MEMBER COUNTRY: Finland
National Report to SCAR for year: 2011

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<th>Activity</th>
<th>Contact Name</th>
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<td>National SCAR Committee</td>
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<td>SCAR Delegates</td>
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<tr>
<td>1) Delegate</td>
<td>Prof. Markku Poutanen</td>
<td>Finnish Geodetic Institute, Geodeetinrinne 2, FIN-02430</td>
<td>+358-9-29555216</td>
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<td><a href="mailto:Markku.Poutanen@fgi.fi">Markku.Poutanen@fgi.fi</a></td>
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<tr>
<td></td>
<td>Prof. Kari Strand</td>
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<td><a href="http://thule.oulu.fi/englanti/index.html">http://thule.oulu.fi/englanti/index.html</a></td>
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<td>2) Alternate Delegate</td>
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<td>Dr Jaakko Mäkinen</td>
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<td>1)</td>
<td>Dr Harri Kuosa</td>
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<td>Prof Jorma Kuparinen</td>
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<td>1)</td>
<td>Dr Yrjo Viisanen</td>
<td>Finnish Meteorological Institute, PO Box 503, FIN-00101</td>
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<td><a href="http://www.fmi.fi">www.fmi.fi</a></td>
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<tr>
<td></td>
<td>Prof. Matti Leppäranta</td>
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<td><strong>ACE</strong></td>
<td>Prof. Kari Strand</td>
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<td>+358 8 5533556</td>
<td>+358 8 5533564</td>
<td><a href="mailto:kari.strand@oulu.fi">kari.strand@oulu.fi</a></td>
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### Action Groups

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### Expert Groups

1) **Geodetic Infrastructure of Antarctica**
   - Prof. Markku Poutanen
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2) ICESTAR
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3) Insert others as needed

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### SCAGI

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   - jaakko.makinen@fgi.fi
   - www.fgi.fi

2) Insert others as needed

### National Antarctic Data Centre

In Finland there is no central national data centre for Antarctic data. The data is safeguarded at the research institutes and universities which are doing research, like Finnish Meteorological Institute and Geological Survey.

### SCAR Database

Insert name of database for which your country has responsibility
**FINNARP 2010 expedition, December 2010 - January 2011**

Carried out at Aboa-station and surrounding areas in Dronning Maud Land in addition to the scientific programs mentioned above also the maintenance and data collection for the AWS and a seismometer which are measuring continuously at Aboa, and the AWS 5, a Dutch weather station about 10 km from Aboa.

**Researcher Onni Järvinen and Professor Matti Leppäranta, University of Helsinki**

During the 2010-2011 season Researcher Onni Järvinen and Professor Matti Leppäranta took part into the FINNARP 2010 expedition. Järvinen studied the accumulation and ablation of snow as well as the metamorphosis of snow and light penetration into it. Data was collected from the two automatic snow station that were installed during the earlier season. Leppäranta studied the physics and ecology of supraglacial lakes and nunatak bonds in Basen, Plogen and Fossilrygg. Samples were also taken for soil ecology studies.

**Geodetic research (coordinator Dr. Jaakko Mäkinen, Finnish Geodetic Institute)**

1) Fieldwork:
   (i) The GPS station at Aboa is collecting continuous data. It is serviced annually by FINNARP expeditions.
   (ii) The time series on the snow stake line for monitoring the close-range snow and ice mass at Aboa has been maintained through the kind support of FINNARP staff.

2) Research:
   (iii) The GPS time series at Aboa was in cooperation with the University of Newcrest incorporated in a large-scale recomputation of Antarctic crustal motion, to better correct GRACE estimates of current ice mass balance for postglacial rebound.
   (iv) The absolute-gravity time series in the Antarctic by FGI and others were analyzed together with observations of vertical motion, to assess the uncertainty in the z-direction (direction of rotation axis) of the global reference frames. In a bipolar approach, the results were then combined with similar data from Fennoscandia.

**The changing atmosphere at the Antarctica (Coordinator Prof. Esko Kyrö)**

The main objective of the project is to improve the understanding of the impact of climate change in the polar regions and its effect on the recovery of the ozone layer. The project continues the long-term Antarctic ozone soundings and UV data series conducted as Finnish-Spanish-Argentine collaboration. These activities resulted in a PhD-thesis which was accepted in the University of Helsinki at the end of 2010. During 2010-2011 first results were published concerning modeling work on Antarctic ozone hole evolution and the impact of longitudinal variations in the hole appearance.

**Interhemispheric ionosphere-magnetosphere studies (Coordinator Doc. Ari Viljanen)**

Like the name tells, this project studies the interhemispheric relationships in solar-terrestrial physics. The topology of the magnetospheric magnetic field is a critical factor controlling the interhemispheric relationships. The project evaluates the performance of some widely used magnetospheric models in describing the interhemispheric symmetries of auroral phenomena. During 2010 a statistical study of the inter-hemispheric relationships in different geomagnetic conditions (magnetic storm-time activations, sawtooth oscillations and steady magnetospheric convection events) were conducted and the main results were presented in the Oslo IPY 2010 meeting. The work for improved tools for the magnetic mapping between the two hemispheres was started in the change of 2010-2011.

**Antarctic Meteorology and its Interaction with the Cryosphere and Ocean (AMICO)**

Timo Vihma, Finnish Meteorological Institute  
Hannu Savijärvi, University of Helsinki  

**Field work**

February – March 2010: Participation in a meteorological measurement campaign using research aircraft, based in Rothera, in collaboration with BAS and AWI.  
December 2010 – January 2011: Field expedition in Queen Maud Land (Aboa station). Measurements on dynamics and thermodynamics of the atmospheric boundary layer, surface energy balance, albedo, as well as properties and thermodynamics of the upper snow pack. Devices used: unmanned aircraft, tethersonde, sodar, weather masts, sonic anemometers, radiation sensors.

**Recent publications:**


GENERAL

 Finnish research activities in the Antarctica during 2009-2012.
The main source of Antarctic research funding in Finland is the Ministry of Education. This funding is distributed by the Academy of Finland. The Academy funded the following research projects for the period 2009-2012. New funding period starts 2013.

Aerosols and snow at the Antarctic coast and continental glacier - Aerosolit ja lumi Eteläamantereena rannikolla ja mannerjäätiköllä.
Contact: Finnish Meteorological Institute, Professor Risto Hillamo
This subproject of the consortium has activities at Dome C and Neumayer stations. The focus is in the relationship between aerosol chemical composition and optical properties. Extended measurements have been carried out at both stations to reveal seasonal cycles.

Aerosols and snow at the Antarctic coast and plateau - Antarctican rannikon ja ylätasangan aerosolit ja lumi.
Contact: University of Helsinki, Professor Markku Kulmala

The changing atmosphere at the Antarctica - Eteläamantereena muuttuva ilmakehä: Tutkimustyökaluina radioluotaukset, satelliittimittaaukset ja ilmakehämallitus. Bi-polaarinen lähestymistapa.
Contact: Finnish Meteorological Institute, Professor Jukka Kyrö

Evolution of snow cover and dynamics of atmospheric deposits in the snow in the Antarctica
- Lumen laadun ja rakenteen evoluutio ja ilmakehän laskeuman dynamiikka Antarktisessa lumipeitteenä.
Contact: University of Helsinki, Professor Matti Leppärantta
FINNARP 2009 expedition, December 2009 - January 2010 at Aboa and surrounding areas in Dronning Maud Land. Field investigations were made on the snow mass balance, snow structure and properties, and solar radiation transfer into snow pack.

Dynamical evolution of Scharffenbergbotnen blue ice area since the Late Glacial Maximum.
Contact: University of Lapland/Arctic Centre, Professor John Moore

Stable boundary layer - Antarctilken rajakeroos.
Contact: University of Helsinki, Professor Hannu Savijärvi

Cenozoic East Antarctic Ice Sheet History from Wilkes Land Sediments,IODP Expedition 318 - IODP Excursion 322
Contact: University of Oulu, Professor Kari Strand
http://iodpfinland.oulu.fi/
Prof. Kari Strand (Thule Institute, University of Oulu) is leading a research project related to the IODP Wilkes Land Glacial Margin Exp 318 drilled in January-March 2010.
Special interest lies in verifying the onset of Eocene-Oligocene glaciation of the East Antarctica by studying heavy minerals and quartz sand grains in sites U1356 and U1360 in collaboration with shipboard scientists Steve Bohaty, Sandra Passchier, Tina van de Flierdt, Stephen Pekar, Francisco Jimenez and Ursula Rühl.
The records from the Wilkes Land margin are complementary to same time interval obtained from the Prydz Bay during ODP Leg 188. Overall, this collaborative study is important in order to verify the history of the East Antarctic Ice Sheet and to increase our understanding of the future behavior of the Antarctic ice sheet.
2011 Wilkes Land Exp 319 science party meeting will be in Ediburgh
Funding for this research is received from the Finnish Antarctic Research Program by the Academy of Finland and it is done in collaboration of the Institute of Electron microscopy at the University of Oulu.
Antarctic Meteorology and its Interaction with the Cryosphere and Ocean (AMICO)
Contact: Finnish Meteorological Institute, Docent Timo Vihma

Crustal movements in the Dronning Maud Land
Permanent GPS station and absolute gravity in base Aboa; Contact Jaakko Mäkinen, Finnish Geodetic Institute