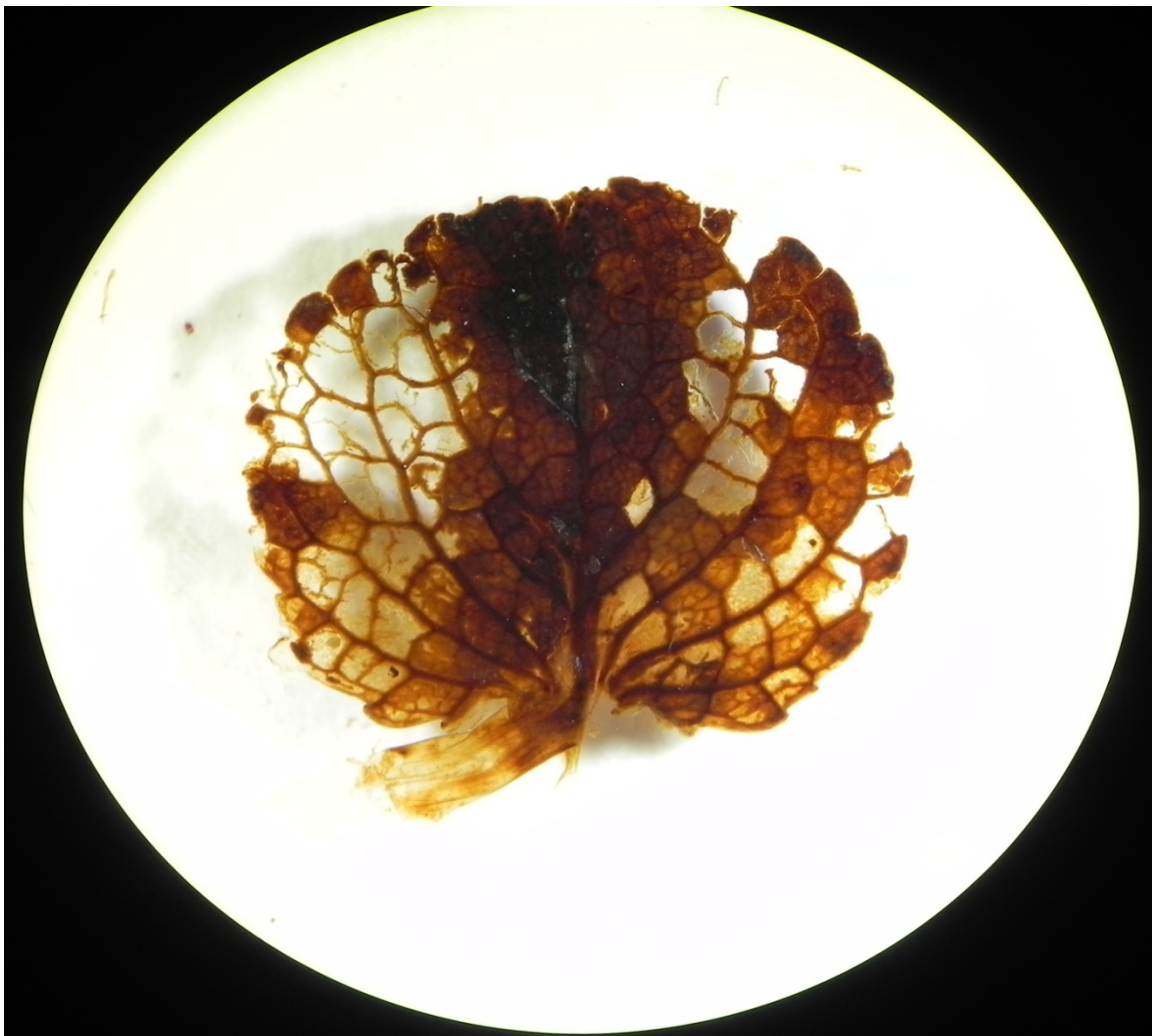


ANNUAL REPORT 2011



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Cover photo: Leaf of *Salix herbace* from the Faroe Islands, ca 11 000 cal. BP. Photo: E. Lind

1. Introduction

The Department of Physical Geography and Quaternary Geology is one of the larger departments at the university, with about 125 employees: 16 professors, ca 50 lecturers and researchers, ca 40 PhD students and ca 25 technical/administrative staff. Our personnel consist of an exciting mix of people coming from around the world, together creating a very dynamic and creative research and education environment.

Together with our neighbours, the Department of Geological Sciences, 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 advanced scientific studies and offer stimulating and awarded education to current and prospective students.

We conduct multi-disciplinary research in the fields of landscape ecology, 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 trends. The department is equipped with a state-of-the-art GIS and remote sensing cluster, and microscopy, sediment and dendroclimatology laboratories.

We also take pride in providing a broad high-quality education at basic, Masters and postgraduate levels. The goal of the undergraduate and Masters 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. We offer a wide range of Masters education subjects, tailored to our research profiles, and taught in English. Every year slightly more than 1700 students attend our undergraduate and Master education programmes. Postgraduate education consists of four years and, given its high standard and international staff, it constitutes an important cornerstone of the department's profile

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 between 1997 and 2008. 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 and Gunhild Rosqvist), glaciology (Margareta Hansson and Peter Jansson), paleoglaciology (Clas Hättstrand and Arjen Stroeven), landscape ecology (Sara Cousins), and Quaternary geology (Frank Preusser and 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 Bert Bolin Centre for Climate Research 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.



Snow depth measurements in Solberg, Hemavan in early January. Photo: S. Ingvander

Ongoing projects

1. Marginal ice dynamics / *Ahlkrona J, Kirchner N*
2. Assessment of model parametric uncertainty in projections of Greenland Ice Sheet behavior / *Applegate P*
3. Ice sheet - ice stream interaction dynamics / *Applegate P, Kirchner N*
4. Learning about the history of the Greenland ice sheet through studies on glacial landforms: a pilot project / *Applegate P, Kirchner N*
5. Snow volume estimation from InSAR / *Brown I*
6. Multi-scale investigations of microwave snowpack observations (MIMSO) / *Brown I, Ingvander S, Jansson P*
7. Estimating volume changes of Patagonian glaciers using inventory data and scaling techniques / *De Angelis H*
8. Exploring the conditions for stability and modes of behaviour of glacier systems / *De Angelis H*
9. The north Greenland Eemian ice drilling / *Hansson M*
10. The European Programme on Ice Coring in Antarctica / *Hansson M, Holmlund K, Karlin T*
11. Climate, glaciers and permafrost in the Swedish mountains / *Holmlund P*
12. Subglacial thermal conditions through a glacial phase / *Holmlund P*
13. The Japanese-Swedish Antarctic Expedition (JASE) / *Holmlund P, Hansson M, Ingvander S, Karlin T, Johansson M*
14. Terrestrial history of the Muonionalusta meteorites / *Hättestrand C*
15. Spatial and temporal snow accumulation patterns along an icedivide in Dronning Maud Land, Antarctica / *Ingvander S*
16. The hydrology and dynamics of the Greenland ice sheet / *Jansson, P*
17. Glacier mass balance and tree rings as indicators of atmospheric circulation / *Jansson P*
18. Spatial and temporal variations in surficial melt on the Greenland ice sheet and the effects on glacier dynamics / *Johansson M*
19. The north Greenland Eemian ice drilling / *Karlin T*
20. Nuclei of glacial inception: The role of Novaya Zemlya during the MIS3-2 glaciation of the Barents-Kara Seas region / *Kirchner N*
21. A Bayesian Hierarchical Modeling approach to investigate former ice shelf configurations in the Arctic Ocean region / *Kirchner N*
22. CARBO-north project / *Kuhry P*
23. Landscape partitioning and lability mapping of soil organic matter in permafrost terrain / *Palmtag J*
24. Simulation of the Cordilleran Ice Sheet through a glacial cycle / *Seguinot J*
25. Paleoglaciology of the northern sector of the Cordilleran ice sheet / *Stroeven A.P, Kleman J*
26. Paleoglaciology of the Shaluli upland on the SE Tibetan Plateau / *Fu P, Stroeven A.P, Hättestrand C, Heyman J*
27. Post YD deglaciation of the Fennoscandian ice sheet / *Stroeven A.P, Hättestrand C, Goodfellow B, Kleman J, Jansson K, Heyman J, Lundqvist J*
28. Glacial and climate history of Central Asia / *Stroeven A.P, Hättestrand C*

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Juri Palmtag

Julien Seguinot

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.

Ongoing projects

1. Reconstruction of environmental and climate changes in Vindelfjällen, northern Sweden, using lake sediments / *Berntsson A*
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. Climate vs past human use in mountain forest ecotones, Sweden The Scottish Pine Project / *Gunnarson B*
5. NEEM project / *Hansson M, Wastegård S*
6. Holocene Climate Variability in southern Greece / *Holmgren K, Finné M, Sundqvist H*
7. Holocene climate variability in southern Africa / *Holmgren K, Sundqvist H*
8. The urban mind - cultural and environmental dynamics / *Holmgren K, Finné M*
9. CARBO-North: Quantifying the carbon budget in northern Russia: past, present and future / *Kuhry P, Holzkämper S, Hugelius G, Palmtag J*
10. Holocene climate change in high latitudes recorded by stable isotopes in peat / *Kaislahti Tillman P*
11. A Bayesian Hierarchical Modeling approach to investigate former ice shelf configurations in the Arctic Ocean region / *Kirchner N*
12. Nuclei of glacial inception: The role of Novaya Zemlya during the MIS3-2 glaciation of the Barents-Kara Seas region / *Kirchner N*
13. Weichselian Ice dammed lakes - formation and climatic significance (WeIDFoCS) / *Kirchner N*
14. Cryo-CARB: Long Term Carbon Storage in Cryoturbated Arctic Soils / *Kuhry P, Hugelius G*
15. Landscape analysis, thermochronology, and the development of elevated passive continental margins / *Lidmar-Bergström K*

16. Stratigraphic Landscape Analysis and geomorphological paradigms: Scandinavia as an example of Phanerozoic uplift and subsidence / *Lidmar-Bergström K*
17. Plains, steps, and hilly relief in northern Sweden – review, interpretations, and implications / *Lidmar-Bergström K*
18. Tephrochronology of the north Atlantic region during the early Holocene / *Lind E, Wastegård S*
19. Landscape analysis for tectonic applications / *Lidmar-Bergström K*
20. Reconstructing Climate in the last millennium / *Moberg A*
21. Past climate variability and environmental change in southern Mozambique / *Norström E*
22. Vegetation development and introduction of cultural landscape in Småland, southern Sweden / *Regnell M*
23. Prehistoric farming in Västra Götaland, south-western Sweden / *Regnell M*
24. Prehistoric plant use, agriculture and environment in southern Sweden / *Regnell M*
25. Environmental changes in the eastern parts of Lake Mälaren, west of Stockholm, during the last 3000 years / *Risberg J*
26. Construction of palaeogeographical maps for eastern Svealand for the last 7000 years / *Risberg J*
27. Climate change in southern Mozambique during the last 4000 years / *Risberg J*
28. Climate change in northwestern Tanzania / *Risberg J*
29. Black carbon aspect of climate change / *Rosqvist G*
30. Modelling plant species dispersal in fragmented landscapes / *Cousins S, Schmucki R*
31. Early Holocene deglaciation and the Holocene thermal maximum at high latitudes as recorded by multi-proxy evidence / *Shala S, Helmens K*
32. DAPHNE - dated speleothem archives of the paleoenvironment / *Sundqvist H, Holmgren K*
33. Nonlinearities in the Arctic Climate System During the Holocene / *Sundqvist, H*
34. Sharpening the tools – improving tephrochronology around the Atlantic Sea / *Wastegård S*
35. SMART project (synchronising marine and ice-core records using tephrochronology) / *Wastegård S*
36. Potrok Aike Lake sediment archive drilling project / *Wastegård S*
37. MILLENNIUM: European climate over the last millennium / *Wastegård S, Moberg A, Rosqvist G, Bergman J, Schonning K, Gunnarson B, Grudd H, Berntsson A*
38. Current expansion and past dynamics of small-holder irrigation farming in African drylands - measuring landscape, labour and climate interactions / *Westerberg L-O*
39. Factors affecting mangroves of the Rufiji Delta and impact on the livelihood of surrounding communities / *Westerberg L-O, Mwansasu S, Dahlberg A*
40. Environmental change in northern Tanzania during the last 1000 years / *Öberg H*

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Coring at Fosenhalvøa, Norway. Photo: S. Wastegård

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 ecological 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.

Ongoing projects

1. Measuring environmental change in Darfur, Sudan: implications for the conflict / *Brown I*
2. Land use change and effects of functional and spatial connectivity on historical and present biodiversity patterns / *Cousins S, Aggemyr E*
3. Historical land use influence on dispersal and diversity of grassland species in rural landscapes / *Cousins S, Auffret A*
4. Modelling plant species dispersal in fragmented landscapes / *Cousins S, Scmuki R.*
5. Changes in wetland distribution and consequences for biodiversity and ecosystem services / *Cousins S, Ermold M*
6. A multiscale, cross-disciplinary approach to the study of climate change on natural resources, ecosystem services and biodiversity (EKOKLIM) / *Cousins S, Ermold M, Lindborg R, Plue J, Tränk L*
7. Linking management and feedback across scales in social-ecological systems - examples from forest ecosystem / *Eriksson I*
8. Effect of agricultural land use on biodiversity and function in Swedish wetlands / *Ermold M*
9. Studies of actual and medieval vegetation in summer farming areas of Snorre Sturlason, Iceland / *Ihse M*
10. Influence of Environmental and Social factors on Wildlife Dispersal Areas in Malagarasi-Moyovosi Ramsar Site, Western Tanzania / *Kalumanga E, Cousins S*
11. Harnessing Biodiversity for Sustaining Agricultural Production and Ecosystem Services (SAPES) / *Lindborg R*

12. Ecosystem services in agricultural landscapes: the development of a framework for assessing synergies and dealing with trade-offs among multiple services / *Lindborg R*
13. How do seed banks contribute to species persistence in fragmented landscapes/ *Plue J, Cousins S*
14. The effect of grazing and land use patterns in the inner archipelago / *Reimark J, Cousins S*
15. EMMA Environmental Mapping and Monitoring with Airborne laser and digital images / *Skånes H*
16. NILS (National inventory of landscapes in Sweden) hosted by Swedish University of Agricultural Sciences / *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 (Bert Bolin Centre for Climate Research)

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.



Wetland in agricultural landscape in Sörmland. Photo: S. Cousins.

Ongoing projects

1. Untangling the role of permafrost in determining the distribution of subsurface hydrologic flow pathways in the sub-arctic / *Dahlke H*
2. Unraveling the spatial variation of organic and inorganic carbon fluxes in two sub-arctic catchments in northern Sweden / *Dahlke H*
3. Pan-Arctic ice-water-biogeochemical system responses and social-ecological resilience effects in a warming climate / *Destouni G, Bring A, Lyon S*
4. Pan-Arctic hydrological and biogeochemical responses to climate change / *Destouni G, Mård Karlsson J, Lyon S, Dyurgerov M, Peterson G*
5. 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.*
6. Risk quantification for accidental pollutant spreading through subsurface water / *Destouni G, Persson K, Prieto C, Darracq A, Jarsjö J*
7. Modelling multi-phase flow in porous and fractured media / *Jarsjö J, Frampton A, Dessirier B*
8. Äspö Task Force, Task8 / *Frampton A, Jarsjö J*
9. DFN-modelling / *Frampton A*
10. Kristallint berg / *Frampton A*
11. Building value from transboundary water management and development / *Granit J*
12. The role of permafrost, hydrological and ecosystem shifts for arctic hydro-climatic interactions and carbon fluxes / *Jantze E*
13. Quantifying the potential of carbon dioxide storage, long-term retention and surface return flow minimization in Swedish bedrock / *Jarsjö J, Destouni G, Desouche C*
14. Mitigating agricultural pollution impacts on health and environment in the Aral Sea Basin / *Jarsjö J, Törnqvist R*
15. Modelling of regional hydro-climatic interactions, changes and feedbacks / *Gong L*
16. Modeling permafrost spatial distributions and thawing rates in arctic/sub-arctic Sweden using recession flow analysis / *Lyon S, Destouni G*
17. Analytical single-potential, sharp-interface solutions for regional seawater intrusion in sloping unconfined coastal aquifers, with pumping and recharge / *Koussis A.D, Mazi E, Destouni G*
18. Hydrological vulnerability thresholds and regime changes in coastal aquifers under sea-level change / *Mazi, E, Koussis A.D, Destouni G*
19. Classification and comparative study of Mediterranean coastal aquifers subject to climate changes with the use of the analytical single-potential, sharp-interface solution / *Mazi E*
20. Hydro-climatic trends and interactions in the Mediterranean region / *Mazi E, Destouni G*
21. Stream flow modeling and variation of runoff in a boreal landscape / *Nathanson M*
22. National Environmental Objectives in the Mountain Environment – management, future and conflict analysis / *Schlyter P, Stjernquist I*
23. The effect of biomass withdrawal on the nutrient balance in forest soils / *Schlyter P, Stjernquist I*
24. Hydrological modelling for climate-change impact assessment / *Seibert J, Teutschbein C*
25. Gruppmodelleringsbaserad analys av miljöanpassad upphandling av livsmedel och måltider: hinder, problem och möjligheter/ *Seibert J, Stjernquist I*
26. Determining and mapping spatial distributions and thawing rates of inland permafrost under climatic change in the Arctic and Sub-Arctic / *Sjöberg Y*
27. Mapping permafrost using ground penetrating radar for validation of hydrological modeling of permafrost distributions / *Sjöberg Y*

28. Modeling permafrost spatial distributions and thawing rates in arctic and sub-arctic Sweden using recession flow analysis / *Sjöberg Y*
29. Near-coastal spatiotemporal variation of temperature in response to insolation / *Vercauteren N*
30. 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 / *Warghagen D*

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2.5. The Bert Bolin Centre for Climate Research

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 Bert Bolin Centre for Climate 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 Bert Bolin Centre for Climate Research researchers in IPCC, and on the policy side in the climate commission of the Swedish government.

2.6. Navarino Environmental Observatory (NEO)

Navarino Environmental Observatory (NEO), a cooperation between Stockholm University, the Academy of Athens and TEMES S.A., the developer of Costa Navarino, is dedicated to research and education on the climate and the environment of the Mediterranean region. Located at Costa Navarino, NEO will develop into a dynamic hub where scientists from all over the world conduct frontline research, develop new tools and methods, as well as meet to exchange knowledge and ideas.

Covering a wide range of topics of both local and global relevance, the research activities of NEO are carried out by scientists from the Bert Bolin Centre for Climate Research at Stockholm University and the Atmospheric Environment Division of Biomedical Research at the Academy of Athens. Atmospheric composition and meteorological parameters are continuously monitored in order to track the origin of particulate and gaseous pollutants and detect climate change signals. Global and regional scale modeling is applied for climate projections and future pollution level simulations. Hydrological research, monitoring and evaluation are undertaken in order to understand past, present and future processes and to develop suitable water resource management strategies for the region. Tectonic, climate, environment and landscape studies are carried out on a long-term perspective, in order to understand the physical science basis of our earth, and on a short-term perspective, in order to understand the role of natural versus human induced climate/environmental changes. An important perspective is to analyze the role of physical factors in the context of tourism and urbanism. All monitoring activities are linked to international networks.

The establishment of NEO is a very important step toward strengthening Swedish-Greek cooperation in the area of climate and environmental research. The operation of NEO presents a real example of how the academic community and the private sector can work together to focus on issues of great importance to society and nature.



Students investigating an eroded river bed on the alluvial plain of Sparta, Greece. Photo: S. Cousins

3. Publications

Reviewed articles

1. Abbuehl, L.M., Norton, K.P., **Jansen, J.D.**, Schlunegger, F., Aldahan, A. and Possnert, G. 2011: Erosion rates and mechanisms of knick zone retreat inferred from ¹⁰Be measured across strong climate gradients on the northern and central Andes Western Escarpment. *Earth Surface Processes and Landforms*, 11, 1464-1473.
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Other publications 2011

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4. **Ihse, M.** 2011: Natur- och kulturmiljövårdens olika språk och världar. I L. Gren (red.) Samhällsförändringar och vården av natur och kultur. En debattskrift om natur- och kulturmiljövårdens utveckling under 100 år. *Riksantikvarieämbetets rapport 2011*, 82-95.
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8. **Ihse, M.**, Barklund, Å., Moström J., Sanders. B. and Sporrang U. 2011: Förord till Landskapsbegreppet - vad gör det för skillnad? *Kungliga Skogs- och Lantbruksakademins tidskrift KSLA-T*, nr 2011, årgång 150, 5- 8.
9. **Ihse, M.** 2011: Bakgrund till landskapsbegreppet och landskapsanalys. *Kungliga Skogs- och Lantbruksakademins tidskrift KSLA-T*, nr 2011, årgång 150, 9-12.
10. **Ihse, M.** 2011: Hur analyserar man ett landskap? *Kungliga Skogs- och Lantbruksakademins tidskrift KSLA-T*, nr 2011, årgång 150, 36-43.
11. **Ihse, M.** 2011. Alpblommor. Recension av Ewa Hellström-Boströms bok Alpblommor. *Fjället – Svenska Fjällklubbens tidskrift*, 4, 27-29.
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13. **Lundqvist, J.** 2011: Kampen om kvartär. *Geologiskt forum*, 2, 8-11.
14. **Lundqvist, J.**, Lundqvist, T., Lindström, M., Calner, M. and Sivhed, U. 2011: Sveriges Geologi, från urtid till nutid. 3:uppl. 628 pp. *Studentlitteratur*. Lund.
15. **Risberg, J.** and **Alm, G.** 2011: Landhöjning och strandförskjutning vid Långhundraleden. In: Arbetsgruppen Långhundraleden (eds): Nytt ljus över Långhundraleden. Bygder, båtar, natur, 40-49. ISBN 978-91-633-8925-2.
16. **Risberg, J.**, Isaksson, M. and **Alm, G.** 2011: Site location in the Stone Age landscape on the Södertörn peninsula, eastern middle Sweden: an ecological and economical approach. *Skrifter från Arkeologikonsult*, 1, 5-44.
17. **Risberg, J.** 2011: Landskapets förändringar vid Runsa fornborg de senaste 3000 åren. Runnhusa: bosättningen på berget med de många husen. Skrifter från projektet Runsa borg, Eds socken, Uppland. *Archaeologica*, 1.
18. **Schlyter, P.**, **Stjernquist, I.**, Sverdrup, H and Johansson, S.C.W. 2011: En gruppmodelleringsbaserad analys av miljöanpassad upphandling av livsmedel och måltider: hinder, problem och möjligheter. Miljöstyrningsrådet, Rapport 2011:8, pp 56.
19. **Schlyter, P.** and **Stjernquist, I.** 2011: Damage and environmental change in the forest. In: Jansson, U. 2011. Agriculture and forestry in Sweden since 1900. *National Atlas of Sweden & KSLA*, Stockholm

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



Traditionally managed pastures in Sörmland. Photo: S. Cousins.

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 1700 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:

- 1-30 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 parts 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
- Environment and Health Protection
- Environmental Protection and Physical Planning
- Geography
- Glaciology and Polar Environments
- 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, 15 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.

Geography, Physical Geography:

Elsa Aggemyr

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

Josefin Ahlkrona

Marginal ice dynamics: higher order modeling of ice streams and their impact on coupled ice sheet/ice shelf systems

Ingela Andersson

Implementing the European Water Framework Directive at local to regional level - Case Study Northern Baltic Sea River Basin District, Sweden

Alistair Auffret

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

Emma Bosson

Water balances and water exchange between deep groundwater and surface water in a periglacial landscape with Permafrost

Arvid Bring

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

Benoit Dessirier

Multi-phase flow in porous and fractured media

Sofia Eriksson

Cross-scale perspectives on heterogeneity in Swedish boreal forests

Martin Finné

Holocene climate variability in southern Greece

Matti Ermold

Changes in wetland distribution and consequences for biodiversity and ecosystem services

Ping Fu

Glacial Geomorphology of the Haizi Shan area, SE Tibetan Plateau

Jakob Granit

The Collective Action Dilemma in Managing Transboundary Freshwaters - An Analysis of an Outcome-Driven Framework

Christian Helanow

Theory for water routing through ice sheets

Gustaf Hugelius

Quantity and quality of soil organic matter in permafrost terrain

Susanne Ingvander

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

Elin Jantze

The role of permafrost, hydrological and ecosystem shifts for arctic hydro-climatic interactions and carbon fluxes

Fernando Jaramillo

Nutrient sources, retention-attenuation and transport in hydrological catchments under climate change

Malin Johansson

Remote sensing of supra-glacial lakes on the west Greenland Ice Sheet

Elikana Kalumanga

Movement and distribution of wild mammals in Malagarasi-Muyovozi Ramsar site, North-West Tanzania

Paul Krusic

Dendroclimatic reconstruction: Eastern Mediterranean region

Martin Margold

Paleoglaciological reconstructions using digital elevation models and satellite imagery

Ekaterina Mazi

Hydro-climatic trends and interactions in the Mediterranean region

Andrew Mercer

Accuracy of methods used for monitoring regional glacier mass balance changes

Shilpa Muliyl Asokan

Basin-scale hydrological impacts of climate and land use changes

Simon Mwansasu

Factors affecting mangroves of the Rufiji Delta and impact on the livelihood of surrounding communities

Johanna Mård Karlsson

Mapping Arctic social-ecological resilience to hydrological change

Marcus Nathanson

Stream flow modeling and variation of runoff in a boreal landscape

Juri Palmtag

Landscape partitioning and lability mapping of soil organic matter in permafrost terrain

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

Julien Seguinot

Simulation of the Cordilleran Ice Sheet through a glacial cycle

Ylva Sjöberg

Determining and mapping spatial distributions and thawing rates of inland permafrost under climatic change in the Arctic and Sub-Arctic

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:

Annika Berntsson

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

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

Carl Lilja

Synchronicity of late-glacial tephra horizons

Ewa Lind

Tephrochronology of the north Atlantic region during the early Holocene

Shyhrete Shala

Early Holocene deglacial environment and hypsithermal warming at high latitudes (N Fennoscandia) as recorded by multi-proxy evidence

Mats Regnell

Prehistoric plant use, agriculture and environment in southern Sweden

List of examinations for 2011

Name	Date	Degree
Sofia Eriksson	11 Feb 2011	PhD, Physical Geography
Gustaf Hugelius	25 Feb 2011	PhD, Physical Geography
Susanne Ingvander	11 Nov 2011	PhD, Physical Geography
Klas Persson	21 Nov 2011	PhD, Physical Geography
Ingela Andersson	23 Sep 2011	PhLic, Physical Geography
Ewa Lind	24 Oct 2011	PhLic, Quaternary Geology
Josefin Reimark	26 Oct 2011	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. Faculty opponent: 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. Faculty opponent: Prof. Robert W. Jacobel
- THOMAS SCHNEIDER, 2001. Hydrological processes in firn on Storglaciären, Sweden. Dissertation No. 19. Faculty opponent: Prof. Andrew Fountain
- HANS W. LINDERHOLM, 2001. Temporal and spatial couplings between tree-ring variability and climate in Scandinavia. Dissertation No. 20. Faculty opponent: Dr. Astrid Ogilvie
- MARIANNE I. LAGERKLINT, 2001. Marine multi-proxy records of late Quaternary climate change from the Atlantic Ocean. Dissertation No. 21. Faculty opponent: 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. Faculty opponent: Prof. William Adams
- ANDERS CLARHÄLL, 2002. Glacial Erosion Zonation - Perspectives on Topography, Landforms, Processes and Time. Dissertation No. 23. Faculty opponent: Dr. Chris Clark
- KRISTER N. JANSSON, 2002. Glacial geomorphology of north-central Labrador-Ungava, Canada. Dissertation No. 24. Faculty opponent: Dr. Andrée Bolduc
- BJÖRN E. GUNNARSON, 2002. Holocene climate and environmental fluctuations from subfossil pines in central Sweden. Dissertation No. 25. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: Doc. Timo Helle
- PER KLINGBJER, 2004: Glaciers and climate in northern Sweden during the 19th and 20th century. Dissertation No. 28. Faculty opponent: Dr. Georg Kaser
- OLA FREDIN, 2004. Mountain centred ice fields in northern Scandinavia Dissertation No. 29. Faculty opponent: 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. Faculty opponent: Dr. Adrian Hall

RICKARD PETTERSSON, 2004. Dynamics of the cold surface layer of polythermal Storglaciären, Sweden. Dissertation No. 31. Faculty opponent: 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. Faculty opponent: Prof. Augusto Mangini

LENA RUBENSDOTTER, 2006. Alpine lake sediment archives and catchment geomorphology; causal relationships and implications for paleoenvironmental reconstructions. Dissertation No. 33. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: Prof. Françoise Gasse

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

ANDERS BORGMARK, 2005: The colour of climate: changes in peat decomposition as a proxy for climate change. Dissertation No. 4. Faculty opponent: 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. Faculty opponent: Dr. Jane Sidall

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

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

ULF JONSELL, 2006: Sulfur in polar ice and snow. Interpretations of past atmosphere and climate through glacial archives. Dissertation No. 2. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: Dr. Clifford Voss.

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

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

AMÉLIE DARRACQ, 2007: Long-term development, modeling and management of nutrient loading to inland and coastal waters. Dissertation No. 10. Faculty opponent: 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. Faculty opponent: 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. Faculty opponent: Prof. Dennis Lettenmaier.
- MATTIAS DE WOUL, 2008: Response of glaciers to climate change – Mass balance sensitivity, sea level rise and runoff. Dissertation No. 13. Faculty opponent: Dr. Roger Braithwaite.
- BRADLEY W GOODFELLOW, 2008: Relict non-glacial surfaces and autochthonous blockfields in the northern Swedish mountains. Dissertation No. 14. Faculty opponent: 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. Faculty opponent: Prof. Donatella Magri.
- LINDA AMPEL, 2008: Dansgaard-Oeschger cycles and Heinrich events in western Europe – A diatom perspective. Dissertation No. 16. Faculty opponent: Prof. Sherilyn Fritz.
- GULL OLLI, 2008: Waterborne sediment and pollutant transport into lakes and accumulation in lake sediments. Dissertation No. 17. Faculty opponent: 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. Faculty opponent: Dr. Philip Barker.
- KARIN EBERT, 2009: Cenozoic landscape evolution in northern Sweden. Geomorphological interpretation within a GIS-framework. Dissertation No. 19. Faculty opponent: Prof. Paul Bishop.
- SOFIA ANDERSSON, 2010: Late Holocene humidity variability in central Sweden. Dissertation No. 20. Faculty opponent: Prof. Frank Chambers.
- JAKOB HEYMAN, 2010: Palaeoglaciology of the northeastern Tibetan Plateau. Dissertation No. 21. Faculty opponent: Prof. Frank Lehmkuhl.
- TIMOTHY JOHNSEN, 2010: Late Quaternary ice sheet history and dynamics in central and southern Scandinavia. Dissertation No. 22. Faculty opponent: Prof. James T. Teller.
- BRITTA SANNEL, 2010: Temporal and spatial dynamics in subarctic peat plateaus and thermokarst lakes. Dissertation No. 23. Faculty opponent: Prof. Serge Payette.
- THOMAS GRABS, 2010: Water quality modelling on landscape analysis: importance of riparian hydrology. Dissertation No. 24. Faculty opponent: Dr. Irena Creed.
- ERIKSSON SOFIA, 2011: Cross-scale perspectives on heterogeneity in Swedish boreal forests. Dissertation No. 25. Faculty opponent: Prof. Risto Kalliola.
- HUGELIUS GUSTAF, 2011: Quantity and quality of soil organic matter in permafrost terrain. Dissertation No. 26. Faculty opponent: Prof. Philip Wookey.

INGVANDER SUSANNE, 2011: Snow particle size investigations using digital image analysis - implications for ground observations and remote sensing of snow. Dissertation No. 27. Faculty opponent: Prof. Matti Leppäranta.

PERSSON KLAS, 2011: Quantifying pollutant spreading and the risk of water pollution in hydrological catchments - A solute travel time-based scenario approach. Dissertation No. 28. Faculty opponent: Prof. Aldo Fiori.

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

Erasmus exchange teacher in Ostrava/Czech republic / *Karin Ebert*

Invited lecture for Masters Students at University of Wroclaw, Poland / *Karin Ebert*

International Lectures: Modeling of palaeoshorelines of the Baltic Sea - University of Tartu, Institute of Ecology and Earth Sciences, Tartu, Estonia / *Jan Risberg*

Exchange programme and joint master programme with the Inst. of Environmental Science and Management, Univ. of Latvia, Latvia / *Peter Schlyter, Ingrid Stjernquist*

Field course for International Environmental Issues, April 2011, in co-operation with the Inst. of Environmental Science and Management, Univ. of Latvia, Latvia / *Peter Schlyter*

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

Green Enterprising and Innovation as a Component of Environmental Management Studies: A Swedish-Russian-Latvian Long-term Network Cooperation with the Russian State Hydrometeorological University, St Petersburg, Russia; the Arkhangelsk State Technical University, Arkhangelsk, Russia; Dept of Environmental Management, Univ of Latvia, Riga, Latvia and the Royal Institute of Technology, Stockholm, Sweden / *Peter Schlyter, Ingrid Stjernquist*

7.2. Student exchange

Erasmus exchange (coordinator: K. Ebert)

Bern University, Switzerland

Innsbruck University, Austria

Freiburg University, Germany

University of Burgundy, Dijon, France

University of Grenoble, France

University of Ostrava, Czech Republic

Leuven University, Belgium

Universities of Leuven and Brussels, Belgium

La Sorbonne, Paris, France

Université Pierre et Marie Curie, Paris, France



Plant survey of road verges in Japan. Collaboration with Kyoto University. Photo: S. Cousins

8. Conferences and seminars

January

Schlyter & Stjernquist: *Green enterprising for a sustainable Baltic region, Workshop GESBAR project, Moscow, Russia*
System analysis for environmental studies, seminar, Moscow, Russia

February

Frampton & Törnqvist: *Svenska hydrologiska rådet (SHR), Uppsala, Sweden*

Ermold: *Meeting of the Swedish Oikos Society in Tjärnö, Sweden*

Lind & Wastegård: *INTIMATE, workshop, Potsdam, Germany*

Holmgren &
Sundqvist: *3rd EQUA workshop, Zanzibar, Tanzania*

March

Brown: *Sentinels 4 Science (European Space Agency/ESRIN, Frascati, Italy)*

Kaislahti Tillman: *41st annual Arctic Workshop, Montreal, Canada*

Sjöberg: *March, Polarforum, Stockholm, Sweden*

Wastegård: *PASADO workshop, Montréal, Canada*

April

Applegate, Bring,
Dahlke, Frampton &
Johansson: *EGU, General Assembly, Vienna, Austria*

Ihse: *European Conference on Biodiversity and Climate Change- Science, Practice and Policy- Federal Agency of Nature Conservation, Bonn, Germany*

May

Kirchner: *2008 – 2011 and beyond*
Bolin Center Advisory Board Meeting, Stockholm University

Ihse: *Seminarium om Europeiska landskapskonventionen, Kungliga Skogs- och Lantbruksakademien, arrangerat av Riksantikvarieämbetet, Stockholm, Sweden*
Seminarium om Utgångspunkter och principer för hur kriterier kan utformas som underlag för att definiera ersättningsberättigade betesmarker, Jordbruksdepartementet, Stockholm, Sweden

Sjöberg: *The Arctic as a messenger for global processes - pollution and climate change, Copenhagen, Denmark*

June

Applegate & Kirchner: *5th APEX conference, Longyearbyen, Svalbard*

Schlyter & Stjernquist: *Lay, Local, Traditional Knowledge and Citizen Science: Their Roles in Monitoring and Assessment of the Environment. European Environmental Agency (EEA), Copenhagen, Denmark*

July

Applegate, Berntsson,
Lind, Kirchner, Margold,
Preusser, Sannel, Seguinot,
Shala & Wastegård: *INQUA-conference, Bern, Switzerland*

Preusser: *Luminescence and ESR dating conference, Torun, Poland*
Climate change and prehistoric occupation of the Arabian Peninsula, University of Bern, Switzerland

August

Auffret: *The 8th IALE World Congress - landscape ecology for sustainable environment and culture, Beijing, China*

Jantze: *The 18th Northern Research Basins (NRB) Workshop and Symposium, Norway*

Stjernquist: *The Delta Kappa Gamma Society International Conference, Baden-Baden, Germany*

September

Auffret: *Frontiers in Historical Ecology, Zürich, Switzerland*

Frampton: *Deep Hydrogeology Workshop, Uppsala, Sweden*

Ihse: *Miljöövervakning med landskapsperspektiv, förändring i fokus-, Svenska IALE, Umeå, Sweden*

Kirchner: *IMPAS. Workshop on Climate Modeling, Bolincenter, Såstaholm, Sweden*

Lyon: *Annual Krycklan Symposium, Umeå, Sweden*

Stjernquist: *The 9th IUFRO International Beech Symposium, Dresden, Germany*

Vercauteren: *EMS (European meteorological society) annual meeting and 10th European Conference on Applications of Meteorology, Berlin, Germany*

Wastegård: *BIOCOLD workshop, Palmse, Estonia*

October

Lyon, Mazi: *NEO workshop on Wetlands and Ecohydrology, Costa Navarino, Peloponnesos, Greece*

Ingvander, Jansson & Johansson: *International Glaciological Society – Nordic Branch Meeting 2011, Oslo, Norway*

Wastegård: *PASADO workshop, Erlangen, Germany
Marine Tephrochronology Meeting, London
Marine Radiocarbon and the INTIMATE timescale, London*

November

Preusser: *German LED meeting, Cologne, Germany*

Schlyter & Stjernquist: *Green Enterprising and the Innovation for a Sustainable Future. Conference within the project Green Enterprising and Innovation as a Component of Environmental Management Studies: A Swedish-Russian-Latvian Long-term Network Cooperation, Stockholm, Sweden*

December

Applegate, Dahlke
Frampton, Ingvander
Jantze & Lyon: *AGU, Fall Meeting, San Francisco, USA*



Traditionally managed paddy fields in Satoyama landscapes in Japan. Collaboration with Kyoto University. Photo: S. Cousins

9. Conference/Seminar convers, Editorships, PhD opponents

- Jansson: Editor-in-Chief, *Geografiska Annaler*, an international Wiley-Blackwell journal in Physical Geography, 2010–.
- Scientific Editor, *Zeitschrift für Gletscherkunde und Glazialgeologie* 2005–.
- Vice President, International Association of Cryospheric Sciences (IACS) of the International Union of Geodesy and Geophysics (IUGG) 2007–2011.
- Lyon: Licentiate examiner for Selome M. Tessema, Land and Water Resources Engineering, KTH, May
Licentiate examiner for Zahra Kalantari, Land and Water Resources Engineering, KTH, December
- Preusser: Member of organizing committee and of the scientific program committee of the XVIII. INQUA congress, Bern, Switzerland
Co-organizer of the workshop: Climate change and prehistoric occupation of the Arabian Peninsula, Bern, Switzerland
Editorial board member of the *Quaternary Science Reviews*, *Quaternary Geochronology*, *Journal of Quaternary Science*
- Schlyter & Stjernquist:
Green Enterprising and the Innovation for a Sustainable Future.
Conference within the project Green Enterprising and Innovation as a Component of Environmental Management Studies: A Swedish-Russian-Latvian Long-term Network Cooperation at Stockholm University
- Wastegård: PhD opponent, University of Bergen, Norway, January
Convener of Marine Tephrochronology Meeting, Royal Society of London, October

10. Financial support

GRANT ORGANIZATIONS

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>
NEO	<i>Navarino Environmental Observatory Research Program</i>
RAÄ	<i>Swedish National Heritage Board (Riksantikvarieämbetet)</i>
RS	<i>Swedish National Space Board (Rymdstyrelsen)</i>
SGU	<i>Geological Survey of Sweden (Sveriges geologiska undersökning)</i>
SIDA	<i>Swedish International Development Cooperation Agency (Styrelsen för internationellt utvecklingssamarbete)</i>
SKB	<i>Swedish Nuclear Fuel and Waste Management (Svensk kärnbränslehantering AB)</i>
SLU	<i>Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet)</i>
SU	<i>Stockholm University</i>
TEMPUS	<i>European Union's programme which supports the modernisation of higher education in the EU's surrounding area</i>
VR	<i>The Swedish Research Council (Vetenskapsrådet)</i>

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Brown/Ingvander/P Jansson	RS	Multi-scale investigations of microwve snowpack obeservations (MIMSO), (dnr139/10:1)	989 000
Brown	SIDA	Measuring environmental change in Dafur, Sudan: implications for the conflict, (SWE-2010-021)	400 000
Cousins/Plue	FORMAS	Hur kan fröbanker bidra till växters uthållighet i fragmenterade landskap vid en klimatförändring? (214-2010-1491)	507 500
De Angelis	Granholms stiftelse/SU	Fältarbete i Sydpatagonien, södra Sydamerika, mars 2012: Istjocklek och massbalansmätningar på tre glaciärer, (463-15-11)	74 000
Destouni/Cvetkovic	VR	Källor, retention-självrening och transport av närsalter i avrinningsområden under klimatförändring - Nutrient sources, retention-attenuation and transport in hydrological catchments under climate change, (VR621-2009-3221)	1 300 000
Frampton	SKB	DFN-modellering (en vetenskaplig artikel: On the significance of fracture network structure for advective transport) (Best.nr. 5531)	100 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Frampton	SKB	Flöde och transport i sprickigt kristallint berg (två vetenskapliga artiklar: Impact of transmissivity and length correlation on tracer transport in crystalline networks och The role of flow persistence in tracer pathways for random walk models in crystalline fracture networks) (Best.nr. 5535)	100 673
Hansson	VR	Vilken källa har den klimatpåverkade sulfataerosolen idag och igår, och vilken betydelse har framtida miljöförändringar för sulfataerosolens klimatpåverkan? - att förstå relevanta processer - Sulphur isotope studies of the atmospheric aerosol at present and in the past for predicting future climate change - understanding climate regulating processes, (VR621-2009-3596)	810 000
Helmens	SKB	Weichselian - Holocene climate variability and environment change in Scandinavia based on the Sokli sediment sequence, (Best.nr. 5112)	1 214 000
Holmgren	VR	Holocena klimatvariationer i södra Afrika. Konfrontation av paleoklimatdata, särskilt från speleothems, med isotop- och klimatmodellering, (VR621-2009-4397)	1 031 000
Holmgren	Gbg univ (SIDA)	Agreement regarding fund entrusted to the Swedish Institution as part of the Agreement on Research Cooperation between Sweden and The University of Dar es Salaam (UDSM) - Integrated Natural resource Mangement, (dnr2009-001882)	367 500
Holmlund	Strålskyddsmyndigheten	Temperaturförhållanden i en inlandsis - Vattenflöde och erosionsförmåga, (SSM 2010/1454)	1 093 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Jansson K m.fl	VR	Katastroftappningar av smältvattensjöar i Patagonien, Sydamerika: omfattning, timing, organisation och smältvattnets inverkan på den termohalina oceancirkulationen - Glacial lake outburst floods of Patagonia, South America: Size, Timing, Organisation and Impact, (VR621-2009-4411)	540 000
Jansson P	SKB	Glacialhydrologi på Grönland och i Fennoscandia - PhD-project to develop theory for water routing trough ice sheets based on Greenland field data and its application to the Fennoscandian Ice Sheet, (Best.nr.2729, 5326)	312 400
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)	400 000
Jarsjö/Frampton	SKB	Äspö Task Force, Task 8, (Best.nr. 5784)	550 000
Kleman m.fl	VR/FORMAS	Linnéansökan - SUCLIM - BBCC Climate evolution, varaibility and sensitivity (Garanterat t.o.m.2016)	3 874 500
Kleman m.fl	FORMAS	Linnéansökan - Forskarskola (Garanterat t.o.m. 2016)	500 000
Kleman/Nilsson	VR	Norra hemisfärens paleotopografi under den glaciala sista cykelns uppbyggnads-faser 115-21 kyr BP, och dess inverkan på atmosfärens cirkulation - Northern Hemisphere paleo-ice sheet topography during ice-sheet build-up phases 115-21 kyr BP, and its impact on atmospheric cirkulation, (VR621-2010-3839)	385 000
Kuhry	VR/ESF	Long-term Carbon Storage in Cryoturbated Arctic Soils CryoCARB, (VR824-2009-7357)	675 000
Lyon	SGU	Modeling permafrost spatial distributions and thawing rates in arctic/sub-arctic Sweden using recession flow analysis, (60-1626/2009)	300 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	AMOUNT
Moberg	VR	Forskaranställning perioden 100101--121231 - Rekonstruktion av klimatet under de senaste årtusendena, (VR622-2009-7515)	1 051 000
Norström	SIDA	Past climate variability and environmental change in southern Mozambique, (SWE-2009-080)	840 000
Risberg	RAÄ UV Öst	Stratigrafiska undersökningar av våtmark vid Kvarnbacken (RAÄ 59 o 69), Vadtenda, Östergötland.	43 296
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, (dnr 00914/2009)	52 500
Schlyter	Sv Institutet (SI)	Konferens - Green innovation and entrepreneurship for a sustainable future - how can education contribute?, S:t Petersburg 111023--24, inom ramen för Svenska institutets Östersjöprogram/ Visbyprogrammet, (dnr 00906/2011)	240 000
Stroeven/Clague, Fabel, Hubbard, Kirchner	VR	En simulering av Koordilleraisen under en nedis-ningscykel - Simulation of the Cordilleran Ice Sheet through a glacial cycle, (VR621-2008-3449)	675 000
Cousins	SU	Ansökan om medel för främjande av internationellt samarbete - Resanslag f forskningsinitierande aktiviteter - Resa till Kyoto Univ, Japan, (SU 463-36-11)	151 000
Hansson/m.fl.	Nordforsk	Cryosphere Atmosphereinteractions in a Chaning Arctic Climate - CRAICC (SU 463-88-11)	200 000
INK/SU (Kleman)	NEO	TEMES - Cooperation and partnership for climate and Environmental Research in the Mediterranean area trough Navarino Environmental Observatory (NEO) Research Program (SU 463-88-09)	2 500 000
INK/SU	SU	Klimatforskarskolan/INK (Fak.besl 110228)	1 250 000
Jansson m.fl.	EU	FP7 Consortium Agreement for Stability and Variations of Arctic Land	

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	Ice - SVALI, (SU 463-28-11) PROJECT	AMOUNT
Margold	SU	Ansökan om medel för främjande av internationellt samarbete - Resanslag f forskningsinitierande aktiviteter - Resa till Lomonosov Moscow State Univ, Ryssland, (SU 463-37-11)	
Rosqvist m.fl.	EU	FP7 Grant Agreement No 262693 - INTER ACT - International Network for Terrestrial Research and Monitoring in the Arctic, (SU 463-70-11)	6 600
Stroeven	SU	Ansökan om medel för främjande av internationellt samarbete - Resanslag f forskningsinitierande aktiviteter - Resa till Purdue Univ, USA, (SU 463-38-11)	342 000
Schlyter/Stjernquist	TEMPUS	TEMPUS förberedande besök i Ryssland jan 2011, (SU 463-172-10)	28 000
Totalt			22 902 969

11. Staff (autumn 2011)

Department Chairman/Head: Professor Arjen Stroeven
Vice Chairman: Dr Ingrid Stjernquist

PROFESSORS

Christiansson, Carl	Professor of Physical Geography,
Cousins, Sara	Professor of Physical Geography
Destouni, Georgia	Professor of Hydrology, Hydrogeology and Water Resources
Hansson, Margareta	Professor of Environmental Science with emphasis on Physical Geography/Quaternary Geology
Holmgren, Karin	Professor of Physical Geography
Holmlund, Per	Professor of Glaciology
Hättestrand, Clas	Professor of Physical Geography
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
Preusser, Frank	Professor of Quaternary Geology with emphasis on Environmental Reconstruction
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)

Arnberg, Wolter	senior lecturer
Dahlberg, Annika	senior lecturer
Helmens Femke, Karin	researcher
Jansson, Krister	senior lecturer
Jarsjö, Jerker	senior lecturer
Lindborg, Regina	senior lecturer
Lyon, Steve	senior lecturer
Moberg, Anders	researcher, also senior lecturer
Risberg, Jan	senior lecturer
Seibert, Jan	senior lecturer

PhD

Applegate, Patrick	postdoctor
Borgström, Ingmar	senior lecturer
Brown, Ian	researcher
Dahlke, Helen	postdoctor
De Angelis, Hernán	research associate
Ebert, Karin	researcher
Frampton, Andrew	associate senior lecturer
Gong, Lebing	postdoctor
Grudd, Håkan	researcher

Gunnarson, Björn	director of studies, researcher
Hind, Alistair	postdoctor
Hugelius, Carl-Gustaf	researcher
Hättestrand, Martina	researcher
Kirchner, Nina	senior lecturer
Malmström Ryner, Maria	researcher
Norström, Elin	researcher
Plue, Jan	postdoctor
Prieto, Carmen	research engineer
Rader, Romina	postdoctor
Sannel, Britta	senior lecturer
Schlyter, Peter	senior lecturer
Schmucki, Reto	postdoctor
Selroos, Jan-Olof	researcher
Skånes, Helle	senior lecturer
Stjernquist, Ingrid	senior lecturer
Sundqvist, Hanna	researcher
van der Velde, Ype	postdoctor
Vercauteren, Nikki	postdoctor
Westerberg, Lars-Ove	senior lecturer

PhLic, MSc, BSc

Eknert, Bo	PhLic, lecturer
Fridfeldt, Anders	BSc, lecturer, director of undergraduate studies
Karlsson, Sven	PhLic, researcher
Nordström, Anders	PhLic, senior lecturer
Regnell, Mats	PhLic, researcher
Trygger Bergman, Sophie	MSc, lecturer
Yrgård, Anders	PhLic, lecturer

Postgraduate students (PhLic, MSc, BSc)

Aggemyr, Elsa
 Ahlkrona, Josefin
 Andersson, Ingela
 Auffret, Alistair
 Berntsson, Annika
 Bosson, Emma
 Bring, Arvid
 Dessirier, Benoit
 Eriksson, Sofia
 Ermold, Matti
 Finné, Martin
 Fu, Ping
 Granit, Jakob
 Helanow, Christian
 Ingvander, Susanne
 Jantze, Elin
 Jaramillo, Fernando
 Johansson, Malin

Kaislahti Tillman, Päivi
Kalumanga, Elikana
Karlin, Torbjörn
Krusic, Paul
Lilja, Carl
Lind, Ewa
Margold, Martin
Mazi, Ekaterina
Mercer, Andrew
Muliyl Asokan, Shilpa
Mwansasu, Simon
Mård Karlsson, Johanna
Nathanson, Marcus
Palmtag, Juri
Persson, Klas
Reimark, Josefine
Seguinot, Julien
Shala, Shyhrete
Sjöberg, Ylva
Teutschbein, Claudia
Törnqvist, Rebecka
Warghagen, Dan
Öberg, Helena

Teaching assistants

Wennbom, Marika
Castro Matamoros, Ana
Dawson, Lucas
Gilljam, Carl
Jokinen, Johanna

ADMINISTRATIVE STAFF

Berggren, Berit	senior administrative officer
Blåndman, Susanna	BSc, BA, human resources administrator
Damberg, Maria	MSc, study advisor
Hansson, Erik	MSc, educational administrator
Henriksson, Carina	University certified administrator, senior administrative officer
Hörnby, Kerstin	MSc, educational administrator
Isdal, Maija-Liisa	BSc, financial administrative officer
Kalivitis, Nikos	PhD, station manager Navarino Environmental Observatory
Kesselberg, Margareta	BA, BBCC administrator and informant
Reuterswärd, Karin	PhLic, educational administrator
Richert, Linus	administrator
Schaffer, Christina	MSc, educational administrator
Stenberg de Serves, Malin	PhD, informant
Sturesson, Elisabeth	MSc, educational administrator
Åkerblom, Lena	higher administrative officer

TECHNICAL STAFF

Alm, Göran	PhLic, systems engineer
Boyd, Meighan	research assistant
Brotén, Bengt	technician
Cabrera, Yanduy	caretaker
Jacobson, Rolf	web editor
Lybäck, John	systems engineer
Morén, Björn	research assistant
Plikk, Anna	research assistant
Skantz, Johan	caretaker
Spångberg, Martin	systems engineer
Tränk, Louise	MSc, GIS modeling
Lindgren, Jessica	MSc, research assistant
Törnberg, Henrik	MSc, technician, Tarfala Research Station

PROFESSORS EMERITI

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