

Sweden – Country Report

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Overview

- **Agencies**
- **New initiatives**
- **IPY Data Country Report**

Agencies – status

- General support and sympathy for SAON
- Some agencies already well informed and to some extent involved: Swedish EPA, Met Office, Polar Logistics, Space Agency, Swedish Research Council
- Others remain to be involved: Forestry, Agriculture, Regional development, Statistics Sweden, Health and Social, and others

General situation

- Discussions tentative, in need of concrete plans and commitments
- Awareness growing of increasing ambitions and possible Arctic council initiated structure
- **Conclusion:** Need for more active discussion with agencies in Sweden between Edmonton and Helsinki

Current relevant initiatives

- Four northern counties create new monitoring scheme on a) climate change related indicators previously not measured, b) indicators relating to climate
- Swedish Parliament's Delegation proposed today (!) "to the governments of the Nordic countries to initiate work to achieve coordinated Nordic observation systems in the Arctic region" (2008-04-09).
- National IPY data collection and organization entrusted to Swedish Met Office (SMHI)

Sweden: country data report

- Initiated and sponsored by the IPY committee in 2007
- Preliminary version presented January 2008
- Covers most areas including social sciences and human dimensions
- Identifies and lists agencies, stations, data bases and status of ongoing work
- Comparison with GCOS and AON variables

Swedish Environmental Monitoring north of 60°N

By Harald Grip and Håkan Olsson

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Space physics

Terrestrial conditions

Aquatic conditions

Social dimensions

Comparison with AON and GCOS variables

Environmental Monitoring in Northern Sweden

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Table 3. Main Sites in Northern Sweden and further north and Programs Purchased and Conducted by Universities and Other Research Bodies (24). SLU(10), LU (8)

Table 4. Climate and Discharge Measurements made by SMHI and Environmental Monitoring Programs in Northern Sweden Purchased and Conducted by SST, SSI, SGU, and IRF (25). SMHI (644), SGU (67)

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Category	Variable	Type	Instrument	Start	Stop	Intensity	Level, m	Lat (X)	Long
Climate 1	Air temperature	Automat	Vaisala probe	1984		1/hr	1.5	7587739	1624020
Climate 1	Air temperature	Automat	Vaisala probe	1995		1/10min	1.5	7587739	1624020
Climate 1	Soil temperature	Automat	Pt-500	1987		1/10min	-1.0	7587721	1624020
Climate 1	Air relative humidity	Manual	Lambr asp ps	1913		3/day	1.5	7587739	1624020
Climate 1	Air relative humidity	Automat	Va HMP450L	1995		1/10min	1.5	7587739	1624020
Climate 1	Precipitation	Automat	Pluv RG200	1984	1995	1/hr		7587745	1624015
Climate 1	Precipitation	Automat	Pluv RG200	1995		1/10min		7587745	1624015
Climate 1	Wind speed	Manual	Comp mean	1913		1/day		7587745	1624015
Climate 1	Wind speed	Automat	Vaisala WA15	1984	1995	1/hr		7587745	1624015
Climate 1	Wind speed	Automat	Vaisala WA15	1995		1/10min		7587745	1624015
Climate 1	Wind direction	Manual	Feeling	1913		1/day		7587745	1624015
Climate 1	Wind direction	Automat	Vaisala WA15	1984	1995	1/hr		7587745	1624015
Climate 1	Wind direction	Automat	Vaisala WA15	1995		1/10min		7587745	1624015
Climate 1	Air pressure	Manual	Barograph	1913		1/day		7587745	1624015
Climate 1	Air pressure	Automat	Vaisala probe	1984	1995	1/hr		7587745	1624015
Climate 1	Air pressure	Automat	Vaisala probe	1995		1/10 min		7587745	1624015
Climate 1	Sunshine hours	Manual	Campbell-St.	1913		1/day		7587745	1624015
Climate 1	Global radiation	Automat	Robitzsch Act	1973	1986	1/hr		7587745	1624015
Etc.									

Environmental monitoring in northern Sweden meet most needs of GCOS and AON

We don't measure

- In the upper air: Earth radiation budget
- In the sea: Environmental tracers.
- Fire disturbance is not explicitly monitored in terrestrial ecosystems
- Cultural diversity is not reflected in official statistics
- **National networks are often denser than needed in a circum-polar context.**
- **Much more extensive than required by GCOS and AON**

Satisfactory	<p>Air temperature, Water vapor concentration, Precipitation, Air pressure, Wind speed, Wind direction, Maximum wind speed, Cloud properties, Total ozone, Aerosol concentration, Atmospheric chemistry.</p> <p>Sea temperature, salinity, Sea level, Sea ice characteristics, Sea surface color, Elevation/ bathymetry, Dissolved oxygen concentration, Biomass.</p> <p>Terrestrial fresh water flux, Snow depth/water equivalent, Land cover, Biomass of forest, Biodiversity, Contaminant concentration.</p> <p>Human demographics, Health, Education, Economic indicators</p>
Sparse or less stable networks	<p>Global radiation, Trace gases, Carbon dioxide, Methane, Albedo.</p> <p>Lake level, Glacier mass balance, Soil moisture, Soil temperature (incl. permafrost), Carbon concentration, Nutrient concentration, Phenology, Organismal behavior and performance, Tracer chemistry</p>

Data bases and access

The organization of data bases and the ease to access data differ between data base hosts.

Data bases sponsored by SEPA (Naturvårdsverket) are mostly easy to find and access, but they are not always easy to handle and often quite different between data base hosts.

Data base hosts with other finance may charge for their data, or demand cooperation for using them. In these cases personal contact with the data owner is mostly required.

Environmental Monitoring in Sweden of interest for understanding the Arctic

By Harald Grip on behalf of the Swedish IPY Data Group

Abstract

The Arctic Climate Impact Assessment identified the need for continuing long-term acquisition of data as crucial since only a few long-term time-series of climate and climate-related variables are available in the Arctic. To meet this requirement environmental monitoring conducted north of approximately 60°N in Sweden was assessed in the present study. The survey includes the Arctic Observing Network's 31 key variables and key indicator variables. National, regional and university environmental monitoring programs were scanned. The main sources of information were the internet and interviews. Programs or variables that could have a bearing on climate change in the Arctic and their biotic or abiotic effects in the Arctic were listed.

The major part of the Environmental Monitoring in Sweden is executed on behalf of the Swedish Environmental Protection Agency (SwEPA) to fulfill international commitments and the 16 environmental objectives set by the Swedish government. It comprises 64 subprograms, is intended to be long-term and is conducted mainly by IVL Swedish Environmental Institute Ltd (IVL), Swedish Meteorological and Hydrological Institute (SMHI), Swedish Geological Survey (SGU), Swedish University of Agricultural Science (SLU) and some of the other universities (Lund, Gothenburg, Stockholm, Uppsala and Umeå).

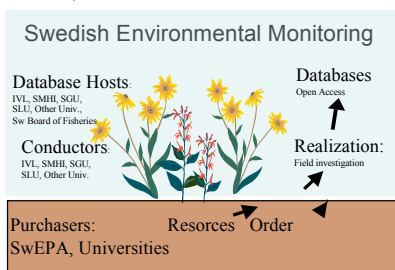
Data collected has its final storage in quality secured bases at different Data Base Hosts (IVL, SGU, SMHI, and SLU), but in some cases still in less organized data bases with the different conductors. The monitoring data gathered with governmental money distributed by SwEPA are free and can be directly assessed from the data bases via the internet. Some other data, notably climatic and runoff data gathered by SMHI is not freely accessible, but can be bought from SMHI. However, some of these data can be found freely from international agencies to which SMHI are obligated to report.

Socioeconomic indicators

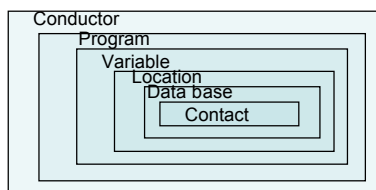
The circumpolar database ArcticStat (www.arcticstat.com), set up by University of Laval, Canada, is a portal that takes users directly to the table they are looking for, whether it is located on the web site of a statistics agency or in the ArcticStat database.

Data from Sweden at present comprises 75 tables of socioeconomic indicators for the two northernmost counties, i.e. Norrbotten and Västerbotten, gathered from Statistics Sweden (SCS).

Additional data of interest is presently gathered by the Swedish IPY Data Group.



Meta Data Base – Tables as First Step



SwEPA Environmental Monitoring Program

- Based on international commitments and 16 environmental goals set by the Swedish government, consists of 10 programs including 64 subprograms.
- Conducted by IVL, SMHI, SGU, SLU, other Universities
- Database Hosts mainly IVL, SMHI, SGU, SLU
- Free access to data

Examples of other programs

- Regional monitoring programs**
Are conducted to complement the national program and are co-financed by SwEPA and the county boards.
- University programs**
Faculty financed or financed by research councils and initiated as research programs.
- Other organizations**
The Royal Swedish Academy of Science (KVA) finances research facilities where environmental monitoring is part of background information.

Inventory Report

- We have a report on Swedish environmental monitoring data under preparation.
- It should be followed by a computerized meta data base describing the data and locating it.