

# ANNUAL REPORT 2014

MALIN STENBERG DE SERVES (ED.)



Students of the Master course "Polar and Alpine environments" watching the view from an esker. Close to Värriö, north-eastern Finland. Photo: Karin Ebert.

## 1. Introduction

The Department of Physical Geography and Quaternary Geology (from 1 January 2015: Department of Physical Geography) is one of the larger departments at Stockholm University and is the largest Earth Science and Geography department in northern Europe. Here, professors, lecturers, researchers, PhD students and technical/administrative staff, coming from around the world, together create a dynamic research and education environment. 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 prize winning education to current and prospective students.

We conduct multi-disciplinary research in the fields of environmental, resource use and sustainability issues; geography; geomorphology and glaciology; hydrology and water resources; landscape ecology; paleoclimatology and quaternary geology; and remote sensing and geographical information systems (GIS). The department is equipped with a state-of-the-art GIS and remote sensing cluster, and microscopy, sediment and dendroclimatology laboratories. We have field activities at two research stations: one in the Kebnekaise mountains of Sweden (Tarfala Research Station) and one in Greece (Navarino Environmental Observatory).

Our research is oriented towards furthering our understanding of short- and long term natural conditions and processes of the world we live in, the impacts of society on the natural environment, and societal responses to environmental challenges. We thereby investigate the fields of global environmental changes, our natural environment and its interaction with human societies. The behavior of past and present systems and interactions between systems are modelled for predictions of future trends.

The department takes pride in providing a broad high-quality education at undergraduate, Masters, and Ph.D. levels, attended by students from all over the globe. Our educational mission is to provide an environment in which the students develop the knowledge, intellectual skills, and technical and communicative skills required to synthesize information, think critically, and develop solutions as the basis for success in employment or academic careers.

We carry 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. Doctoral education consists of four years and, given its high standard and international staff, it constitutes an important cornerstone of the department's profile.

Karin Holmgren  
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 (prof. emeritus 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 intervals: the entire quaternary period (last 2.5 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.



Field work in Tarfala. Photo: Gunhild Rosqvist.

## *Ongoing projects*

1. Snow volume estimation from InSAR / *Brown I*
2. Multi-scale investigations of microwave snowpack observations (MIMSO) / *Brown I, Ingvander S, Jansson P*
3. Modelling the transfer of supraglacial meltwater to the bed of glaciers through moulins and lake drainages / *Clason C*
4. Modelling the Late Weichselian Scandinavian Ice Sheet and its sensitivity to surface meltwater-enhanced basal sliding / *Clason C*
5. Investigating flow pathways and transit times for the dispersal of hydrocarbon pollution on Rabots glacier, Kebnekaise / *Clason C*
6. Mapping and analysis of glacial geomorphology from multibeam bathymetry on the bed of the Baltic Sea and the Gulf of Bothnia / *Clason C*
7. The impact of glacial erosion on northern shields (GEONORTHS) / *Ebert K, Kleman J*
8. The north Greenland Eemian ice drilling (NEEM) / *Hansson M*
9. The European Programme on Ice Coring in Antarctica (EPICA) / *Hansson M*
10. Erosion of Tibet investigated using cosmogenic nuclide analysis / *Heyman J*
11. Climate, glaciers and permafrost in the Swedish mountains / *Holmlund P*
12. Subglacial thermal conditions through a glaciation 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. The hydrology and dynamics of the Greenland ice sheet / *Jansson, P*
16. Glacier mass balance and tree rings as indicators of atmospheric circulation / *Jansson P*
17. Frozen landscapes in transition:improving predictions of ice sheet stability in a warming world by numerical modeling / *Kirchner N*
18. Marginal ice dynamics / *Kirchner N*
19. CARBO-north project / *Kuhry P*
20. PAGE21: Changing Permafrost in the Arctic and its Global Effects in the 21st Century / *Kuhry P, Hugelius G*
21. DEFROST: Impacts of a changing cryosphere - depicting ecosystem-climate feedbacks from permafrost, snow and ice / *Kuhry P, Hugelius G*
22. Ensuring disaster risk reduction via sustainable wetland development in Zambia / *Steve Lyon S, Lindborg R*
23. Landscape partitioning and lability mapping of soil organic matter in permafrost terrain / *Palmtag J*
24. On the age and origin of glacial overdeepening in the Alps / *Preusser F*
25. The fate of hydrocarbon pollution in Kebnekaise / *Rosqvist G, Jarsjö J*
26. Simulation of the Cordilleran Ice Sheet through a glacial cycle / *Seguinot J, Stroeven A.P, Kleman J, Zhang Q*
27. Paleoglaciology of the northern sector of the Cordilleran ice sheet / *Stroeven A.P, Margold M*
28. Paleoglaciology of the Shaluli upland on the SE Tibetan Plateau / *Fu P, Stroeven A.P, Hättestrand C, Heyman J*
29. Deglaciation of the Fennoscandian ice sheet / *Stroeven A.P, Kleman J, Hättestrand C, Goodfellow B, Rosqvist, G, Jansson K, Heyman J, Lundqvist J*
30. Glacial and climate history of Central Asia / *Blomdin R, Gribenski N, Harbor J, Stroeven A.P, Hättestrand C, Jansson K, Preusser F, Heyman J*

*Staff affiliations*

Margareta Hansson, Professor (see also 2.2)  
Jon Harbor, visiting Professor  
Per Holmlund, Professor  
Clas Hättestrand, Professor (see also 2.2)  
Peter Jansson, Professor  
Johan Kleman, Professor (see also 2.2, 2.3)  
Peter Kuhry, Professor (see also 2.2)  
Frank Preusser, Professor (see also 2.2)  
Gunhild Rosqvist, Professor (see also 2.2)  
Arjen Peter Stroeven, Professor (see also 2.2)

Jan Lundqvist, Professor emeritus (see also 2.2)

Karin Helmens, Docent (see also 2.2)  
Krister Jansson, Docent (see also 2.2, 2.3)  
Nina Kirchner, Docent (see also 2.2)

Caroline Clason, PhD  
Ingmar Borgström, PhD (see also 2.2)  
Ian Brown, PhD (see also 2.3)  
Karin Ebert, PhD (see also 2.2)  
Bradley Goodfellow, PhD (see also 2.2)  
Jakob Heyman, PhD  
Gustaf Hugelius, PhD  
Susanne Ingvander, PhD  
Britta Sannel, PhD (see also 2.2, 2.3, 2.4)

*Postgraduate students:*

Annika Berntsson (see also 2.2)  
Ping Fu  
Torbjörn Karlin (see also 2.2)  
Juri Palmtag  
Julien Seguinot  
Matthias Siewert  
Niels Weiss



## 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 apply computer simulations to study the functional behaviour of the climate system under conditions different from those of today and to investigate how glaciers, ice sheets and global sea level are affected by climatic change. We also develop statistical methods to compare paleo-proxy data and climate model simulations.



Coring for sediments in a wetland, Cherangani Hills, Kenya. A current project explores climatic variation during the last c. 1000 years. Photo L-O Westerberg.

## Ongoing projects

1. Reconstruction of environmental and climate changes in Vindelfjällen, northern Sweden, using lake sediments / *Berntsson A*
2. Speleothems in Warm Climates – Holocene records from the Caribbean and Mediterranean / *Boyd M*
3. Current expansion and past dynamics of small-holder irrigation farming in African drylands, measuring landscape, labor and climate interactions / *Caretta MA, Börjeson L, Westerberg L-O*
4. Measuring earthquake periodicity and calculating chemical weathering rates with a portable XRF and cosmogenic isotopes/ *Fritzon R, Goodfellow B, Stroeven A.P, Skelton A*
5. Precipitation control on chemical weathering / *Goodfellow B*
6. Chemical and mechanical processes of granitoid weathering / *Goodfellow B*
7. Controls of tor formation, Cairngorm Mountains, Scotland / *Goodfellow B*
8. Multiproxy dendroclimatology in Greece / *Grudd H, Krusic P*
9. Tree-ring density and stable isotopes from Torneträsk, northern Sweden / *Grudd H*
10. Pollution investigations in trees / *Grudd H*
11. Finding the key to shipwreck preservation / *Grudd H*
12. Climate vs past human use in mountain forest ecotones, Sweden The Scottish Pine Project / *Gunnarson B*
13. The north Greenland Eemian ice drilling (NEEM) / *Hansson M, Wastegård S*
14. Environmental history and climate change in relation to historical land use changes in East Africa / *Higgins L, Westerberg L-O, Risberg J*
15. Holocene Climate Variability in southern Greece / *Holmgren K, Finné M, Sundqvist*
16. Holocene climate variability in southern Africa / *Holmgren K, Sundqvist H, Zhang Q*
17. Late Quaternary climate variability and vegetation dynamics in southern Greece / *Holmgren K, Boyd M, Finné M, Norström E, Sundqvist H*
18. European isotope-climate reconstruction for the last 2000 years based on lake sediments, speleothems and treerings / *Sundqvist, Holmgren K*
19. Formation and age of Veiki moraine, northern Sweden / *Hättestrand M, Hättestrand C*
20. Frozen landscapes in transition:improving predictions of ice sheet stability in a warming world by numerical modeling / *Kirchner N*
21. CARBO-North: Quantifying the carbon budget in northern Russia: past, present and future / *Kuhry P, Holzkämper S, Hugelius G, Palmtag J*
22. Cryo-CARB: Long Term Carbon Storage in Cryoturbated Arctic Soils / *Kuhry P, Hugelius G*
23. Key sites for relief identification on the South Swedish Dome / *Lidmar-Bergström K*
24. Plains, steps, hilly relief, and valleys in northern Sweden – review, interpretations, and implications for conclusions on Phanerozoic tectonics / *Lidmar-Bergström K*
25. Tephrochronology of the north Atlantic region during the early Holocene / *Lind E, Wastegård S*
26. Ensuring disaster risk reduction via sustainable wetland development in Zambia / *Steve Lyon S, Lindborg*
27. Cross-timescale perspective on Modern River Deltas: Insights from Save River Delta, Mozambique / *Massuanganhe E, Westerberg L-O, Risberg J, Alm G*
28. Climate data-model comparisons for the last millennium / *Moberg A, Grudd H*
29. A statistical framework for comparing paleoclimate data and climate model simulations / *Moberg A, Zhang Q*
30. Euro-Atlantic climate variability during the last millennium: atmospheric circulation and extreme events / *Moberg A*



31. Past climate variability and environmental change in southern Mozambique / *Norström E*
32. Landslides in the central Kenyan highlands: Risks and actors / *Nylund M, Westerberg L-O, Borgström I*
33. Climate dynamics and environmental change during the Eemian Interglacial (MIS 5e) in Fennoscandia inferred from a unique sediment sequence at Sokli (northern Finland) / *Pliikk A, Helmens K*
34. Holocene climate and glacier change in northern Sweden / *Rosqvist G*
35. Reconstructions of past changes in precipitation using geochemical signatures in lake sediments / *Rosqvist G*
36. Environmental changes in the eastern parts of Lake Mälaren, west of Stockholm, during the last 8000 years / *Risberg J*
37. Construction of palaeogeographical maps for eastern Svealand for the last 7000 years / *Risberg J*
38. Climate change in southern Mozambique during the last 4000 years / *Risberg J*
39. Climate change in northwestern Tanzania / *Risberg J*
40. Black carbon aspect of climate change / *Rosqvist G*
41. Modelling plant species dispersal in fragmented landscapes / *Cousins S, Schmucki R*
42. Early Holocene deglaciation and the Holocene thermal maximum at high latitudes as recorded by multi-proxy evidence / *Shala S, Helmens K*
43. Constraining the chronology of glacial advances on Svalbard–Kapp Ekholm revisited / *Preusser F*
44. Reconstructing the environmental history of Arabia / *Preusser F*
45. Towards a revised chronology of the glaciation history of northern Switzerland / *Preusser F*
46. Geoarchaeology of Amiternum, central Italy / *Preusser F*
47. Testing the potential of OSL to date glacial sediments from Estonia / *Preusser F*
48. Reconstructing sea-level change on Ruhnu Island, Baltic Sea / *Preusser F*
49. Geoarchaeology of Beidha, Jordan / *Preusser F*
50. Investigating potential geohazards along the coast of Oman / *Preusser F*
51. Landslide scars in the Kenyan highlands: Physical and chemical topsoil changes and landslide susceptibility assessment under tropical conditions / *Wahlstrand A, Borgström I, Westerberg L-O*
52. Sharpening the tools—improving tephrochronology around the Atlantic Sea / *Wastegård S*
53. SMART project (synchronising marine and ice-core records using tephrochronology) / *Wastegård S*
54. Potrok Aike Lake sediment archive drilling project / *Wastegård S*
55. Factors affecting mangroves of the Rufiji Delta and impact on the livelihood of surrounding communities / *Mwansasu S, Westerberg L-O, Brown I, Dahlberg A*
56. Greenland in a warming Arctic / *Zhang Q, Li Q*
57. Atmospheric modelling using space-based observations of stable water isotopes / *Zhang Q*

#### *Staff affiliations*

Sara Cousins, Professor (see also 2.3)  
 Margareta Hansson, Professor (see also 2.1)  
 Karin Holmgren, Professor  
 Clas Hättstrand, Professor (see also 2.1)

Johan Kleman, Professor (see also 2.1, 2.3)  
Peter Kuhry, Professor (see also 2.1)  
Frank Preusser, Professor (see also 2.1)  
Gunhild Rosqvist, Professor (see also 2.1)  
Arjen Peter Stroeven, Professor (see also 2.1)  
Stefan Wastegård, Professor

Wibjörn Karlén, Professor emeritus  
Karna Lidmar-Bergström, Professor emerita  
Jan Lundqvist, Professor emeritus (see also 2.1)  
Urve Miller, Professor emerita

Annika Dahlberg, Docent  
Karin Helmens, Docent  
Steffen Holzkämper, Docent  
Krister Jansson, Docent (see also 2.1, 2.3)  
Nina Kirchner, Docent (see also 2.1)  
Anders Moberg, Docent  
Jan Risberg, Docent

Ingmar Borgström, PhD (see also 2.1)  
Karin Ebert, PhD (see also 2.1)  
Brad Goodfellow, PhD (see also 2.1)  
Håkan Grudd, PhD  
Björn Gunnarson, PhD  
Jakob Heyman, PhD  
Alistair Hind, PhD  
Martina Hättestrand, PhD  
Gustaf Hugelius, PhD (see also 2.3)  
Qiang Li, PhD  
Sven Karlsson, PhLic  
Anders Nordström, PhLic  
Elin Norström, PhD  
Britta Sannel, PhD (see also 2.1, 2.3, 2.4)  
Hanna Sundqvist, PhD  
Lars-Ove Westerberg, PhD (see also 2.4)  
Qiong Zhang, PhD  
Helena Öberg, PhD

*Postgraduate students:*

Annika Berntsson (see also 2.1)  
Meighan Boyd  
Martin Finné  
Ping Fu  
Lindsey Higgins  
Charlotta Högberg  
Torbjörn Karlin (see also 2.1)  
Ewa Lind, PhLic  
Elidio Massuanganhe  
Simon Mwansasu,

Michaela Nylund  
Anna Plikk  
Mats Regnell, PhLic  
Shyhrete Shala  
Anna Wahlstrand



The picture shows stalagmite EH1, which was collected from Alepotrypa Cave, Greece in 2014.

The middle dark section contains a large amount of charcoal and dust from the burning of animal dung in the cave. This activity occurred between 8000-5000 years BP, during the Neolithic period, while the cave was inhabited.

The cave closed during an earthquake, and the clear material at the top of the stalagmite grew while there were no people in the cave.

This stalagmite has been used as a proxy for human activity, for vegetation and soil biological activity above the cave, and for rainfall amount during the Holocene.

Photo: Meighan Boyd.

## 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.



Remnant habitats (deciduous forests and grasslands) important for species richness in an intensively managed agricultural landscape in Selaön, south-eastern Sweden. Photo: Sara Cousins.



### *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. Changes in wetland distribution and consequences for biodiversity and ecosystem services / *Cousins S, Ermold M*
5. 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, Auffret A, Lindgren J*
6. Linking management and feedback across scales in social-ecological systems - examples from forest ecosystem / *Eriksson I*
7. Effect of agricultural land use on biodiversity and function in Swedish wetlands / *Ermold M*
8. Studies of actual and medieval vegetation in summer farming areas of Snorre Sturlason, Iceland / *Ihse M*
9. Woody or treeless pastures? Linking subsidy systems, farmers decisions and management for understanding biodiversity patterns / *Jakobsson S, Lindborg R*
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. Ensuring disaster risk reduction via sustainable wetland development in Zambia / *Steve Lyon S, Lindborg*
15. EMMA Environmental Mapping and Monitoring with Airborne laser and digital images / *Skånes H*
16. NorthScape (Nordic network for land use and land-cover monitoring). A Network project between Denmark, Norway, Sweden, Iceland and Finland / *Skånes H*
17. Habitat restoration in fragmented landscapes: effects on biodiversity and ecosystem functions / *Waldén E, Lindborg R*

### *Staff affiliations*

Sara Cousins, Professor (see also 2.2)

Johan Kleman, Professor (see also 2.1, 2.2)

Carl Christiansson, Professor emeriti

Margareta Ihse, Professor emerita

Krister Jansson, Docent (see also 2.1, 2.2)

Regina Lindborg, Docent

Alistair Auffret, PhD

Ian Brown, PhD (see also 2.1)  
Karin Ebert, PhD (see also 2.1, 2.2)  
Gustaf Hugelius, PhD (see also 2.2)  
Jan Plue, PhD  
Britta Sannel, PhD (see also 2.1, 2.2, 2.4)  
Peter Schlyter, PhD (see also 2.4)  
Helle Skånes, PhD

*Postgraduate students:*

Elsa Aggemyr  
Matti Ermold  
Simon Jakobsson  
Elikana Kalumanga  
Jessica Lindgren  
Emelie Waldén

## 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.



Kongsfjorden, Svalbard. Photo: Ewa Lind.

## Ongoing projects

1. Finding the source: Where does the excess water in Arctic rivers come from? / *Bring A*
2. Pan-Arctic ice-water-biogeochemical system responses and social-ecological resilience effects in a warming climate / *Destouni G, Bring A, Lyon S*
3. Pan-Arctic hydrological and biogeochemical responses to climate change / *Destouni G, Mård Karlsson J, Lyon S, Dyurgerov M, Peterson G*
4. 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.*
5. Risk quantification for accidental pollutant spreading through subsurface water / *Destouni G, Persson K, Prieto C, Darracq A, Jarsjö J*
6. FutureLearn: Utveckling av ett simulerings- och visualiseringsverktyg för flöde- och transportprocesser inom hydrologisk utbildning / *Frampton A*
7. Flow and tracer transport in crystalline fractured media / *Frampton A*
8. The role of permafrost, hydrological and ecosystem shifts for arctic hydro-climatic interactions and carbon fluxes / *Janze E*
9. Modelling multi-phase flow in porous and fractured media / *Jarsjö J, Frampton A, Dessirier B*
10. The role of permafrost, hydrological and ecosystem shifts for arctic hydro-climatic interactions and carbon fluxes / *Janze E*
11. Quantifying the potential of carbon dioxide storage, long-term retention and surface return flow minimization in Swedish bedrock / *Jarsjö J, Destouni G, Desouche C*
12. Mitigating agricultural pollution impacts on health and environment in the Aral Sea Basin / *Jarsjö J, Törnqvist R*
13. Improved streamflow and flood monitoring using remotely sensed LiDAR data / *Lam N, Lyon S, Nathansson M*
14. The invisible carbon – an early indication of ecosystem change / *Lyon S*
15. LiDAR 2.0: better utilization of current and next generation LiDAR data / *Lyon S*
16. Development of simulation and visualization tools for flow and transport processes in hydrological education / *Frampton A, Lyon S, Jarsjö J*
17. Water resources effects of land-water management in Tanzania, Africa / *Lyon S, Jarsjö J, Lindborg R, Dahlke H, Holmgren K*
18. Cross-scale modeling of coupled hydrological-permafrost interactions and carbon transport in a changing climate / *Lyon S, Frampton A*
19. Ensuring disaster risk reduction via sustainable wetland development in Zambia / *Lyon S, Lindborg R*
20. The Dynamics of Mountains, Landscape, and Climate in the Distribution and Generation of Biodiversity in the Amazon/Andean Forest (US National Science Foundation) / *Manzoni S*
21. Controls over C Sequestration: Physiology vs. Physics (US National Science Foundation) / *Manzoni S*
22. Quantifying a safe operating space for human use of coastal groundwater under multiple change pressures/ *Mazi A*
23. Seawater intrusion risks and controls for safe use of coastal groundwater under multiple change pressures - Analytical evaluation and exemplification for Mediterranean aquifers / *Mazi, A*
24. Intensively exploited Mediterranean aquifers: resilience to seawater intrusion and proximity to critical thresholds / *Mazi, A*
25. Classification and comparative study of Mediterranean coastal aquifers subject to climate changes with the use of the analytical single-potential, sharp-interface solution / *Mazi A*



26. Hydro-climatic trends and interactions in the Mediterranean region / *Mazi A, Destouni G*
27. Identifying key landscape features which contribute to the ecosystem service of waterborne nutrient and pollutant retention / *Quin A, Destouni G*
28. National Environmental Objectives in the Mountain Environment – management, future and conflict analysis / *Schlyter P, Stjernquist I*
29. The effect of biomass withdrawal on the nutrient balance in forest soils / *Schlyter P, Stjernquist I*
30. Hydrological modelling for climate-change impact assessment / *Seibert J, Teutschbein C*
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32. Determining and mapping spatial distributions and thawing rates of inland permafrost under climatic change in the Arctic and Sub-Arctic / *Sjöberg Y*
33. Mapping permafrost using ground penetrating radar for validation of hydrological modeling of permafrost distributions / *Sjöberg Y*
34. Modeling permafrost spatial distributions and thawing rates in arctic and sub-arctic Sweden using recession flow analysis / *Sjöberg Y*
35. Green Infrastructures for ecological sustainability and human well-being: a network of forest rural and urban landscapes as laboratories for integrative research / *Stjernquist I*

#### *Staff affiliations*

Georgia Destouni, Professor

Jerker Jarsjö, Docent

Steve Lyon, Docent

Arvid Bring, PhD

Andrew Frampton, PhD

Stefano Manzoni, PhD

Anders Nordström, PhLic

Carmen Prieto, PhD

Andrew Quin, PhD

Britta Sannel, PhD (see also 2.1, 2.2, 2.3)

Peter Schlyter, PhD (see also 2.3)

Ingrid Stjernquist, PhD

Claudia Teutschbein, PhLic

#### *Postgraduate students:*

Benoit Dessirier

Fernando Jaramillo

Elin Jantze

Alexander Koutsouris

Norris Lam

Aikaterini Mazi

René Mbanguka

Johanna Mård Karlsson

Jan Pietron

Ylva Sjöberg

Rebecka Törnqvist

## 2.5. The Bolin Centre for Climate Research

Founded in 2006, the Bolin Centre for Climate Research is a multi-disciplinary consortium of researchers led by Stockholm University that conducts fundamental research on critical processes in the climate system. It involves researchers mainly from the Faculty of Science, Stockholm University as well as the Rossby Centre and KTH. The research program strives to understand natural climate evolution and variability, as well as changes imposed by the increasing human impact on the Earth System. It aims to build next generation expertise and knowledge on climate-influencing processes, over a range of time-scales and subsystems while addressing related societal issues. The challenge is to effectively harness national scientific expertise in a growing international effort to understand, mitigate and adapt to climate change.

*The research is structured into six multidisciplinary cross departmental research areas:*

- Oceans-atmosphere dynamics and climate
- Clouds, aerosols, turbulence and climate
- Hydrosphere, Cryosphere and Climate
- Biogeochemical cycles and climate
- Historical to millennial climate variability
- Orbital to tectonic climate variability



Climate modelling, database management and a Climate Research School are cross-cutting activities. This research is implemented through the coordination of the Bolin Centre Directorate, the oversight of the Bolin Centre Board and the guidance of external and internal Science Advisory Boards.

The Bolin Centre for Climate Research is a collaboration between the Departments of Meteorology, Environmental Science and Analytical Chemistry, Physical Geography and Geological Sciences at Stockholm University together with FLOW at KTH Royal Institute of Technology and the Rossby Centre at the Swedish Meteorological and Hydrological Institute.

## 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.



Navarino Environmental Observatory in Peloponnese, Greece. Photo: Giorgos Maneas.

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.

## 2.7. Tarfala Research Station

Tarfala research station is owned and run by Stockholm University and it is open between mid-March to early May and from late June to mid-September. The station is located in northern Sweden, 200 km north of the Arctic circle. Every year researchers and students worldwide visit Tarfala to study the effects of climate on glaciers, rivers, the sub-Arctic alpine ecosystem and landforms.

Tarfala Research Station has its own program for monitoring climate effects on sub-Arctic nature including measurements of glacier mass balance, mountain meteorology, glacial hydrology, snow-chemistry, permafrost, and high-alpine vegetation development. This data provides scientists with a unique and detailed record of short- and long-term effects of climate change.

Four glaciers are located in the Tarfala valley of which Storglaciären is the most well known and one of the best studied glaciers in the world. The elevation of the Kebnekaise south summit was measured to be 2097,5 m the 27 August 2014 and it is for the moment Sweden's highest peak!



Starting up the winter / spring season in March at Tarfala Research Station. Photo: Gunhild Rosqvist.



### 3. Publications 2014

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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



Students on the Biology-Earth Science program doing field work close to Navarino Environmental Observatory at Gialova lagoon in Greece. Photo: Christina Schaffer.

## 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 offers education at undergraduate (bachelor's) level in geography, earth sciences, integrated biology-earth science, and in environmental studies. In addition, a wide spectrum of graduate (master's level) programmes and courses are given, reflecting the research profiles of the department. Every year almost 2000 students attend our undergraduate and graduate education.

At Stockholm University degrees are structured as:

First cycle: 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 credits, corresponding to approximately 20 study weeks, and a full study year is composed of 60 credits, corresponding to 40 study weeks.

### 5.1. Bachelor's level (First Cycle)

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 credits, which correspond to three years of full-time studies:

1-30 credits: Geography I, 30 credits

31-60 credits: Geography II, 30 credits

61-90 credits: Geography III, 30 credits

91-165 credits: Elective and Optional courses

166-180 credits: Geography, Degree Project (Bachelor's Thesis), 15 credits

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 around 100 students start 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 independent 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 globalization is steadily increasing.





Geography students on a field course to New Zealand at Fox Glacier. Photo: Britta Sannel.

#### *Bachelor's Programme in Earth Science*

The Bachelor's Programme in *Earth Science* (180 credits) is given in collaboration with the Department of Geological Sciences 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 credits) consists of mandatory courses where students learn the basics in earth science: Physical Geography and Quaternary Geology (30 credits) and Geology (30 credits), respectively. After the first year the students specialize within Physical Geography, Hydrology, Quaternary Geology, Geology, Marine Geoscience, or Geochemistry. The programme is completed with a 15 credits 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 and Hydrogeology. Together with the Department of Geological Sciences we also have an internet based Bachelor Programme in Earth Science autumn since 2014.

#### *Bachelor's Programme in Biology-Earth Science*

The Biology-Earth Science study programme encompasses 180 credits, and is carried out in collaboration with the Department of Biology Education at Stockholm University. The programme consists of 90 credits mandatory courses in earth sciences and environmental issues and 90 credits in biology. A 15 credits 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 Bachelor's level (first cycle). The courses are independent courses that are optional within the study paths of the bachelor programmes in Geography, Earth Science, Biology, and many other subjects.

### 5.2. Master's level (Second Cycle)

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, Geographic Information Systems, Cartography, Remote Sensing and Landscape Ecology. In addition the department offers courses in Political Ecology, Environmental Issues and Environment and Health Protection. The courses provide 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. 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 elective or optional courses and finish the programmes with a Degree Project of 1-2 semesters.

### *Master's Programmes*

- Environment and Health Protection
- Environmental Management and Physical Planning
- Geography
- Geomatic with Remote Sensing and GIS
- Glaciology and Polar Environments
- Hydrology, Hydrogeology and Water Resources
- Landscape Ecology
- Physical Geography and Quaternary Geology
- Quaternary Science and Climate Development

The Department of Human Geography also hosts the Master's programme in Globalization, Environment and Social Change, 120 credits together with our department and the Department of Economic History.

### *Summer courses*

The summer course "Glaciers and High Mountain Environments 7.5 credits" is a glaciology field course held at the Tarfala Research Station, northern Sweden. The field-based part of the course introduces different methods of measurement and analysis and the study of glacial or periglacial landscapes and processes. Another summer course, "Ecohydrology - a Mediterranean Perspective 7.5 credits", is based on theory and field-based experimentation relevant for ecohydrology. The field-based part of the course is held at the Navarino Environmental Observatory (NEO) in Greece. We also have a summer course on first level: "Urban Farming – Planning, Environment and Health 7.5 credits".

### 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*

Robin Blomdin

*Paleoglaciology and paleoclimate history of Central Asia bordered by the Kunlun Shan, Tian Shan and Altai Mountains*

Meighan Boyd

*Speleothems in Warm Climates – Holocene records from the Caribbean and Mediterranean*

Lucas Dawson

*Systems dynamics and scenario-based modelling for integrated management and adaptive governance of functional green infrastructure and natural resource analysis at multiple spatial scales*

Benoit Dessirier

*Multi-phase flow in porous and fractured media*

Matti Ermold

*Changes in wetland distribution and consequences for biodiversity and ecosystem services*

Ruben Fritzon

*Earthquake periodicity in southern Greece from geochemical and geochronological studies of fault surfaces*

Ping Fu

*Glacial Geomorphology of the Haizi Shan area, SE Tibetan Plateau*

Natacha Gribenski

*Comparison of dating methods for glacier chronology in the Central Asia mountains*

Christian Helanow

*Theory for water routing through ice sheets*

Lindsey Higgins

*Environmental history and climate change in relation to historical land use changes in East Africa*

Charlotta Högberg

*Atmospheric modelling using space-based observations of stable water isotopes*

Simon Jakobsson

*Woody or treeless pastures? Linking subsidy systems, farmers decisions and management for understanding biodiversity patterns*

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*

Elikana Kalumanga

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

Daniel Ketzer

*Potential of Agrovoltaic systems to reduce land use competition between food and energy production*

Alexander Koutsouris

*Land management effect on water resources in Tanzania, Africa*

Paul Krusic

*Dendroclimatic reconstruction: Eastern Mediterranean region*

Norris Lam

*Improving streamflow and flood monitoring using LiDAR*

Jessica Lindgren

*Small remnant habitats additive value for biodiversity and ecosystem services in intensively utilized landscapes*

Elidio Massuanganhe

*Modeling sustainability of the Mozambican coastal zone – Geomorphology and changes of the Mozambican coast*

René Mbanguka

*Modelling water resources effects of land-water management in Tanzania, Africa*

Andrew Mercer

*Accuracy of methods used for monitoring regional glacier mass balance changes*

Simon Mwansasu

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

Michaela Nylund

*Mass movements in the Kenyan highlands – Land use and vulnerability*

Juri Palmtag

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

Romain Pannetier

*Modelling permafrost dynamics, permafrost hydrology and related solute transport under climate change*

Jan Pietron

*Basin-scale hydrological spreading of pollutants and wetland opportunities for reducing them*

Matthias Siewert

*High-resolution mapping of soil organic matter storage and remobilization potential in periglacial landscapes*

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*

Lucile Verrot

*Soil moisture and linked hydrological flow and transport changes*

Anna Wahlstrand

*Mass movements in the Kenyan highlands – Tropical soils and vulnerability*

Emelie Waldén

*Effects of local and regional processes on biodiversity in restored semi-natural grasslands*

Carl Österlin

*Systematisk modellering för utveckling av metoder, prioriteringsverktyg och indikatorer för integrerad natur- och kulturmiljövård*

Tam Nguyen Thanh

*"Integrated rice-fish farming-safeguarding biodiversity for sustainable food production in the Mekong Delta, Vietnam"*

### ***Quaternary Geology:***

Hans Johansson

*Late Quaternary tephrochronology of the Azores*

Torbjörn Karlin

*Deep ice core analysis of processes in the climate system*

Anna Plikk

*Climate dynamics and environmental change during the Eemian Interglacial (MIS 5e) in Scandinavia inferred from a unique sediment sequence at Sokli (northern Finland)*

Sandra Siteo

*Reconstructing flooding events in the Limpopo River flood-plain area, Mozambique*

## 6. Dissertations in 2014



Dissertation covers 2014. Photo: Malin Stenberg de Serves.

SHYHRETE SHALA, 2014: Palaeoenvironmental changes in the northern boreal zone of Finland: local versus regional drivers. Dissertation No. 40. Faculty opponent: Doc. Christian Bigler.

EWA LIND, 2014: Tephra horizons in the North Atlantic region during the Early Holocene. Dissertation 41. Faculty opponent: Dr. Victoria Smith.

AIKATERINI MAZI, 2014: Seawater intrusion risks and controls for safe use of coastal groundwater under multiple change pressures. Dissertation No. 42. Faculty opponent: Doc. Adrian Werner.



JULIEN SEGUINOT, 2014: Numerical modelling of the Cordilleran ice sheet. Dissertation No. 43.  
Faculty opponent: Dr. Shawn Marshall.

ANNIKA BERTSSON, 2014: The sensitivity of Swedish alpine lakes to hydro-climatic changes during the Late Holocene. Dissertation No. 44. Faculty opponent: Dr. Peter G. Langdon.

MARTIN FINNÉ, 2014: Climate in the eastern Mediterranean during the Holocene and beyond – A Peloponnesian perspective. Dissertation No. 45. Faculty opponent: Prof. Neil Roberts.

JOHANNA MÅRD KARLSSON, 2014: Arctic Water System Change and its Interactions with Permafrost and Ecosystem Changes. Dissertation No. 46. Faculty opponent: Dr. Daqing Yang.

<b>Name</b>	<b>Date</b>	<b>Degree</b>
Shala, Shyhrete	31 January	PhD, Quaternary Geology
Lind, Ewa	21 February	PhD, Quaternary Geology
Mazi, Aikaterini	12 June	PhD, Physical Geography
Seguinot, Julien	25 September	PhD, Physical Geography
Berntsson, Annika	9 October	PhD, Quaternary Geology
Finné, Martin	14 November	PhD, Physical Geography
Mård Karlsson, Johanna	21 November	PhD, Physical Geography

## 7. International exchange

We have 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 our 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.

*Erasmus exchange (coordinator: Karin Ebert)*

Brussels / Belgium

Freiburg / Germany

Innsbruck / Austria

Berne / Switzerland

Leuven / Belgium

Ostrava / Czech Republic

Grenoble / France

Aachen / Germany

Gent / Belgium

Turku / Finland

Patras / Greece

Kiel / Germany

## 8. Financial support

### GRANT ORGANIZATIONS

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>
RS	<i>Swedish National Space Board (Rymdstyrelsen)</i>
SGU	<i>Swedish Geological Survey (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 (Svenska lantbruksuniversitetet)</i>
SU	<i>Stockholm University</i>
VR	<i>The Swedish Research Council (Vetenskapsrådet)</i>

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	START DATE	TOT AMOUNT	AMOUNT 2014
Berg	SSEESS/Kungl. Vetenskaps-akademien	Diversified livelihood	140618	90 000	90 000
Berg	Univ. och Högskolerådet	Planning grant Tanzania	141008	60 000	60 000
Bring	VR	Finding the source: Where does the excess water in Arctic rivers come from?	131128	3 150 000	1 050 000
Cousins	Formas	Biodiversity and ecosystem services of small forest fragments in European landscapes (smallFOREST)	111117	475 000	275 000
Cousins	SU	EkoKlim Land	100406		1 783 500
Dahlberg	Mittuniversitetet	Beyond Conflicts: Understanding Challenges and Opportunities in the Swedish Mountain Landscapes	131217	370 000	200 000
De la Torre Castro	VR	Gendered Dimensions in Fishery Dependent Communities in the face of Climate Change	110920	3 000 000	1 000 000
Destouni	TEMES	TEMES	100816	200 000	225 000
Destouni	Oskarshamns kommun	NOVA	120523	1 150 000	766 333
Destouni	Formas	Basin-scale hydrological spreading of pollutants and wetland opportunities for reducing them under different hydroclimatic and other regional conditions	121203	3 780 000	1 260 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	START DATE	TOT AMOUNT	AMOUNT 2014
Destouni	VR	A National Geosphere Laboratory at Äspö Hard Rock Laboratory with surroundings and related research-supporting facilities	121107	1 060 000	530 000
Destouni	Formas	he Baltic Sea Region System: water changes across scales and subsystems over the forthcoming 30-year horizon (BALSYS)	140213	4 402 437	1 467 479
Destouni	Oskarshamns kommun	NGL-Nova	140820	100 000	100 000
Destouni	SU	EkoKlim	091215	1 950 000	2 041 500
Frampton	SGU	Cold region hydrogeology: climate-induced changes, feedbacks and impacts	140117	991 000	411 000
Grudd	TEMES	TEMES	100816	225 000	225 000
Hansson	Nordforsk	CRAICC	101221	1 000 000	200 000
Helmens	SKB	Climate dynamics and environmental change during the Eemian interglacial (MIS 5e) in Scandinavia inferred from a unique sediment sequence at Sokli (northern Finland)	120419	3 412 400	700 973
Heyman	VR	Återvändarbidrag	130627	858 000	572 000
Holmgren	TEMES	TEMES	100816	225 000	225 000
Holmgren	SIDA via Uppsala universitet	Environment and Climate Research Programme	111101	965 000	197 500
Holmgren	SIDA via Uppsala universitet	Environment and Natural Resource Management	111101	810 000	172 500
Holmgren	VR	Late Quaternary climate variability and vegetation dynamics in southern Greece	121024	5 000 000	1 350 000
Holmgren	VR via Lunds universitet	European sotope-climate reconstruction for the last 2000 years based on lake sediments, speleothems and tree rings	121210	1 017 000	450 000
Holmgren	SU	NEO, sektionssatsning	101202	400 000	1 600 000
Holmlund	VR	Arctic climate and environment 1880-1980	111108	2 200 000	700 000
Holzkämper	Formas	Dendroclimatology and Forest Ecology in Sweden	140619	20 000	20 000
Hugelius	VR	Svenskt deltagande i JPI Climate Arctic and Boreal system år 2014-2017	140707	2 513 000	628 250

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	START DATE	TOT AMOUNT	AMOUNT 2014
Hättestrand C.	Stiftelse- förvaltningen/ Decemberfonden	Pedagogiskt pris, årets lärare	140528	50 000	50 000
Ingvander	RS	Multiscale investigations of microwave observations	131211	1 626 000	400 000
Jansson P.	SKB	Develop theory for water routing through ice sheets based on Greenland field data and its application to the Fennoscandian Ice Sheet.	100413	879 400	300 000
Jansson P.	SKB	Vetenskapligt expertstöd	100416	528 000	297 000
Jarsjö	SKB	Äspö Task Force, Task 8, 2	110615	1 800 000	600 000
Kirchner	Formas	Frozen landscapes in transition: improving predictions of ice sheet stability in a warming world by numerical modeling	131112	5 982 000	800 100
Kleman	TEMES	TEMES	100816	125 000	75 000
Kleman	VR	Non-linear ice sheet build-up due to physiographically governed feedbacks	131025	2 100 000	700 000
Kuhry	Nordforsk via Lunds universitet	Defrost	101214		777 230
Kuhry	VR	Glacial Epoch Permafrost Carbon Pools and Fluxes: An approach combining new modeling and terrain-based reconstructions to improve knowledge of future changes	121122	2 366 001	788 667
Lindborg	Formas	Woody or treeless pastures? Linking subsidy systems, farmers decisions and management for understanding biodiversity patterns.	111114	4 136 000	1 378 000
Lindborg	Lunds universitet	SAPES	111207	1 020 100	106 500
Lyon	VR	Improved streamflow and flood monitoring using remotely sensed LiDAR data	111118	2 200 000	700 000
Lyon	VR	SWE-2011-66 Water resources effects of land-water management in Tanzania, Africa	130101	2 400 000	800 000
Margold	VR	Meltwater drainage along the northwestern Laurentide Ice Sheet: assessing its role in abrupt Late Glacial climate change	140522	3 150 000	525 000

RESEARCH GRANT RECEIVER	FUNDING AUTHORITY	PROJECT	START DATE	TOT AMOUNT	AMOUNT 2014
Moberg	VR	Climate data-model comparisons for the last millennium	111128	2 500 000	800 000
Norström	SU	Intensive agriculture in Bokoni	140528	96 750	96 750
Persson	SU	Hydrologi & klimat	141013	854 050	215 000
Qiong	RS	Atmospheric modelling using space-based observations of stable water isotopes	121129	936 000	960 999
Qiong	SU	Klimatmodeller	130131	1 985 500	948 300
Qiong	SU	Klimatmodeller	130910	1 683 450	854 050
Qiong	SU	Klimatmodeller	130910	1 987 950	883 050
Rosqvist	EU	INTERACT	110419		312 223
Rosqvist	VR	SITES	130610	5 000 000	1 000 000
Rosqvist	Statens Fastighetsverk	Hercules, Kebnekaise	130101	1 394 500	400 000
Schlyter	Richert Stiftelse	Mini-UAV för miljö- och planeringstillämpningar - tillämpningsförsök och integration inom utbildningsprogram i miljö-och hälsoskydd samt miljövard och fysisk planering	140626	290 000	290 000
Shala	Stiftelsen Kulturmiljövard	Uppdragsprojekt	140214	203 000	203 000
Skånes	Länsstyrelsen Stockholm	Biotopdatabas	141104	300 000	300 000
Stjernquist	Formas via SLU	Gröna infrastrukturer för ekologisk hållbarhet och människors hälsa: ett nätverk av skogs-, landsbygds- och stadslandskap som laboratorier för kunskapsproduktion och lärande	111114	2 548 442	790 148
Stjernquist	Formas via SLU	Green infrastructures for ecological sustainability and human well-being: a network of forest, rural and urban landscapes as laboratories for integrative research	140319	885 200	885 200
Stroeven	VR	Glacial and Climate History of Central Asia and Tibet	111118	3 400 000	800 000
Stroeven	EU	Changing glaciers	130227		1 231 165
<b>Totalt</b>					<b>37 568 420</b>



## 9. Staff (autumn 2014)

Department Chairman/Head:	Professor Karin Holmgren
Vice Chairman:	Docent Jerker Jarsjö
Head of administration	Sabina Pracic

### **PROFESSORS**

Cousins, Sara	professor of Physical Geography
Destouni, Georgia	professor of Hydrology, Hydrogeology and Water Resources
Hall, Adrian	adjunct professor of Geomorphology
Hansson, Margareta	professor of Environmental Science with emphasis on Physical Geography/Quaternary Geology
Harbor, Jonathan	affiliate professor
Holmgren, Karin	professor of Physical Geography
Holmlund, Per	professor of Glaciology
Hättstrand, 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
Näslund, Jens-Ove	adjunct professor in Environmental Risk Assessment
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)*

Berg, Håkan	senior lecturer
Brown, Ian	senior lecturer
Dahlberg, Annika	senior lecturer
De La Torre Castro, Maricela	senior lecturer
Gunnarson, Björn	director of studies, researcher
Helmens Femke, Karin	researcher
Holzkämper, Steffen	senior lecturer
Jansson, Krister	senior lecturer
Jarsjö, Jerker	senior lecturer
Kirchner, Nina	docent
Lindborg, Regina	senior lecturer
Lyon, Steve	senior lecturer
Moberg, Anders	senior lecturer
Risberg, Jan	senior lecturer
Seibert, Jan	senior lecturer

#### *PhD*

Auffret, Alistair	researcher
Ballarotta, Maxime	postdoctor

Berntsson, Annika	researcher
Borgström, Ingmar	senior lecturer
Bring, Arvid	researcher
Clason, Caroline	postdoctor
Frampton, Andrew	senior lecturer
Gowan, Evan	postdoctor
Grudd, Håkan	data base coordinator
Hind, Alistair	postdoctor
Hugelius, Carl-Gustaf	researcher
Hättstrand, Martina	researcher
Heyman, Jakob	postdoctor
Ingvander, Susanne	researcher
Kalantari, Zahra	researcher
Lea, James	postdoctor
Manzoni, Stefano	senior lecturer
Persson, Klas	postdoctor
Plue, Jan	senior lecturer
Quin, Andrew	postdoctor
Rogberg, Peter	researcher
Sannel, Britta	senior lecturer
Shala, Shyhrete	researcher
Schlyter, Peter	senior lecturer
Skånes, Helle	senior lecturer
Stjernquist, Ingrid	senior lecturer
Sundqvist, Hanna	researcher
Westerberg, Lars-Ove	senior lecturer, director of undergraduate studies
Winterdahl, Mattias	postdoctor
Zhang, Qiong	senior lecturer
Öberg, Helena	postdoctor

*PhLic, MSc, BSc*

Eknert, Bo	PhLic, lecturer
Fridfeldt, Anders	BSc, lecturer, director of undergraduate studies
Karlsson, Sven	PhLic, researcher
Nordström, Anders	PhLic, senior lecturer

*Postgraduate students (PhLic, MSc, BSc)*

Aggemyr, Elsa  
Blomdin, Robin  
Boyd, Meighan  
Bring, Arvid  
Dawson, Lucas  
Dessirier, Benoit  
Ermold, Matti  
Finné, Martin  
Fritzon, Ruben  
Gribenski, Natacha  
Helanow, Christian  
Higgins, Lindsey

Högberg, Charlotta  
Jakobsson, Simon  
Jantze, Elin  
Jaramillo, Fernando  
Johansson, Emma  
Johansson, Hans  
Kalumanga, Elikana  
Katransiotis, Christos  
Ketzer, Daniel  
Koutsouris, Alexander  
Krusic, Paul  
Lam, Norris  
Lindgren, Jessica  
Massuanganhe, Elidio  
Mbanguka, René  
Mercer, Andrew  
Mwansasu, Simon  
Mård Karlsson, Johanna  
Nylund, Michaela  
Palmtag, Juri  
Pannetier, Roman  
Pietron, Jan  
Plikk, Anna  
Seguinot, Julien  
Siewert, Matthias  
Shala, Shyhrete  
Siteo, Sandra  
Sjöberg, Ylva  
Stoltz, Jonathan  
Than Nguyen, Tam  
Thorslund, Josefin  
Verrot, Lucile  
Waldén, Emelie  
Wahlstrand, Anna  
Weiss, Niels  
Österlin, Carl

*Teaching assistants*

Andersson, Marcus, BSc  
Ekstedt, Karin, MSc  
Hamré, Moa, BSc  
Gilljam, Carl, MSc

**ADMINISTRATIVE STAFF**

Blåndman, Susanna	BSc, BA, human resources administrator
Damberg, Maria	MSc, study advisor
Ebert, Karin	PhD, education coordinator
Hansson, Erik	MSc, educational administrator
Henriksson, Carina	BSc, senior administrative officer

Holmlund, Moa	MSc, educational administrator
Hörnby, Kerstin	MSc, educational administrator
Isdal, Maija-Liisa	BSc, financial administrative officer
Karlin, Torbjörn	MSc, station manager Tarfala research station
Karpegård, Madeleine	financial administrative officer
Maneas, Giorgos	MSc, station manager Navarino Environmental Observatory
Person, Karin	BSc, administrator
Pracic, Sabina	MSBA, head of administration
Reuterswärd, Karin	PhLic, educational administrator, study advisor
Schaffer, Christina	MSc, educational administrator
Stenberg de Serves, Malin	PhD, communicator
Stolarska, Monika	financial administrative officer
Sturesson, Elisabeth	MSc, educational administrator
Trygger Bergman, Sophie	MSc, educational coordinator
Åkerblom, Lena	educational administrator

#### **TECHNICAL STAFF**

Alm, Göran	PhLic, systems engineer
Berglöf, Rasmus	systems engineer
Brotén, Bengt	technician
Cabrera, Yanduy	caretaker
Jacobson, Rolf	web editor
Levi, Lea	MSc, research assistant
Li, Qiang,	PhD, scientific programmer
McGlynn, Laura	MSc, research assistant
Muliyil Asokan, Shilpa	PhD, research assistant
Prieto, Carmen	PhD, research engineer
Segerström, Rebecka	research assistant
Sjöström, Jenny	MSc, research assistant
Skantz, Johan	caretaker
Spångberg, Martin	systems engineer
Wennbom, Marika	MSc, research engineer

#### **PROFESSORS EMERITI**

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



Our INK (Intressanta Naturvetenskapliga Kvinnor) team ready to run "Våruset" in May at Stora Skuggan. From the left: Sussie, Johanna, Moa, Maria, Hanna and Caroline.

**Postadress**  
**Mailing address**  
Stockholms universitet  
106 91 Stockholm

**Besöksadress**  
**Visiting address**  
Svante Arrheniusv. 8

**Telefon/Phone**  
+46 8 16 20 00  
**Telefax**  
+46 8 16 48 18

**Internet**  
[www.natgeo.su.se](http://www.natgeo.su.se)