit these opportunities.



Photo: Markus Spiske

Innovation

Innovation is important for the development of the knowledge-based society. The task of developing and ensuring wide utilization of new solutions is one of NILU's most important goals, and societal impacts are evidence of relevant R&D at the institute. We will in particular focus on:

Innovation and commercialization

Innovation is closely related to market understanding. Positioning new solutions in different markets requires insight apart from the technical understanding of the product or service.

innovation at the institute, where culture and structure are important elements for efficient and predictable processes. NILU's subsidiary, Innovation nilu AS, handles the sale of NILU-relevant products and services, and functions as a holding company for NILU's daughter companies.

Culture and structure

NILU has its own innovation department that works across all departments and aims to be a driving force for increased

Network

In order to work effectively with new solutions for commercial and/or public markets, NILU must have relevant networks within areas where NILU's solutions are current.

Communication

Authorities and contractors are increasingly expecting public communication about research from research institutes. Access to research-based, verified and quality-assured knowledge is crucial to ensure that as many people as possible are able to participate in the community debate, on an equal footing. Communication is important to make research and the change and development research contributes to, known to the public.

HR

NILU is an archetypal knowledge company where the main part of the value creation takes place in the heads of our employees. It is imperative that our employees are highly motivated and academically strong. Management must help build teams where the sum of the results created is greater than the individual's contribution. NILU has, and will continue to have, a multifaceted and cross-cultural workforce and an unprejudiced and inclusive work environment.

IT

NILU's IT infrastructure is robust and well-functioning. Through several years of focusing on processing and storage, NILU has become a major information center with great potential for future growth. NILU has a centralized operation and uses new technology to renew and streamline services for internal and external users. This requires NILU to have expertise and being able to handle challenges and events in an efficient and fast way. Further development of our IT-based systems is important for NILU's relevance in the future.



NILU annually participates in the Oslo Science Expo, in collaboration with the other CIENS institutes. In 2017, the theme of the stand was "How much is clean air worth for you". Photo: Christine F. Solbakken / NILU

*Partner in CIENS og Framsenteret
ISO-certified in accordance with NS-EN ISO 9001/ISO 14001*

NILU - Norwegian Institute for Air Research
PO box 100
2027 KJELLER
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Visit: Instituttveien 18, 2007 Kjeller

NILU - Norwegian Institute for Air Research
Framsenteret
9296 TROMSØ
Phone: +47 63 89 80 00/Fax: +47 63 89 80 50
Visit: Hjalmar Johansens gt. 14, 9007 Tromsø

Kindly address any mail to NILU, not to individual persons.

Email: nilu@nilu.no / nilu-tromso@nilu.no
Web page: www.nilu.no

Bank: 5102.05.19030
VAT number.: 941705561