



Norwegian Ministries

Strategy

Strategy for research and higher education in Svalbard

Svalbard – top of the world for knowledge of global significance





Frontpage:
Students conducting fieldwork
Photo: Øystein Grasdahl / UNIS

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Foreword

Svalbard's strong scientific community, unique natural environment, geographic location, ease of accessibility and modern infrastructure make Svalbard an attractive platform for Norwegian and international research and higher education. The need for knowledge and expertise about the Arctic is greater than ever, not least because of changes in climate and the environment. Svalbard plays an important role in the collaborative global knowledge effort and serves as a hub in several international observation networks. At the same time, its location provides outstanding

opportunities for, among other things, space research and Arctic Ocean research.

Interest in Svalbard-based research is on the rise. As the host of international research activities, the Norwegian Government is committed to ensuring that Svalbard's natural advantages and unique opportunities as a research platform are utilised in the best possible way while safeguarding its natural environment and cultural heritage sites. This is why the Government is issuing this strategy for research and higher education in Svalbard.



Scientists with mesocosm rooves Photo: Nick Cobbing

The strategy is a long-term platform that determines the frameworks and principles for research and higher education in Svalbard. The strategy conveys what the Norwegian authorities expect of knowledge communities in Svalbard, contributes to a clearer Norwegian role as host and encourages collaborative research activities in Svalbard. The strategy outlines high-level objectives and ambitions while clarifying the frameworks for forward-looking and sustainable development of research and higher education in Svalbard. The frameworks and principles

cited are of crucial importance for implementing the Government's ambitions and objectives for research and higher education in Svalbard. For this reason we call it a strategy. Any initiatives to be pursued will be proposed by the Government in upcoming budget processes.

Iselin Nybø



Ocean acidification experiment in Kongsfjorden
Photo: Nick Cobbing



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Nature in Svalbard
Photo: Mariusz Prusaczyk / Colourbox

Introduction

Since the 1960s, Norwegian authorities have actively facilitated Norwegian and international research and environmental monitoring in Svalbard. Throughout this history, research institutions from other nations have contributed to developing the current research activity at the archipelago. There have been research investments in Barentsburg and Hornsund for decades. For Norway, developing Ny-Ålesund from a mining town into a natural sciences research station has been an undertaking of key importance. From the start, Norway's scientific ambitions for Svalbard have been high, and Norwegian investments in research buildings, installations and facilities have been substantial. Those same high ambitions led Norway to invite research institutions from a variety of countries to lease quarters and make use of the Ny-Ålesund infrastructure. In addition to the many Norwegian institutions present in Ny-Ålesund, institutions from 10 other countries are presently engaged in long-term research there. From 1991 onwards, the research institutions in Ny-Ålesund have cooperated through the Ny-Ålesund Science Managers Committee (NySMAC).

The majority of researchers resident in Svalbard live in Longyearbyen. Longyearbyen also hosts the widest variety of scientific activities and disciplines in the archipelago – from basic to applied research, from biology to Arctic technology. Much of the activity in Longyearbyen is related to field studies in surrounding areas and the use of nearby research infrastructure. Svalbard Science Centre, which was established in Longyearbyen in 2005, houses the University Centre in Svalbard (UNIS) and a variety of other institutions. It is a dynamic and influential centre for research, higher education, science communication and information.

In Svalbard, the history of higher education is shorter than that of research. UNIS, the world's northernmost institution for higher education, was established in Longyearbyen in 1993. Since then UNIS has grown from a study programme for a few Norwegian university students to a centre for research and Arctic studies at the highest level, with students from all over the world. Today, UNIS is the largest scientific institution in Svalbard and holds a key position in the archipelago's international science community. In collaboration with Norwegian universities, UNIS offers research-based higher education.

About 700 students from around the world study at UNIS each year for shorter or longer periods of time, equating to about 220 full-time-equivalent student positions. About 50 per cent of the students come from Norwegian institutions. UNIS's attractiveness is due to its high academic quality. The number of applicants is quite high, and UNIS provides both students and researchers with effective structures for international collaboration and networking. UNIS's programmes allow graduates from numerous educational institutions to obtain an education with an Arctic profile, which is useful for both public administration and the private sector. UNIS also contributes to the recruitment of future polar researchers.

More than 1,000 researchers from about 30 different countries visit Svalbard every year. Those from Norwegian institutions account for more than half of full-time-equivalent research days. The bulk of activity is based in Longyearbyen and Ny-Ålesund. There are also activities based in Barentsburg and Hornsund. The fjords and marine areas around Svalbard are also used for research and education.



Glaucous gull (*Larus hyperboreus*)

Photo: Martin Kristiansen / NP (section of image)

International interest in research in Svalbard contributes to knowledge development in the Arctic and provides a basis for strengthened international research collaboration. Increased activity actualises the need to minimise the environmental footprint, to preserve the unique Svalbard nature and secure its role as a reference area for research.

Protection of the natural environment is one of the constants in Norwegian Svalbard policy, and the preservation of Svalbard's distinctive natural wilderness has long been one of the policy's primary objectives. About 65 per cent of land area and 87 per cent of territorial water is protected by designation as nature reserves and national parks. Svalbard has its own environmental protection legislation that establishes a framework for all activities that could affect the natural environment and cultural heritage sites. The Governor of Svalbard is the highest authority, administering Norwegian law as it applies to Svalbard. When field activity permits are required, the Governor issues them upon application.

The Norwegian Polar Institute is the central government institution for mapping, environmental monitoring and management-oriented scientific research in polar areas, including Svalbard. The institute serves as a scientific and strategic adviser on polar affairs to the Governor of Svalbard, the environmental directorates and the central government. In addition, the Norwegian Polar Institute has been given special responsibility to serve as host in Ny-Ålesund and ensure that development and activities in the area are well coordinated.

The scientific communities of Svalbard have high academic ambitions and contribute both individually and collectively to the development of knowledge and expertise of high international calibre. The Government wants to facilitate continued advancement of best practice in research and higher education in Svalbard, so that Svalbard's research communities may continue to play a key role in international polar research in future.



Krill (*Thysanoessa* sp) and small zooplankton illuminated by a diver's light

Photo: Geir Johnsen / Norwegian University of Science and Technology (NTNU) / UNIS / The Exhibition "Polar Night"

Objectives and ambitions

The Government's objectives and ambitions for research and higher education in Svalbard derive from Meld. St. 32 (2015–2016), the government's white paper on Svalbard, and include the following:

- Svalbard shall be further developed and strengthened as a platform and key area for research that utilises Svalbard's natural advantages.
- The research shall make significant contributions to the advance of international knowledge and contribute to the knowledge base needed to address key national undertakings and global challenges.
- A more comprehensive approach shall be followed as Ny-Ålesund is further developed as a Norwegian platform for international cooperation in world-class natural sciences research.
- Research communities active in Svalbard shall take the lead in moving towards shared research data and infrastructure.
- UNIS's role as a unique institution for university-level studies and research in Svalbard will continue to be enhanced, with a range of academic programmes and research activity that capitalise on the natural advantages of the location.
- Facilitate further cooperation between UNIS and mainland universities to make the most of UNIS's potential, to satisfy the requirement that 50 per cent of students come from Norwegian institutions and improve predictability for both UNIS and the universities.
- Higher educational programmes shall provide university and university college students with competence in Arctic subjects and contribute to polar research recruitment.
- Svalbard's vulnerable natural environment shall be preserved as a reference area for research.
- The archipelago's research infrastructure and unique research possibilities shall be exploited to even better effect.



Documenting spring bloom of sea ice algae
Photo: Angelika Renner / NP (section of image)

General frameworks and principles

The Government will work to ensure that research and higher education in Svalbard develop in a forward-looking, sustainable manner. The activity must be developed in line with established international standards for scientific practice and within the framework of Norwegian laws and regulations. As long as activity takes place within the framework and principles described here, the Government will not micromanage individual activities or professional priorities. This strategy pertains to land-based activities as well as activities in territorial waters when research projects there are linked to a research project in Svalbard. Research projects that concern marine areas only, fall outside the strategy's purview.

With increasing activity and climate change, it is even more important to preserve Svalbard's natural environment and cultural heritage sites. Some limitations on scientific and educational activities are therefore necessary. But adaptation to comply with environmental requirements can also help promote scientific best practice. By prioritising certain types of activity, demanding higher scientific quality and coordinating and collaborating more effectively – including the sharing of equipment and data – we can reduce the impact on nature and increase scientific quality and resource utilisation.

This strategy sets forth the Government's general principles and frameworks for research and higher education in Svalbard. These principles are crucial to successfully developing Svalbard as a world-class scientific hub, using the archipelago's available resources and natural strengths to best advantage. The departure point could not be better: a large number of outstanding researchers and institutions from around the world, excellent facilities, and a wide range of

advanced research infrastructure assembled within a limited geographic area. Through a variety of arrangements and cooperative forums, a great deal of productive collaboration has already been established. To achieve its ambitions and objectives for continued development of scientific activity in Svalbard, the Government will keep encouraging active involvement by research communities. Meeting the Government's objectives will require all actors to work together and actively implement the principles described here.

Using Svalbard's natural advantages

Research activities and educational programmes in Svalbard should be based on the natural advantages inherent in the archipelago's location. The kinds of activity pursued here should be those that can be done only – or done best – in Svalbard. Climate, nature and the environment are natural focus areas, but Svalbard's location also makes it an opportune setting for space research, geology and Arctic technology, among other subjects.

High scientific ambitions

The Government assumes that the research communities in Svalbard have the highest scientific ambitions and strive for quality through international cooperation with other researchers in Svalbard and elsewhere in the world. To the degree possible, research results shall be made openly available and published in a way that helps push forward the frontiers of research. Much of the research occurring in Svalbard is thematically limited to the archipelago itself and surrounding marine areas. If more of this research were placed in a larger pan-Arctic or global context, it could help increase its relevance and the frequency of citation. The scientific activities being pursued should be complementary while representing, in sum, a strong and comprehensive research effort.



Svalbard Science Centre in Longyearbyen
 Photo: Eva Therese Jenssen / UNIS

The higher education provided in Svalbard must maintain a high level of quality. The provisions Norway has made for higher education in the archipelago are through UNIS. To establish other institutions of organised higher education (university and university college level) in Svalbard is not desirable, but education is also a natural part of research. Such student activities should occur in affiliation with a research community with activities in Svalbard, and as a rule should be field based, expedition based or directly linked to research activity or research infrastructure in Svalbard.

Overriding consideration for the environment

All activity must be consistent with environmental regulations and make accommodation for Svalbard's vulnerable natural environment and cultural heritage sites. In all phases of research and educational activity, attention must be paid to minimising the footprint and overall impact on the environment. This can be achieved by coordinating activities and sharing fieldwork data and results. Whenever possible, remote measurement and automated data collection should also be employed to reduce environmental impact.



Students at Festningen, Grønfjorden near Barentsburg
 Photo: Øystein Grasdahl / UNIS



The EISCAT aerial outside Longyearbyen
 Photo: Bjørn Frantzen / NP (section of image)

Using established communities and research stations – field activity by application

By and large, research should be based in established communities and research stations. Activities in protected areas of the archipelago should generally be limited to what cannot be done elsewhere. As a rule, most field activities require a permit from the Governor. For activity in territorial waters, a permit may be needed from other authorities, including the Directorate of Fisheries and the Norwegian Petroleum Directorate.

Good logistics support, security management and security training

Research and educational activities in and around Svalbard generate traffic both on land and at sea. There may be considerable risk involved, so a high level of security management, security training and logistics support for students and researchers is necessary. It is important that institutions present



Kjell Henriksen Observatory, waiting for solar eclipse
Photo: Noora Partamies / UNIS



The Zeppelin station above Ny-Ålesund
Photo: Max König / NP (section of image)



Spider for injecting CO₂
Photo: Nick Cobbing



Impressions of fossil leaves in Tertiary sandstone
Photo: Dierk Blomeier / NP (section of image)

in Svalbard possess the skills, equipment and facilities necessary to direct and support such activities.

Sharing project information and coordinating field activity

Both research and higher education are based in large part on field measurements, field observations and field sampling. The Government expects research communities to do everything possible to avoid duplication and the extra strain on nature that goes with it.

The Government expects everyone to register and share information about projects and field activities, and that they use such information as a basis for coordinating field activities and improving the utilisation of field equipment and research vessels. This is done through active use of the Research in Svalbard (RiS) database

(see page 26). Having better information about ongoing projects can also make it easier to initiate cooperation with other relevant actors.

Coordination and mutual access to infrastructure

The Government sees great potential in more systematic and committed infrastructure cooperation among Svalbard's researchers. All parties in Svalbard with research infrastructure at their disposal shall do their best to provide others with access to equipment, vessels, laboratories and other such assets. New infrastructure initiatives must complement existing research infrastructure and support high-priority subject areas, geographical advantages and special local features. The Government encourages the institutions to coordinate such initiatives through the Svalbard Integrated Arctic Earth Observing System (SIOS).



Photo: Nick Cobbing



Excavating an Ichthyosaur (*Cryptopterygius kristiansenae*)
Photo: Jørn Hurum / NHM, UiO



Arctic geology lesson
Photo: Maria Jensen / UNIS



Photo: Nick Cobbing

Sharing research results and data

Research data must be made available as openly as possible and be shared in accordance with internationally recognised principles. Data sharing is an increasingly important factor in modern research, where understanding complicated systems requires the collection and compilation of large, standardised measurement series. In Svalbard it is especially important because data collection is very costly and often involves physical intervention in the natural landscape, pollution and erosive wear and tear in vulnerable natural areas. This heightens the importance of avoiding duplication and redundant activity. By international standards, the scientific communities present in Svalbard have already done much to embrace data sharing. The implementation of SIOS will reinforce this development. Svalbard research can lead the way towards open research and data sharing due to the unique opportunities inherent in the archipelago combined with the need to limit pressure on the natural environment.

Norway aims to be among the forerunners in pushing for all publicly funded scientific articles to be openly available from the time of

publication. The Research Council of Norway has an open-publication requirement in order for research activities in Svalbard to receive funding. The objective is to boost quality and enable other researchers as well as the business community, public administrative bodies and the general public to more actively use the findings obtained. Researchers, funding institutions and the authorities all have to become engaged and to contribute. The Government's ambition is for Svalbard to be a pioneer in open publication and data sharing.

Framework for further development of the Ny-Ålesund research station

The Government's primary objectives, ambitions and priorities for Svalbard as a whole also provide direction and a framework for developments and activities in Ny-Ålesund. For the Government it is important that research conducted in Ny-Ålesund consistently exploits the area's unique character as a clean natural science laboratory. The special features and natural advantages of Ny-Ålesund and the Kongsfjord area must be exploited in the best ways possible.



The impact of glacier retreat on fjord circulation and the ecosystems, Kronebreen.

Photo: Katrin Lindbäck / NP

Buildings, infrastructure and services in Ny-Ålesund shall be developed and managed so as to support the comprehensive thematic priorities of the place. The Government will therefore continue development towards more thematically based centres with shared-use infrastructure. This approach will create a solid basis for outstanding research within priority areas.

In order to ensure sound frameworks for academic development and coordination of activities, the Government has asked the Research Council to develop a Ny-Ålesund research strategy. The research strategy is to be developed in close collaboration with all actors conducting research in Ny-Ålesund and with the cooperative forum in Ny-Ålesund Science Managers Committee (NySMAC). The Research Council has overall responsibility for the strategy. The Norwegian Polar Institute performs Norway's host role in Ny-Ålesund and is responsible for implementation and daily follow-up of the strategy locally. In addition, the Norwegian Polar Institute is to be the point of contact in Ny-Ålesund for scientific research and associated activities. The operation and development of services and infrastructure in Ny-Ålesund must

be in accordance with the research needs and priorities identified in the strategy. The Norwegian Polar Institute will have overall on-site responsibility for coordinating and for ensuring that such coordination occurs.

The research communities of Ny-Ålesund have established the NySMAC cooperative forum for developing academic, technical and logistic cooperation among themselves. NySMAC helps bring the communities together and avoid fragmentation. The Norwegian Polar Institute serves as the forum's secretariat. NySMAC will be an important partner for the institute in its daily work implementing and following up on the research strategy and performing its host role in Ny-Ålesund.

The Government believes a good foundation has already been laid for a more strategic and comprehensive approach to developing the Ny-Ålesund research station in future. Important aspects include the flagship research programmes that have been set up in Ny-Ålesund, information sharing via the RiS database and the development of more binding forms of cooperation under



Arctic biology students conducting fieldwork.

Photo: Steve Coulson / UNIS

SIOS direction. This shows that the ambitions of the scientific communities and the Government are in harmony with regard to Ny-Ålesund. That creates a solid fundament on which to develop and implement the research strategy.

The involvement of master's and doctoral degree students in research projects can help in the recruitment of new generations of polar researchers. The Government does not want education to constitute a significant activity in Ny-Ålesund, but it should still be possible to bring students to Ny-Ålesund in connection with research projects. When important for the educational programme, UNIS will also be able to continue using joint facilities, provided the use conforms with frameworks and coordination practices in force locally. Use of facilities for educational

purposes in Ny-Ålesund must be adapted to the capacity of the locale, the environment and cultural heritage assets, with activities limited to those requiring access to nearby instrumentation or local field possibilities. Business activity in and around Ny-Ålesund must operate within the frameworks established by the research activities.

Radio silence and a local environment that is as pristine as possible are important premises for further development and use of Ny-Ålesund. Important instruments, observatories and other facilities depend on this. At the same time, it is important that on-site research organisations continue the constructive dialogue already under way to develop good systems for managing their shared presence and maintaining a solid basis for high-quality research and monitoring.



Logistics warehouse at Svalbard
Science Centre, Longyearbyen
Photo: Jan Roald / NP (section of image)

Facilitation and instruments

Svalbard Integrated Arctic Observing System (SIOS)

SIOS is a Norwegian-initiated international cooperation to exploit Svalbard's research infrastructure for the purpose of increasing knowledge about global climate and environmental changes. Its participants are Norwegian and foreign institutions with research infrastructure relevant to interdisciplinary earth system studies – studies, that is, of the complex interrelationships between ocean currents, atmospheric and geological conditions, the extent of ice and snow, and plants and animals. Svalbard is well suited for such research, in part because climate and environmental changes occurring in the Arctic are clear and easy to observe. Such study programmes require access to far more expertise, infrastructure (laboratories, observatories, field equipment, etc.) and measurement data than any single research institution can obtain. SIOS itself will not own and operate any research infrastructure but will facilitate mutual access to existing equipment and collected data. SIOS will also help improve coordination of new infrastructure initiatives. SIOS has developed a data policy of its own that is in line with international principles. Assuming a good level of participation, SIOS will help Svalbard become a leader internationally with regard to the sharing of data, infrastructure and findings. The Government encourages all institutions with research infrastructure relevant to earth system science in Svalbard to take part in SIOS.

University Centre in Svalbard (UNIS)

The University Centre in Svalbard (UNIS) is a unique centre for university-level study and research in Svalbard. UNIS is the Government's institution for providing higher education in Svalbard. UNIS offers educational programmes in Arctic-oriented subjects at bachelor, master's and doctoral level to both Norwegian and foreign students. Four fields of study are available at UNIS – Arctic biology, Arctic geology, Arctic geophysics and Arctic technology – and active research is conducted in all fields. Many UNIS employees are closely affiliated with other research institutions in Norway and abroad. Instruction takes place in English and is based mainly on terrestrial and marine fieldwork. All of UNIS's study programmes are offered in cooperation with one or more Norwegian universities. The aim is for 50 per cent of students at UNIS to be from Norwegian universities and university colleges, and for all programmes to be an integrated part of a degree programme at the student's home university.

Norwegian Polar Institute (NPI)

The Norwegian Polar Institute is the central governmental institution for mapping, environmental monitoring and management-oriented scientific research in polar areas. The institute serves as scientific and strategic adviser on polar matters to the Governor of Svalbard, the environmental directorates and the central government. The institute has been active in Svalbard for 90 years. Its permanent presence in Ny-Ålesund and Longyearbyen has led over time to substantial growth in infrastructure and activity.

Continuous development of the Ny-Ålesund research station

Norwegian authorities are committed to steadily developing the Ny-Ålesund research station within sound environmental frameworks, and annual investment funding has been provided over many years with an eye to further development of the station. Looking ahead, the development of Ny-Ålesund research station shall support the comprehensive, high-priority thematic priorities set forth in the research strategy for Ny-Ålesund.

Svalbard Science Forum (SSF)

In 1998 the Norwegian authorities set up the Svalbard Science Forum (SSF) to increase cooperation, coordination and information sharing between all the research sites in Svalbard (Longyearbyen, Ny-Ålesund, Barentsburg and Hornsund) as well as to strengthen cooperation between individual researchers and research institutions in Svalbard, both Norwegian and international. The Norwegian Research Council heads SSF and operates the secretariat. The secretariat administers schemes to support cooperation in research and fieldwork, with both Norwegian and international actors eligible to apply. The support schemes have been essential to the establishment of joint flagship research topics in Ny-Ålesund and the Kongsfjord area.



The Marine Laboratory, the first joint research infrastructure in Ny-Ålesund. Photo: Linda Bakken, Kings Bay AS



Ny-Ålesund settlement, winter. Photo: Max König / NP (section of image)



Ny-Ålesund settlement, summer. Photo: Max König / NP (section of image)

Research in Svalbard (RiS) database

The SSF secretariat is also responsible for the Research in Svalbard (RiS) database, a portal for registering all types of research projects in Svalbard and surrounding marine areas. It contains information about the researchers and institutions taking part in projects, the time and location of fieldwork and an overview of publications and data. By searching such openly available information, researchers and others can gain an overview of activities where coordination may be possible and find partners

for collaboration. RiS is also used for ordering services in Ny-Ålesund as well as applying for permits and reporting on them to the Governor of Svalbard. The database has enabled new joint initiatives and made it much easier for research communities to coordinate field activities and logistics. This has helped to improve resource utilisation and limit strain on Svalbard's natural and cultural environments. The Government expects all who conduct research in Svalbard to familiarise themselves with the RiS database and to use it actively.



Basement rocks
Photo: Winfried Dallmann / NP

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