

Department of Physical Geography
and Quaternary Geology



Stockholm
University



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Cover photo: Plotting fabric data from an extensive but mysterious diamicton at Kongsfjordhallet, Svalbard. Photo: Helena Alexanderson.

1. Introduction

The Department of Physical Geography and Quaternary Geology is one of the larger departments at the university, with about 120 employees: 13 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 Kubry. 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), paleoclimatology (Gunbild Rosqvist) 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.



The Blomstrandbreen glacier has retreated significantly during the last few years, exposing a “new” small island with a tiny glacier remnant on top. Northwestern Svalbard. Photo: Helena Alexanderson.

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. Estimating volume changes of Patagonian glaciers using inventory data and scaling techniques / *De Angelis H.*
4. Exploring the conditions for stability and modes of behaviour of glacier systems / *De Angelis H.*
5. Deglaciation of the British-Irish ice sheet / *Greenwood S.*
6. Mega-scale glacial geomorphology from the Laurentide ice sheet / *Greenwood S., Kleman J*
7. The north Greenland Eemian ice drilling / *Hansson M.*
8. The European Programme on Ice Coring in Antarctica / *Hansson M., Holmlund P., Karlin T.*
9. Climate, glaciers and permafrost in the Swedish mountains / *Holmlund P.*
10. Subglacial thermal conditions through a glaciation phase / *Holmlund P.*
11. The Japanese-Swedish Antarctic Expedition (JASE) / *Holmlund P., Hansson M., Ingvander S., Karlin T., Johansson M.*
12. Terrestrial history of the Muonionalusta meteorites / *Hättestrand C.*
13. Spatial and temporal snow accumulation patterns along an icedivide in Dronning Maud Land, Antarctica / *Ingvander S.*
14. Spatial and temporal variations in surficial melt on the Greenland ice sheet and the effects on glacier dynamics / *Johansson M.*
15. A statistical approach to former ice shelf configurations in the Arctic Ocean / *Kirchner N.*
16. 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.*
17. Paleoglaciology of the northern sector of the Cordilleran ice sheet / *Stroeven A.P., Kleman J.*
18. Paleoglaciology of the NE Tibetan Plateau / *Stroeven A.P., Hättestrand C., Alexanderson H., Kleman J., Heyman J.*
19. Paleoglaciology of the Shaluli upland on the SE Tibetan Plateau / *Stroeven A.P., Hättestrand C., Fu P., Heyman J.*
20. Post YD deglaciation of the Fennoscandian ice sheet / *Stroeven A.P., Hättestrand C., Heyman J., Kleman J., Jansson K., Alexanderson H., Johnsen T., Lundqvist J.*

Staff affiliations

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Sampling a boulder on the southeastern Tibetan Plateau for cosmogenic exposure dating. Photo: Jakob Heyman.

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.



A core of sub-till interstadial sediments at Rūpiharju, northern Sweden. Photo: Helena Alexanderson.

Ongoing projects

1. Late Holocene humidity variability in central Sweden / *Andersson S.*
2. Bridging the gap between rhetoric and practice in integrated conservation and development efforts. Experiences from South Africa / *Dahlberg A.*
3. The role of land ownership and land use for sustainable landscape care and management: The case of Sweden in a European and global comparative analysis / *Dahlberg A.*
4. Cenozoic landscape evolution in northern Sweden. Geomorphological interpretation within a GIS-framework / *Ebert K.*
5. Meteoric ¹⁰Be dating of Miocene-Quaternary saprolites on plains with residual hills in northern Sweden / *Ebert K.*
6. NEEM project / *Hansson M., Wastegård S.*
7. The urban mind / *Holmgren K.*
8. The impacts of the climate: sea level rise and flood legends in Mozambique / *Holmgren K.*
9. Africa's climate and the survival of communities – eastern Africa during the 18th and 19th centuries / *Holmgren K.*
10. Holocene climate variability in southern Greece / *Holmgren K.*
11. CARBO-North: Quantifying the carbon budget in northern Russia: past, present and future / *Kubry P., Holzschläger S., Hugelius G.*
12. Landscape analysis for tectonic applications / *Lidmar-Bergström K.*
13. Climate in the last millennium / *Moberg A.*
14. Human impact in the Fällnäs area, south of Stockholm, Sweden / *Risberg J.*
15. Environmental changes in the eastern parts of Lake Mälaren, west of Stockholm, during the last 3000 years / *Risberg J.*
16. Construction of palaeogeographical maps for eastern Svealand for the last 7000 years / *Risberg J.*
17. Sea level changes along the Mozambiquan coast during the last 7000 years / *Risberg J.*
18. Climate change in southern Mozambique during the last 4000 years / *Risberg J.*
19. Climate change in northwestern Tanzania / *Risberg J.*
20. Black carbon aspect of climate change / *Rosqvist G.*
21. Africa's climate and the survival of communities – Eastern Africa during the 18th and 19th centuries / *Ryner M.*
22. Understanding the spatial and temporal variability of climate in northern Tanzania during the last 1000 years / *Ryner M.*
23. Temporal and spatial dynamics of subarctic peat plateau / thermokarst lake complexes / *Sannel B.*
24. DAPHNE - dated speleothem archives of the paleoenvironment / *Sundqvist H.*
25. Holocene climate variability over Scandinavia / *Sundqvist H., Moberg A., Holmgren K.*
26. Sharpening the tools – improving tephrochronology around the Atlantic Sea / *Wastegård S.*
27. SMART project (synchronising marine and ice-core records using tephrochronology) / *Wastegård S.*
28. Potrok Aike Lake sediment archive drilling project / *Wastegård S., Veres D.*
29. MILLENNIUM: European climate over the last millennium / *Wastegård S., Moberg A., Rosqvist G., Bergman J., Schoning K., Gunnarson B., Grudd H., Berntsson A.*
30. 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.*
31. The impacts of the climate: sea level rise and flood legends in Mozambique / *Westerberg L.O.*
32. Environmental change in northern Tanzania during the last 1000 years / *Öberg H.*

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Coring interstadial sediments at Riipiharju, northern Sweden. Photo: Helena Alexanderson.

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.



Small remnant habitats of a traditional rural landscape at Långmaren, Nynäs Nature Reserve on the coast of the Baltic Sea. Photo: Sara Cousins.

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. Modelling plant species dispersal in fragmented landscapes / *Cousins S.*
4. Linking management and feedback across scales in social-ecological systems - examples from forest ecosystems / *Eriksson S.*
5. Studies of actual and medieval vegetation in summer farming areas of Snorre Sturlason, Iceland / *Ihse M.*
6. EMMA Environmental Mapping and Monitoring with Airborne laser and digital images / *Skånes H.*
7. Natura 2000 follow-up project / *Skånes H.*

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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.



Collecting river sand from the eastern Tibetan Plateau for erosion rate measurements. Photo: Jakob Heyman.

Ongoing projects

1. Pan-Arctic ice-water-biogeochemical system responses and social-ecological resilience effects in a warming climate / *Destouni G., Bring A., Lyon S.*
2. Pan-Arctic hydrological and biogeochemical responses to climate change, The Swedish Research Council Formas / *Destouni G., Mård Karlsson J., Lyon S., Dyurgerov M., Peterson G.*
3. The subsurface water system role for land-to-atmosphere and land-to-sea vapor-water partitioning and solute mass flows / *Destouni G., Asokan S., Prieto C., Darracq A.*
4. Risk quantification for accidental pollutant spreading through subsurface water / *Destouni G., Persson K., Prieto C., Darracq A., Jarsjö J.*
5. Water quality modelling based on landscape analysis: importance of riparian hydrology / *Grabs T.*
6. Quantifying the potential of carbon dioxide storage, long-term retention and surface return flow minimization in Swedish bedrock / *Jarsjö J., Destouni G., Desouche C.*
7. Mitigating agricultural pollution impacts on health and environment in the Aral Sea Basin / *Jarsjö J., Destouni G., Törnqvist R., Asokan S.*
8. Stream flow modeling and variation of runoff in a boreal landscape / *Nathanson M.*
9. Mapping global regime shifts / *Peterson G.*
10. Modelling dynamics of multiple ecosystem services / *Peterson G.*
11. Hydrological modelling for climate-change impact assessment / *Seibert J., Teutschbein C.*
12. Water package - an information package for increased awareness in water issues / *Seibert J.*
13. Northern Watershed Ecosystem Response to Climate Change, NORTH-WATCH / *Seibert J.*
14. Green Governance / *Schlyter P., Stjernquist*
15. National Environmental Objectives in the Mountain Environment – management, future and conflict analysis / *Schlyter P., Stjernquist*
16. The effect of biomass withdrawal on the nutrient balance in forest soils / *Schlyter P., Stjernquist*
17. Hydrological modelling for climate change impact assessment / *Teutschbein C.*

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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.



Stranded “icebergs” at a beach close to the actively calving Blomstrandbreen glacier on NW Svalbard. Photo: Helena Alexanderson.

3. Publications

Reviewed articles

1. Alekseeva I., **Jarsjö J.**, Schrum C. and **Destouni G.** 2009: Reproducing the Aral Sea water budget and sea-groundwater dynamics between 1979 and 1993 using a coupled 3-D sea-ice-groundwater model. *Journal of Marine Systems*, 76, 296-309.
2. Baresel C. and **Destouni G.** 2009: Diffuse subsurface zinc loads from mining areas in the Dalälven River Basin, Sweden. *Hydrology Research*, 40, 445-453.
3. Bayer-Raich M. and **Jarsjö J.** 2009: Breakthrough of attenuating contaminant plumes in pumping wells: Analytical model and implications for integral pumping tests. *Water resources research*, 45, W02413.
4. Bennett E.M., **Peterson G.D.** and Gordon L.J. 2009: Understanding relationships among multiple ecosystem services. *Ecology letters*, 12, 1394-1404.
5. Bishop K., Beven K., **Destouni G.**, Abrahamsson K., Andersson L., Johnson R., Rodhe J. and Hjerdt N. 2009: Nature as the “natural” goal for water management: A Conversation. *Ambio*, 38, 209-214.
6. Bos J.A.A., **Helmens K.F.**, Bohncke S.J.P., Seppä H. and Birks H.J.B. 2009: Flora, vegetation and climate at Sokli, northeastern Fennoscandia, during the Weichselian Middle Pleniglacial. *Boreas*, 38, 335-348.
7. Breuer L., Huisman J.A., Willems P., Bormann H., Bronstert A., Croke B.F.W., Frede H.G., Graff T., Hubrechts L., Jakeman A.J., Kite G., Lanini J., Leavesley G., Lettenmaier D.P., Lindstrom G., **Seibert J.**, Sivapalan M. and Viney N.R. 2009: Assessing the impact of land use change on hydrology by ensemble modeling (LUCHEM). I: Model intercomparison with current land use. *Advances in Water Resources*, 32, 129-146.
8. **Bring A.** and **Destouni G.** 2009: Hydrological and hydrochemical observation status in the pan-Arctic drainage basin. *Polar Research*, 28, 327-338.
9. Broxton P., Troch P. and **Lyon S.** 2009: On the role of aspect to quantify water transit times in small mountainous catchments. *Water resources research*, 45, W08427-W08427.
10. Burke J. and **Kuylenstierna J.** 2009: The Water Variable - Producing enough food in a climate insecure world. In: *Perspective papers on Water and Climate Change Adaptation*. 5th World Water Forum.
11. Conley D.J., Björck S., Bonsdorff E., Carstensen J., **Destouni G.**, Gustafsson B.G., Hietanen S., Kortekaas M., Kuosa H., Meier H.E.M., Muller-Karulis B., Nordberg K., Norkko A., Nurnberg G., Pitkänen H., Rabalais N.N., Rosenberg R., Savchuk O.P., Slomp C.P., Voss M., Wulff F. and Zillén L. 2009: Hypoxia-Related Processes in the Baltic Sea. *Environmental Science and Technology*, 43, 3412-3420.
12. Conley D.J., Bonsdorff E., Carstensen J., **Destouni G.**, Gustafsson B.G., Hansson, L.-A., Rabalais N.N., Voss M. and Zillén L. 2009: Tackling hypoxia in the Baltic Sea: Is engineering a solution?. *Environmental Science and Technology*, 43, 3407-3411.
13. **Cousins S.A.O.** 2009: Landscape history and soil properties affect grassland decline and plant species richness in rural landscapes. *Biological Conservation*, 142, 2752-2758.
14. **Cousins S.A.O.** 2009: Extinction debt in fragmented grasslands: paid or not? *Journal of Vegetation Science*, 20, 3-7.
15. **Cousins S.A.O.**, Lindborg R. and **Mattsson S.** 2009: Land use history and site location are more important for grassland species richness than local soil properties. *Nordic Journal of Botany*, 27, 483-489.
16. **Dahlberg A.** and Burlando C. 2009: Addressing trade-offs: Experiences from conservation and development initiatives in the Mkuze Wetlands, South Africa. *Resilience Alliance*, 14.

17. **Dahlberg A.** and **Trygger S.** 2009: Indigenous medicine and primary health care: The importance of lay knowledge and use of medicinal plants in rural South Africa. *Human Ecology*, 37, 79-94.
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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

5. Education

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 theoretical and practical competence within the fields of education.

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.

Since 2007, Stockholm University has structured its education in accordance with the Bologna Model of higher education:

- 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.

Stockholm University uses 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.

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

Bachelor's programme in Geography

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 bachelor's programme in *Earth Science* (180 HEC) 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. Within the programme, the first year (60 HEC) consists of compulsory courses where students learn the basics in earth science: Physical Geography and Quaternary Geology (30 HEC) and Geology (30 HEC), respectively. After the first year the students specialise within Physical Geography, Hydrology, Quaternary Geology, Geology, Marine Geoscience, or Geochemistry. 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, and is carried out in collaboration with the Department of Biology Education at Stockholm University. The programme consists of 90 HEC mandatory courses in earth sciences and environmental issues and 90 HEC in biology. A 15 HEC Degree Project (Bachelor's Thesis) ends the programme. A distinctive feature of the programme is the integration between Earth Science and Biology. The Earth Science part focus particularly on biogeography, climatology, geomorphology, cartography, soil science, aerial photograph interpretation and GIS, 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

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 modelling 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
- Martin Margold
Paleoglaciological reconstructions using digital elevation models and satellite imagery
- Shilpa Muliyl Asokan
Basin-scale hydrological impacts of climate and land use changes
- Johanna Mård Karlsson
Mapping Arctic social-ecological resilience to hydrological change
- Marcus Nathanson
Stream flow modeling and variation of runoff in a boreal landscape
- 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
- Shyhrete Shala
Early Holocene deglacial environment and hypsithermal warming at high latitudes (N Fennoscandia) as recorded by multi-proxy evidence.
- 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
Water management and changing land use. Coping with expansion – Norrtälje as a case study. How intensified land use due to expansion affects the use and management of a municipality's water resource.
- Helena Öberg
Environmental change in northern Tanzania during the last 1000 years

Quaternary Geology:

Sofia Andersson

Late Holocene humidity variability 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

Carl Lilja

Synchronicity of late-glacial tephra horizons

Ewa Lind Mettävainio

Tephrochronology of the north Atlantic region during the early Holocene

Torbjörn Karlin

Deep ice core analysis of processes in the climate system

List of examinations for 2009

Name	Date	Degree
Christina Jonsson	02 Oct 2009	PhD, Physical Geography
Karin Ebert	04 Dec 2009	PhD, Physical Geography
Sofia Eriksson	14 Jan 2009	PhLic, Physical Geography
Gustaf Hugelius	08 Jun 2009	PhLic, Physical Geography
Klas Persson	26 Nov 2009	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. KANGALAWA, 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. Françoise 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.

CHRISTINA E. JONSSON, 2009: Holocene climate and atmospheric circulation changes in northern Fennoscandia – interpretations from lacustrine oxygen isotope records. Dissertation No. 18. Fakultetsopponent: Dr. Philip Barker.

KARIN EBERT, 2009: Cenozoic landscape evolution in northern Sweden. Geomorphological interpretation within a GIS-framework. Dissertation No. 19. Fakultetsopponent: Prof. Paul Bishop.



Documenting a saprolite excavation in the Parkajoki area, northern Sweden, August 2009. Photo: Karin Ebert.

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 / *Stjernquist I., Schlyter P.*

Nordic-Russian cooperation in higher 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.*

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

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 Grenoble, France
University of Ostrava, Czech Republic
Leuven University, Belgium

8. Conferences and seminars

January

- Lyon: *State of the art of catchment-scale residence time: conceptualization, modeling and analysis, Vienna, Austria*
- Moberg: *MILLENNIUM 'Error Bar' Workshop 1, Oxford, UK*
- Skånes: *EMMA kickoff, Stockholm, Sweden*

February

- Alexanderson: *Geodiversity: water, ice, landscape and people in variable climate, Ås, Norway*
- Alexanderson: *Exploratory workshop on the frequency and timing of glaciations in northern Europe (including Britain) during the Middle and Late Pleistocene, Berlin, Germany*
- Sundqvist: *1st International Cave Monitoring Workshop, Gibraltar, Spain*

March

- Cousins: *Biosphere as a global force of change, Kyoto, Japan*
- Dahlberg: *The multifunctional commons of the world landscapes: Between private property and public use. Nordic Landscape Research Network and the Centre for Forest and Landscapes, Slangerup, Denmark*
- Greenwood: *VII Drumlin Symposium, Westport, Ireland*
- Holmlund & Rosqvist: *Swedish Polar Research meeting, Ånn, Sweden*
- Ihse: *Paneldebatt Geografiska Förbundet, Stockholm, Sweden*
- Jarsjö & Teutschbein: *Hydrologidagarna 2009: Hydrologiska processer i samhällsbyggandet: modeller, osäkerhet och risker, Gothenburg, Sweden*
- Jarsjö: *AquaTerra Final Conference, Tübingen, Germany*
- Jarsjö: *Världsvattendagen 2009: Det gränslösa vattnet, Stockholm, Sweden*
- Moberg, Rosqvist & Wastegård: *MILLENNIUM 3rd Milestone Meeting, Cala Millor, Spain*

April

- Alexanderson & Kirchner: *Arctic Palaeoclimate and its Extremes (APEX) – beyond the frontier, Copenhagen, Denmark*
- Cousins: *International Association of Vegetation Science, Crete, Greece*
- Finné, Grabs, Heyman, Holmgren, Hugelius, Kirchner, Lyon, Moberg, Norström, Seibert & Sundqvist: *EGU General Assembly, Vienna, Austria*
- Risberg: *Nordic Diatomists Meeting, Helsinki, Finland*

May

- Margold: *CANQUA (Canadian Quaternary Association) Meeting, Vancouver, Canada*
- Schlyter & Stjernquist: *Nordic-Russian University Cooperation in Higher Environmental Education, Helsinki, Finland*
- Teutschbein: *Lund RCM2009 conference, Lund, Sweden*

June

- Hugelius & Sannel: *2nd CAPP Workshop: Carbon Pools in Permafrost Regions, Stockholm, Sweden*
Lind Mettävainio & Shala *NEPAL workshop, Bergen, Norway*

August

- Andersson & Warghagen: *World Water Week, Stockholm, Sweden*
Andersson: *The Water Framework Directive – sharing experiences and meeting future challenges, Stockholm, Sweden*
Fu & Heyman: *The 5th International Symposium on Tibetan Plateau / The 24th Himalaya-Karakorum-Tibet Workshop, Beijing, China*
Holmlund: *The northern regions of the World: Civilizations and the Environmental Change, Sapporo, Japan*
Stjernquist: *The Delta Kappa Gamma Society International Conference, Oslo, Norway*

September

- Andersson: *SIWI seminar, Stockholm, Sweden*
Grabs: *Geomorphometry Conference, Zürich, Switzerland*
Desouche, Grabs, Jarsjö,
Kirchner, Lyon,
Teutschbein & Wastegård: *BBC annual meeting, Stockholm, Sweden*
Holmlund: *Planet Earth under pressure: Global Changes, Regional Challenges. IGBP-KVA, Stockholm, Sweden*
Ihse: *International workshop of “Biodiversity, ecosystem services and governance”, Tjärnö, Sweden*
Ihse: *Swedish LALE conference on “Green environment in urban landscapes”, Stockholm, Sweden*
Ihse: *Swedish Man and Biosphere organisation meeting, Gränna, Sweden*
Norström: *Southern African Society for Quaternary Research, Knysna, South Africa*
Sannel: *The Role of Peatlands in the Global Carbon Cycle: Past, Present and Future, Prague, The Czech Republic*
Seibert: *NorthWatch workshop, Dorset, Canada*

October

- Andersson & Warghagen: *Klimatanpassningsseminarium Naturvårdsverket, Sweden*
Finné: *Climate and Ancient Societies, CAS, Stine Rossel Memorial Conference, Copenhagen, Denmark*
Hind & Moberg: *MILLENNIUM 'Error Bar' Workshop 2, Gower, UK*
Holmgren: *The Stine Rossel Memorial Conference, Copenhagen, Denmark*
Holmgren: *Diversitas OSC2, Biodiversity and Society, Cape Town, South Africa*
Holmlund: *Space and the Arctic, ESA, Stockholm, Sweden*
Holmlund: *Polarforum, Swedish Polar Secretariat, Stockholm, Sweden*
Ihse: *National seminar at Royal Academy for Forestry and Agriculture, Stockholm, Sweden*
Ihse: *Nordic Council of Ministers seminar, Trondheim, Norway*
Jarsjö: *Klimatförändring – klimatanpassning. Naturvårdsenhetens temadagar, Länsstyrelsen i Västra Götaland, Karlsborg, Sweden*
Peterson: *2009 science meeting of Resilience Alliance on Gabriola Island, Canada*

Warghagen: *Nordens roll i klimatförhandlingarna - Norden i Fokus, Stockholm, Sweden*

November

Alexanderson: *SciencePub 3rd annual meeting, Oscarsborg, Norway*

Dahlberg, Ryner &

Westerberg: *Historical Ecologies of East African Landscapes, HEEAL-PLATINA research meeting, Stockholm, Sweden*

Lyon: *Synthesizing International Understanding of Changes in the Arctic Hydrological System, Stockholm, Sweden*

Törnqvist: *The 2009 International Conference on Integration of Sustainable Agriculture and Rural Development in the Context of Climate Change, the Energy Crisis and Food Insecurity, Agadir, Morocco*

Warghagen: *Hur kan vi öka samarbetet mellan universiteten och skolorna, Stockholm, Sweden*

December

Cousins: *Changing Nature of Nature: New Perspectives from Transdisciplinary Field Science, Kyoto, Japan*

Dahlberg: *What belongs in a changing nature? Northern and southern perspectives on nature and everyday landscape. International workshop at Hönö, Sweden*

Hind & Moberg: *MILLENNIUM Nordic Data Workshop, Rovaniemi, Finland*

Lyon: *AGU Fall Meeting, San Francisco, USA*

Skånes: *NILS annual landscape meeting, Umeå, Sweden*

9. Conference/Seminar convers, Editorships, PhD opponents

- Alexanderson: Programme responsible for SciencePub 3rd annual meeting, Oscarsborg, Norway, November.
- Cousins: Faculty opponent at University of Tartu, Estonia
Editor for Journal of Vegetation Science
- Dahlberg: Member of Examining committee for Hoang Thi Sen, Swedish University of Agricultural Sciences (SLU), Sweden, October.
- Holmgren: Convenor: Conflicts over Land in the 21st Century. Colloquium at Royal Swedish Academy of Sciences, organised by the National Committee for Geography, Stockholm, Sweden, November.
Faculty opponent for Jemma Finch, University of York, UK.
Faculty opponent for Aina Dahlo Janbu, University of Bergen, Norway.
- Ihse: Convener at Swedish IALE conference on “Green environment in urban landscapes”, Stockholm, Sweden, September.
Chair of Swedish Man and Biosphere organisation meeting, Gränna, Sweden, September.
Convener at National seminar at Royal Academy for Forestry and Agriculture, Stockholm, Sweden, October.
Member of organization committee for the Nordic Council of Ministers seminar, Trondheim, Norway, October.
Faculty opponent for Anders Bryn, Bergen University, Norway, October.
- Moberg: Organizer of Workshop on Statistics and Climate (Bert Bolin Centre for Climate Research and Division of Mathematical Statistics), Stockholm University, Sweden, May.
- Peterson: Review editor for Ecology and Society.
- Seibert: Associated editor for Hydrology and Earth System Sciences.
Associated editor for Geography Compass.
Associated editor for Water Resources Research.
Associated editor for Geografiska Annaler: Series A, Physical Geography.
- Skånes: Member of editorial board of Fennia, international journal of geography.
- Stjernquist: Faculty opponent for Evelin Urbel-Piirsalu, Lund University, Sweden, December.

10. Financial support

GRANT ORGANIZATIONS	
C-Core	<i>Centre for Cold Ocean Research Engineering</i>
ESF	<i>European Science Foundation</i>
EU	<i>European Union</i>
FORMAS	<i>The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Forskningsrådet för miljö, areella näringar och samhällsbyggande)</i>
KSLA	<i>The Royal Swedish Academy of Agriculture and Forestry (Kungliga Skogs- och Lantbruksakademien)</i>
KVA	<i>The Royal Swedish Academy of Sciences (Kungliga Vetenskapsakademien)</i>
RS	<i>Swedish National Space Board (Rymdstyrelsen)</i>
SIDA	<i>Swedish International Development Cooperation Agency (Styrelsen för internationellt utvecklingssamarbete)</i>
SGU	<i>Geological Survey of Sweden (Sveriges geologiska undersökning)</i>
SLU	<i>Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet)</i>
SKB	<i>Swedish Nuclear Fuel and Waste Management (svensk kärnbränslehantering AB)</i>
STINT	<i>The Swedish Foundation for International Cooperation in Research and Higher Education (Stiftelsen för Internationalisering av högre utbildning och forskning)</i>
SU	<i>Stockholm University</i>
VR	<i>The Swedish Research Council (Vetenskapsrådet)</i>

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Brown	C-Core, CA	Polar View Project - 19276-05-I-EC	920 800
Brown	RS	The application and refinement of SAR methods for identifying climate impacts on glaciers and ice sheets 63/08:1	700 650
Brown	KSLA	Polarimetric SAR scattering from forests under winter and summer conditions	150 000
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	540 000
Cousins	FORMAS	Markanvändningsförändringar och effekten av funktionell och rumslig konnektivitet på historiska och nutida diversitetsmönster, 215-2007-1428	1 253 600
Cousins	FORMAS	Modellering av växters spridning i fragmenterande landskap - <i>Modelling plant species dispersal in fragmented landscapes</i> , 217-2008-1024	425 000
Dahlberg	SIDA	Bridging the gap between rhetoric and practice in integrated conservation and development efforts SWE-1999-332	600 000
Destouni	VR	Mark-grundvattensystemets roll för flöden av vatten, ånga och lösta ämnen och föroreningar mellan mark och atmosfär och från land till hav - <i>The subsurface water system role for land-to-atmosphere and land-to-sea water-vapor, solute and pollutant flows</i> , 621-2006-4366	472 500
Destouni	FORMAS	Pan-Arktisk hydrologisk och biogeokemisk respons på klimatförändringar, 214-2007-1263	567 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Destouni	VR	Pan-arktiska glaciär-vatten-biogeokemiska systemförändringar och effekter på socio-ekologiska resiliens i ett varmare klimat, 311-2007-8393	1 900 000
Destouni/Jarsjö/ Persson	Räddnings- verket	Risikvantifiering vid olyckor med förorenings-spridning i mark o grundvatten 061127 Överenskommelse RV 621-6092-2005	465 900
Ebert	SGU	Meteoric ¹⁰ Be dating of Miocene-Quaternary saprolites on plains with residual hills in northern Sweden	89 000
Gunnarson	SLU	Analysarbete inom Anpassning av naturresursbaserade samhällen till klimat- o samhällsförändringar - Samisk rennäring i dåtid, nutid o framtid - <i>Adaptions of natural resource-based communities to climatic and societal changes - The case of Sami reindeer herding in the past, present and future</i>	50 000
Hansson	FORMAS	Havets produktivitet och atmosfärens koldioxidhalt över tiden - <i>Productivity changes influencing ocean-atmosphere carbon fluxes</i> , 241-2006-1107	900 000
Hansson	VR	Nationellt driftsbidrag till det internationella djupborringsprojektet NEEM på Grönland - framtagande av isborrkärna för unika klimatstudier, 821-2007-3926	135 000
Helmens	SKB	Weichselian-Holocene climate variability and environmental change in Scandinavia based on the Sokli sedimentary sequence best.nr. 19860	1 130 000
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	SIDA	Climate and hydrological variability in Engaruka, northern Tanzania, during the last millennium, SWE-2005-341	600 000
Holmgren	SIDA	The role of Geological Sciences for Sustainable Development in Mozambique, 2006-001251	300 000
Holmgren	Uppsala univ	The Climate Dimension (underkontr till MISTRAs Idéstöd <i>The Urban Mind. Cultural and Environmental Dynamics, FOR2007/78</i>)	178 676
Holmgren	SIDA	Africas climate and the survival of communities - Eastern Africa during the 18th and 19th centuries, SWE-2008-036	700 000
Holmlund	VR	Den japansk-svenska Antarktisexpeditionen 2007/08 - ett bidrag till det fjärde internationella polaråret - <i>The Japanese Swedish Antarctic Expedition 2007/08 - A contribution to the 4th International Polar Year</i> , 621-2006-5699	945 000
Holmlund	Strålsäker- hetsmynd	Istemperaturens betydelse för permafrost, erosion och hydrologi, SSM 2009/362, proj 1556	149 850
Ingvander	VR	Uppföljning av IPY - Projektbidrag till den svenska sektionen av Association of Polar Early Career Scientists (APECS)	25 000
Jansson P	VR	Dynamiskt volym-area förhållande för arktiska och sub-arktiska glaciärer för korrekt uppskattning av glaciär-smältning under ett allt varmare klimat - <i>Dynamic volume-area relationship for Arctic and sub-Arctic glaciers for correct glacier melt assessments in a warming climate</i> , 621-2007-3752	606 000
Jarsjö	SIDA	Mitigating pollution impacts on health and environment in the Aral Sea Basin, SWE-2006-308	500 000
Jarsjö/Frampton, Destouni, Cvetkovic	SGU	Quantifying the potential of CO2 storage, long-term retention and surface return flow minimization in Swedish bedrock, 60-1661/2008	390 000
Jarsjö	STINT	Vattensystem vid Bajkalsjön ...besök vid Irkutsk State Univ, KU2003-4664	50 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Kleman <i>m.fl</i>	VR/FORMAS	Linnéansökan - SUCLIM - BBCC Climate evolution, variability and sensitivity	3 500 000
Kleman <i>m.fl</i>	FORMAS	Linnéansökan - SUCLIM - BBCC Forskarskola	1 000 000
Kleman	VR	Den Laurentiska inlandsisens utveckling och dynamik - Laurentide Ice Sheet evolution and dynamics, 621-2007-4978	440 000
Kleman	RS	Remote Sensing of past ice sheet beds and current ice sheet surfaces, 110/08:1	486 000
Kuhry	VR/ESF	Long-term Carbon Storage in Cryoturbated Arctic Soils CRYOCARB	675 000
Moberg	VR	Forskaranställning - Rekonstruktion av klimatet under de senaste årtusendena, perioden 070101--091231, 622-2006-453	965 000
Moberg	VR	Klimatet under det senaste millenniet - Climate in the last Millennium, VR621-2007-4542	941 000
Norström/Finné	KSLA	Fifth EGU Alexander von Humboldt International Conference "Africa Climate Change Conference", Cap Town, South Africa, Jan 09	25 000
Peterson	FORMAS	Modellering av interaktioner mellan ekosystemtjänster i landskap dominerade av människan, 215-2008-1283	640 000
Regnell	Arkeologcentr., Kulturmiljö Halland o Mälard.	Växtfossilanalyser av jordprover fr: Jörlanda 328, Bohuslän; Stafsinge 7:1, RAÄ129, Halland; Mosjö RAÄ69; Attersta, Gällersta sn RAÄ 39, Närke	51 050
Regnell	Wallin kultur- landskap o arkeologi	Makrofossilanalys av prover från Bara 40, Skåne	7 200
Rosqvist	Metsä Tissue AB	Cooperation and partnership for climate research in the Arctic associated with the International Polar Year	700 000
Ryner	SIDA	Understanding the spatial and temporal variability of climate in northern Tanzania during the last 1000 years, SWE-2008-274	900 000
Schlyter	Sv Institutet (SI)	Green enterprising and innovation as a component of environmental management studies - A Swedish-Russian-Latvian long-term network cooperation i samarbete med Lettland, Ryssland, St Petersburg, Archangelsk (Barents). SI:s Östersjöprogram/Visbyprogrammet, 00914/2009	300 000
Seibert	FORMAS	Hydrologisk modellering av klimatförändringens effekter - Hydrological modelling for climate-change impact assessment, 214-2007-1433	824 000
Seibert	FORMAS	Vattenpaketet - ett informationspaket för att öka medvetenhet i vattenfrågor - Water-package - an information package for increased awareness in water issues. 209-2007-1543	298 350
Skånes	SLU/NV	Kartering och miljöövervakning med flygburen laserskanning och digitala bilder - Environmental Mapping and Monitoring with Airborne laser and digital images (EMMA)	147 150
Skånes	NV	Uppföljningsmanual flygbildstolkning - Upprättande av manual - Natura 2000, 235-4203-09 Nf	400 000
Stenberg de Serves	VR	Levande frågelådan med tema Polar, 327-2008-7712	37 800
Stroeven	VR	Glaciärer eller inlandsisar: En studie om landskapsutveckling och glaciationshistoria på den nordöstra Tibetanska höglättan - Glacial history and landscape evolution in the north-east Tibetan Plateau: Was there a Huang He ice sheet? 348-2007-6924	150 000
Stroeven/Clague/Fabel/ Hubbard/Kirchner	VR	En simulering av Koordillerasien under en nedslagningscykel - Simulation of the Cordilleran Ice Sheet through a glacial cycle, 621-2008-3449	945 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Wastegård	VR	Att slipa verktygen - förbättring av tefrokronologiska dateringar runt Atlanten - <i>Sharpening the tools - improving tephrochronology around the Atlantic Sea</i> , 621-2006-5868	817 000
Approved external research grants			29 593 526
RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Borgström	SU	Pedagogiska priset - Årets lärare	50 000
Destouni	SU	½ lektorat i fem år med 300 tkr/år under 2006-2010 (SU611-2777-04)	300 000
Holmgren	SU	Forskningsstöd	99 000
INK	SU	Årets utbildningsinstitution	50 000
INK	Skolverket	Läraryftet - Klimat, vatten o hållbar utveckling	974 025
INK (Cousins/Seibert)	Kammarkoll	Forskarskola för Lärare	324 000
INK	SU	Miljödiplomering	10 000
Kuhry	EU	CARBO-North - Quantifying the Carbon budget in Northern Russia: pase, present and future	906 000
Stroeven	SU	Startbidrag - forass HDA	50 000
Total		Approved research grants	32 356 551

11. Staff (autumn 2009)

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
Dyurgerov, 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
Rosqvist, Gunhild	professor of Geography, especially Physical Geography
Stroeven, Arjen	professor of Physical Geography
Sverdrup, Harald	visiting professor
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, director 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
Seibert, Jan	senior lecturer

PhD

Bergman, Jonas	researcher
Borgström, Ingmar	senior lecturer
Brown, Ian	researcher
Codilean, Alexandru	postdoctor
Dahlberg, Annika	senior lecturer
Darracq, Amelie	researcher
De Angelis, Hernán	research associate
Greenwood, Sarah	researcher
Grudd, Håkan	researcher
Helmens Femke, Karin	researcher

Hind, Alistair	postdoctor
Holzkämper, Steffen	researcher
Hättestrand, Martina	researcher
Jonsson, Christina	researcher
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Lyon, Steve	researcher
Malmström Ryner, Maria	researcher
Norström, Elin	researcher
Peterson, Garry	researcher
Prieto, Carmen	research engineer
Regnell, Mats	researcher
Schlyter, Peter	senior lecturer
Schmucki, Reto	postdoctor
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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)

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 Finné, Martin
 Fu, Ping
 Grabs, Thomas
 Heyman, Jakob
 Hugelius, Carl-Gustaf
 Ingvander, Susanne
 Johansson, Malin
 Johnsen, Timothy
 Kaislahti Tillman, Päivi

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Mercer, Andrew MSc
Wennbom, Marika

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Berggren, Berit senior administrative officer
Bländman, Susanna BSc, personnel administrator
Damberg, Maria MSc, study advisor
Gunnarson, Björn director of studies, researcher
Hansson, Erik MSc, educational administrator
Henriksson, Carina university certified administrator, senior administrative officer
Hörnby, Kerstin MSc, educational administrator
Maija-Liisa Isdal BSc, financial administrative officer
Kruckenberg, Anita PhD, senior administrative officer
Malin Stenberg de Serves PhD, informant
Sturesson, Elisabeth MSc, educational administrator
Crepin, Karin Ulfsson BA, Coordinator Strategic Partnerships
Åkerblom, Lena higher administrative officer

TECHNICAL STAFF

Alm, Göran PhLic, systems engineer
Berglöf, Rasmus caretaker
Brotén, Bengt technician
Cabrera, Yanduy caretaker
Desouche, Coralie MSc, research assistant
Jacobson, Rolf web editor
Krusic, Paul specific project assistant
Nehlstedt, Jonas systems engineer
Spångberg, Martin systems engineer
Törnberg, Henrik MSc, technician, Tarfala Research Station

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Organising samples after six weeks of fieldwork on the southeastern Tibetan Plateau. Photo: Jakob Heyman.

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