

Svalbard Integrated Arctic Earth Observing System (SIOS)

Main Goals of SIOS

- To build up a comprehensive observation platform capable of monitoring the Arctic Earth System in the Svalbard region, thus matching Earth System models.
- To establish a major European environmental research infrastructure in the frame of ESFRI and catalyse the development of the European-Atlantic segment of SAON.
- To secure the legacy of the International Polar Year

Why Svalbard?

- Svalbard is located in a region where key Arctic processes take place and large natural gradients exist: an ideal location to study variability and change.
- A wide set of scientific infrastructure and strong international cooperation already exists.
- Svalbard is easily accessible year-round and has excellent logistical and communication infrastructure.
- Existing satellite communication infrastructure will provide excellent access to remote sensing data – in a region with very high satellite monitoring coverage.

Institutions contributing to SIOS

Akvaplan-niva, Norway
 Alfred Wegener Institute, Germany
 Andoya Rocket Range, Norway
 Arctic and Antarctic Research Institute, Russia
 EISCAT Scientific Association
 Finnish Meteorological Institute, Finland
 Geophysical Survey – RAS, Russia
 Institut Polaire Paul Emile Victor, France
 Institute of Geophysics – PAS, Poland
 Institute of Marine Research, Norway
 Institute of Oceanology – PAS, Poland
 Kings Bay AS, Norway
 Kola Science Centre – RAS, Russia
 Kongsberg Satellite Services, Norway
 Korea Polar Research Institute, Republic of Korea
 Nansen Environmental & Remote Sensing Center, Norway
 National Centre for Antarctic and Ocean Research, India
 National Environment Research Council, UK
 National Environment Research Institute, Denmark
 National Institute of Polar Research, Japan
 National Research Council, Italy
 National Science Foundation, USA
 NORRSAR, Norway
 Northern Research Institute Tromsø, Norway
 Norwegian Directorate of Energy and Water Resources, Norway
 Norwegian Institute for Air Research, Norway
 Norwegian Institute of Nature Research, Norway
 Norwegian Institute of Water Research, Norway
 Norwegian Mapping Authority, Norway
 Norwegian Meteorological Institute, Norway
 Norwegian Ministry of Education and Research, Norway
 Norwegian Polar Institute, Norway
 Norwegian Space Agency, Norway
 Norwegian University of Science and Technology, Norway
 Polar Geophysical Institute – RAS, Russia
 Polar Research Institute of China, P.R. of China
Research Council of Norway (coordinator)
 Scottish Association for Marine Research, UK
 Stockholm University, Sweden
 The Governor of Svalbard, Norway
 University of Bergen, Norway
 University of Groningen, Netherlands
 University of Lapland, Finland
 University of Leicester, UK
 University of Oslo, Norway
 University of Tromsø, Norway
 University Studies in Svalbard (UNIS), Norway



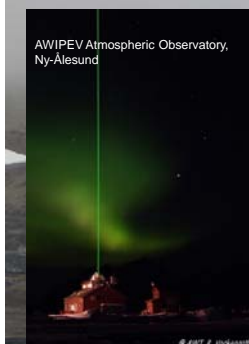
Core element:

The SIOS Knowledge Centre

- Data centre
- Logistics coordination
- Education and Outreach
- Communication centre
- Scientific catalyser

What will be included in SIOS?

- **Observations of upper atmosphere and solar-terrestrial coupling:**
EISCAT - visible auroral observations - geomagnetic observations - active sounding
- **Active and passive atmospheric monitoring:** stratosphere and ozone layer, tropospheric components, radiation, trace gases, climate drivers (GHG, aerosols, clouds)
- **Cryosphere monitoring:** glaciers and ice sheet mass balance, permafrost characteristics and changes, sea ice properties and changes
- **Ocean monitoring:** heat transport, deep ocean water formation, ocean acidification, coastal dynamics, pollution transport using mooring stations, seafloor observatories, research vessels
- **Ecosystem studies:** variability, productivity and long-term changes of marine ecosystems; inventory of terrestrial ecosystems and climate-induced changes, marine-terrestrial ecosystem interaction
- **Solid Earth:** stability of seafloor (methane hydrates), effects of deglaciation, regional seismicity, mobilisation of paleo-carbon reservoirs, land uplift
- **Couplings and feedback loops between all these components**



SIOS Time Plan

Spring 2010: Contract negotiations SIOS Preparatory Phase project (SIOS-PP)

Autumn 2010: SIOS-PP kick-off

2011-2013: Investment phase, build-up of SIOS Knowledge Centre

Summer 2013: Formal Establishment of SIOS Infrastructure

From autumn 2013: Operational Phase

