

# Svalbard Integrated Arctic Earth Observing System (SIAEOS)

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# The goal of SIAEOS

Establish an Arctic Earth Observing System in and around Svalbard that integrates the studies of geophysical, chemical and biological processes from all research and monitoring platforms.

SIAEOS is an opportunity for Europe to establish the central node in the global monitoring of the High Arctic.

# To achieve this we will:

1. Organize all infrastructure and all research and monitoring activities into four observation platforms being land-based, sea-based, glacier/ice-based and space/air-based.
2. Assess the present infrastructure and activities to identify gaps and weaknesses in the system. Invest in additional infrastructure and activities to close these gaps.
3. Establish a Knowledge Centre in Longyearbyen for data assessment, integration, storage and delivery, education and outreach, cooperative efforts, and input to Earth System modeling.
4. Take actions to coordinate the SIAEOS initiative with complementary ESFRI efforts as well as other Earth Observation Systems and related modelling efforts.



# Svalbard integrated Arctic Earth Observing System



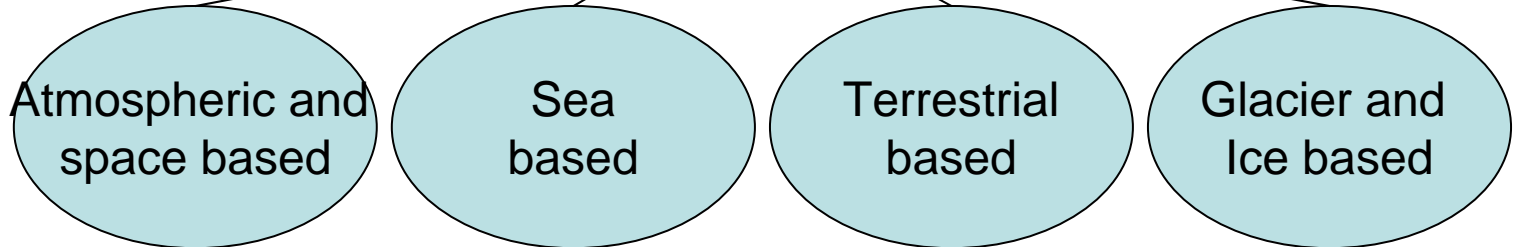
Selected end users: Policy makers, NGO's



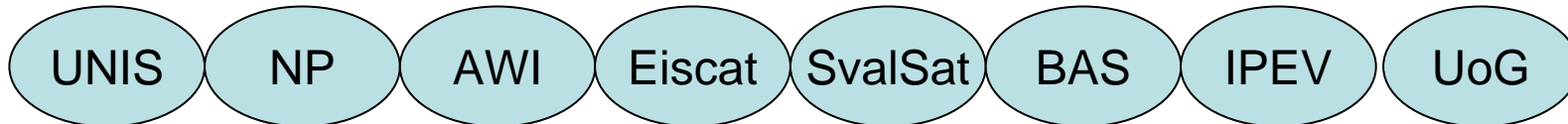
Integrating platform



Observational platforms



Selected contributing organizations





# Why Svalbard: Unique qualifications



- Excellent opportunities for studies of ecosystem changes.
- Well positioned to observe and analyse the changing Arctic ice cover.
- Well positioned to study the energy balance in the atmosphere.
- The location provides for dense satellite monitoring.
- Prevailing oceanic and atmospheric transport patterns bring pollution from Europe to the High Arctic.



# Why SIAEOS?

- Environmental and climate related challenges require an Earth System approach.
- Observation systems have not been developed with the same systematic approach as Earth System modeling.
- SIAEOS will secure the heritage of IPY and further develop the data series of the High Arctic.



# Extensive infrastructure in place



- Research organizations from 20 countries are present on a regular basis, operating a wide variety of land and sea-based facilities.
- Norway has established an international university in Longyearbyen with students and staff from 25 countries.
- Ny-Ålesund has been developed into an international, high standard field station focusing on environmental and climate research.
- Svalbard is accessible all year round because of its advanced community infrastructure and its relatively mild climate.
- Svalbard has the highest available data bandwidth in the High Arctic.



# Major research facilities



- SvalSat/SvalRak
- Eiscat
- Aurora Observatory
- SPEAR
- Marine Laboratory
- Zeppelin Station
- Sverdrup Station
- Svalbard Science Centre
- Research stations in Ny-Ålesund, Barentsburg, Hornsund and Svea
- Numerous field stations
- Research vessels



Sval Sat facilities



# Active institutions in Svalbard



- University Centre in Svalbard
- Norwegian Polar Institute
- Alfred-Wegener-Institute
- Institute Polaire Français
- British Antarctic Survey
- National Research Council of Italy
- National Institute for Polar Research, Japan
- Korea Polar Research Institute
- Chinese Arctic and Antarctic Administration
- Arctic Centre, Univ. of Groningen, Holland
- Eiscat Scientific Association
- Arctic Antarctic Research Institute, Russia
- Polish Academy of Sciences
- Norwegian Mapping Authority
- SINTEF Group
- Norwegian Institute for Air Research
- Stockholm University, Sweden
- Andøya Rocket Range
- Norwegian Space Centre
- University of Tromsø
- Nagoya University, Japan
- University of Leicester, UK



AWI-UNIS signing ceremony



# Supporting institutions



- Norwegian National Committee on Polar Research, with members representing:
  - Norwegian Institute of Marine Research, Norwegian Space Centre
  - Norwegian Institute for Nature Research, Norwegian World Heritage
  - Norwegian Meteorological Institute, Norwegian Polar Institute,
  - University of Tromsø, Danish Polar Center
  - University Centre in Svalbard, StatoilHydro
- Alfred Wegener Institute (AWI)
- French Polar Institute Paul Emil Victor (IPEV)
- Polish Academy of Sciences, Institute of Geophysics
- Natural Environment Research Council (NERC)
- Finnish Meteorological Institute
- EISCAT Scientific Association
- University of Groningen and The Willem Barentz Polar Institute
- University of Rostock - Leibniz-Institute of Atmospheric Physics
- Arctic and Antarctic Research Institute of Roshydromet. St. Petersburg
- Norwegian University of Science and Technology (NTNU)
- University of Oslo
- Norwegian Institute for Air Research (NILU)

# As the proposal is presented

(Feb. 18th 2008)



Foto: Olli Jokiaho

- The Aurora Observatory officially opens in Longyearbyen by Norwegian Minister of Research and Education.
- Fully financed by the Norwegian government (3,5 mill. Euro).
- Complements the EISCAT and SPEAR facilities on Mine 7 Mountain.
- Offers a valuable contribution to atmospheric based observation platform.



# Tenants at the observatory

- University of Oslo, Norway
- Finnish Meteorological Institute
- University College of London
- National Institute of Polar Research, Japan
- University of Southampton, UK
- Danish Meteorological Institute
- Air Force Research Laboratory
- Augsburg College, USA
- University of New Hampshire
- Embry Riddle Aeronautical University, USA
- University of Tromsø, Norway
- University of Wales, Aberystwyth
- University of Sendai, Japan
- University of Alaska, USA
- Institute of Radio Astronomi, Ukraine.

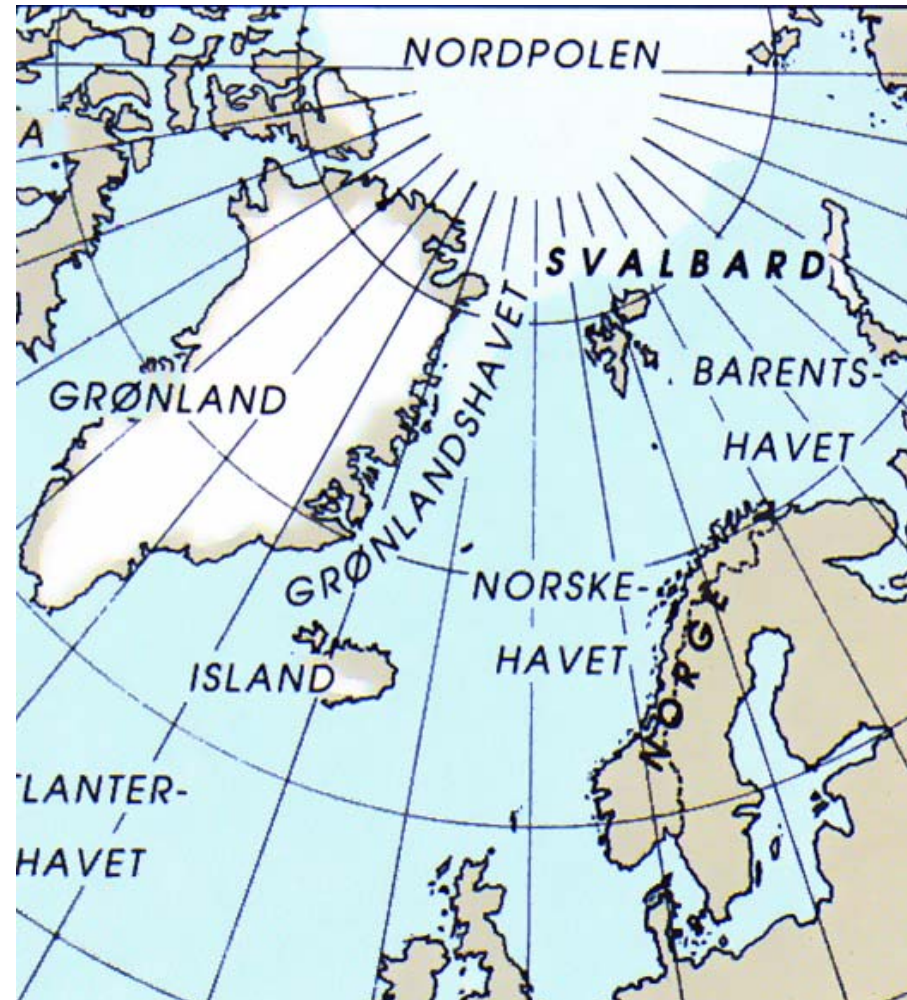




# Open door policy



- The SIAEOS proposal is submitted by the University Centre in Svalbard (host institution), the Norwegian Polar Institute and the Norwegian Research Council.
- We invite research organizations in Greenland, Scandinavia and Russia to enter into collaborations with SIAEOS with the purpose of extending the observation system.
- We invite the main institutions in Svalbard to join the steering committee.
- We invite all institutions in Svalbard to participate in the gap analysis and in designing the Knowledge Centre.



# Preliminary costs SIAEOS

- Preproject June 2008 – April 2010; 4 – 6 mill NOK
- Preparatory Phase – funding from EU 7. Framework Programme, max 5 mill EURO
- Investment in research infrastructure, appr. 400 mill NOK, all participating countries contribute, Norway as a host country appr. 30% of this
- Operating costs of infrastructure and Joint knowledge centre; 50 – 70 mill NOK per year, all participating countries contribute, Norway as a host country appr. 30% of this
  - Data collection, handling, storage and delivery
  - Data assimilation including integration of satellite and field data
  - Space and timing integrating facility
  - Input to Earth Modelling Systems
  - Outreach and communication

A person stands on the peak of a dark, rocky mountain, silhouetted against a bright, glowing sunset. The sun is low on the horizon, casting a warm, orange light across the sky and illuminating the person's arms as they are raised in a gesture of triumph or achievement. The background shows a vast, hazy landscape of rolling hills or mountains under a sky filled with soft, orange-tinted clouds. The overall mood is one of accomplishment and connection with nature.

*SIAEOS will be the engine that pulls all infrastructure and all research activities together in a shared effort to understand the environmental state of the High Arctic.*

Thank you for your kind attention!