Department of Physical Geography and Quaternary Geology

Stockholm University

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Cover photo: Tracked vehicle traversing the East Antarctic ice sheet during the Japanese Swedish Antarctic Expedition 2007/08. Photo: Per Holmlund.

1. Introduction

The Department of Physical Geography and Quaternary Geology is one of the larger departments at the university, with about 110 employees: 12 professors, ca 45 lecturers and researchers, ca 30 PhD students and ca 25 technical/administrative staff. The personnel now consists of a broad mix of people coming 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, the Department of Applied Environmental Science 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. Our research can be grouped under 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 slightly more than 1000 students attend our undergraduate education programmes.

Arjen Stroeven
Head of the 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. In 2005, following a strategic decision to develop the Department's profile in hydrology, a new professorship in hydrology, hydrogeology and water resources was established. The position is held by Georgia Destouni.

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 became the first full professor of Quaternary Geology at Stockholm University. Lundqvist retired in 1993 and was succeeded by Bertil Ringberg, and, from 2002 to 2007, 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), paleoclimatology (Karin Holmgren), glaciology (Peter Jansson), remote sensing (Bengt Lundén), paleoglaciology (Arjen Stroeven) and Quaternary stratigraphy (Stefan Wastegård). 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 research profiles described below. All research groups are involved in the BBCC program (2.5).

2.1. Glaciers and polar environments

Research themes and areas

Research focusses on glaciers, ice sheets and cold (permafrost) environments in a global perspective. Study areas include Antarctica and Greenland, alpine environments in Scandinavia (and elsewhere), and the tundra regions. In a temporal perspective we are working with three different time slots: the entire quaternary period (last 2 million years), the present (last 200 years) and the future. Research activities can be subdivided into:

- Climate related processes and impacts of Global Change.
- Glacial processes and ice physical properties
- Paleoglaciological inverse and numerical modelling of past and present ice sheets.
- Coupling between high latitude land ecosystems and the global climate system.

A significant number of projects are linked to Tarfala Research Station in the Kebnekaise massif where the department is running an extensive monitoring programme. Tarfala is used as a platform for both education and for national and international research programmes.

Perito Moreno Glacier close to El Calafate in Argentina is fed by the Southern Patagonian Icefield. Photo: Krister Jansson.

Ongoing projects

1. Applying the optically stimulated luminescence (OSL) technique to date the Weichselian glacial history of south and central Sweden / *Alexanderson H.*
2. Arctic Natural Climate and Environmental Changes and Human Adaptation (SciencePub) - ice-sheet variability on Svalbard (project leader J. Landvik) / *Alexanderson H.*
3. The glacial history of Jameson Land, East Greenland (with L. Håkansson) / *Alexanderson H.*
4. Estimating volume changes of Patagonian glaciers using inventory data and scaling techniques / *De Angelis H.*
5. Exploring the conditions for stability and modes of behaviour of glacier systems / *De Angelis H.*
6. The North Greenland Eemian ice drilling / *Hansson M.*
7. The European Programme on Ice Coring in Antarctica / *Hansson M., Holmlund P., Karlin T.*
8. Subglacial conditions beneath the East Antarctic Ice Sheet / *Holmlund P.*
9. Changes in size and thermal distribution of Swedish glaciers / *Holmlund P.*
10. Permafrost in glacier environments / *Holmlund P.*
11. The Japanese-Swedish Antarctic Expedition 2007/08 / *Holmlund P., Hansson M., Ingvander S., Karlin T., Johansson M.*
12. Terrestrial history of the Muonionalusta iron meteorites / *Hättestrand C.*
13. Spatial and temporal snow accumulation patterns along an icedivide in Dronning Maud Land, Antarctica / *Ingvander S.*
14. Assessing the timing, extent and volume of Tibetan Plateau ice during the last 130.000 years by numerical simulations: A model for interpreting its Quaternary glacial history / *Kirchner N., Stroeven A.P., Heyman J.*
15. Paleoglaciology of the northern sector of the Cordilleran ice sheet / *Stroeven A.P., Kleman J.*
16. Paleoglaciology of the NE Tibetan Plateau / *Stroeven A.P., Hättestrand C., Alexanderson H., Kleman J., Heyman J.*
17. Paleoglaciology of the Shaluli upland on the SE Tibetan Plateau / *Stroeven A.P., Hättestrand C., Heyman J.*

Staff affiliations

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Students investigate assumed Early Weichselian beach sediments on Kvadehuksletta, northwestern Svalbard, to study the sediments and soil profiles and to take samples for luminescence dating. Photo: Helena Alexanderson.

2.2. Climate, environment and landscape development

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, China, Antarctica and Greenland.

We make use of long instrumental records as well as 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.

View towards NW from the inselberg Pallastunturi in northern Finland (close to the Swedish border), on August 16 2008. Photo: Karin Ebert.

Ongoing projects

1. RESOLuTION – Rapid climate and environmental shifts during OIS 2 and 3 – linking high-resolution terrestrial, ice core and marine archives / *Ampel L., Engels S., Helmens K., Wastegård S.*
2. Time-synchronous correlation of late Holocene climatic changes and their environmental impact in central Sweden / *Andersson S.*
3. Cenozoic landscape development in northern Fennoscandia. Geomorphologic interpretation within a GIS framework / *Ebert K.*
4. Early Glacial palaeoclimatic changes in northern Fennoscandia: a multi-proxy study on the lacustrine record of Sokli / *Engels S., Helmens K.*
5. Holocene environmental changes and climate development in Greenland / *Engels S., Helmens K.*
6. A short lacustrine record from Pilgrimstad: palaeoenvironmental changes inferred from fossil Chironomidae and related Diptera / *Engels S.*
7. NEEM project / *Hansson M., Wastegård S.*
8. The Urban Mind / *Holmgren K.*
9. The impacts of the climate: sea level rise and flood legends in Mozambique / *Holmgren K., Risberg J., Arnberg W., Westerberg L.O.*
10. Regional and temporal patterns in climate / *Holmgren K.*
11. CARBO-North: Quantifying the Carbon Budget in Northern Russia: Past, Present and Future / *Kuhry P., Holzkämper S., Hugelius G.*
12. Palaeorelief, saprolites and uplift/denudation of cratons / *Lidmar-Bergström K.*
13. Climate in the last millennium / *Moberg A.*
14. Late Quaternary climate and environmental change in the summer rainfall region of South Africa / *Norström E.*
15. Local and regional shore displacement in central Baltic area / *Risberg J.*
16. Usage of grinding stones in arachaeology based on siliceous microfossils and EDS element analyses / *Risberg J.*
17. GIS applications on palaeogeography / *Risberg J., Alm G.*
18. Den glaciala-interstadiala utvecklingen under Weichselistiden / *Robertsson A.-M.*
19. Arctic Sweden / *Rosqvist G.*
20. Climate change in the polar front zones / *Rosqvist G.*
21. Understanding the spatial and temporal variability of climate in northern Tanzania during the last 1000 years / *Ryner M.*
22. Africa's climate and the survival of communities – Eastern Africa during the 18th and 19th centuries / *Ryner M.*
23. Holocene Climate Variability over Scandinavia / *Sundqvist H.*
24. Sharpening the tools – improving tephrochronology around the Atlantic Sea / *Wastegård S.*
25. SMART project (Synchronising Marine and ice-core records using tephrochronology) / *Wastegård S.*
26. Potrok Aike Lake Sediment Archive Drilling Project / *Wastegård S., Veres D.*
27. MILLENNIUM: European climate over the last millennium / *Wastegård S., Moberg A., Rosqvist G., Bergman J., Schoning K., Gunnarson B., Grudd H., Berntsson A.*
28. 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.*
29. Environmental change in northern Tanzania during the last 1000 years / *Öberg H.*

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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, landscape ecologic 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.

The Department has been instrumental in the development of the National Atlas project and its GIS components, as in applied projects of landscape and habitat inventory and monitoring in cooperation with the Swedish Environmental Protection agency in the Landscape Monitoring project of the agricultural landscapes, LiM, and the Natura 2000 program.

INK master programme course Ecological geography - mapping, analysis and visualization field course to Turku in May 2008. The beautiful remnant of an oak landscape is a common feature to us within the Hemiboreal region. Photo: Helle Skånes.

Ongoing projects

1. Land use change and effects of functional and spatial connectivity on historical and present biodiversity patterns / *Cousins S., Aggemyr E.*
2. Historical land use influence on dispersal and diversity of grassland species in rural landscapes / *Cousins S., Auffret A.*
3. Linking management and feedback across scales in social-ecological systems - Examples from forest ecosystems / *Eriksson S.*
4. State of the art description of landscape planning strategies for biodiversity / *Ihse M.*
5. Studies of actual and medieval vegetation in summer farming areas of Snorre Sturlasson, Iceland / *Ihse M.*
6. Assessment of changes in marine vegetation in Eastern Africa using satellite remote sensing / *Lundén B.*
7. Plant functional traits on satellite islands; effects of space and time / *Reimark J., Cousins S.*

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2.4. Land and water resources

Research themes and areas

We investigate natural processes and anthropogenic effects in different land, soil and water environments and their changes in space and time.

The research relates also to other Earth and environmental sciences, and to environmental monitoring, management and regulation of land and water resources in different applications. We carry out research for different parts of the world on:

- Land, water and waterborne substance interactions, flow and transport dynamics and changes in space and time.
- Freshwater interactions with climate, coastal and marine waters, snow/ice and socio-economic systems.
- Land and water resources in different physical, biogeochemical, ecological and cultural environments.
- The interaction between climate extremes, air pollution, soil conditions and forest ecosystems.
- Climate feedbacks and effects on land-water systems within the cross-disciplinary Stockholm University Climate Research Environment (BBCC)

In this research, we use, develop and couple tools such as hydrological flow and solute-pollutant transport models, geographical information systems and remote sensing for both basic process quantifications and different applications.

Using ancient tools for frontier research. Lake Babati, Tanzania. Photo: Lars-Ove Westerberg.

Ongoing projects

1. Pan-Artic hydrological and biogeochemical responses to climate change / *Bring A.*
2. Pan-Arctic glacier-water-biogeochemical system responses and social-ecological resilience effects in a warming climate / *Bring A., Dyurgerov M.*
3. The subsurface water system role for land-to-atmosphere and land-to-sea vapor-water partitioning and solute mass flows / *Destouni G., Darracq A.*
4. Mitigating agricultural pollution impacts on health and environment in the Aral Sea Basin / *Jarsjö J., Törnqvist R.*
5. Estimation of characteristic relations for unsaturated flow through rock fractures in the Forsmark area / *Jarsjö J.*
6. Participation, Deliberation and Sustainability: Governance beyond rhetoric in the domains of Climate, Forestry and Food Safety / *Schlyter P.*
7. Hydrological modelling for climate-change impact assessment / *Seibert J., Teutschbein C.*
8. Water package - an information package for increased awareness in water issues / *Seibert J.*
9. Water quality modelling based on landscape analysis: importance of riparian hydrology / *Seibert J.*
10. Modelling of climate influences on surface water DOC-regimes across spatial and temporal scales / *Seibert J.*
11. NORTHWATCH - Northern Watershed Ecosystem Response to Climate Change / *Seibert J.*
12. Participatory governance in Swedish forestry / *Stjernquist I.*
13. The relationship between air pollution deposition and the vitality of beech and oak forests in southern Sweden / *Stjernquist I., Schlyter P.*
14. Sustainable management in broadleaved forests / *Stjernquist I.*

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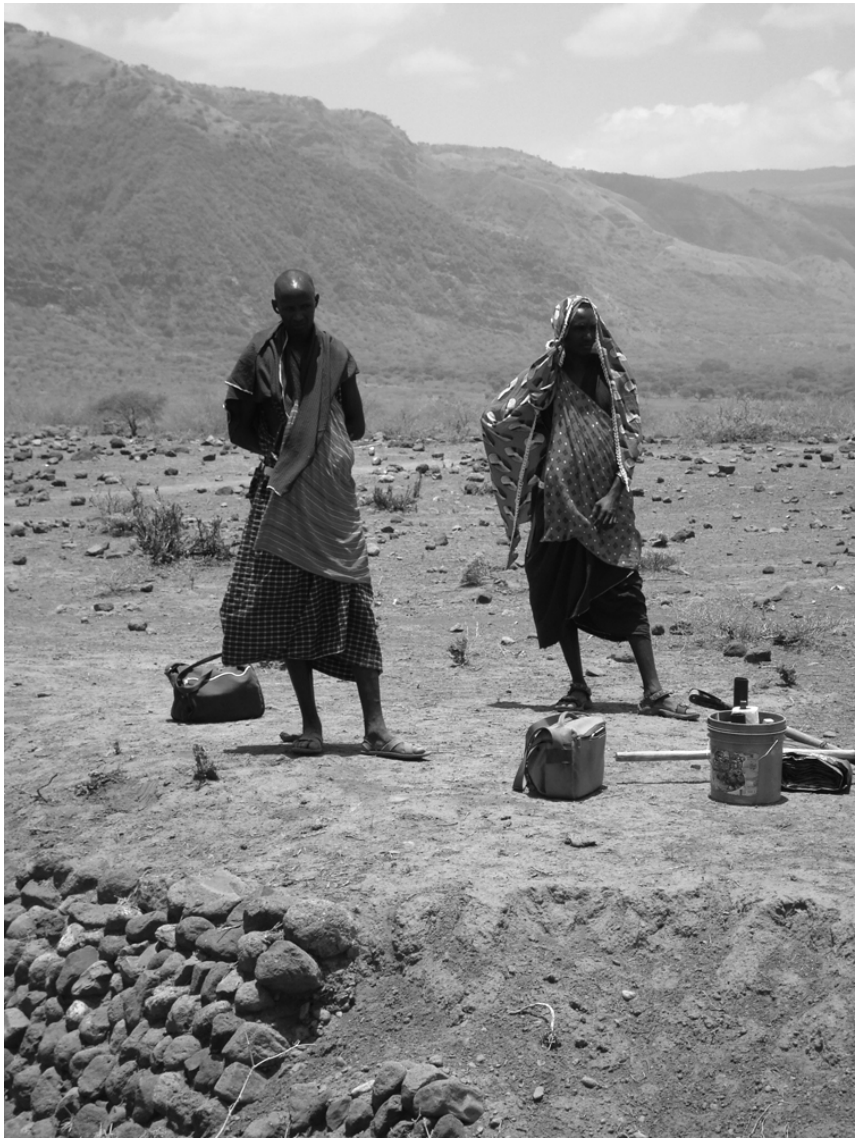

Two maasai warriors at an excavation for OSL sampling of an ancient irrigation system in Tanzania. Photo: Lars-Ove Westerberg.

2.5. The Bert Bolin Centre for Climate Research (BBCC)

The centre conducts a 10-year research and research environment-building program, funded by a Linné-grant from FORMAS and VR. The research program brings together the climate research expertise in four departments, and the program is coordinated by the Department of Physical Geography and Quaternary Geology. The research program focuses on five cross-disciplinary core themes; climate variability, atmospheric and ocean circulation, geodata for circulation system modeling, biogeochemical cycles, and climate governing small-scale processes. The financial framework is 10 Mkr (1.7 mill $)/year over the 10-year period 2006-2016, with an additional 2 Mkr/year for the associated research school.

Important policy decisions for sustainable development are based on climate scenarios derived through numerical climate modeling. Such models are a synthesis of our current understanding of climate-influencing processes in the various components of the climate system. Our challenge and aim is to provide improved knowledge about climate-influencing processes, over a range of time-scales and subsystems. The BBCC research program embraces natural climate processes and variability, as well as changes imposed by man´s ever-increasing impact on the climate system through emission of greenhouse gases and aerosols, and changes in land-use, vegetation and hydrology. With the present strong public and political interest in climate research, interaction with media and policy makers is an important task for many of the researchers involved in the program. There is already a strong involvement by BBCC researchers in IPCC, and on the policy side in the climate commission of the Swedish government.

Peat, a climate archive in the Russian tundra (*Sphagnum* hummock). Photo: Päivi Kaislahti Tillman.

3. Publications

Reviewed articles

1. **Alexanderson H.**, Eskola K.O. and **Helmens K.F.** 2008: Optical dating of a Late Quaternary sediment sequence from Sokli, northern Finland. *Geochronometria*, 32.
2. **Ampel L.**, Wohlfarth B., **Risberg J.** and **Veres D.** 2008: Paleolimnological response to millennial and centennial scale climate variability during MIS 3 and 2 as suggested by the diatom record in Les Echets, France. *Quaternary Science Reviews*, 27, 1493-1504.
3. **Asokan S.M.** and Dutta D. 2008: Analysis of water resources in the Mahanadi River Basin, India under projected climate conditions. *Hydrological Processes*, 22, 3589-3603.
4. Beedle M., **Dyurgerov M.**, Tangborn W., Khalsa S.J.S., Helm C., Raup B., Armstrong R. and Barry R.G. 2008: Improving estimation of glacier volume change: a GLIMS case study of Bering Glacier System, Alaska. *The Cryosphere*, 2, 33-51.
5. Bishop K., Buffam I., Erlandsson M., Folster J., Laudon H., **Seibert J.** and Temnerud J. 2008: Aqua Incognita: the unknown headwaters. *Hydrological Processes*, 22, 1239-1242.
6. **Borgmark A.** and **Wastegård S.** 2008: Regional and local patterns of peat humification in three raised bogs in Värmland, south-central Sweden. *GFF*, 130, 161-176.
7. Briffa K.R., Shishov V.V., Melvin T.M., Vaganov E.A., **Grudd H.**, Hantemirov R.M., Eronen M. and Naurzbaev M.M. 2008: Trends in recent temperature and radial tree growth spanning 2000 years across northwest Eurasia. *Philosophical Transactions of the Royal Society B*, 363, 2271-2284.
8. **Bring A.** and **Destouni G.** 2008: Spatial patterns of decline in pan-arctic hydrological monitoring networks: a vulnerability map. *Nordic Hydrological Programme: NHP Report*, 50, 60-66.
9. **Brown I.A.** and **Sandgren E.** 2008: Investigation of the spatial variations in Synthetic Aperture Radar backscatter in western Dronning Maud Land, Antarctica. *Journal of Applied Remote Sensing*, 2, 023509.
10. Brunet M., Saladié O., Jones P., Sigró J., Aguilar E., **Moberg A.**, Lister D., Walther A. and Almarza C. 2008: A case-study/guidance on the development of long-term daily adjusted temperature datasets: Climate Data and Monitoring WCDMP-No. 66. *WMO-TD*, 1425, 43 pp.
11. Buffam I., Laudon H., **Seibert J.**, Mörth C.M. and Bishop K. 2008: Spatial heterogeneity of the spring flood acid pulse in a boreal stream network. *Science of the Total Environment*, 407, 708-722.
12. Büntgen U., Frank D.C., **Grudd H.** and Esper J. 2008: Eight centuries of Pyrenees summer temperatures from tree-ring density. *Climate Dynamics*, 31, 615-631.
13. **Cousins S.A.O.** and **Aggemyr E.** 2008: The influence of field shape, area and surrounding landscape on plant species richness in grazed ex-fields. *Biological Conservation*, 141, 126-135.
14. **Cousins S.A.O.** and Lindborg L. 2008: Remnant grassland habitats as source communities for plant diversification in agricultural landscapes. *Biological Conservation*, 141, 233-240.
15. **Darracq A.**, Lindgren G. and **Destouni G.** 2008: Long-term development of phosphorus and nitrogen loads through the subsurface and surface water systems of drainage basins. *Global Biogeochemical Cycles*, 22, GB3022, doi:10.1029/2007GB003022.
16. Davies S.M., **Wastegård S.**, Rasmussen T.L., Svensson A., Johnsen S.J., Steffensen J.P. and Andersen K.K. 2008: Identification of the Fugloyarbanki tephra in the NGRIP ice-core: a key tie-point for marine and ice-core sequences during the last glacial period. *Journal of Quaternary Science*, 23, 409-414.
17. **De Angelis H.** and **Kleman J.** 2008: Palaeo-ice stream onsets: examples from the north-eastern Laurentide Ice Sheet. *Earth Surface Processes and Landforms*, 33, 560-572.

18. Delmonte B., Andersson P.S., **Hansson M.**, Schöberg H., Petit J.R., Basile-Doelsch I. and Maggi V. 2008: Aeolian dust in East Antarctica (EPICA-Dome C and Vostok): Provenance during glacial ages over the last 800 kyr. *Geophysical Research Letters*, 35, L07703.
19. **Dessie G.** and **Christiansson C.** 2008: Forest decline and its causes in the South Central Rift Valley of Ethiopia: Human impact over a one hundred year perspective. *Ambio*, 37, 263–271.
20. **Dessie G.** and Kinlund P. 2008: Khat expansion and forest decline in Wondo genet, Ethiopia. *Geografiska Annaler Series B*, 90, 187-203.
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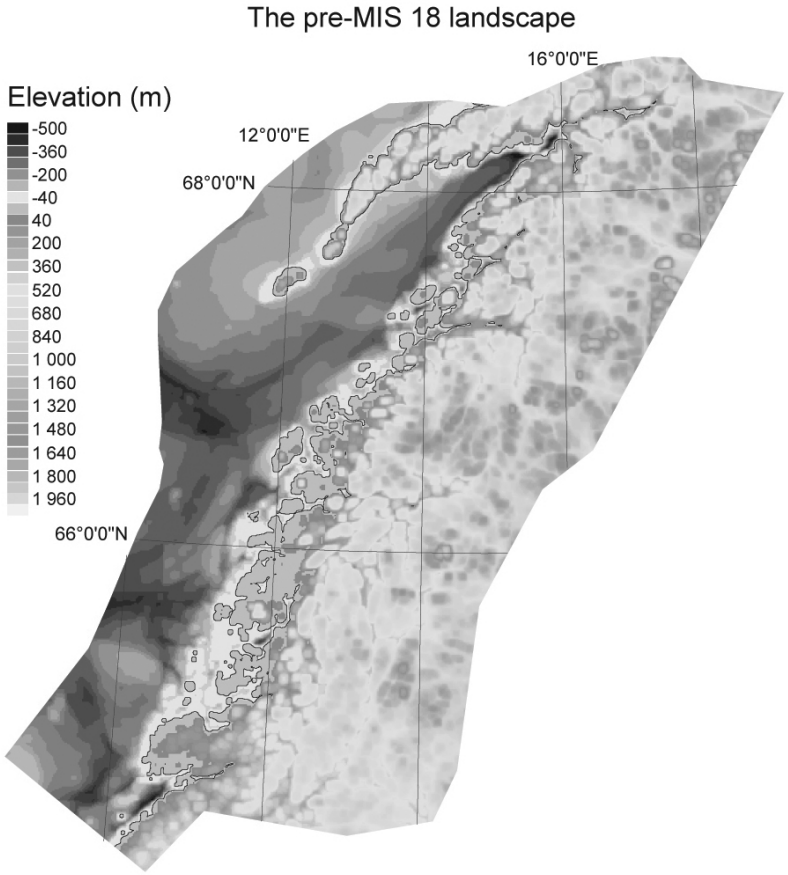

The reconstruction of the pre-MIS 18 landscape is performed by using a GIS filtering model created to mimic the general patterns of glacial erosion over multiple glacial cycles in northwestern Scandinavia (Jansson, unpublished).

4. Publication series

Ongoing

Dissertations from the Department of Physical Geography and Quaternary Geology, 2006-

Reports from the Department of Physical Geography and Quaternary Geology, 2002-

Tarfala Research Station Annual Reports, electronic pdf-based series, 1998-

Past

Thesis in Quaternary Geology, 2002-2005

Thesis in Geography with emphasis on Physical Geography, 2001-2006

Quaternaria. Series A, 1995-2001

Quaternaria. Series B, 1995-2001

The Department of Physical Geography, Stockholm University Dissertation Series, 1994-2000

Research Report, Department of Physical Geography, 1968-2000

Meddelanden från Naturgeografiska institutionen, 1965-1994

The importance of understanding soils when studying tropical environments. Field course in Kenyan highlands. Photo: Maria Ryner.

5. Education

In July 2007 Stockholm University shifted to the Bologna Model of higher education together with all other universities in Sweden. In short this means that new degrees were introduced:

- First cycle: Högskoleexamen 2 years, Kandidatexamen (Bachelor's Degree) 3 years
- Second cycle: Magisterexamen 1 year, Masterexamen (Master's Degree) 2 years;
- Third cycle: Licentiatexamen 2 years, Doktorsexamen (Doctorate) 4 years.

In addition a new system of credits was introduced, compatible with the European Credit Transfer and Accumulation System, ECTS. One academic credit (Sw. *högskolepoäng* or hp; Eng. translation *Higher Education Credit* or HEC), corresponds to one ECTS credit or approximately 3 days of full time studies. One semester is composed of 30 HEC, corresponding to approximately 20 study weeks, and a full study year is composed of 60 HEC, corresponding to 40 study weeks.

The final stage towards a full compliance with the Bologna agreement was concluded with the implementation of a new system of grading that was fully introduced 1 July 2008. This system corresponds roughly to the ECTS standard grading scale, but at Stockholm University a criterion-referenced grading is practised, while the ECTS system is a relative grading system, i.e. with a set distribution of grades among the student population. In addition, during the autumn term 2008 all our course syllabus and programme plans were translated to English.

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 issues. In addition a wide spectrum of graduate (master's level) programmes and courses are given, reflecting the research profiles of the department. Every year about 1500 students attend our undergraduate and graduate education.

5.1. Undergraduate (First Cycle) education

Three undergraduate (Bachelor's) programmes are given by the Department of Physical Geography and Quaternary Geology:

- Bachelor's programme in Geography
- Bachelor's programme in Earth Science
- Bachelor's programme in Biology-Earth Science

<u>Bachelor's programme in Geography</u>
The *Geography programme* includes courses up to 180 Higher Education Credits (HEC), which correspond to three years of full-time studies (1 HEC is roughly 3 days of full-time studies):

- 1-30 HEC: Geography I, 30 HEC
- 31-60 HEC: Geography II, 30 HEC
- 61-90 HEC: Geography III, 30 HEC
- 91-165 HEC: Optional courses
- 166-180 HEC: Geography, Degree Project (Bachelor's Thesis), 15 HEC

The Department of Physical Geography and Quaternary Geology and the Department of Human Geography at Stockholm University collaborate within the geography education, and much of the

education is integrated physical and human geography. Every year 100-120 students starts their Geography studies. 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 Stockholm University. Geography can be studied within a programme framework or as stand-alone courses. Seen over a period of ten years, the influx of students has increased substantially. One reason for this increase is the elevated interest, and need for knowledge, in the field of geography in a world where globalisation is steadily increasing.

Bachelor's programme in Earth Science

The education in *Earth Science* is given in collaboration with the Department of Geology and Geochemistry at Stockholm University. Courses can be taken within the programme framework or as stand-alone courses, both study paths leading to a Bachelor's Degree. The programme encompasses 180 HEC. Within the study programme, the first year (60 HEC) consists of compulsory courses where students learn the basics in earth science: Geology and Marine Geoscience, Physical Geography, Geochemistry, and Hydrology and Quaternary Geology. After the first year the students specialise within either Geology, Marine Geoscience and Geochemistry, or Physical Geography, Hydrology and Quaternary Geology. The programme is completed with a 15 HEC Degree Project (Bachelor's Thesis), which at the Department of Physical Geography and Quaternary Geology is either in Quaternary geology, physical geography, or in hydrology/hydrogeology.

Bachelor's programme in Biology-Earth Science

The Biology-Earth Science Study Programme encompasses 180 HEC. The programme is carried out in collaboration with the Department of Biology Education at Stockholm University. The programme consists of 75 HEC mandatory courses in earth sciences and environmental issues and 90 HEC are in biology. A 15 HEC Degree Project (Bachelor's Thesis) in either biology, earth science or environmental issues ends the programme. 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 issues and nature conservation.

Environmental Studies

The Department of Physical Geography and Quaternary Geology offers a wide range of courses on environmental issues on basic level (first cycle) and advanced level (second cycle). The courses are stand-alone courses that are optional within the study paths of the bachelor programmes in Geography, Earth Science, Biology, and many other subjects.

5.2 Graduate (Second Cycle) education

The Department of Physical Geography and Quaternary Geology offers advanced courses in glaciology and glacial geomorphology, climatology and palaeoclimatology, palaeoecology, Quaternary geology, hydrology and hydrogeology, soil science, Geographic Information Systems, cartography and map production, remote sensing, ecological geography, and natural resources, environment, and land use in the tropics. The courses provides the prospective geoscientist and geographer with an overall breadth to be used in working with, for example, nature and environmental control, geoscientific examinations, planning, risk assessment and research.

The advanced courses are compiled in a number of Master's Programmes. These are all two years long and always include a research task in the form of a Degree Project, which may be one semester long (20 weeks), one and a half semester long (30 weeks) or a full study year long (40

weeks). The programmes in general start with 1.5-2 semesters of mandatory courses with a certain topical emphasis. Thereafter the students take 1-1.5 semester of optional courses and finish the programmes with a Degree Project of 1-2 semesters.

Master's Programmes

- Biology-Earth Sciences
- Environmental Analysis and Management
- Environment and Health Protection
- Environmental Protection and Physical Planning
- Geography
- Glaciology and Polar Environments
- Globalization, Environment and Social Change
- Hydrology, Hydrogeology and Water Resources
- Landscape Analysis with Remote Sensing, GIS and Cartography
- Physical Geography and Quaternary Geology
- Quaternary Science and Climate Development

Other courses

The course "Science Communication, 30 HEC" is an advanced 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 and in communicating science in media.

The summer course "Glaciers and high mountain environments, 7.5 HEC" 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.

5.3. Postgraduate (Third Cycle) education

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 "Physical Geography" or in "Quaternary Geology". The success of our postgraduate programme is reflected in the amount and quality of Doctoral theses produced (see section 6 in this report for a list of recent theses). Below, we will tabulate currently enrolled students and their projects within each examination subject.

Physical Geography / Geography with emphasis on Physical Geography:

Elsa Aggemyr
Land use change and effects of connectivity on past and present plant patterns in the archipelago

Ingela Andersson
The influence and concerns of the local physical landscape in regional planning of water quality

Alistair Auffret
Historical land use effects on dispersal of grassland species in rural landscapes

Arvid Bring
Distributed modelling of hydrological dynamics and waterborne mass fluxes in cold regions

Martial Duguay
The effects of climate change induced glacier melt on water resources in the La Paz region, Bolivia

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

Malin Johansson
Spatial and temporal variations in surficial melt on the Greenland ice sheet and the effects on glacier dynamics

Sofia Eriksson
Linking management and feedback across scales in social-ecological systems - Examples from forest ecosystems

Thomas Grabs
Water quality modeling based on landscape analysis: importance of riparian hydrology

Jakob Granit
Coping with Global Environmental Change: Water Resources Management and Development

Jakob Heyman
Paleoglaciology of the northeastern Tibetan Plateau

Gustaf Hugelius
Landscape patterns of soil organic matter quantity and quality in permafrost terrain

Susanne Ingvander
Spatial and temporal snow accumulation patterns along an ice divide in Dronning Maud land, Antarctica

Christina Jonsson
Stable isotopes in lake sediments from Lappland

Martin Margold
Paleoglaciological reconstructions using digital elevation models and satellite imagery

Shilpa Muliyil Asokan
Basin-scale hydrological impacts of climate and land use changes

Johanna Mård Karlsson
Mapping Arctic social-ecological resilience to hydrological change

Marcus Nathanson
Spatial Variations of Runoff in a Boreal Landscape – controlling factors and consequences

Klas Persson
Solute transport processes and risk propagation in coupled groundwater and surface water systems

Josefin Reimark
Plant functional traits on grazed and abandoned satellite islands; effects of space and time

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

Claudia Teutschbein
Hydrological Modelling for Climate Change Impact Assessment

Rebecka Törnqvist
Basin-scale hydrological och pollutant load impacts of land use and climatic changes

Dan Warghagen
The changing land use: From agricultural heritage to leasure use

Helena Öberg
Environmental change in northern Tanzania during the last 1000 years

Quaternary Geology:

Sofia Andersson
Time-synchronous correlation of late Holocene climatic changes and their environmental impact in central Sweden

Annika Berntsson
Reconstruction of environmental and climate changes in Vindelfjällen, northern Sweden, using lake sediments

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

Päivi Kaislahti Tillman
Holocene climate and environmental change in high latitudes as recorded by stable isotopes in peat deposits

Torbjörn Karlin
Deep ice core analysis of processes in the climate system

List of examinations for 2008

Name	**Date**	**Degree**
Elin Norström	17 Mar 2008	PhD, Physical Geography
Fredrik Hannerz	07 Apr 2008	PhD, Physical Geography
Mattias de Woul	30 May 2008	PhD, Physical Geography
Brad Goodfellow	05 Jun 2008	PhD, Physical Geography
Martina Hättestrand	24 Oct 2008	PhD, Quaternary Geology
Linda Ampel	14 Nov 2008	PhD, Quaternary Geology
Gull Olli	04 Dec 2008	PhD, Physical Geography
Britta Sannel	24 Jan 2008	PhLic, Physical Geography
Jakob Heyman	23 Apr 2008	PhLic, Physical Geography
Sofia Eriksson	02 Dec 2008	PhLic, Physical Geography

6. Dissertations

The Department of Physical Geography and Quaternary Geology, Stockholm University

Thesis in Geography with emphasis on Physical Geography (2001-2006)

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

KATARINA LUNDBLAD, 2006. Studies on Tropical Palaeo-variation in Climate and Cosmic Ray Influx. Geochemical Data from Stalagmites Collected in Tanzania and Northern South Africa. Dissertation No. 32. Fakultetsopponent: Prof. Augusto Mangini

LENA RUBENSDOTTER, 2006. Alpine lake sediment archives and catchment geomorphology; causal relationships and implications for paleoenvironmental reconstructions. Dissertation No. 33. Fakultetsopponent: Prof. Catherine Souch

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 (2002-2005)

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

ANDERS BORGMARK, 2005: The colour of climate: changes in peat decomposition as a proxy for climate change. Dissertation No. 4. Fakultetsopponent: Dr. Bas van Geel

JENS HEIMDAHL, 2005: Urbanised nature in the past – site formation and environmental development in two Swedish towns, AD 1200-1800. Dissertation No. 5. Fakultetsopponent: Dr. Jane Sidall

HÅKAN GRUDD, 2006: Tree rings as sensitive proxies of past climate change. Dissertation No. 1. Fakultetsopponent: Prof. Brian Luckman

ULF JONSELL, 2006: Sulfur in polar ice and snow. Interpretations of past atmosphere and climate through glacial archives. Dissertation No. 2. Fakultetsopponent: Dr. Mark Curran.

HANNA S. SUNDQVIST, 2007: Speleothems as environmental recorders – A study of Holocene speleothems and their growth environments in Sweden. Dissertation No. 3. Fakultetsopponent: Prof. Frank McDermott.

PATRIK KLINTENBERG, 2007: More water, less grass? An assessment of resource degradation and stakeholders' perceptions of environmental change in Ombuga grassland, northern Namibia. Dissertation No. 4. Fakultetsopponent: Prof. Stein Bie.

MARIA RYNER, 2007: Past environmental and climate changes in northern Tanzania. Vegetation and lake level variability in Empakaai Crater. Dissertation No. 5. Fakultetsopponent: Prof. Henry Lamb.

DANIEL S. VERES, 2007: Terrestrial response to Dansgaard-Oeschger cycles and Heinrich events: the lacustrine record of Les Echets, south-eastern France. Dissertation No. 6. Fakultetsopponent: Prof. John J. Lowe.

YOSHIHIRO SHIBUO, 2007: Modelling water and solute flows at land-sea and land-atmosphere interfaces under data limitations. Dissertation No. 7. Fakultetsopponent: Dr. Clifford Voss.

GESSESSE DESSIE, 2007: Forest Decline in South Central Ethiopia: Extent, history and process. Dissertation No. 8. Fakultetsopponent: Prof. Mats Widgren.

HERNÁN DE ANGELIS, 2007: Palaeo-ice streams in the north-eastern Laurentide Ice Sheet. Dissertation No. 9. Fakultetsopponent: Dr. Colm Ó Cofaigh.

AMÉLIE DARRACQ, 2007: Long-term development, modeling and management of nutrient loading to inland and coastal waters. Dissertation No. 10. Fakultetsopponent: Prof. Andrea Rinaldo.

ELIN NORSTRÖM, 2008: Late Quaternary climate and environmental change in the summer rainfall region of South Africa - A study using trees and wetland peat cores as natural archives. Dissertation No. 11. Fakultetsopponent: Prof. Michael Meadows.

FREDRIK HANNERZ, 2008: Making water information relevant on local to global scale - the role of Information Systems for Intergrated Water Management. Dissertation No. 12. Fakultetsopponent: Prof. Dennis Lettenmaier.

MATTIAS DE WOUL, 2008: Response of glaciers to climate change – Mass balance sensitivity, sea level rise and runoff. Dissertation No. 13. Fakultetsopponent: Dr. Roger Braithwaite.

BRADLEY W GOODFELLOW, 2008: Relict non-glacial surfaces and autochthonous blockfields in the northern Swedish mountains. Dissertation No. 14. Fakultetsopponent: Dr. Adrian Hall.

MARTINA HÄTTESTRAND, 2008: Vegetation and climate during Weichselian ice free intervals in northern Sweden – interpretations from fossil and modern pollen records. Dissertation No. 15. Fakultetsopponent: Prof. Donatella Magri.

LINDA AMPEL, 2008: Dansgaard-Oeschger cycles and Heinrich events in western Europe – A diatom perspective. Dissertation No. 16. Fakultetsopponent: Prof. Sherilyn Fritz.

GULL OLLI, 2008: Waterborne sediment and pollutant transport into lakes and accumulation in lake sediments. Dissertation No. 17. Fakultetsopponent: Prof. Ingmar Renberg.

Preparation of samples for gamma spectrometry, which is used to measure the natural radioactivity in sediments to determine the annual dose for optically stimulated luminescence dating, Risø, Denmark. Crushed sediment is mixed with hot wax and cast into "gamma cups". Photo: Heidi Ryen.

7. International exchange

INK has the perfect preconditions for international exchange. Our department is popular among incoming students from our partner universities (and other universities). This has always been the case but English Master Courses have increased INKs popularity. Some students get back to us after their Erasmus-stay as visiting students to write their thesis here. We can observe an increased interest among our own students to study in other countries.

7.1. Lecturer exchange

Exchange programme and joint master programme with the Institute of Environmental Science and Management, University of Latvia / *Schlyter P.*

Nordic-Russian cooperation in heigher education with the Russian State Hydrometeorological University, St Petersburg, Russia; the Arkhangelsk State Technical University, Arkhangelsk, Russia; the The Nansen International Environmental and Remote Sensing Centre, St petersburg, Russia, the The Department of Physics at the University of Helsinki, Finland; and the Royal Institute of Technology, Stockholm, Sweden / *Stjernquist I., Schlyter P.*

INNOLEC: Lectures for students at Masaryk University, Brno, Czech Republic / *Moberg A.*

NordPlus: Bilateral teaching exchange with University of Turku, Finland / *Skånes H.*

ERASMUS: Visiting lecturer from Insbruck, Austria, Dr. Maria Wastl

7.2. Student exchange

Erasmus exchange (coordinator: K. Ebert)

Bern University, Switzerland
Innsbruck University, Austria
Freiburg University, Germany
Bordeaux University, France
University of Burgundy, Dijon, France
University of Ostrava, Czech Republic

8. Conferences and seminars

January

Hättestrand & Margold:	*28th Nordic Geological Winter Meeting, January 7 - 10, 2008, Aalborg, Denmark*
Lyon:	*Workshop Spatial Statistics in Watercourses, Uppsala, Sweden*

February

Bring & Grabs:	*Hydrologidagarna, Uppsala, Sweden*
Ihse:	*United Nations Subsidiary Body for Scientific, Technical and Technological Advice for Convention of Biodiversity (SBSTTA), Rome, Italy*
Sundqvist:	*FG-DAPHNE, 2nd Workshop, Heidelberg, Germany*

March

Alexanderson:	*SGU FoU-seminarium, Uppsala, Sweden*
Berntsson, Grudd, Gunnarson, Jonsson, Moberg, Rosqvist, Schoning, Sundqvist & Wastegård:	*MILLENNIUM 2nd Milestone Meeting, Cala Millor, Spain*
de Woul:	*IGS Workshop on mass balance measurements and modelling, Skeikampen, Norway*

April

Alexanderson:	*Arctic Palaeoclimate and its Extremes (APEX) – Recent Advances (2nd international conference and workshop), Durham, UK*
Ebert, Engels, Hättestrand, Lyon, Margold & Seibert:	*EGU General Assembly, Vienna, Austria*
Grudd, Gunnarson, Holmgren, Holzkämper, Jonsson, Moberg, Rosqvist, Sundqvist & Wastegård:	*BBCC Workshop on Holocene Climate Variability over Scandinavia, Ingarö, Sweden*
Ihse:	*IALE – US yearly congress, Madison, USA*
Schlyter & Stjernquist:	*Forest Governance - Accountability, Expertise and Effectivity. A Forest Governance Research Workshop, Stockholm, Sweden*

May

Nordström:	*Municipal inspectors in Environment and Health Protection, Stockholm, Sweden*
Norström:	*Meeting global challenges in research cooperation, Uppsala, Sweden*
Ihse:	*International Standardisation Organisation ISO/TC 21125th Plenary and working group meeting, Copenhagen, Denmark*

June

Ingvander:	*IGS – International Symposium on Radioglaciology and its Application, Madrid, Spain*
Ryner:	*WAC-6 – 6th World Achaeological Congress, Dublin, Ireland*
Sundqvist:	*SUPRA-net Melting-pot Workshop, Sheffield, UK*

July

Holmlund:	*SCAR/IASC IPY Open Science Conference, St Petersburg, Russia*
Hugelius & Sannel:	*9th International Conference on Permafrost, Fairbanks, USA*

August

Bring:	*Northern Hydrology and its Global Role: XXV Nordic Hydrological Conference, Reykjavik, Iceland*
Holmlund, Kirchner & Lidmar-Bergström:	*33rd International Geological Congress, Oslo, Norway*
Stjernquist:	*The Delta Kappa Gamma Society International Conference, Chicago, USA*
Teutschbein:	*World Water Week, Stockholm, Sweden*

September

Alexanderson & Johnsen:	*12th International Conference on Luminescence and Electron Spin Resonance Dating, LED2008, Beijing, China*
Ampel, Engels & Wastegård:	*RESOLuTION Final workshop, Bordeaux, France*
Andersson, Berntsson, Holzkämper, Kaislahti Tillman & Wastegård:	*NEPAL 2nd Conference, Höör, Sweden*
Bring & Lyon:	*BBCC 3rd Annual Meeting, Stockholm, Sweden*
Heyman:	*International Glaciological Society British Branch Annual Meeting, Swansea, UK*
Holmgren, Ryner & Westerberg:	*The Energy-Climate Conflict and Bio-Fuels: A North-South Perspective, Stockholm, Sweden*
Ihse:	*Swedish IALE-SU conference on "Wetlands in the landscape", Kristianstad, Sweden*
Kirchner:	*Forum for Research Into Ice Shelf Processes (FRISP) / WAIS workshop, Castleton, UK*
Moberg:	*MILLENNIUM SG5 workshop, Kandersteg, Switzerland*
Seibert:	*HydroPredict'2008, Prague, Czech Republic*
Stjernquist:	*IUFRO 1.01.07 Ecology and Silviculture of Beech, Nanae, Hokkaido, Japan*
Wastegård:	*INTIMATE 10th Workshop, Oxford, UK*

October

Moberg:	*MILLENNIUM Nordic Multiproxy workshop, /Abisko, Sweden*
Sannel:	*Global Change Impacts on Nordic Sub-arctic Palsa Mires and Greenhouse Gas Feedbacks in the Climate System, Abisko, Sweden*
Schlyter & Stjernquist:	*Nordic-Russian University Cooperation in Higher Environmental Education, St Petersburg, Russia*
Stroeven:	*Derde Belgische dagen van de geografie: Geography on the Move, Brussels, Belgium*
Teutschbein:	*ENSEMBLES Fifth General Assembly, Santander, Spain*
Teutschbein:	*Rossby Centre Workshop (SMHI), Norrköping, Sweden*

November

Alexanderson:	*SciencePub projektmöte, Tromsö, Norge*
Bring:	*A Global Contract Based on Climate Justice – The Need for a New Approach Concerning International Relations, Brussels, Belgium*
Holmgren:	*Seminar of 30 years of Cooperation University of Edourdo Mondlane, Mocambique-Sida/SAREC, Maputo, Moçambique*
Holzkämper:	*CARBO-North workshop, Utrecht, Netherlands*
Kirchner:	*International Glaciological Society - Nordic Branch Meeting, Helsinki, Finland*

December

Darracq:	*International Workshop on The Sustainable City - Technologies and Systems for Sustainable Development, Kerala State, India*
Goodfellow, Grabs & Lyon:	*AGU Fall Meeting, San Francisco, USA*
Hansson, Holmlund, Ingvander, Johansson & Karlin:	*21st Symposium on Polar Meteorology and Glaciology, Tokyo, Japan*
Schlyter & Stjernquist:	*Nordic-Russian University Cooperation in Higher Environmental Education, Workshop, Stockholm*

9. Conference/Seminar convers, Editorships, PhD opponents

Goodfellow:	Convener of session "Cold regions geomorphology: present landforms and past climate", EGU General Assembly, Vienna, Austria, April.
Holmgren, Ryner & Westerberg:	Organiser of conference: "The Energy-Climate Conflict and Bio-Fuels: A North-South Perspective", Stockholm University, Sweden, September.
Hättestrand:	Convener of session "Glaciology and glacial geology", Aalborg, Denmark, January Convener of session "Glacial landscape evolution and paleoglaciological reconstructions", EGU General Assembly, Vienna, Austria, April.
Ihse:	Chair of Swedish IALE-SU conference on "Wetlands in the landscape", Kristianstad, Sweden, September.
Lyon:	Convener of session "Linking catchment hydrological and biogeochemical processes across spatial scales", EGU General Assembly, Vienna, Austria, April. Convener of session "Catchment Processes and Heterogeneity at Multiple Scales – Benchmarking Observations, Conceptualization and Prediction", AGU Fall Meeting, San Francisco, USA, December.
Nordström:	Organiser of Municipal inspectors in Environment and Health Protection Conference, Stochkolm University, Sweden, May
Seibert:	Chair of subdivision on catchment hydrolog, EGU General Assembly, Vienna, Austria, April. Member of Scientific Advisory Committee, HydroPredict'2008, Prague, Czech Republic, September. Associated editor for Hydrology and Earth System Sciences. Opponent for Licentiate thesis at Uppsala University, Sweden.
Schlyter & Stjernquist:	Organiser of Forest Governance - Accountability, Expertise and Effectivity. A Forest Governance Research Workshop, Stockholm University, Sweden, April. Organiser of Nordic-Russian University Cooperation in Higher Environmental Education, Workshop, Stockholm, Sweden, December.
Stroeven:	Guest Editor of Geomorphology 97 (1-2). External Opponent for Sarah Greenwood, Sheffield University, UK, April. External Opponent for Nick Golledge, University of Edinburgh, UK, October.

9. Financial support

GRANT ORGANIZATIONS	
EU	*European Union*
FORMAS	*The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Forskningsrådet för miljö, areella näringar och samhällsbyggande)*
KVA	*The Royal Swedish Academy of Sciences (Kungliga Vetenskapsakademien)*
RS	*Swedish National Space Board (Rymdstyrelsen)*
SIDA	*Swedish International Development Cooperation Agency (Styrelsen för internationellt utvecklingssamarbete)*
SLU	*Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet)*
SKB	*Swedish Nuclear Fuel and Waste Management (svensk kärnbränslehantering AB)*
SKI	*Swedish Nuclear Power inspectorate*
SU	*Stockholm University*
VR	*The Swedish Research Council (Vetenskapsrådet)*

RESEARCH GRANT RECEIVER	**FUNDING AUTHORITY**	**PROJECT**	**AMOUNT**
Bring	VR	Interdisciplinary Science Workshop 14-16 May 2008 for Early Career Scientists organized by the IPY Swedish Youth Steering Committee, VR 327-2008-80	50 000
Brown	RS	The application and refinement of SAR methods for identifying climate impacts on glaciers and ice sheets RS121/06:2	553 500
Cousins	FORMAS	Historiska källor och geografi för analys av markanvändningens påverkan på spridning av gräsmarksarter och dess konsekvenser för mångfald i framtidens jordbrukslandskap, 215-2006-2130	541 000
Cousins	FORMAS	Markanvändningsförändringar och effekten av funktionell och rumslig konnektivitet på historiska och nutida diversitetsmönster, 215-2007-1428	885 600
Destouni	VR	The subsurface water system role for land-to-atmosphere and land-to-sea water-vapor, solute and pollutant flows, 621-2006-4366	472 500
Destouni	FORMAS	Pan-Arktisk hydrologisk och biogeokemisk respons på klimatförändringar, 214-2007-1263	594 000
Destouni	VR	Pan-arktiska glaciär-vatten-biogeokemiska systemförändringar och effekter på socio-ekologiska resiliens i ett varamare klimat, 311-2007-8393	1 900 000
Destouni/Jarsjö/ Persson	Räddnings-verket	Riskkvantifiering vid olyckor med föroreningsspridning i mark o grundvatten 061127 Överenskommelse RV 621-6092-2005	447 000
Hansson	FORMAS	Productivity changes influencing ocean-atmosphere carbon fluxes, 214-2006-1107	900 000
Hansson	VR	Nationellt driftsbidrag till det internationella djupborr-ningsprojektet NEEM på Grönland - framtagande av isborrkärna för unika klimatstudier, 821-2007-3926	135 000
Helmens	SKB	Weichselian climate variability in Scandinavia based on a unique sediment sequence preserved at Sokli, 17534	678 000
Helmens	SKB	Weichselian climate variability in Scandinavia based on a unique sediment sequence preserved at Sokli, 17534/2	474 300
Helmens	SKB	"Literature review Greenland" in collaboration with De Nationale Geologiske Undersoegelser for Danmark og Groenland (GEUS), 18634	319 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Hock	SIDA	The effects of climate change induced glacier melt on water resources in the La Paz region, Bolivia, SWE-2005-347	600 000
Holmgren	VR	Regional and temporal patterns in climate, with focus on southern and eastern Africa	335 000
Holmgren	SIDA	Climate and hydrological variability in Engaruka, northern Tanzania, during the last millennium, SWE-2005-341-A	600 000
Holmgren	SIDA	The role of Geological Sciences for Sustainable Development in Mozambique, 2006-001251	300 000
Holmgren	Uppsala univ	The Climate Dimension (MISTRAs Idéstöd The Urban Mind, Cultural and Environmental Dynamics, FOR2007/78)	536 027
Holmlund	VR	The Japanese Swedish Antarctic Expedition 2007/08 - A contribution to the 4th International Polar Year	945 000
Holmlund	SKI	Glaciers and permafrost in Sweden, SKI2007/423/200710245	52 500
Holmlund	KVA	Inmätning av glaciärfronter i Sarek 2007-2008	48 000
Jansson K	VR	A 3-dimensional GIS reconstruction of the Quaternary relief evolution in northwestern Fennoscandia based on integrated terrestrial geomorphology and off-shore sesmic data, 621-2003-3221	434 700
Jansson P	VR	Dynamic volume-area relationship for Arctic and sub.Arctic glaciers for correct glacier melt assessments in a warming climate, 621-2007-3752	675 000
Jansson P	SKB	Greenland Ice Sheet Hydrology Project, 19637	1 326 000
Jarsjö	SIDA	Mitigating pollution impacts on health and environment in the Aral Sea Basin SWE-2006-308	550 000
Jarsjö	SKB	Estimation of characteristic relations for unsaturated flow through rock fractures in the Forsmark area according to attached proposal, 18873	440 000
Kleman m.fl	VR/FORMAS	Linnéansökan - Climate evolution, varaibility and sensitivity SUCLIM/BBCC	3 874 500
Kleman m.fl	FORMAS	Linnéansökan - Forskarskola SUCLIM/BBCC	1 000 000
Kleman	VR	Laurentide Ice Sheet evolution and dynamics, 621-2007-4978	405 000
Kleman	RS	Remote Sensing of past ice sheet beds and current ice sheet surfaces - methods development and delivery of constraints for climate modelling, RS126/06:2	486 000
Kuhry	VR	Landscape patterns of soil organic matter quantity and lability in permafrost terrain, 621-2005-4246	432 000
Lundén	SIDA	Assessment of changes in marine vegetation in Eastern Africa using satellite remote sensing, SWE2005-337	400 000
Moberg	VR	Forskaranställning - Rekonstruktion av klimatet under de senaste årtusendena, 622-2006-453	965 000
Moberg	VR	Climate in the last Millennium, 621-2007-4542	810 000
Regnell	Jönköping o Bohusläns museum	Växtmakrofossilanalyser av jordprover fr Rökinge 15:17-18 + Näs 6:3, Visingsö; Bollarp, Vireda sn; Råby 1:2, Skärstad sn, Småland; St. Peders sn, RAÄ 67, V Götaland; Tanum RAÄ 539, Bohslän; Ljungarum 3:2, Småland; Botaniska analyser fr Göta älv, V Götaland	203 900
Regnell	Lödöse museum	Makrofossilanalys av jordprover från en arkeologisk undersökning Övre krok, Örby sn RAÄ448, 450, V Götaland	40 150
Regnell	Vänermuseet Lidköping	Botanisk analys av prov fr Sunnerby 9:1, Otterstad sn RAÄ 59, V Götaland	11 500
Robertsson	SKB	Den glaciala - interstadiala utvecklingen under Weichseltiden, 16310/2	124 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Seibert	VR	Water quality modelling based on landscape analysis: importance of riparian hydrology	540 000
Seibert	FORMAS	Hydrological modelling for climate-change impact assessment 214-2007-1433	824 000
Seibert	FORMAS	Water-package - an information package for increased awareness in water issues, 209-2007-1543	290 250
Skånes	SLU	Basinventering av Natura 2000 och skyddade områden	587 980
Stroeven	VR	Spatial and temporal pattern of erosion under the Cordilleran ice sheet deduced using terrestrial cosmo-genic nuclides and geomorphology	608 000
Stroeven	VR	Glacial history and landscape evolution in the north-east Tibetan Plateau: Was there a Huang He ice sheet?	150 000
Wastegård	VR	Sharpening the tools - improving tephrochronology around the Atlantic Sea	884 000
Wastegård	SKB	Granskning av kap "Geological development during the Quaternary period" till SKB-rapporten "Geological evolution, palaeoclimate and historic development of the Forsmark and Laxemar-Simpevarp areas" 18218	6 000
Approved external research grants			27 434 407

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Bäckstrand/Stjernqvist	Lunds univ	Participation, Deliberation and Sustainability:	440 000
Schlyter m.fl.	FORMAS	Governance beyond rhetoric in the domains of Climate, Forestry and Food Safety	
Destouni	SU	½ lektorat i fem år med 300 tkr/år under 2006-2010 (SU611-2777-04)	300 000
INK (Wastegård)	EU	Millennium - European climate of the last millennium (Contr No.017008) 2006--2009	5 471 736
INK (Holmgren m.fl.)	SU	UNESCO	500 000
INK	Skolverket	Lärarlyftet - Klimat, vatten o hållbar utveckling (SU172-1405-07)	810 000
INK (Cousins/Seibert)	Kammarkoll	Forskarskola för Lärare	324 000
Kuhry	EU	CARBO-North - Quantifying the Carbon budget in Northern Russia: pase, present and future	634 972
Stroeven	SU	Strategisk satsning engångsmedel	600 000
Total		**Approved research grants**	36 515 115

7. Staff (late autumn 2008)

Department Chairman/Head:	Professor Arjen Stroeven
Vice Chairman:	Professor Georgia Destouni

PROFESSORS

Christiansson, Carl	professor of Physical Geography,
Destouni, Georgia	professor of Hydrology, Hydrogeology and Water Resources
Duyrgerov, Mark	visiting professor of Hydrology and Water Resources
Holmgren, Karin	professor of Physical Geography
Holmlund, Per	professor of Glaciology
Jansson, Peter	professor of Physical Geography
Kleman, Johan	professor of Remote Sensing
Kuhry, Peter	professor of Physical Geography
Kuylenstierna, Johan	visiting professor of Water Resources
Lundén, Bengt	professor of Remote Sensing
Stroeven, Arjen	professor of Physical Geography
Wastegård, Stefan	professor of Quaternary Geology

ACADEMIC STAFF

Associate Professors (PhD, Docenter)

Alexanderson, Helena	senior lecturer
Arnberg, Wolter	senior lecturer
Cousins, Sara	senior lecturer
Hansson, Margareta	senior lecturer
Hättestrand, Clas	senior lecturer, headdirector of undergraduate studies
Jansson, Krister	associate senior lecturer
Jarsjö, Jerker	senior lecturer
Moberg, Anders	researcher, also senior lecturer
Nordberg, Maj-Liz	senior lecturer
Risberg, Jan	senior lecturer
Rosqvist, Gunhild	senior lecturer
Seibert, Jan	research associate, also senior lecturer

PhD

Baresel, Christian	research engineer
Bergman, Jonas	researcher
Borgström, Ingmar	senior lecturer
Brown, Ian	researcher
Darracq, Amelie	researcher
De Angelis, Hernán	research associate
Engels, Stefan	researcher
Goodfellow, Bradley	researcher
Greenwood, Sarah	researcher
Grudd, Håkan	researcher
Gunnarson, Björn	researcher

Helmens Femke, Karin	researcher
Holzkämper, Steffen	researcher
Hättestrand, Martina	researcher
Kirchner, Nina	senior lecturer
Lyon, Steve	researcher
Norström, Elin	researcher
Peterson, Garry	researcher
Prieto, Carmen	research engineer
Regnell, Mats	researcher
Ryner, Maria	senior lecturer
Schlyter, Peter	senior lecturer
Schoning, Kristian	researcher
Skånes, Helle	senior lecturer
Stjernquist, Ingrid	senior lecturer
Sundqvist, Hanna	researcher
Westerberg, Lars-Ove	senior lecturer

PhLic, MSc, BSc

Bråvander, Lars Gunnar	MSc, senior lecturer
Eknert, Bo	PhLic, lecturer
Fridfeldt, Anders	BSc, lecturer
Karlsson, Sven	PhLic, researcher
Nordström, Anders	PhLic, senior lecturer
Trygger Bergman, Sophie	MSc, lecturer
Yrgård, Anders	PhLic, lecturer

Postgraduate students (PhLic, MSc, BSc)

Aggemyr, Elsa
Andersson, Ingela
Andersson, Sofia
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Hugelius, Carl-Gustaf
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Johansson, Malin
Johnsen, Timothy
Jonsson, Christina
Kaislathi Tillman, Päivi
Karlin, Torbjörn
Margold, Martin
Muliyil Asokan, Shilpa

Nathanson, Marcus
Persson, Klas
Reimark, Josefin
Sannel, Britta
Teutschbein, Claudia
Törnqvist, Rebecka
Warghagen, Dan
Öberg, Helena

Teaching assistants

Holmlund, Moa	BSc
Liljewalch-Fogelmark, Klara	BSc
Mercer, Andrew	BSc
Wennbom, Marika	

ADMINISTRATIVE STAFF

Berggren, Berit	senior administrative officer
Blåndman, Susanna	BSc, personnel administrator
Damberg, Maria	MSc, study advisor
Hansson, Erik	MSc, educational administrator
Henriksson, Carina	university certified administrator, senior administrative officer
Hultblad, Gertrud	university certified administrator, senior administrative officer
Maija-Liisa Isdal	BSc, financial administrative officer
Jacobsson, Henrik	BSc, study advisor
Kruckenberg, Anita	PhD, senior administrative officer
Malin Stenberg de Serves	PhD, Informant
Sturesson, Elisabeth	MSc, educational administrator
Åkerblom, Lena	higher administrative officer

TECHNICAL STAFF

Alm, Göran	PhLic, systems engineer
Brotén, Bengt	technician
Cabrera, Yanduy	caretaker
Castro Matamoros, Ana Lucia	MSc, specific project assistant
Dellgar Hagström, Mirja	MSc, specific project assistant
Finné, Martin	MSc, specific project assistant
Granell, Håkan	supervisor of office services
Jacobson, Rolf	web editor
Runborg, Siv	BSc, research assistant
Spångberg, Martin	systems engineer
Svanered, Ola	BSc, systems engineer
Törnberg, Henrik	MSc, technician, Tarfala Research Station

PROFESSORS EMERITI

Ihse, Margareta
Lidmar-Bergström, Karna
Lundqvist, Jan
Karlén, Wibjörn
Miller, Urve
Ringberg, Bertil
Wastenson, Leif
Østrem, Gunnar DSc

On a sunny day in September 2008, the department staff went off on an excursion in Uppland (Vallentuna, Norrtälje) to celebrate Margareta Ihse, professor in ecological geography and colleague of many years, who is now retiring from her post after long and faithful service. Photo: Joakim Lannek.

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