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1. Introduction

The Department of Physical Geography and Quaternary Geology is one of the larger departments at the university, with about 100 employees: 10 professors, 30-40 lecturers and researchers, ca 30 PhD students and 24 technical/administrative staff. The staff now consists of a broad mix of people from around the world, together creating a very dynamic and creative research and education environment at the department.

Together with our neighbours, the Department of Geology and Geochemistry and the Department of Human Geography, in the Geosciences building at the campus of Stockholm University, we constitute one of the most complete geocentres in Scandinavia. Within one building, we have all the facilities of a modern university: library, laboratories, and equipment to conduct increasingly successful scientific studies and offer stimulating and advanced education to current and prospective students.

We conduct multi-disciplinary research in the fields of ecological geography, geomorphology and paleoglaciology, glaciology, hydrology, paleoclimatology, Quaternary geology, remote sensing and GIS, and tropical geography. In 2004 we reorganised the research fields and defined the following research profiles: i) climate, environment and landscape development; ii) glacier and polar environments; iii) land and water resources and iv) landscape analysis and geomatics. Basic research is oriented towards furthering our understanding of short- and long term processes and interactions that lead to landscape development and environmental and climate changes. The behaviour of past and present systems and interactions between systems are modelled for predictions of future likely trends. The department is equipped with sediment laboratories and a dendroclimatological laboratory.

We also take pride in providing a broad high-quality basic education. The goal of the undergraduate education is to offer high-quality learning, reflecting the research profiles of the department, and meeting the society's need for a sound theoretical competence. The department carries out undergraduate education in geography, earth sciences, integrated biology-earth science, and in environmental sciences. Every year around 1000 students attend our undergraduate education programmes.

Karin Holmgren
Head of Department

History

Geography was established at Stockholm University as a subject in its own right in 1912, but it was not until 1929 that the first professor, Hans W:son Ahlmann, was appointed. He held this position until 1950. Gunnar Hoppe was appointed professor in 1954, one year before the division between Physical Geography and Human Geography commenced. Professor Hoppe retired in 1980 and was succeeded by Gunnar Østrem, Wibjörn Karlén, and, in 2003, by Peter Kuhry. Hans W:son Ahlmann, particularly interested in Arctic research, led several expeditions to the Arctic and initiated the establishment of a glaciological research station in the Swedish mountains, the Tarfala Research Station. Valter Schytt was appointed professor of glaciology in 1970 and held the position until 1985. Per Holmlund succeeded him in 1999. Gunnar Hoppe pioneered the incorporation and interpretation of aerial photographs in geomorphological research. His strong interest in remote sensing led to the creation of a professorship in remote sensing at the Department of Physical Geography in 1980, a position held by Leif Wastenson until 2001. Johan Kleman succeeded him. Leif Wastenson developed and expanded the field of remote sensing leading to the establishment of a professorship in ecological geography, held by Margareta Ihse since 1997.

As long as geology has been a subject at Stockholm University, Quaternary Geology has received considerable attention. Two early professors of geology, Gerard De Geer (1897-1924) and Lennart von Post (1929-1950) had international reputations in Quaternary geology, De Geer for his invention of the clay-varve dating method and von Post as the father of pollen analysis. In 1956 von Post's successor, Ivar Hessland, created an assistant professorship, the first holder of which was Carl-Gösta Wenner, who gave the department new direction towards applied geology. In 1962 Quaternary Geology became an independent subject and in 1963 a department on its own. Jan Lundqvist succeeded Wenner in 1980 and become the first full professor of Quaternary Geology at Stockholm University. Lundqvist retired in 1993 and was succeeded by Bertil Ringberg, and, in 2002, by Barbara Wohlfarth.

The Department of Physical Geography and the Department of Quaternary Research amalgamated to create the Department of Physical Geography and Quaternary Geology on January 1, 2001. Research interests of other professorships at the department are in tropical geography (Carl Christiansson), hydrology (Georgia Destouni), geomorphology (Karna Lidmar-Bergström), glaciology (Peter Jansson) and paleoglaciology (Arjen Stroeven). Together with the aforementioned professorships we successfully straddle both traditional and innovative directions in physical geography and Quaternary geology.

2. Current Research

Research groups in the fields of ecological geography, geomorphology and paleoglaciology, glaciology, hydrology, paleoclimatology, Quaternary geology, remote sensing and GIS, and tropical geography contribute to four newly defined research profiles described below.

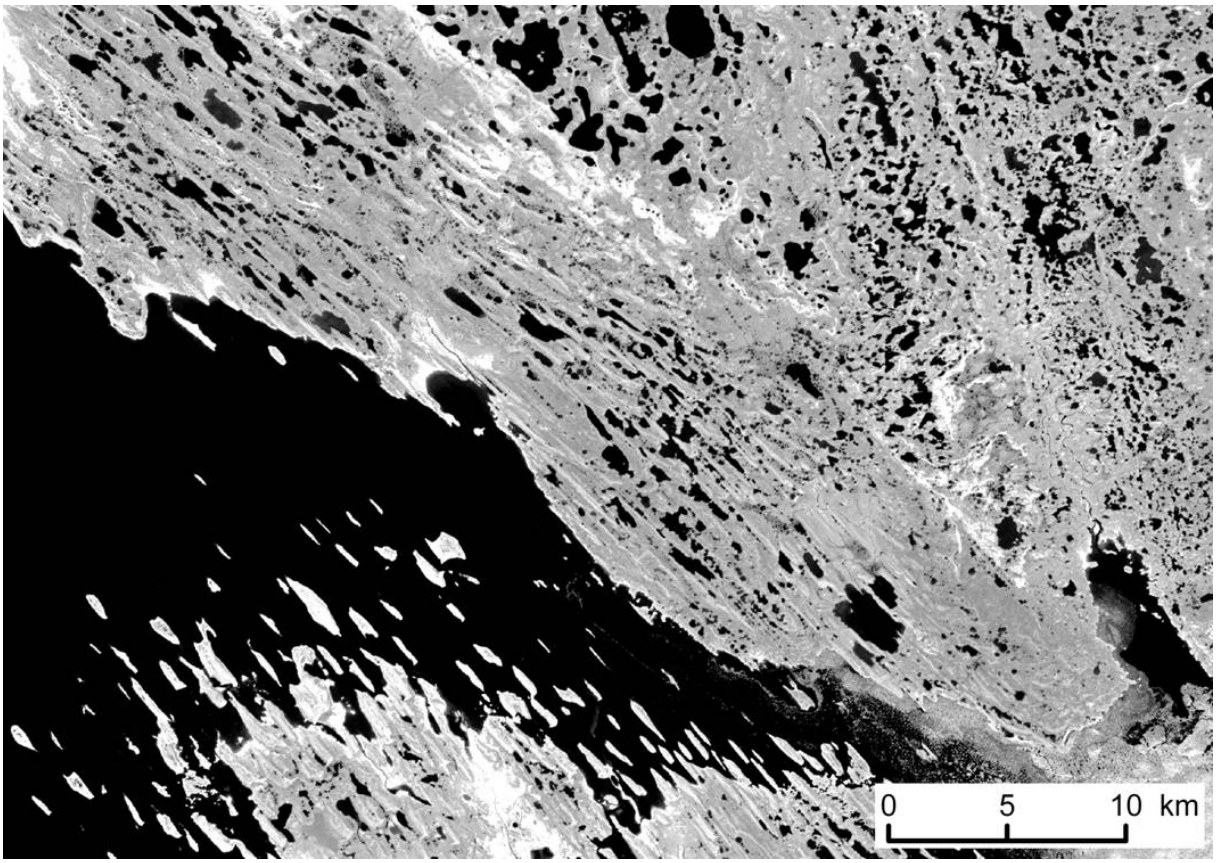
2.1. Glaciers and polar environments

Research themes and areas

We investigate glaciers, ice sheets and adjacent polar and alpine environments from a past, present and future time perspective. Work is carried out across the globe with ongoing projects in the Nordic countries, North-America, Russia, Patagonia, Antarctica and Greenland.

Research on glaciers and ice sheets aims at understanding glacial processes and the ice-climate connection. Our studies include research on ice movement, glacial hydrology, mass balance and ice cores. Paleoglaciological research, encompassing studies on landforms and sediment sequences from former ice sheet areas, aims at presenting reconstructions of ice sheet and ice stream evolution that can be used for ice sheet and climate modelling. Research on ecosystems in polar and alpine environments aims to assess how sensitive periglacial areas will be affected by global warming and feedbacks between terrestrial ecosystems in permafrost regions and the global climate system.

The Department runs the Tarfala Research Station, located in the high-alpine environment of the Swedish Kebnekaise massif. The station is used as a platform for education, national and international research programmes, and monitoring activities.



An ancient ice stream: Abrupt lateral margin between a palaeo-ice stream and its neighbouring inter-ice stream ridge. King William Island, Nunavut, Arctic Canada (Landsat 7 ETM+ image). Figure provided by Hernán De Angelis.

Ongoing projects

1. Glacial dynamics and deglaciation chronology in southern Sweden / *Alexanderson H.*
2. Glacier monitoring within the "Northern View" Project - Global Monitoring for Environment and Security program / *Brown I., Hock R.*
3. Response of glacier melt and discharge to future climate / *de Woul M., Hock R.*
4. Deep ice core analyses of climate variations over glacial cycles / *Hansson M., Jonsell U.*
5. Climate change and impact on glaciers and permafrost in Northern Sweden / *Holmlund P.*
6. Balanced ice flux studies on the East Antarctic continent / *Holmlund P., Näslund J-O., Brown I.*
7. Glacial history and ice sheet dynamics of the Welsh Ice Cap / *Jansson K.*
8. Variations in cold surface layer thickness and its effect on the dynamics of polythermal glaciers / *Jannson P.*
9. Spatial distribution and temporal dynamics of ocean-terminating paleo-ice streams in the Laurentide ice sheet/ *Kleman J.*
10. GLIMPSE (Global implications of Arctic climate processes and feedbacks) / *Kuhry P.*
11. Basal conditions and hydrology of continental ice sheets / *Näslund J.-O., Jansson P.*
12. Modelling of future sea level rise from the retreat of glaciers / *Radić V., Hock R.*
13. Determination of Antarctic snow accumulation / *Richardson-Näslund C.*
14. Post-Younger Dryas deglaciation of Fennoscandia / *Stroeven A.*
15. Glacial modelling of the Fennoscandian ice sheet through one glacial cycle / *Stroeven A.*

Staff affiliations

Per Holmlund, Professor (see also 2.2)
Peter Jansson, Professor
Johan Kleman, Professor (see also 2.2, 2.3)
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Arjen Peter Stroeven, Professor (see also 2.2, 2.3)

Jan Lundqvist, Professor emeritus (see also 2.2)

Margareta Hansson, Docent (see also 2.2)
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2.2. Climate, environment and landscape

Research themes and areas

Our research is aimed at describing climate, environment and landscape changes in time and space, and understanding underlying processes and causes. Investigations address recent and rapid change as well as long term evolution over millions of years. We work over the whole world with ongoing projects in the Nordic countries, the rest of Europe, Africa, South-America, northern Russia, Canada, Antarctica and Greenland.

We make use of natural archives such as lake sediments, peat deposits, ice cores, drip stones, tree rings, glacial sequences and archeological evidence to investigate changes in climate, environment and associated biological, chemical and physical processes. The comparison between multiple archives allows a better reconstruction of past changes at local, regional and global scales. We interpret landscape, landforms and sediment layers to understand landscape development. Regional reconstructions of landscape and ice sheet development are performed through a combination of spatial analyses based on aerial photos, satellite images, digital terrain models and field mapping with studies of sediments and their stratigraphy, and dating of landforms and sedimentary deposits. We also apply computer simulations to investigate how glaciers, ice sheets and global sea level are affected by climatic change.

Ridge palsas in Northeast European Russia developed as a result of permafrost aggradation in the strings of an aapa mire. Photographed by Peter Kuhry.

Ongoing projects

1. Pleistocene glaciations and ice-free periods on East Greenland / *Alexanderson H., Håkansson L.*
2. EPICA / *Hansson M., Jonsell U.*
3. Reconstruction of past climate variability in Southern Africa through analyses stalagmites, trees, peat and lake sediments / *Holmgren K., Lundblad K., Norström E., Ryner M.*
4. Environmental factors affecting speleothem growth, recorded in Swedish speleothems. /*Holmgren K., Sundqvist H.*
5. Ice coring in rock caves in Romania and Norway / *Holmlund P., Holmgren K., Hansson M.*
6. Late Quaternary glaciation history in northern Fennoscandia and Kola peninsula / *Hättestrand C.*
7. A 3-dimensional GIS reconstruction of the Quaternary relief evolution in north-western Fennoscandia based on integrated terrestrial geomorphology and off-shore seismic data / *Jansson K.*
8. Pollenanalytiskt arbete / *Karlsson S.*
9. Paleorelief, saprolites, and uplift/denudation of cratons / *Lidmar-Bergström K.*
10. Shore displacement in northern Uppland / *Risberg J., Alm G.*
11. Vegetation changes and shore displacement along Norrortsleden in the northern outskirts of Stockholm / *Risberg J., Karlsson S.*
12. Salinity changes in the Baltic Sea offshore Forsmark based on siliceous microfossils /*Risberg, J.*
13. Shore displacement in relation to rock carvings in the Tanum area, Bohuslän, western Sweden / *Risberg, J.*
14. Microfossil analyses of till and sediment samples from Forsmark, northern Uppland/ *Robertsson A.-M.*
15. Determining climate variability using lacustrine stable isotopes on Gotland / *Rosqvist G.*
16. Climate variability in northern Lapland- determining atmospheric circulation changes over the last 1500 year using lacustrine stable isotopes / *Rosqvist G.*
17. Cosmogenic nuclide-based boundary conditions for numerical ice sheet models: A simulation of the Fennoscandian ice sheet through a glacial cycle / *Stroeven A.*
18. Glacial chronology and erosion patterns of the eastern margin of the Tibetan Plateau (using cosmogenic radionuclides) / *Stroeven A.*
19. Correlation and dating of marine, terrestrial and ice-core records from the Late Quaternary in the North Atlantic region through the common occurrences of tephra horizons / *Wastegård S.*
20. Compilation of North European climate archives / *Wohlfarth B., Hohl V.*
21. A 2000-year climate reconstruction for Sweden / *Wohlfarth B.*
22. Terrestrial and limnic response to rapid climate variability between 20 000 and 60 000 years before present / *Wohlfarth B.*

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Urve Miller, Professor emerita

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Ann-Marie Robertsson, Docent
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Daniel Veres

2.3. Landscape analysis and geomatics

Research themes and areas

Research and education in these fields comprises methods development in satellite image processing, air photo interpretation, positioning, geographical information systems, and the application of these methods to a wide variety of geoscientific, bioscientific and environmental issues. Study areas are in Sweden, other Nordic countries, the British Isles, Russia, Canada, South America, Eastern Africa, Southeast Asia, Antarctica and Greenland.

Research in glacial and periglacial environments include glacial geomorphological mapping for reconstructions of paleoglaciological and long-term landscape evolution, the mapping of recent dynamics in permafrost landscapes, and glaciological remote sensing. Remote sensing and modelling techniques are developed to monitor changes in water quality and coastal ecosystems. The research of landscape ecological questions includes vegetation mapping for change detection in sensitive mountainous environments, analysis of landscape ecological structures, and mapping and monitoring of biodiversity and biological values in cultural landscapes. GIS is applied for monitoring and analysis of the cultural landscape and for environmental management and protection in urban/semiurban areas.

An internationally recognised activity of the Department is the United Nations International Training Course on Remote Sensing Education for Educators organised in co-operation with the Government of Sweden. The Department has also been instrumental in the development of the National Atlas project and its GIS components.

The desert and intensely irrigated agriculture on the edge to Sahara in northern Egypt. Land use changes can in many cases adversely affect the environment, in this specific case non-renewable ground water aquifers. Remote sensing technology offers unique possibilities to follow land use development worldwide. Figure provided by Fredrik Hannerz.

Ongoing projects

1. "Northern View" Project - Global Monitoring for Environment and Security program / *Brown I.*
2. Parameterisation of Envisat ASAR backscatter from snow and ice / *Brown I.*
3. Mapping of oldgrowth forest in Stockholm area for planning purposes of recreation / *Ihse M.*
4. Changing agricultural landscapes in Sweden - monitoring by CIR aerial photos and GIS, the LiMproject / *Ihse M.*
5. A 3-dimensional GIS reconstruction of the Quaternary relief evolution in northwestern Fennoscandia based on integrated terrestrial geomorphology and off-shore seismic data / *Jansson K.*
6. Development of a coupled sea-atmosphere model for MERIS data over the Baltic Sea / *Kratzer S.*
7. Assessment of changes in marine vegetation in eastern Africa using satellite remote sensing / *Lundén B.*
8. User project within RESE (Remote sensing for the environment) – Fusion of environmental quality indicators for environmental quality objectives / *Nordberg M.-L., Arnberg W.*
9. BIOHAB (Biodiversity and Habitats) / *Skånes H.*
10. Landscape memory as means to deal with human impact on biotope resilience and potential biodiversity. Development of integrated remote sensing methods / *Skånes H.*
11. Workshop on harmonisation of Nordic habitat classifications in an EU perspective / *Skånes H.*

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Reuben Sebego

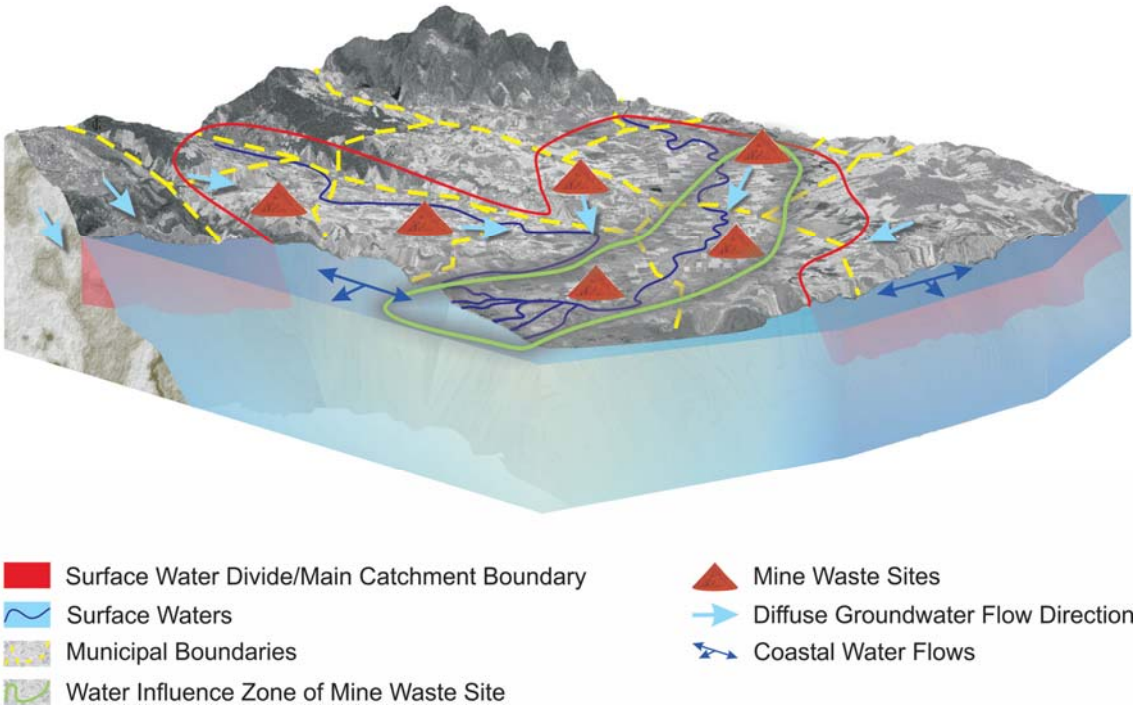
2.4. Land and water resources

Research themes and areas

We investigate natural and anthropogenic changes in space and time of land, soil and water resources, and contribute thereby to the knowledge of environmental and societal development possibilities and risks associated with the use of land and water. We also study the effects of different strategies for handling risks, and relate research results to environmental monitoring and legislation, and to management of land, soil and water resources for sustainable development. Study areas include Sweden, the rest of Fennoscandia, other parts of Europe, central and Southeast Asia, and eastern and southern Africa.

The research addresses: (i) land and water resources in different physical, biogeochemical, ecological and cultural environments; (ii) the processes that determine the characteristics, dynamics and quality variations of soil and water in space and time; (iii) the interactions between freshwater, soils, land use, climate, coastal and marine waters, glaciers and ice caps, ecosystems, and the socio-economic and engineered systems that meet various human needs.

We focus primarily on historic and strategic time scales for integrated socio-economic and environmental development. We use, develop and couple tools such as hydrological flow and solute/pollutant transport models, geographical information systems, remote sensing, observations and measurements in the field and interview surveys. We aim for both basic process quantification and applications to land use, soil and water related environmental, engineering and socio-economic problems and their possible solutions.



Schematic illustration of a surface water catchment, showing that the catchment may cross administrative-political (municipal) boundaries and that groundwater and coastal water flow paths associated with the catchment may cross the surface water divide, which constitutes the catchment boundary. Indicated mine waste sites represent water pollution sources within the catchment, each having its own water influence zone (example indication by green line); the water influence zones of pollution sources within a catchment may cross political-administrative, catchment, and surface water-groundwater-coastal water system boundaries. Reproduced from ERMITE Consortium (Mine Water and the Environment, 2004; see publication list).Figure provided by Georgia Destouni.

Ongoing projects

1. Studies of environmental change during the last century: The case of Awassa watershed, southern Ethiopia / *Christiansson C.*
2. More Water, Less Grass? Assessment of resource degradation and stakeholders' perceptions of environmental change in Ombuga grasslands, northern Namibia / *Christianssons C., Klintenberg P.*
3. Watershed management in Southeast Asia: Case studies from Cambodia, China, Laos and Vietnam / *Christiansson C., Fahlén A.*
4. Modelling reactive transport in natural heterogeneous subsurface and surface waters: the LaSAR-PHREEQC method / *Destouni G., Darracq A.*
5. Bridging research and knowledge gaps for the effective use and management of groundwater resources in the Aral Sea region / *Destouni G., Jarsjö J., Shibuo Y.*
6. GIS-based modelling of catchment-scale solute transport / *Destouni G.*
7. Environmental regulation of mine waters in the European Union / *Destouni G., Hannerz F.*
8. The response of glacier melt and discharge to future climate change / *Hock R.*
9. CE 'Climate and Energy' / *Hock R., de Woul, M.*
10. People Land and Time in Africa / *Holmgren K.*
11. Mistra-projektet MiMi (Mitigating the Environmental Impact of Mining Waste)/ *Jarsjö J.*
12. GIS-based hydrologic modelling with PCRaster / *Jarsjö J., Destouni G., Shibuo Y.*
13. The role of climate-environmental change, in relation to socio-economic factors, in the rise and fall of Engaruka fossil land use system, Tanzania / *Westerberg L.-O., Holmgren K.*

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Fredrik Hannerz
Patrik Klintenberg, PhLic (see also 2.3)
Yoshihiro Shibuo

3. Publications

Reviewed articles

1. Bayer-Raich, M., **Jarsjö, J**., Liedl, R., Ptak, T. and Teutsch, G. 2004: Average contaminant concentration and mass flow in aquifers from temporal pumping well data: Analytical framework. *Water Resources Research*, vol 40, doi:10.1029/2004WR003095.
2. Bergman, J., **Wastegård, S.**, Hammarlund, D., **Wohlfarth, B**. and Roberts, S.J., 2004: Holocene tephra horizons at Klocka Bog, west-central Sweden: aspects of reproducibility in subarctic peat deposits. *Journal of Quaternary Science,* 19, 241-249.
3. **Bergström, M**. and **Ihse, M**. 2004: The Border and the Bordered. A transdisciplinary comparison of the origin and function of the border of the parish Gryt in Södermanland, Sweden and the border of the corresponding in H. Palang et al.(eds): *European Rural Landscapes: Persistance and Change in a Globalising Environment – Kluwer Academic Publisher*, Netherlands, 151-175.
4. Braun, M. and **Hock, R**. 2004: Spatially distributed surface energy balance and ablation modelling on the ice cap of King George Island (Antarctica). *Global and Planetary Change,* 42(1-4), 45-58. doi 10.1016/j.gloplacha.2003.11.010.
5. Christl, M., Mangini, A., **Holzkämper, S**. and Spötl, C. 2004: Evidence for a link between the flux of galactic cosmic rays and the Earth's climate during the past 200,000 years. *Journal of Atmospheric and Solar-Terrestrial Physics,* 66, 313-322.
6. Clague, J. J., **Wohlfarth, B.**, Ayotte, J., Eriksson, M., Hutchinson, I., Mathewes, R. W., Walker, I. R., and Walker, L. 2004: Late Holocene Environmental Change at Treeline in the Northern Coast Mountains, British Columbia, Canada. *Quaternary Science Reviews*, 23(23-24), 2413-2431.
7. Darmody, R.G., Thorn, C.E., **Schlyter, P**. and Dixon, J.C. 2004: Relationship of vegetation distribution to soil properties in Karkevagge, Swedish Lapland. *Arctic, Antarctic, and Alpine Research*, 36(1), 21-32.
8. Davies, S. M., **Wohlfarth, B**., **Wastegård, S.**, Andersson, M., Possnert, G. and Blockley, S. 2004: Were there two Borrobol Tephras during the early Lateglacial period: implications for tephrochronology? *Quaternary Science Reviews,* 23, 581-589.
9. **Ebert, K.** and **Kleman, J.** 2004: Circular moraine features on the Varanger Peninsula, northern Norway, and their possible relation to polythermal ice sheet coverage. *Geomorphology,* 62(3-4), 159-168.
10. EPICA community members (incl. **M. Hansson**) 2004: Eight Glacial Cycles from an Antarctic Ice Core. *Nature,* 429, 623-628.
11. ERMITE Consortium (incl. **Destouni G., Hannerz F.**), Mining Impacts on the Fresh Water Environment: Technical and Managerial Guidelines for Catchment-Focused Remediation, In: Younger PL, Wolkersdorfer C (eds). *Mine Water and the Environment*, 23, Suppl. Issue 1, pp 80.
12. Hammarlund, D., Velle, G., Wolfe, B. B., Edwards, T. W. D., Snowball, I., Barnekow, L., Holmgren, S., Lamme, S., **Wohlfarth, B.** and Possnert, G. 2004: Palaeolimnological and sedimentary responses to Holocene forest retreat in the Scandes Mountains, west-central Sweden. *The Holocene*, 14(6), 862-876.
13. Hjort, C., Möller, P. and **Alexanderson, H.** 2004: Weichselian glaciation of the Taymyr Peninsula, Siberia. In: Ehlers J & Gibbard PL (eds.): *Quaternary glaciations - extent and chronology*, Vol. 1, Europe. Elsevier, Amsterdam, 359-367.
14. **Holmlund, P**. 2004: Climate and Ice-Shelf Extension. *Antarctic Challenges* (ed: A. Elzinga) Gothenburg May 10-13, 2001. The Royal Society of Arts and Sciences in Göteborg, 200-208.

15. **Holzkämper, S.**, Mangini, A., Spötl, C. and Mudelsee, M. 2004: Timing and progression of the Last Interglacial derived from a high alpine stalagmite. *Geophysical Research Letters,* 31, doi:10.1029/2003GL019112.
16. Hulbe, C.L., MacAyeal, D.R., Denton, G.H., **Kleman, J.** and Lowell, T.H. 2004: Catastrophic Ice-Shelf Breakup as the Source of Heinrich-Event Icebergs. *Paleoceanography, 19(1).*
17. **Hättestrand, C**., Kosche, S., **Näslund J.-O**., Fabel D.and **Stroeven, A.P.** 2004: Drumlin formation time: Evidence from northern and central Sweden. *Geografiska Annaler*, 86A(2), 155-167.
18. **Jansson, K. N.** and **Kleman, J.** 2004: Early Holocene glacial lake meltwater injections into Labrador Sea and Ungava Bay. *Paleoceanography, 19(1).*
19. **Jansson, K. N.** and **Lidmar-Bergström, K.** 2004: Observations on Weathering Forms at the Caniapiscau Reservoir, North-Central Québec, Canada. *Canadian Geographer*, 48, 1–10.
20. **Jarsjö, J.**, and **Destouni, G.** 2004: Groundwater discharge into the Aral Sea after 1960, *Journal of Marine Systems*, 47, 109-120.
21. **Johnsen, T.F.** and Brennand, T.A. 2004: Late-glacial lakes in the Thompson Basin, British Columbia: paleogeography and evolution. *Canadian Journal of Earth Sciences*, 41, 1367–1383.
22. Jönsson, A.M., Linderson, M-L., Stjernquist, I., **Schlyter, P**., and Bärring, L. 2004: Climate change and the effect of frost damage causing temperature backlashes in *Picea abies*. *Global and Planetary Change* 44(1-4), 195-207.
23. Lindgren, G., and **Destouni, G.** 2004: Nitrogen loss rates in streams: scale-dependence and up-scaling methodology, *Geophysical Research Letters*, 31, L13501, doi: 10.1029/2004GL019996.
24. Lindgren, G.A., **Destouni, G**., and Miller, A.V. 2004: Solute transport through the integrated groundwater-stream system of a catchment, *Water Resources Research*, 40, doi: 10.1029/2003WR002765.
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4. Education

4.1. Undergraduate programme

The goal of the undergraduate education at the Department of Physical Geography and Quaternary Geology is to offer a high quality education, reflecting the research profile of the Department, and meeting the society's need for a sound theoretical competence.

The Department carries out undergraduate education in geography, earth sciences, integrated biology-earth science, and in environmental sciences. Every year around 1500 students attend our undergraduate education programmes.

Geography

The *Geography programme* includes courses up to 100 credits, i.e. 2.5 years in total (one Swedish credit is roughly the equivalent of one week of full-time study or 1.5 ECTS):

- 1-20 credits: Geography, basic course, 20 credits
- 21-40 credits: Geography, intermediate course, 20 credits
- 41-60 credits: Geography, advanced course, 20 credits
- 61-80 credits: Geography, specialised course I, 20 credits
- 81-100 credits: Geography, specialised course II, 20 credits
- Included in the advanced and/or specialised courses is a Bachelor or Master thesis of 10-20 credits.

The Department of Physical Geography and Quaternary Geology and the Department of Human Geography collaborate within the geography education. Every year 400-600 students attend the Geography programme. They study geography either as a part of ordinary university studies or as a part of the theoretical education within the teachers' training programme at the Stockholm Institute of Education. Seen over a period of ten years, the influx of students has increased. One reason for this increase is probably the elevated interest in, and need for knowledge, in the field of geography. Another reason is the return of geography as an independent subject at senior high-school level.

Earth Science

Courses in the *Earth Science* are carried out in collaboration with the Department of Geology and Geochemistry. The courses can be taken within the *Earth Science Study Programme* or as stand-alone courses outside the study programme. The Earth Science Study Programme encompasses 160 credits but final degrees are either 120 credits (Bachelor) or 160 credits (Master). Within the study programme, the first 80 credits consist of compulsory courses where students learn the basics of the Earth's evolution, geology, geomorphology, soils, hydrology, meteorology, climatology, remote sensing and Geographical Information Systems (GIS). For the remaining 40 or 80 credits of the programme, the students can specialise within the earth science spectrum. The Department of Physical Geography and Quaternary Geology offers advanced courses in historical geomorphology, glaciology and glacial geomorphology, climatology and palaeoclimatology, palaeoecology, Scandinavian Quaternary geology, risk assessment in geosciences, hydrology, soil science, GIS for earth scientists, cartography and map production, remote sensing, geographic analysis and visualisation in GIS, ecological geography, and natural resources, environment, and land use in the tropics. The programme provides the prospective geoscientist with an overall breadth to be used in working with, for example, nature and environmental control, geoscientific examinations, planning, and research.

Biology-Earth Science

The Biology-Earth Science Study Programme encompasses 160 credits but final degrees are either 120 credits (Bachelor) or 160 credits (Master). The programme is carried out in collaboration with the Department of Biology Education. The programme starts with a basic education of 110 credits consisting of about 45 credits of earth sciences, 55 credits of biology and 10 credits of environmental management and conservation. The distinctive feature of the programme is the integration between earth science and biology. Earth sciences include geology, Quaternary geology, climatology, geomorphology, cartography, aerial photograph interpretation and GIS, hydrology, and environmental and nature control. After the basic education the student has the option to do a 10 credits degree project towards a 120 credits Bachelor degree. If the students wish to opt for a 160 credits degree, they can either take the Environment and Health Protection course of 40 credits or other advanced courses, finishing their studies with a 20 credits Master project.

Environmental Sciences

The Master programme in *Environment and Health Protection* accepts students with 120 credits in Biology, Chemistry, Earth Sciences or Biology-Earth Sciences. The programme consists of four courses of 10 credits each, Environment Studies and Health Protection, Environment Technology, Law and Planning, and a degree project in Environment and Health Protection.

The Department of Physical Geography and Quaternary Geology offers an *Environmental Science Programme* of up to 95 credits. The programme accepts students with a background in Geography, Earth Science, Biology, and many other subjects. The following courses are included:

- Environmental Studies (basic course), 10 credits.
- International Environmental Issues (intermediate course), 10 credits.
- Environmental management and nature conservation in Swedish landscapes (intermediate course), 10 credits.
- Energy and environment (intermediate course), 10 credits.
- Environmental management systems (intermediate course), 5 credits.
- Swedish environmental quality objectives (intermediate course), 10 credits.
- Environmental Technology (intermediate course), 5 credits
- Case studies in environmental impact assessments (advanced course), 10 credits.
- Soil remediation in theory and in practice (advanced course), 10 credits.
- Environmental management in agriculture and forestry (advanced course), 10 credits.
- Environmental management in planning (advanced course), 10 credits.

Other courses

”The Science communication course” of 20 credits is a specialised course, which offers a generally deepened understanding of the role that scientific research plays in society and the problems attached to it, and offers a practice in the style of scientific writing.

The summer course ”Glaciers and high mountain environments, advanced course, 5 credits” is a glaciology field course held at the Tarfala Research Station, northern Sweden. The field-based part of the course introduces different methods of measurement and analysis and the study of glacial or periglacial landscapes and processes.

”Earth Science in Northern Scandinavia, advanced course, 5 credits” is another field based summer course, which emphasises the northern Scandinavian environment with respect to bedrock geology, Quaternary geology, geomorphic processes and ecology.

Since 1990 the Department has organized annually "United Nations International Training Course on Remote Sensing Education for Educators", in cooperation with UN Office for Outer Space Affairs and mainly financed by the Swedish International Development Cooperation Agency (SIDA). The main objective of this six weeks Course has been to enable educators from developing countries to introduce or to enhance remote sensing courses in their respective academic institutions.

4.2. Postgraduate programme

The postgraduate education program at the Department of Physical Geography and Quaternary Geology, Stockholm University, includes courses, seminars, excursions and the writing and defence of a Licentiate and a Doctoral thesis. Students can choose to either graduate in "Geography with emphasis on Physical Geography" or in "Quaternary Geology". Postgraduate students are expected to participate in an annual "symposium" within the Department where they present their progress (research and education) and plans for the coming year(s). The success of our postgraduate programme is reflected in the amount and quality of Doctoral theses produced (see section 4 in this report for a list of recent theses). Below, we will tabulate currently enrolled students and their projects within each examination subject.

<u>Geography with emphasis on Physical Geography:</u>

Maria Bergström
The use of natural resources in a Swedish parish- comparison between historical periods from Neolithicum to recent time

Hernán De Angelis
Paleo-ice stream dynamics and evolution in the north-western Laurentide Ice Sheet

Gessesse Dessie
Environmental Change during the Last Century: the Case of Awassa Watershed, Southern Ethiopia

Mattias de Woul
Modelling of glacier mass balance - Sensitivity and response to predicted future climate changes

Karin Ebert
Cenozoic landscape development in northern Fennoscandia. Geomorphologic interpretation within a GIS-framework

Bo Eknert
Changing biotopes in the agricultural landscape and the effects of the bird fauna

Anders Fahlén
Watershed management in Southeast Asia: Case studies from Cambodia, China, Laos and Vietnam

Bradley Goodfellow
Relict surfaces of Northern Fennoscandia: process, rates, and formative conditions

Fredrik Hannerz
Dynamic GIS based modelling of catchment solute transport, an information perspective approach

Ulf Jonsell
Sulphate in the climate system over glacial cycles

Christina Jonsson
Stable isotopes in lake sediments from Lappland

Patrick Klintenberg
Analysing environmental change in arid and semi-arid Namibia using environmental indicators

Marcus Liljeberg
Remote sensing for characterisation of waste water plumes

Katarina Lundblad
Geochemical studies of stalagmites and coral skeletons in Tanzania

Elin Norström
Reconstruction of past climate variability in South Africa through studies of trees and pollen

Valentina Radić
Modelling the sea level rise from the retreat of glaciers

Lena Rubensdotter
The effect of different geomorphological processes on lake sedimentation, and their implications for Holocene palaeoclimatic reconstructions

Maria Ryner
Climate and environmental change in northern Tanzania

Britta Sannel
Temporal and Spatial Dynamics of Subarctic Peat Plateau / Thermokarst Lake Complexes

Hanna Sundqvist
Environmental factors affecting speleothem growth, recorded from Swedish speleothems

Quaternary Geology:

Linda Ampel
Limnic responses to Heinrich events and DO-cycles at Les Echets, France

Sofia Andersson
Dating and correlation of mid Holocene climate events in Scandinavia

Anders Borgmark
Climate variations in Sweden during the Holocene, variations in peat decomposition as a climatic archive

Amélie Darracq
Coupled modelling of reactive solute transport and geochemical reactions in subsurface and surface water systems

Jens Heimdal
Plant macrofossils and lithostratigraphy as tools in tracing the urban archaeological, alluvial environment in two Swedish towns

Martina Hättestrand
Vegetation and climate in N Sweden during Weichselian Interstadials, as compared with early Holocene and recent pollen floras

Timothy Johnsen
Dynamics and chronology of ice sheet deglaciation in the central Fennoscandian mountain range

Yoshihiro Shibuo
GIS-based hydrological modelling -coupling groundwater-surface water

Daniel Veres
Terrestrial response to Dansgaard-Oeschger cycles and Heinrich events during OIS 2 and 3

List of examinations for 2004

Name	Date	Degree
Per Klingbjer	23 Apr 2004	PhD, Physical Geography
Angelica Feurdean	6 May 2004	PhD, Quaternary Geology
Ola Fredin	26 May 2004	PhD, Physical Geography
Johan Bonow	28 May 2004	PhD, Physical Geography
Rickard Pettersson	3 Jun 2004	PhD, Physical Geography
Maria Bergström	27 Jan 2004	PhLic, Physical Geography
Patrik Klintenberg	24 Feb 2004	PhLic, Physical Geography
Maria Ryner	10 Mar 2004	PhLic, Physical Geography
Katarina Lundblad	10 Dec 2004	PhLic, Physical Geography

5. Dissertations

The Department of Physical Geography, Stockholm University,

Dissertation Series (2000)

MALIN M. STENBERG, 2000. Spatial variability and temporal changes in snow chemistry, Dronning Maud Land, Antarctica. Dissertation No. 15. Fakultetsopponent: Prof. Jon-Ove Hagen

OLA AHLQVIST, 2000. Context sensitive transformation of geographic information. Dissertation No. 16. Fakultetsopponent: Prof. Peter Fisher

The Department of Physical Geography and Quaternary Geology, Stockholm University

Thesis in Geography with emphasis on Physical Geography (2001-2004)

SARA A. O. COUSINS, 2001. Plant species diversity patterns in a Swedish rural landscape: Effects of the past and consequences for the future. Dissertation No. 17. Fakultetsopponent: Dr. Roy Haines-Young

CECILIA RICHARDSON-NÄSLUND, 2001. Spatial distribution of snow in Antarctica and other glacier studies using ground-penetrating radar. Dissertation No. 18. Fakultetsopponent: Prof. Robert W. Jacobel

THOMAS SCHNEIDER, 2001. Hydrological processes in firn on Storglaciären, Sweden. Dissertation No. 19. Fakultetsopponent: Prof. Andrew Fountain

HANS W. LINDERHOLM, 2001. Temporal and spatial couplings between tree-ring variability and climate in Scandinavia. Dissertation No. 20. Fakultetsopponent: Dr. Astrid Ogilvie

MARIANNE I. LAGERKLINT, 2001. Marine multi-proxy records of late Quaternary climate change from the Atlantic Ocean. Dissertation No. 21. Fakultetsopponent: Dr. Lloyd H. Burckle

RICHARD Y. M. KANGALAWE, 2001. Changing land-use patterns in the Irangi hills, central Tanzania. A study of soil degradation and adaptive farming strategies. Dissertation No. 22. Fakultetsopponent: Prof. William Adams

ANDERS CLARHÄLL, 2002. Glacial Erosion Zonation - Perspectives on Topography, Landforms, Processes and Time. Dissertation No. 23. Fakultetsopponent: Dr. Chris Clark

KRISTER N. JANSSON, 2002. Glacial geomorphology of north-central Labrador-Ungava, Canada. Dissertation No. 24. Fakultetsopponent: Dr. Andrée Bolduc

BJÖRN E. GUNNARSON, 2002. Holocene climate and environmental fluctuations from subfossil pines in central Sweden. Dissertation No. 25. Fakultetsopponent: Prof. Mike G. L. Baillie

KATARINA. LÖFVENHAFT, 2002. Spatial and temporal perspectives on biodiversity for physical planning – Examples from urban Stockholm, Sweden. Dissertation No. 26. Fakultetsopponent: Prof. Jan Bengtsson

ANNA ALLARD, 2003: Vegetation changes in mountainous areas - A monitoring methodology based on aerial photographs, high-resolution satellite images, and field investigations. Dissertation No. 27. Fakultetsopponent: Doc. Timo Helle

PER KLINGBJER, 2004: Glaciers and climate in northern Sweden during the 19th and 20th century. Dissertation No. 28. Fakultetsopponent: Dr. Georg Kaser

OLA FREDIN, 2004. Mountain centred ice fields in northern Scandinavia Dissertation No. 29. Fakultetsopponent: Prof. Jon Landvik

JOHAN M. BONOW, 2004. Paleosurfaces and paleovalleys on North Atlantic previously glaciated passive margins-reference forms for conclusions on uplift and erosion. Dissertation No. 30. Fakultetsopponent: Dr. Adrian Hall

RICKARD PETTERSSON, 2004. Dynamics of the cold surface layer of polythermal Storglaciären, Sweden. Dissertation No. 31. Fakultetsopponent: Prof. Helgi Björnsson

The Department of Physical Geography and Quaternary Geology, Stockholm University

Thesis in Quaternary Geology, published in Quaternaria, ser A. (2001)

KRISTIAN SCHONING, 2001. Marine conditions in middle Sweden during the late Weichselian and early Holocene as inferred from foraminifera, Ostracoda and stable isotopes. Dissertation No. 8.

LAIMDOTA KALNINA, 2001. Middle and Late Pleistocene environmental changes recorded in the Latvian part of the Baltic Sea basin. Dissertation No. 9.

ANNA HEDENSTRÖM, 2001. Early Holocene shore displacement in eastern Svealand, Sweden, based on diatom stratigraphy, radiocarbon chronology and geochemical parameters. Dissertation No. 10.

TIIT HANG, 2001. Proglacial sedimentary environment, varve chronology and late Weichselian development of the Lake Peipsi, eastern Estonia. Dissertation No. 11.

The Department of Physical Geography and Quaternary Geology, Stockholm University

Thesis in Quaternary Geology (2002-2004)

GREGER LINDEBERG, 2002. The Swedish varved clays revisited: Spectral- and image analysis of different types of varve series from the Baltic Basin. Dissertation No. 1. Fakultetsopponent: Prof. Björn Malmgren

RATHNASIRI PREMATHILAKE, 2003: Late Quaternary palaeoecological event stratigraphy in the Horton Plains, central Sri Lanka - with contributions to the recent pollen flora. Dissertation No. 2. Fakultetsopponent: Prof. Francoise Gasse

ANGELICA FEURDEAN, 2004: Palaeoenvironment in north-western Romania during the last 15,000 years. Dissertation No. 3. Fakultetsopponent: Prof. Katherine J. Willis

6. Conferences and seminars

January

Alexanderson Hättestrand:	*26th Nordic Geological Winter Meeting, Uppsala, Sweden*
de Woul & Hock:	*International Glaciological Society (IGS), Nordic branch meeting, Uppsala, Sweden*
Destouni:	*Science and technical education in Sweden, Kerala Science Congress, Kozhikode (Calicut), India*

February

Holmgren:	*Holocene palaeodata integration and ananlysis, HOLIVAR, Bremen, Germany*
Holmlund:	*1st International Workshop on Ice Caves, Capus-Cluj, Romania*
Ihse, Johansson & Skånes:	*BioHab Nordic workshop, Stockholm, Sweden*

March

Hock:	*International workshop on automatic weather stations, Pontresina, Switzerland*
Ihse:	*IVL nationell miljökonferens, Från miljö till hållbar utveckling- ett nytt vägskäl för näringslivet, Stockholm, Sweden*
Nordberg:	*Kartdagarna 2004 (National Cartographic confernece), Jönköping, Sweden*
Schlyter:	*The Commemorative Workshop for Prof. Norikazu Maeno, The institute of Low Temperature Science, Hokkaido University, Sapporo, Japan*

April

Holmgren & Ryner:	*African Environmental history and applied research, Sigtuna, Sweden*
Ihse:	*Flora- och fauna konferensen, Mål och verklighet för biologisk mångfald, Stockholm, Sweden*
Ihse & Skånes:	*BioHab workshop IV, Prague, Czech Republic*
Näslund, Rickardson-Näslund & Wolfarth:	*European Geosciences Union, Nice, France*

May

De Angelis:	*Canadian Geomorphology Research Group and Association Québécoise pour l'étude du Quaternaire, Québec, Canada*
Destouni, Jarsjö & Hock:	*Joint assembly of the American Geophysical Union (AGU) and the Canadian Geophysical Union (CGU), Montreal, Canada*

Ihse, Skånes & Eknert:	*IALE Sweden annual meeting. Angarnsjöängen/Vadadalen, Stockholm, Sweden*
Kleman:	*J. Louis Agassiz symposium, University of Maine, Orono Maine, USA*
Schlyter:	*Weather extremes and forest damage- Climate change and future risks, MICE Workshop, Lund University, Sweden*
Shibuo:	*18th Salt Water Intrusion Meeting (SWIM), Cartagena, Spain*

June

Darracq & Destouni:	*14th Goldschmidt Geochemistry Conference, Copenhagen, Denmark*
Holmgren:	*3rd PLATINA (People land and time in Africa) work shop, Futululu, South Africa*

July

Holmlund:	*SCAR-COMNAP symposium, Bremen, Germany*
Jansson P. & Näslund:	*International Symposium on Ice and Water Interactions: Processes across the Phase Boundary,* Portland State University, Oregon, USA

August

Brown, De Angelis, de Woul, Hock, Holmlund & Jansson P.:	*International Glaciological Society (IGS) – Artic Glaciology, Geilo, Norway*
Christiansson:	*Annual Review Panel Meeting, NCCR North-South, Berne, Switzerland*
Darracq & Destouni:	*32nd International Geological Congress 2004, Florence, Italy*
Klintenberg:	*The Arid Zone Ecology Forum, Victoria West, South Africa*
Lundén:	*Pakistan Regional Workshop on Monitoring & Protection of the Natural Environment - Educational Needs and Experience Gained from United Nations International Training Course on Remote Sensing Education for Educators, Islamabad, Pakistan*

September

Destouni:	*Conference on Contaminated Land – Achievements and Aspirations, Loughborough University, UK*
Holmlund:	*7th EU-framework, Bryssel, Belgium*
Jansson N.K.:	*British Branch of the International Glaciological Society Meeting, Sheffield, UK*
Kuhry:	*Bjerknes Centenary Conference, ' Climate Change in High Latitude', Bergen, Norway*
Wastegård	*INTIMATE workshop, Bonn, Germany*

October

Alexanderson & Hättestrand:	*QUEEN Terminal Meeting, Brorfelde, Denmark*
Goodfellow**:**	*Workshop on the Applications of Cosmogenic Isotope Analysis in Geomorphology and Quaternary Science, University of Edinburgh, UK*
Hansson:	*EPICA Dust consortium science meeting, Grenoble, France*
Hansson, Jonsell & Rickardson-Näslund:	*EPICA Science meeting (ESF), Paris, France*
Holmgren:	*MUSCAD, Gothenburg, Sweden*
Schlyter:	*MICE workshop: Modelling impacts of climate extremes, Florens, Italy*

November

Alexanderson, Hättestrand Johnsen & Lundqvist:	*Quaternary glaciations – a global perspective, Seminar in honour of Jan Mangerud, Bergen, Norway*
Ihse:	*IUCN (International Union for Nature Conservation) World Conference," People and Nature- only one world", Bangkok, Thailand*
Johansson:	*Monitoring the Effectiveness of Biological conservation, Vancouver, BC, Canada*
Kuhry:	*The Arctic Climate Impact Assessment Symposium. Reykjavik, Iceland*
Skånes:	*BioHab workshop VI, Wageningen, The Netherlands*

December

Destouni:	*AGU Fall meeting, San Francisco, USA*
Risberg:	*Holocene landscape changes and human impact- combined conference, field work and planning meeting, Colombo, Sri Lanka*

7. Financial support

GRANT ORGANIZATIONS	
C-Core	*Centre for Cold Ocean Research Engineering*
EU	*European Union*
FORMAS	*The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Forskningsrådet för miljö, areella näringar och samhällsbyggande*)
IFS	*International Foundation for Science*
KVA	*The Royal Swedish Academy of Sciences (Kungliga Vetenskapsakademien)*
LHS	*The Stockholm Institute of Education (Lärarhögskolan)*
METRIA	*part of Swedish Land Survey (Lantmäteriverket)*
MISTRA	*Foundation for Strategic Environmental Research (Stiftelsen för miljöstrategisk forskning)*
NMD (NMR)	*The Nordic working group for Environmental Monitoring and Data (The Nordic Council of Ministers)*
RAÄ	*Cultural Heritage Manegment (Riksantikvarieämbetet)*
RS	*Swedish National Space Board (Rymdstyrelsen)*
SIDA	*Swedish International Development Cooperation Agency (Styrelsen för internationellt utvecklingssamarbete)*
SKB	*Swedish Nuclear Fuel and Waste Management (svensk kärnbränslehantering AB)*
SKI	*Swedish Nuclear Power Inspectorate (Statens kärnkraftinspektion)*
SLL	*Stockholm County Council (Stockholms Landstings Miljövårdsfond)*
STINT	*The Swedish Foundation for International Cooperation in Research and Higher Education (Stiftelsen för internationalisering av högre utbildning och forskning)*
VR	*The Swedish Research Council (Vetenskapsrådet)*

RESEARCH GRANT RECEIVER	**FUNDING AUTHORITY**	**PROJECT**	**AMOUNT FOR 2004**
Brown / Hock	C-Core, CA	"Northern View" Project - Global Monitoring for Environment and Security program.	468 000
Brown	RS	Parameterisation of Envisat ASAR backscatter from snow and ice	330 750
Brown	RS	Deltagande i international Symposium on Arctic Glaciology Geilo, Norge, 2004-08-23--27	13 000
Christiansson	SIDA	Studies of environmental change during the last century: The case of Awassa watershed southern Ethiopia	260 000
Dessie	IFS	Studies of environmental change during the last century: The case of Awassa watershed southern Ethiopia	45 000
Destouni	FORMAS	Modellering av reaktiv transport i naturliga, heterogena grund-, mark- och ytvatten: La SAR-PHREEQC-metoden. (dnr21.0/2002-1494)	585 000
Destouni	SIDA	Bridging research and knowledge gaps for the effective use and management of groundwater resources in the Aral Sea region. (Garanterat t.o.m. 2005, SWE-2003-261)	400 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT FOR 2004
Destouni	VR	GIS-baserad modellering av ämnestransport i avrinningsområden - GIS-based modelling of catchment-scale solute transport (Garanterat t.o.m. 2006, 621-2003-2997)	351 000
Hansson	VR	Djupiskärneanalyser av klimatvarationer över istidscykler.	325 000
Hock	VR	Framtida klimatförändringars påverkan på glaciärers avsmältning och avrinning. (Garanterat t.o.m. 2005, 621-2001-2503)	630 032
Hock	VR	Projektbidrag enligt ovan.	130 000
Hock	FORMAS	Modelering av framtida havsnivåförändringar orsakade av minskade glaciärer - Modelling of future sea level rise from the retreat of glaciers. (Garanterat t.o.m. 2005, dnr2003-0387)	486 000
Holmgren	VR	Klimatets variationer i tid och rum.	650 000
Holmgren	SIDA	Reconstruction of past climate variability in Southern Africa through analyses of trees and pollen.	450 000
Holmgren/Holmlund	SKI	Utvärdering av klimatförändringars påverkan på ett slutförvar - säkerheten efter förslutning av SFL 2/200409107	43 210
Holmlund	VR	Klimatets växlingar och dess påverkan på glaciärer och permafrost i norra Sverige. (621-2002-5580)	202 800
Hättestrand	VR	Senkvartär nedisningshistoria i norra Fennoskandia och Kolahalvön. (621-2001-1977))	156 000
Hättestrand	KVA	Projektsamarbete med forskare i f.d. Sovjetunionen	120 000
Ihse	SLL	Komplettering av Flygbildkartering av äldre, tätortsnära skog, avtal BMS0302. Delt i seminarium 040514.	36 000
Jansson K	VR	En 3-dimensionell rekonstruktion av den kvartära reliefutvecklingen i nordvästra Fennoscandia baserad på integrerade terrestra och marina data - A 3-dimensional GIS reconstruction of the Quaternary relief evolution in northwestern Fennoscandia based on integrated terrestrial geomorphology and off-shore sesmic data. (Garanterat t.o.m. 2008, dnr621-2003-3221)	434 700
Jansson P.	VR	Variationer i kalla ytskiktets tjocklek och dess effekt på polytermala glaciärers dynamik. (621-2001-1996)	260 000
Jansson P.	SKB	Färdigställande av paleohydrologisk datavas enl underlag o offert.	42 000
Jarsjö	MISTRA	Mistra-projektet MIMI.	23 000
Jarsjö / Destouni	SKB	GIS-baserad hydrologisk modellering med PCRaster-POLFLOW	101 500

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT FOR 2004
Karlsson S.	RÄ	Pollenanalytiskt arbete (040701--050630).	228 849
Karlsson S.	RÄ	Forts. Pollenanalys och avrapportering - Fågelsta. Resultatet redovisas i form av pollendiagram senast 041231 (projnr 1510176)	358 490
Kleman	VR	Paleo-isströmmars rums-tidsfördelning och sediment-transportdynamik - isströmmar med oceankontakt i den Laurentiska inlandsisen. (Garanterat t.o.m. 2005, 621-2002-5571)	351 520
Klingbjer	RS	Deltagande i international Symposium on Arctic Glaciology Geilo, Norge, 2004-08-23—27	13 000
Kratzer	RS	Development of a coupled sea-atmosphere model for MERIS data over the Baltic Sea.	261 900
Kuhry	EU	GLIMPSE (EVK2.CT.2002-00164)	360 000
Lundén	SIDA	Assessment of changes in marine vegetation in eastern Africa using satellite remote sensing.	75 000
Lidmar-Bergström	VR	Nedärvda landformer, vittringstäcken och upphöjning/ erosion av kratoner (resistensområden) - Paleorelief, saprolites, and uplift/denudation of cratons. (Garanterat t.o.m. 2005, dnr621-2003-3325)	270 000
Nordberg/Arnberg	METRIA	Användarprojekt inom RESE Miljömål - Fusion av miljömålsindikatorer	50 000
Regnell	Smålands museum	Beställning av växtmakrofossilanalyser av jordprover från arkeologiska lämningar.	55 000
Regnell	Läns-museet Gävleborg	Växtmakrofossilanalyser av jordprover från Hälsingtuna socken, Hälsingland	14 400
Näslund/Jansson	SKB	Inlandsisars bottenförhållanden och hydrologi - Basal conditions and hydrology of continental ice sheets. (Garanterat t.o.m. 2006, 7166/2)	1 330 000
Richardson-Näslund	FORMAS	Determination of Antarctic snow accumulation. (Garanterat t.o.m. 2005, 21.4/2003-1442)	730 000
Risberg	RAÄ	Mikrofodssilanalyser av kokgrop.	75 000
Risberg/Karlsson S	RAÄ	Pollendiagram från strandförskjutningar - sjöarna Fjäturen och Gullsjön - uppdraget anknyter till de arkeologiska undersökningarna för vägsträckningen Norrortsleden, Solletuna - Täby, södra Uppland.	1 295 000
Robertsson	SKB	Preparering och analyser av polen- och diatoméprover	75 000
Rosqvist	Bergvalls Stiftelse	Bestämning av klimatets variabilitet med hjälp av stabila isotoper i sjösediment från Gotland.	30 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT FOR 2004
Rosqvist	G Gustafs-sons stif	Klimatvariationer i norra Lappland - Bestämning av förändringar i atmosfärscirkulationen under de senaste 1500 åren med hjälp av stabila isotoper i sjösediment	55 000
Skånes/Ihse	EU	BIOHAB (Biodiversity and Habitats) Contr No: EVK2-CT-2002-20018 BioHab, Proposal No: EVK2-2001-00362.	175 000
Skånes	FORMAS	Landskapets "minne" som nyckel till förståelsen av människans inverkan på biotoper och potentiell biodiversitet. Utveckling av integrerad fjärranalysmetodik. (21.5/2002-0080)	488 728
Skånes	NMD (NMR)	Workshop kring harmonisering av nordisk habitatklassificering i EU perspektiv - Workshop on harmonisation of Nordic habitat classifications in an EU perspective.	100 000
Stroeven	VR	En simulering av den Skandinaviska inlandsisen under en nedisningscykel med hjälp av kosmogena radio-nuklider och en numerisk inlandsismodell. (621-2001-2331)	390 000
Wastegård	VR	Tefrokronologisk datering och korrelation av senkvartära klimatarkiv runt Nordatlanten - Correlation and dating of marine, terrestrial and ice-core records from the Late Quaternary in the North Atlantic region through the common occurences of tephra horizons. (Garanterat t.o.m. 2006, dnr2003-3529)	675 000
Wohlfarth/Hohl	SKB	Sammanställning av Nordeuropeiska klimatarkiv	135 000
Wohlfarth/Moberg	SKB	A 2000-year climate reconstruction for Sweden (Garanterat t.o.m. 2005)	551 000
Wohlfarth	STINT	Samarbete m John Clague, Earth Sciences, Simon Fraser Univ, Canada. (IG2001-2008)	500 000
Wohlfarth	VR	Effekter av plötsliga klimatförändringar i terrestra och limniska system: en case-study från den klimatiskt dynamiska perioden 20 000 - 60 000 år före nutid - Terrestrial and limnic response to rapid climate variability between 20 000 and 60 000 years before present. (Garanterat t.o.m. 2006, dnr621-2003-3607)	594 000
Delsumma			*15 779 879*
Natgeo/Lundén	SIDA	United Nations Remote Sensing Course 2004.	3 341 826
Natgeo/Lundén	SIDA	United Nations Remote Sensing – uppföljning	1 510 156
GU	LHS		709 000
Total		**Approved research grants**	**21 340 861**

8. Staff (31 December 2004)

Department Chairperson/Head : Associate Professor Karin Holmgren
Vice Chairperson: Professor Barbara Wohlfarth

PROFESSORS

Christiansson, Carl	Professor of Physical Geography,
Destouni, Georgia	Guest Professor, Professor of Hydrology
Holmlund, Per	Professor of Glaciology
Ihse, Margareta	Professor of Ecological Geography
Jansson, Peter	Professor of Physical Geography
Kleman, Johan	Professor of Remote Sensing
Kuhry, Peter	Professor of Physical Geography
Lidmar-Bergström, Karna	Professor of Physical Geography
Stroeven, Arjen Peter	Professor of Physical Geography
Wohlfarth, Barbara	Professor of Quaternary Geology

ACADEMIC STAFF

Associate Professors (PhD, Docenter)

Arnberg, Wolter	Senior lecturer
Hansson, Margareta	Senior lecturer
Hock, Regine	Research associate
Hättestrand, Clas	Senior lecturer, also research associate
Lundén, Bengt	Senior lecturer, also Professor at Oslo University
Näslund, Jens-Ove	Senior lecturer
Risberg, Jan	Senior lecturer
Robertsson, Ann-Marie	Senior lecturer
Rosqvist, Gunhild	Senior lecturer
Wastegård, Stefan	Senior lecturer

PhD

Alexanderson, Helena	Research associate
Bonow, Johan	Researcher
Borgström, Ingmar	Senior lecturer
Brown, Ian	Research associate
Brunnberg, Lars	Senior lecturer
Clarhäll, Anders	Senior lecturer
Gouirand, Isabelle	Researcher
Holzkämper, Steffen	Researcher
Jansson, Krister	Senior lecturer, also research associate
Jarsjö, Jerker	Researcher
Kratzer, Susanne	Researcher
Kristiansson, Jan	Senior lecturer
Nordberg, Maj-Liz	Senior lecturer
Richardson-Näslund, Cecilia	Research associate
Schlyter, Peter	Senior lecturer, director of undergraduate studies
Skånes, Helle	Senior lecturer, also research associate

Westerberg, Lars-Ove	Senior lecturer, head director of undergraduate studies
Wickman, Tonie	Senior lecturer

PhLic, MSc, BSc

Bråvander, Lars Gunnar	MSc, senior lecturer
Delteus, Åke	BSc, lecturer
Eknert, Bo	BSc, lecturer
Fridfeldt, Anders	BSc, lecturer, director of undergraduate studies
Karlsson, Sven	PhLic, researcher
Nordström, Anders	PhLic, senior lecturer
Perhans, Karl-Erik	BSc, lecturer
Yrgård, Anders	PhLic, lecturer

Postgraduate students (PhLic, MSc, BSc)

Ampel, Linda
Andersson, Sofia
Bergström, Maria
Borgmark, Anders
Darracq, Amélie
De Angelis Hernán
Dessie, Gessesse
de Woul, Mattias
Ebert, Karin
Fahlén, Anders
Goodfellow, Bradley
Hannerz, Fredrik
Heimdahl, Jens
Hättestrand, Martina
Johnsen, Timothy
Jonsell, Ulf
Jonsson, Christina
Kindström, Merit
Klintenberg, Patrik
Liljeberg, Marcus
Lundblad, Katarina
Norström, Elin
Radić, Valentina
Rubensdotter, Lena
Ryner, Maria
Sannel, Britta
Shibuo, Yoshihiro
Sundqvist, Hanna
Veres, Daniel

Teaching assistants

Frödin Nyman, Sara	MSc
Öberg, Helena	MSc

ADMINISTRATIVE STAFF

Berggren, Berit	Senior administrative officer
Blåndman, Susanna	BSc, personnel executive
Envall, Berit	Financial executive
Geltner, Petra	BSc, personnel executive
Henkow, Månika	Higher administrative officer
Henriksson, Carina	University-certified administrator, senior administrative officer
Hultblad, Gertrud	University-certified administrator, senior administrative officer
Lenngren, Maria	MSc, study advisor
Persdotter, Eva	Higher administrative officer
Schuber, Pernilla	MSc, study advisor
Åkerblom, Lena	Higher administrative officer

TECHNICAL STAFF

Alm, Göran	PhLic, systems engineer
Beskow, Andreas	MSc, systems engineer
Brotén, Bengt	Technician
Cabrera, Yanduy	Caretaker
Granell, Håkan	Supervisor of office services
Hansson, Erik	MSc, research engineer
Jacobson, Rolf	IT-manager
Johansson, Eva-Maria	MSc, research engineer
Karlsson, Ann	Laboratory assistant
Svanered, Ola	BSc, systems engineer
Törnberg, Henrik	MSc, technician, Tarfala Research Station
Walter, Ola T	Supervisor of security
Willis, Karin	BSc, research assistant, lecturer

PROFESSORS EMERITI

Hoppe, Gunnar	DSc
Lundqvist, Jan	
Karlén, Wibjörn	
Miller, Urve	
Ringberg, Bertil	
Wastenson, Leif	
Østrem, Gunnar	DSc

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