Annual Report 2008

Department of Geography
University of Zurich
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Report from the Head of Department
During the last year, the Department of Geography has made significant progress in terms of both expansion and renewal. In recent years, increases in student numbers and the resulting workload as a consequence of the Bologna reforms and the increasingly successful acquisition of third-party funds at the same time have put the understaffed Department under great pressure. In recognition of the pressing need to invest in new staff and improve the student-staff ratio, the University and Faculty agreed to establish an additional assistant professorship (tenure track) in Physical Geography (Climate and the Water Cycle). We identified an outstanding new colleague in Prof. Jan Seibert, who will be in post from February 2009. Furthermore, a seamless replacement for Prof. Klaus Itten was realised through the appointment of Prof. Michael Schaepman, who will head the Remote Sensing Laboratories from March 2009. Efforts to consolidate and enhance this large unit with a new assistant professorship are on the agenda!

Unfortunately, the search for a similarly seamless replacement for Prof. Hans Elsasser failed during the negotiation process with the top-ranked candidate. The search committee has resumed its work, and we look forward to a successful conclusion to the faculty search procedure in Economic Geography in 2009. For the Spring Semester, an in-house interim solution was found; however, a gap in supervision capacities for students specialising in Economic Geography as well as in launching new projects will present a challenge to the Department. At the same time, Prof. Benedikt Korf, assistant professor of Political Geography for the last two years, received an offer for an associate professorship at another university. Through an accelerated conclusion of the tenure procedure, we hope it will be possible to keep Prof. Benedikt Korf in Zurich! Nonetheless this constellation of events is challenging for the Department, especially Human Geography, given the additional responsibilities and workload that fell to the Department Head.

Nonetheless, we look forward with optimism to bringing both faculty search and tenure procedures to a successful end in 2009. With a consolidated and growing team of professors, we will certainly see an exciting phase of development in Geography in the years to come. Furthermore, we aim to making progress with putting the Faculty’s long-term strategic plan of additional assistant professorships (with tenure track) in Remote Sensing and Human/Economic Geography into practice, and finding a seamless replacement for Prof. Wilfried Haeberli in 2012.

We are convinced that enlarging the staff of the Department will, in the medium and long term, contribute to ensuring that a large number of students will benefit from a high and continuously improving level of education in geography. This growth should also enable us to expand PhD studies and develop the PhD graduate programme. Last but not least, this increase in staff will also give senior researchers more time to dedicate to their own research.

The large number of students (in the Autumn Semester 2008 there were 640 students majoring in Geography) proves that the University of Zurich continues to be an attractive place to study geography. The number of first semester students majoring in Geography was slightly higher than in the previous year (2007: 120 students; 2008: 123 students). Roughly half of all MNF final year students graduated with a degree in Geography, and 89 students sat their final exams in 2008 (69 Diploma and 20 Master’s theses). Teaching new and improved MSc courses has been a rewarding experience for the lecturers and was beneficial for the students. In 2008, the first cohort of students received their MSc degrees. Several groups are successfully developing and spreading e-learning tools. The e-learning project GITTA (project leader: R. Weibel) won an
award at the 2008 Medida Prix. The e-learning course GLOPP by the Human Geography unit was chosen as a test project for the League of European Research Universities (eLERU).

The specialised PhD programme ‘Development Studies: Global Change and Sustainable Development’ was launched by the Development Study Group. One major step in 2009 will be the launch of the Zurich Graduate School in Geography - thanks to additional funding by the Bologna 3 programme. In addition, a joint inter-university doctoral programme in ‘Global Change, Innovation and Sustainable Development’ started with funding from the ProDoc scheme (SNSF). The cooperation project, which comprises a training module and research modules, creates a permanent structure among the participating universities for research partnerships with the South. We will also investigate the possibilities of offering specialised Master’s degrees linked with this promising network of graduate programmes.

Geography is one of the most successful Departments at attracting outside funding (2008: 5’417’000 CHF) – an indicator of the quality and external recognition of our research. The large number of successful post-doctorate grant applications, the fact that four members of the Department were offered a chair, as well as the number of nine completed PhDs, are all visible signs of the Department’s health and success. Sadly, a new round of budget cuts in 2008 again affected the Department, even though the allocation from Bologna funding pool was able to ease the problems to some extent.

The Department also provides various scientific services to third parties, e.g. the National Point of Contact (NPOC) for Satellite Images (jointly with Swisstopo) and a geochronological dating laboratory. An encouraging message was the decision by the Federal Government to support the World Glacier Monitoring Service financially through GCOS Switzerland. This important international activity of policy-relevant UN programmes is ideally embedded in the overall policy of the Department with its strength in glaciology, remote sensing, geographic information science, and development research.

The reorganisation of systems administration and IT services, and the redesign of the website were the last steps in the reorganisation of management structures and support services, and they were carried out in 2008. R. Weibel was elected as deputy director of the Department to stand in for W. Haeberli, whose term had ended.

Dr. Martin Hölzle was appointed full professor in Physical Geography, specialising in cryosphere and high-mountain research, at the University of Fribourg, Switzerland. PD Dirk Burghardt was called to become assistant professor at the Technische Universität Dresden, Germany (Kartographische Kommunikation) and accepted. A professorship was offered to Prof. Claudia Binder at the University of Graz and to Prof. B. Korf at the University of Fribourg. We offer our warmest congratulations to them on these wonderful successes!

We are especially obliged to the members of staff who are celebrating their anniversary at GIUZ:

Prof. Dr. Kurt Graf 40 years
Prof. Dr. Conradin Burga 30 years
Bruno Kägi 30 years
Dr. Erich Meier 30 years
Elisabeth Cottier 15 years
PD Dr. Markus Egli 15 years
Iva Stoupa 10 years
We would like to thank the students at the GIUZ, the interested public, and especially the authorities of the university and the faculty, for their support, and also wish to express our thanks to all staff members for all their commitment and efforts.

Ulrike Müller-Böker, Head of Department
A Farewell to Hans Elsasser and Klaus Itten

The farewell party for H. Elsasser and K. Itten took place in January 2009. About 400 guests came to this large event, among them many of Hans’ and Klaus’s former students, collaborators and colleagues.

Hans Elsasser left the GIUZ at the end of January and Klaus Itten at the end of February. To come straight to the point: it isn’t easy for our Department to lose two colleagues to retirement at the same time, two colleagues who have played a key role at the GIUZ, showing great commitment, and much experience and wisdom. I use the word “play” intentionally because Hans’ and Klaus’s contributions have left many traces and these are — of this I am convinced — sustainable.

Both of them had the privilege — and sometimes the burden — of training a very large number of undergraduate and PhD students, and they have contributed hugely to strengthening the human capital of our society. Some figures: Klaus and Hans have trained, supervised and examined some 150 and 250 undergraduate and master’s students respectively. They supervised 50 PhD students each! Both have contributed to strengthening and consolidating the GIUZ and the University of Zurich institutionally, both as institute directors and on various boards and committees.

Hans was a member of the university’s personnel committee, among others. He represented the professors on the united staff association body and was faculty delegate on the equal opportunities committee. Klaus’s list of functions is just as long and, personally, I greatly appreciated his mediation skills in his positions as teaching ombudsman for Department IV and Geography.

Last but not least, both of them have made substantial contributions to progress in their fields of research and to the expansion of knowledge in general.

**Hans Elsasser** studied and gained his doctorate at the Department of Geography of the University of Zurich, incidentally about periglacial geomorphology. He subsequently put his knowledge into practice by working in a geological-hydrological office and then became section head of the Orts-, Regional- und Landesplanung (ORL) institute at the ETHZ. He habilitated at the UZH and was appointed professor at the University of Zurich in 1987, where he thenceforth headed the economic geography unit.

He and his team, whom he always left a great deal of space to pursue their own research interests, carried out research in a wide range of different areas: urban and regional development, the real estate and residential markets, geographical gender research, and tourism. One of his most foresighted and innovative projects was research into climate change and tourism, in particular winter tourism in the Alps, the results of which shook up quite a few local councils.

Before the term even existed, Hans was always committed to transdisciplinarity and thus participated in many research and planning groups as a scientific expert. He was a member of the steering committee of LFP 48 ‘Landscapes and Habitats of the Alps’, in the support group to the COST programme ‘Transit traffic and land use’ and ‘Landscapes in conurbations’. He also led the conflict resolution group on overhead power-lines and was a member of the Swiss National Park’s research committee.
Through these activities, he established – and systematically maintained - an excellent network of contacts in Switzerland. Many of his students and colleagues benefited from this. So he was not a researcher and teacher stuck in an ivory tower, but rather a man who assumed a social responsibility reaching well beyond the walls of the university.

Klaus Itten studied and gained his doctorate at the Department of Geography of the University of Zurich. He did his post-doc at NASA and his greatest dream was to become an astronaut – and he was after all one of the five Swiss selected as candidates to become ESA astronauts. But it was Claude Nicollier who went into space, and Klaus habilitated and pursued an academic career from assistant professor to full professor. His fascination for looking at the Earth from a great distance never left him, and he made a profession out of it! The aim of his research involved improving views of the Earth and analyzing the processes that could be observed on Planet Earth.

In 1986, he created the Remote Sensing Laboratories at the GIUZ together with Harald Haefner and Daniel Nüesch. This research centre is now one of the leading remote sensing institutes in Europe. When Harald Haefner retired, Klaus Itten took over as head of the RSL, which by then employed around 30 staff.

His research focused on developing and implementing digital multi-spectral systems to process satellite data and thematic mapping and adaptive filtering techniques, developing spectroradiometry, image spectrometry and goniometry. He was also interested in how these technologies were applied. For example, he was head of the ‘Sri Lanka Swiss Remote Sensing Project’ for over 20 years, which provided the developing country with a 1:100,000 land use inventory that was unique for its time.

His last large and sometimes gruelling project was developing an ultramodern hyperspectral sensor, the Airborne PRISM Experiment for the European Space Agency. The airborne device takes pictures of the Earth in up to 500 adjacent spectral bands and makes it possible to carry out basic research in image spectroscopy to an unprecedented degree.

Hans and Klaus can therefore look back on their careers with much pride and satisfaction. I would like to thank them personally and on behalf of the whole Geographical Institute for all that they have achieved – and for all their responsible support and commitment, their utter reliability and their friendship.

I sincerely wish them all the best for the next stage of their lives!

Ulrike Müller-Böker, Head of Department
1 Main research activities

The highly specialised research practiced at the GIUZ under the umbrella theme ‘The Earth in accelerated change: habitats in 21st century research’ is one of our main strategic assets, with great potential to discover pioneering topics at the interface between sub-disciplines. In order to analyse and develop strategies for complex processes such as global climatic change or globalization, the majority of geographers are members of inter- and transdisciplinary networks, both national and international.

The Physical Geography research field will continue to concentrate on dynamics in high mountain areas and global biogeochemical cycles as the focal points where climatic and climato-political aspects meet. The newly created assistant professorship will extend this programme with its focus on climate and the water cycle. Earth observation and geographical information science are at the heart of the Methods research field, with the aim of enabling the development and visualization of space-time databases capable of capturing fast and complex processes as they unfold. Innovative input and potential for cooperation can be expected from the Remote Sensing Laboratories (RSL). In the Human Geography research field, the development-oriented research of the Human and Political Geography units will continue to focus on the livelihood strategies of poor people, migration, and access to and use of natural resources, as well as on violence and statehood. The Economic Geography unit will strike out on a new path, but what this path will be has not yet been fully determined, due to the ongoing faculty search process. The ideas and opinions of the newly appointed colleagues will need to be integrated here.
1.1 Glaciology, Geomorphodynamics & Geochronology
General Overview

One special landmark of another busy and fruitful year was the move of Martin Hoelzle to the Geography Department of the University of Fribourg, where he took up a faculty position in physical geography with a specialisation in cryosphere and high-mountain research. Like Andreas Kääb, who had received a faculty position at the Geoscience Institute of the University of Oslo a few years ago, Martin Hoelzle had since the late 1990s been one of the main driving forces and an essential, constructive and innovative member of the team that set up the institute’s new Glaciology, Geomorphodynamics & Geochronology (3G) section. We are proud of his success and look forward to continuing our cooperation. Our deeply felt thanks and best wishes accompany him. Jeannette Noetzli and Nadine Salzmann – who is back from her post-doctoral time at NCAR in Boulder/Colorado – will take over his position in our unit.

Two young collaborators of the section received special recognition for their scientific accomplishments as well. Jeannette Noetzli was given the award of the the faculty for her PhD thesis ‘Modelling Transient Three-dimensional Temperature Fields in Mountain Permafrost’, and the Swiss Academy of Sciences presented the Prix A.F. Schläfl to Michael Zemp for his PhD thesis entitled ‘Glaciers and Climate Change – Spatio-Temporal Analysis of Glacier Fluctuations in the European Alps after 1850’ (published in 2006). The Ninth International Conference on Permafrost at Fairbanks University received a large delegation from our section with a total of 15 papers, and a plenary presentation (Wilfried Haeberli and Stephan Gruber on ‘Research Challenges for Permafrost in Steep and Cold Terrain: An Alpine Perspective’) was published in the conference proceedings.

A further most encouraging highlight was the decision by the Swiss Federal Government to provide financial support to the World Glacier Monitoring Service through GCOS Switzerland. This important international activity of policy-relevant UN programmes is ideally embedded at the institute with its strength in glaciology, remote sensing, geographic information science, and development research. With PERMOS, the permafrost-monitoring network for Switzerland, one of the group’s other important tasks is to coordinate a national observational service supported by the Swiss Academy of Sciences, the Federal Office for the Environment (FOEN) and MeteoSwiss.

Main research activities and scientific progress

Glaciology

In the first phase of the ESA project GlobGlacier, key regions for data processing were defined in close collaboration with the user group, and glacier outlines are now being generated from Landsat satellite data (F. Paul, PhD H. Frey, PhD R. Le Bris). Planned uses for the data include change detection and hazard aspects. A web site (www.globglacier.ch) has been created; it describes the project and its progress in detail (D. Caduff). The project was presented at several national and international meetings and received very positive feedback. The SNSF project ALGLAMBA-CLIP was brought to a successful conclusion with the dissertation and defence by H. Machguth. The project developed a method to downscale and couple the output from a regional climate model (20 km cells) to a regional-scale mass balance model (100 m cells) in close cooperation with the Max Planck Institute for Meteorology in Hamburg (S. Kotlarski). Applying this model to the Swiss Alps indicates that existing high-resolution (2 km) precipitation climatologies tend to overestimate precipitation in the Aletsch region and to underestimate it in the Engadin region. The mass balance measurements on the Findel and Adler glaciers have been continued with a view to their replacing the observational series on rapidly
shrinking, smaller, low-altitude glaciers in the existing glacier mass balance network in the Alps. A new project called Climate Change impacts on GLaciers In Switzerland (CCGLINCH) started in November 2008 (F. Paul, PhD A. Linsbauer). The project is funded by FOEN and hydropower companies in the Valais, and will be performed in close cooperation with the WSL (M. Zappa). The major objective of the GIUZ's contribution is to develop glacier-specific retreat scenarios for all Swiss glaciers as input for the distributed hydrological model PREVAH and to construct a digital elevation model of the Swiss Alps “without glaciers” for further analyses (lakes, hazards, sediment balance, etc.).

The SNSF ROCKFROST project (S. Gruber, M. Hoelzle, W. Haeberli, PhD J. Noetzli) was brought to a successful completion by the thesis and defence by J. Noetzli. Within this project, a modelling procedure was developed and validated that simulates transient 3-D permafrost temperatures in high mountain topography. The modelling procedure is based on RCM output, distributed surface energy balance, and 3-D subsurface heat transfer. When the model is applied to artificial and real topographies (Schilthorn, Zugspitze, Matterhorn), it shows complex 3-D distribution patterns of subsurface temperature fields that are influenced by past climate variations, and a significant acceleration of temperature changes due to steep topography. The new alpine-wide PermaNET project aims at establishing a pan-alpine permafrost monitoring network, a permafrost map of the entire Alpine region, and a common strategy with guidelines for the consideration of permafrost in risk and water resource management. PermaNET is a transnational cooperation (Austria, France, Germany, Italy and Switzerland) and is part of the 2007–2013 European Territorial Cooperation Alpine Space Programme. Within the framework of this project, a new statistical permafrost model will be developed at GIUZ and applied to the whole alpine region. Additionally, numerical 4-D modelling of subsurface temperatures for selected mountains in Austria (Sonnblick) and Germany (Zugspitze) will be applied to investigate future transient effects in high-altitude permafrost (S. Gruber, J. Noetzli, PhD L. Boeckli). Work continued on a coupled heat and water transfer scheme including freezing processes for soil to be included in a mountain cryosphere model (S. Gruber, in collaboration with Univ. Trento, Italy, M. Dall’Amico and R. Rigon). The GEOtop model for the simulation of temperatures in Alpine bedrock is currently being validated (S. Gruber, in collaboration with Univ. Torino, Italy, P. Pogliotti, M. Giardino). In collaboration with the British Columbia Forest Service, several sites for monitoring of temperatures and permafrost in steep rock slopes have been installed in northern British Columbia, Canada (S. Gruber, British Columbia Forest Service, M. Gertseema). Several shallow boreholes for permafrost monitoring have been drilled and instrumented on Livingston Island, Antarctica as part of the international PERMAMODEL & PERMADRILL projects (A. Hasler, S. Gruber).

Geomorphodynamics and Natural Hazards
Research within the framework of the transdisciplinary PERMASENSE project funded by NCCR MICS and FOEN has been further expanded. The wireless sensor network (WSN) set up to provide detailed measurements on frost weathering processes and rock movement at the Matterhorn Hörnligrat at 3400 m a.s.l. has been operating reliably since last summer. Numerical modelling as well as laboratory experiments to be carried out in a cold-room laboratory in Caen (France) support the interpretation of measurements (S. Gruber, PhD A. Hasler). Also, as a part of PERMASENSE, research has been started into the improved exploitation of distributed datasets and distributed models concerning the mountain cryosphere (S. Gruber, R. Purves, PhD S. Gubler). Kinematics for Gruben and Murtèl rock glaciers of the last decade (1996–2006) were quantified by means of
digital photogrammetry (I. Gaertner-Roer, in collaboration with P. Thee, WSL, and A. Kääb, Univ. Oslo). Terrestrial measurements continued in the Turtmann Valley (Valais). A DFG-financed bundle project on ‘Sensitivity of Mountain Permafrost to Climate Change (SPCC)’ started in September 2008, where I. Gaertner-Roer holds a post-doc position for her project ‘Monitoring and process analysis of permafrost creep and failure in changing temperature regimes’. In the SNSF-project ‘Slope stability in perennally frozen and glacierized rock walls’ (C. Huggel, PhD L. Fischer), important insights into slope-instability dynamics at the large, glacierized high-mountain wall of Monte Rosa could be gained by high-resolution terrain data derived by LiDAR and photogrammetry. The resolution of the studies both in time and space is unprecedented, and advance our understanding of related processes, which is important in view of current and future climatic changes and related slope stability. The project ‘Rock-ice avalanches: a systematic investigation of the influence of ice’ (C. Huggel, W. Haeberli, PhD D. Schneider, in cooperation with WSL, B. McArdell, P. Bartelt) was approved by the SNSF for funding. First lab experiments with a rotating drum using mixtures of ice and rock have been performed and will be continued in 2009. Numerical avalanche modelling studies focus on an improved understanding of the processes in large avalanches. A study of glacial erosion in relation to the effects of possible future ice ages on radioactive waste disposal in Switzerland, especially concerning the potential maximum depth of linearly concentrated effects from subglacial meltwater, is now underway on behalf of NAGRA (V. Burki). The Swiss and Peruvian governments initiated a new climate change adaptation programme in 2008. The 3-year project is funded by the Swiss Agency for Development and Cooperation (SDC) and works as a pilot study for Swiss projects about climate change adaptation in developing countries. The scientific part includes a Swiss scientific consortium of six research institutions led by UZH (C. Huggel, N. Salzmann). In Colombia, the SDC-funded hazard prevention project (C. Huggel) has been concluded, but will enter its second phase in 2009.

Geochronology

Easily recognizable traces of dramatic climatic variations make high mountain regions unique geotopes and “storytellers” about the past and possible future effects of climate change on landscape dynamics and living conditions in regions with rugged topography. The chronology of Alpine landscape processes is often based on a few dates, some of them questionable. A central objective of our research activities is to develop and compare dating techniques (numerical and relative techniques) and to derive conceptual approaches for processes and landscape evolution. Investigation into chrono-sequences provides further insight into the rates of processes at variable scales (from landscapes to clay minerals).

M. Egli had some time in Palermo with the ERASMUS programme. His stay was connected with research and teaching activities. There was a further research stay, focusing especially on isotope research, at the University of Michigan in Ann Arbor (USA). Three PhD projects (R. Boehlert: ‘Constructing a temporal framework for landscape dynamics in the eastern Swiss Alps during the late glacial and early Holocene’; F. Favilli: ‘Soil and Alpine landscape evolution since the late glacial and early/mid Holocene in Val di Sole (Trentino, Italy)’ and C. Mavris: ‘Initial stages of soil and clay mineral formation’), funded by the SNSF and the Stiftung zur Förderung der wiss. Forschung (University of Zurich), focus on the application of several numerical and relative dating techniques to the high-alpine region and on the derivation of the rates of the processes involved. Numerical techniques such as surface exposure dating using $^{10}$Be, optically stimulated luminescence
(OSL), or radiocarbon dating are combined with relative techniques such as Schmidt hammer rebound values, weathering rinds, and soil mineral/chemical properties on the same landforms to cross-check the methods. In a separate field study at Aiguille du Midi (F), the surface exposure ages of rock walls and the rock surface colour (based on spectral properties) were compared. Remarkably old ages of almost 40,000 years were discovered along with a pronounced relationship between surface exposure ages and spectral signature (R. Boehlert, S. Gruber). The projects are under the main supervision of M. Egli, and the ISSDS (Florence), IGT (ETHZ), TU Freiberg, IPP (ETHZ), Macaulay Institute (Aberdeen), the WSL and the University of Michigan (Ann Arbor, US) are also involved.

Services

Geochronology laboratory ($^{14}$C, $^{10}$Be/$^{26}$Al) services: Quite a large number of analyses were performed using the AMS technique. Around 30% of these samples were dated for projects carried out by foreign institutions. The remainder was from our own projects or for other cantonal and archaeological services. Ivan Woodhatch was able to re activate the Liquid Scintillation Counter.

M. Zemp, I. Gaertner-Roer and W. Haeberli coordinate the operational business of the World Glacier Monitoring Service (WGMS). During a scientific working stay (June–September) at the US National Snow and Ice Data Centre in Boulder, Colorado, M. Zemp intensified the WGMS’s cooperation with the World Data Center for Glaciology and the Global Land Ice Measurements from Space initiative (GLIMS) and decided how databases related to internationally coordinated glacier monitoring could be integrated. In 2008, the World Glacier Monitoring Service published the Volume IX of the ‘Fluctuations of Glaciers’ compiling the worldwide glacier measurements from the observation period between 2000 and 2005 (M. Zemp, M. Hoelzle, W. Haeberli). Together with the United Nations Environment Programme (UNEP), WGMS published a report on ‘Global Glacier Changes: Facts and Figures’ which provides a sound and well-illustrated review using available data of the global distribution of glaciers and ice caps, and their changes since the maximum extents of the Little Ice Age (M. Zemp, I. Gaertner-Roer). In June 2008, the Swiss Federal Council approved a proposal to guarantee long-term funding for the central service of the WGMS from 2010 onwards.

The Network for Permafrost Monitoring in Switzerland (PERMOS) documents the status and long-term variations of permafrost in the Swiss Alps based on temperature measurements at the surface and in the subsurface, and on permafrost dynamics. The coordination office is based at GIUZ and is responsible for the operation of the network (D. Vonder Muehll, J. Noetzli, I. Gaertner-Roer). Based on a decision of the Swiss Federal Council in 2008, long-term funding of the network is guaranteed through GCOS Switzerland and channels of FOEN, the Swiss Academy for Sciences (SCNAT) and MeteoSwiss.

Wilfried Haeberli and collaborators
1.2 Soil Science and Biogeography
General Overview
The Soil Science and Biogeography unit seeks to understand how global change affects the multiple interactions of vegetation, soil, and the terrestrial carbon cycle. Research highlights included: i) the publication of ten papers in international refereed journals; ii) the success of two scientists who received funding from the University Research Fund (Maximilian Schneider) and the ‘Ambizione’ programme (Samuel Abiven), a 3-year grant from the Swiss National Foundation to young scientists to pursue their research projects; and iii) the acceptance of an ESF-funded research networking programme (2008-2013) on isotopic and organic chemistry exploration of carbon stabilization and biogeochemistry in terrestrial ecosystems and soils (Michael Schmidt). At the end of the year, the vegetation map of the ‘Monte Caslano’ national nature heritage area in the Ticino was published and this is now available to the public in Italian and German (Conradin Burga).

Main research activities and scientific progress
In 2008 three projects received funding through the COST Action on ‘Greenhouse gas budget of soils under changing climate and land use (BurnOut)” (F. Hagedorn and S. Zimmermann, WSL, J. Leifeld, ART, M. Schmidt). Its objectives are to estimate how land-use changes in alpine regions affect the storage, quality, and turnover of soil organic matter, and to measure soil C and N stocks, respiration rates, and biomarkers along altitudinal gradients with a well documented change from pasture to forest on adjacent sites.

We completed the field and lab work for the NCCR Climate Plant/Soil project on summer drought effects on grassland ecosystems. This is a joint project between the Plant Nutrition group (University of Berne), Grassland Sciences group (ETH Zurich) and our group (A. Heim, O. Joos, M. Schmidt), which is carried out in collaboration with WSL (F. Hagedorn) and PSI (R. Siegwolf, M. Saurer). Results confirmed that summer drought decreases the CO₂ efflux of Swiss grassland soils, although the dynamics and net balances over several years could not be established. Furthermore, we could improve and simplify the technique used to measure the isotopic composition of soil respiration.

How anthropogenic, atmospheric nitrogen deposition will affect ecosystems and especially the terrestrial carbon cycle has puzzled scientists for decades. A. Hofmann evaluated the effect of nitrogen addition on the decay of soil organic carbon and lignin in an ¹³C-labeled arable soil from a 36-year field experiment (Cadriano, University of Bologna) and studied lignin stabilization mechanisms with a combined aggregate size and density fractionation of a ¹³C-labeled arable soil from an 18-year field experiment (Askov, University of Aarhus) and, together with A. Heim, interpreted the data and produced several manuscripts.

A. Heim and S. Abiven developed a model that enables us to estimate confidence limits for results from organic matter turnover studies. S. Abiven focused his research on C stabilization in the plant-soil system. He is developing fungi as a bio-indicator to estimate lignin stabilization in soils, and he used analysis of lignin specific compounds to describe the effects of organic inputs to soils that are subjected to important physical stress. He also developed preliminary research into fire-derived carbon degradation and stabilization in soil (co-decomposition with woody substrates, solubilisation).

Future climate change will bring with it more wildfires, also in European forests, and will thus produce more fire-derived organic carbon (‘char’). It is not clear at present how quickly this relatively stable form of carbon is returned to the atmosphere or if it stays in the (sub)soil for many centuries. Two projects have been funded (S. Abiven, N. Nimisha, M. Schmidt) as part of the Char Study Initiative (CSI Swiss) to track the fate of
isotopically labelled char in ‘Laegern’, an experimental forest site northwest of Zurich. In a model experiment in the laboratory, M. Schneider is trying to trace the effect of the formation temperature on the chemical structure of fire-derived carbon, a project that is funded by the University Research Fund. He learned the new analytical technique to separate char markers using high-performance liquid chromatography during a visit at the Florida State University and successfully implemented this technique within our group.

E. Eckmeier has accomplished her post-doc project ‘A geoarchaeological approach to investigate human-environment interactions in the Valle Leventina’. The project, which was funded by the University Research Fund, has been carried out in cooperation with the Dept. of Pre- and Protohistory of the Institute of History.

C. Burga is project leader of the mountain peak flora monitoring project in the Upper Engadin region, a contribution to GLORIA (Global Observation Research Initiative in Alpine Environments). Some important results from the Bernina region were published in 2008. Furthermore, he continued his permanent plots monitoring project of primary plant successions within the glacier forefield of the Morteratsch glacier in 2008. In November 2008, a new project to map vegetation in the Upper Engadin region started (with funding from various sources).

Michael Schmidt and collaborators
1.3 Human Geography
General overview
The Human Geography unit is investigating questions of how different people in different regions perceive and use their natural and social environments, and analyses how these social practices change or ‘develop’ over time. The core themes of our research are:

- Poor people’s livelihood strategies in a globalising world
- Sustaining livelihoods through migration
- Negotiating sustainability in natural resource use and management.

The Human Geography unit conducts development-related research with the aim of contributing to sustainable development in both developing and industrialised countries. The Development Study Group (DSGZ) coordinates work with other South-oriented research at the Department. We are continuing our various research activities in these fields with success.

In January, the South-Asia research group had a fruitful synthesis workshop and field trip in Pakistan. However, the planned Site Visit of the international review panel was cancelled – due to perceived security problems. One of the year’s major highlights was the International Conference on Research for Development in July in Berne, where all the researchers from the NCCR North-South group presented their results.

By October 2008, a joint doctoral programme on ‘Global Change, Innovation and Sustainable Development’ started with funding from the ProDoc scheme of the SNSF. The idea behind this cooperation project is to build on the NCCR North-South by creating a permanent structure for research partnerships with the South among the participating universities of Berne, Zurich and Basel, as well as the Swiss Tropical Institute and swisspeace. B. Korf and two PhD students of the Development Study group are participating in the doctoral programme, which comprises a training module and 4 research modules.

As part of the NCCR North-South, we established a regional coordination office in Nepal. The South Asia Regional Office coordinates and supports the programme’s ongoing research, teaching and advocacy activities in Nepal, Pakistan and India. It has now become an important regional contact point for poverty-oriented livelihood research. To facilitate its operations, the office has been registered as an independent international research institution. The corresponding agreement between the NCCR North-South and the Nepalese Ministry of Foreign Affairs was signed on May 21, 2008.

O. Ejderyan and B. Junker (in collaboration with WSL) successfully defended their PhD dissertations. O. Ejderyan is now post-doc researcher at Chiba University, Japan, working on a project called ‘The contextualization of expertise in the implementation of Japanese river restoration projects’ and funded by the Japan Society for the Promotion of Science.

Main research activities and scientific progress
Livelihood options and globalisation
U. Müller-Böker, U. Geiser
http://www.north-south.unibe.ch/content.php/page/id/9

This project is part of the NCCR-North-South and focuses on poor people’s livelihood strategies in a globalising world. The involved researchers developed considerable expertise in people-centred and livelihood-oriented research. Theoretical and methodological approaches were refined and researchers as well as practitioners made aware of poor people’s strategies to achieve livelihood security. Conceptually, the project applies
a livelihood perspective, focusing on institutional issues of (contested) access to assets, and people’s entitlement to benefit from assets. These questions are operationalized through the following activities, which are based on research partnerships with organisations in the respective countries.

**Nepal research group**
The core interest of the Nepal research group is to understand and analyse different rural livelihood strategies in marginalised areas of Nepal with their urban links, and to identify related institutions that support or hinder poor people’s efforts to secure the means to improve their lives. Ongoing case studies deal with landless and discriminated people (Dalits) and with internally displaced persons.

**Pakistan research group**
U. Geiser, A. Suleri, M. Jan, B. Shahbaz, K. Siegmann, T. Ali, Sultan-i-Rome; PhD student: J. Grünenfelder
www.nccr-pakistan.org
NCRR N-S research in Pakistan focuses on (i) the political ecology of forests, (ii) the impact of migration on the family members that remain in the villages, and (iii) the relations between development policies and livelihood realities. In 2008, emphasis was laid - besides the publication of research results - on critical dialogues with policymakers from the state, civil society, and donors. Among other things, a workshop was held in Peshawar on the impact of migration on families in sending areas, and an action research project was launched to improve trust between forest users and the state through independent mediation. J. Grünenfelder carried out fieldwork in northwestern Pakistan.

**Research in India**
U. Geiser, K.N. Nair, V. Menon, R. Ramakumar. PhD students: B. Strasser (completed), C.P. Vinod, Indu K.
This research group focuses on how people cope with change - the effects of decentralisation and economic globalisation on rural livelihoods. The publication of the book based on research in Kerala, ‘Water insecurity, institutions and livelihood dynamics’ has led to intensive debates among concerned scholars and activists. R. Ramakumar completed the field studies in Maharasthra on agrarian change and is now analysing his data. The renowned Indian publisher Manohar has published the PhD thesis of B. Strasser.

**Research in Kyrgyzstan**
U. Müller-Böker. PhD student: B. Steimann
This work package’s research in Kyrgyzstan concentrates on the effects of post-socialist transition upon actors and institutions around the use and management of pastures. In his PhD study, B. Steimann looks at the interaction between pasture-dependent livelihoods and the institutional change resulting from the collapse of the Soviet Union and the subsequent process of privatisation in agriculture. Empirical research in Kyrgyzstan continued from June to September 2008. In early June 2008, B. Steimann participated in a joint field excursion with researchers from Switzerland, Central Asia and West Africa on pasture management in the Swiss Alps. C. Meierhans completed her diploma thesis on ‘Knowledge of pasture appraisal and its role in
sustainable pasture management’ by February 2008. From April to June 2008, N. Schoch carried out empirical field research in Kyrgyzstan for her Master’s thesis on ‘Effects of migration on traditional livestock farming in rural Kyrgyzstan’. The study, co-supervised by B. Steimann and S. Thieme, was completed in December 2008.

Link between research and practice
The NCCR North-South provides for what are known as supplementary Partnership Actions, which, although conducted by NGOs, are closely tied to NCCR research projects. Partnership Actions are a vehicle to test the practical application of development research results. In 2008, the following projects were continued or started in association with the Human Geography unit:

- Facilitating access of Dalit people to land resources in Nepal (completed);
- Strengthening communication and trust between actors for sustainable forest governance in the NWFP of Pakistan (ongoing);
- Strengthening migrants’ wives in rural northwest Pakistan (ongoing);
- Bridging the gap between research, policy and practice on land issues (due to start at the beginning of February 2009).

Decentralisation, social movements and natural resource management
U. Geiser, S. Rist
This project brings together insights into the discourse and practice of decentralising state functions, specifically in the field of natural resource management. Papers submitted by researchers from Mexico, Argentina, Bolivia, India, Pakistan and Nepal are presently being edited for a book entitled ‘Decentralisation meets local complexity - Local Struggles, State Decentralization and Access to Natural Resources in South Asia and Latin America’.

Knowledge, power, politics: evaluating social and institutional practices in sustainable development and syndrome mitigation research
C. Zingerli, A. Uzeda Vásquez, To Xuan Phuc
This NCCR North-South post-doc project deals with questions regarding knowledge production in development research and knowledge exchange processes between development research, policy and practice. The project embraces three complementary case studies conducted in Switzerland, Bolivia and Vietnam. Project activities during 2008 were mainly dedicated to empirical work with data collection in Switzerland, Bolivia, and Vietnam. First results were presented in international conferences and site visits (Geneva, Berne, La Paz). A workshop on knowledge production in international teams was provided for a NCCR North-South research team.

Sustaining livelihoods in trans-local and trans-national settings
S. Thieme, S. Barbora
This ongoing NCCR N-S post-doc research project deals with the multi-local dimension of people’s livelihoods, and investigates the potentials and risks of this multi-locality. Case studies are being carried out in Central Asia, South Asia and Central America. Some highlights in 2008 were the joint panel ‘Life After Empires: Identity,
Mobility and Livelihoods in Central and South Asia’ at the Association for Asian Studies Conference in Atlanta, USA, in April, and the finalisation of the documentary ‘The Other Silk Road’ with screenings at the Ethnographic Film Festival ‘Regard Bleu’ in Zurich and the ‘One World Film Festival’ in Kyrgyzstan.

Globalisation and livelihood options of people living in poverty (GLOPP)
Globalisation and Livelihood Options of People Living in Poverty (GLOPP) is a blended learning project (e-learning and class attendance) financed by the Swiss Virtual Campus (SVC) and the University of Zurich. The course was completed during 2008 and enters its full implementation phase. There is now a comprehensive e-learning platform, and several courses have been integrated into the curriculum, providing Bachelor’s and Master’s students with experience of research processes and applications, as well as analytical skills.

Overcoming the nature-culture dualism?
U. Müller
This post-doc research project, granted by the University Priority Programme Asia and Europe, examines and links two innovative conservation projects that attempt to reconcile conservation and livelihood interests in protected areas: the Kangchenjunga Conservation Area in Nepal and the UNESCO Biosphere Entlebuch, Switzerland. Actors’ notions of nature and nature protection are analysed through methods of discourse, image analysis and observation. The aim is to bring out if and how the so-called model regions deal with the dichotomies characteristic of modernity, in particular the separation of nature and culture. In 2008, a field trip to Nepal served to meet nature conservation representatives, collect reports for further analysis, and explore the current developments in the case study area.

Landscapes and habitats of the Alps: processes of perception
N. Backhaus, C. Reichler, M. Stremlow
In this synthesis of landscape-related projects within NRP 48 ‘Landscape and habitats of the Alps’, a newly established landscape model was developed in order to come up with recommendations for landscape practice. The model is based on the analysis of landscape as a concept rooted in different disciplines and cultural spaces. It includes the preferences and estimations of different stakeholders regarding (alpine) landscapes. Since its publication in 2007, the landscape model has been presented at various conferences. Furthermore, it has proved a useful analytical tool in several research projects.

Youth in public space
S. Landolt
This PhD project focuses on practices of the appropriation of public space (e.g. by drinking in public spaces) by adolescents in Zurich. By examining the significance of public space for young people, the project considers how adolescents experience social norms and regulations governing public spaces. Moreover, the project analyses adolescents’ resistance to space produced by - and orientated towards - the needs of adults. In 2008, the main research activities were fieldwork, data collection and data interpretation. In addition, S. Landolt participated as an expert at the Fachgremium Jugend Zurich.
Adaptive governance of natural hazards - the implementation of risk maps in Switzerland
U. Geiser, C. Schwank, M. Zaugg Stern
Following the severe flooding of recent years, Swiss municipalities are supposed to prepare risk maps showing the settled areas potentially at risk from natural hazards. Our research - jointly implemented with the Centre for Urban Landscape, Zürcher Hochschule für Angewandte Wissenschaften, Winterthur - analyses the processes by which these risk maps are translated into protective measures. Conceptually, this analysis starts from an adaptive governance perspective, i.e. that policy implementation represents an arena of negotiation, and that innovations such as risk maps demand adaptive capabilities in the overall governance regime. A first workshop with stakeholders from cantonal and municipal levels was conducted, and village-level case studies in the Linthebene plain were launched.

Negotiating Rural Development at South Asia’s Frontier
U. Müller-Böker, B. Korf, B. Klem, M. Junginger
The SNSF has approved a ProDoc research module on Negotiating Rural Development in South Asia that is being jointly carried out by Human and Political Geography and hosts two PhD studies. In Human Geography, M. Junginger is conducting his PhD on migration, multi-local livelihoods and social change in Far West Nepal. The newly launched revived the project (suspended during the civil war) on multi-local livelihoods in Far West Nepal.

Ulrike Müller-Böker and collaborators
1.4 Political Geography
General Overview
Political Geography is a newly established research group within the Department of Geography. Our main fields of interests are in political geography (in particular violent conflict), political ecology (nature-society dialectics), development theory and theoretical (philosophical, methodological) debates in human geography. We collaborate closely with colleagues from Human Geography and the sotomo group. Some highlights of our activities in 2008 are listed below.

- In September, Dr. S.H. Hasbullah, Department of Geography, University of Peradeniya, Sri Lanka, joined our group as a visiting researcher, working on a project on Muslim geographies in eastern Sri Lanka.
- In early September, B. Korf organised an internal workshop that brought together researchers from the UK, Sri Lanka and Switzerland who took stock of their ongoing FAITH project, analysed research results and discussed dissemination options.
- Pia Hollenbach joined the Political Geography group as a PhD student and affiliate of the University Priority Research Programme Asia and Europe (UFSP). Her research explores the moral geographies of tsunami aid in Sri Lanka.
- In August and September, Mark Starmanns collaborated with the NGO ‘Erklärung von Bern’ in the publication of their brochure “Fair Fashion”, which compares and assesses Swiss clothing labels.
- In October 2008, the book ‘Zukunftsfähiges Deutschland’ was published as the result of a collaborative work of a group of authors to which M. Starmanns belonged.
- Tobias Hagmann conducted one month of field research into the impacts of ethnic federalism on local politics in Ethiopia in mid-2008.
- The Commission for Research Partnerships with Developing Countries (KFPE) awarded a research grant to Michelle Engeler for her ongoing doctoral work on youth and the state in Guinea. She conducted one month of fieldwork in Guinea’s capital Conakry during the national celebrations of 50 years of independence in September 2008.
- B. Klem was awarded a research grant on behalf of the University Research Fund to carry out research on the role of religious organisations in the Sri Lankan civil war, which will be part of this PhD thesis.

Main research activities and scientific progress
Our research centres around three core themes that shape contemporary geographies of global networks and uneven development: geographies of violence, moral geographies, and geographies of power. We conduct theory-guided empirical research in Africa and South Asia. Our aim is to contribute to, challenge and refine ongoing academic debates on nature-society dialectics, resource conflicts, ‘new’ wars, state failure, ethical trading and uneven development. At the same time, we collaborate and dialogue with policy makers and development practitioners and establish partnerships with academics from the global South.

AID: Aid, Conflict and Peacebuilding in Sri Lanka
B. Korf, J. Goodhand, J. Spencer
and will be an important contribution to analyse the failure of the 2002-2003 peace process in Sri Lanka and the subsequent slide into shadow war.

**DECENTRALIZATION: Promises and pitfalls of ethnic-based decentralization in federal Ethiopia**

T. Hagmann

Ethiopia has embarked on a radical reform of its public institutions since the coming to power of the current EPRDF government in 1991. The federal restructuring of the country’s administration and of political representation relies on ethnically defined units. A growing body of literature on Ethiopia’s ‘ethnic federalism’ has scrutinized its impacts on inter-ethnic conflicts, state-society relations and service delivery at a local level. The objective of this research is to take stock of this literature and to assess ethnic-based decentralization from a national governance perspective. Of particular interest is ethnic federalism’s record in terms of enabling popular participation, balancing urban/rural and highland/lowland disparities, enhancing public services and maintaining stability.

**FAITH: Conflict, Community and Development in Sri Lanka**

B. Korf, B. Klem, J. Goodhand, J. Spencer, K. T. Silva, S. Hasbullah

This is a collaborative project with the University of Edinburgh, the School of Oriental and African Studies (SOAS) and the University of Peradeniya in Sri Lanka funded by ESRC. The project studies the linkages between aid, religion and conflict in the multi-ethnic and multi-religious east coast of Sri Lanka. In 2008, B. Klem conducted various rounds of field research in Akkaraipattu. In early September, we organised an internal workshop that brought together all researchers of the project to take stock of the research results and to plan dissemination, publication and policy dialogue.

**GIFT: Moral Geographies and the Tsunami Gift in Sri Lanka**

P. Hollenbach

The University Priority Research Programme Asia and Europe (UFSP) funds this PhD project. The project is based on working experiences in the tsunami rehabilitation and reconstruction process in Sri Lanka. The ethnographic work aims to explain and reveal how humanitarian aid works on the ground; how interests and expectations on both sides of the aid chain and the role of the aid brokers constitute a system in which the main objective of demand-oriented humanitarian aid has to be delivered. The project traces the multi-local nodes of the aid chain of a German Protestant aid agency, analyses moral discourse and practices of giving and how these translate into concrete aid practices and rituals. Research is conducted in Sri Lanka and Germany.

**PASTORALISM: Pastoral Conflicts in the Horn of Africa and Pastoral Development in sub-Saharan Africa**

T. Hagmann, C. Ifejika-Speranza, G. Fokou, B. Bonfoh

Pasture-based extensive livestock production is the dominant land-use system in the Horn of Africa. The proliferation of violent inter-group conflicts in the past two decades has raised the question of the long-term
viability of transhumant herding. In collaboration with colleagues from the NCCR North-South, a summary report on pastoral conflict causes and management strategies by state and non-state actors and institutions in the Horn of Africa has been produced. In addition, a planned journal special issue is currently in preparation that will look at new avenues for pastoral development in sub-Saharan Africa from an interdisciplinary viewpoint.

**RURAL: Negotiating Rural Development at South Asia’s Frontier**
U. Müller-Böker, B. Korf, B. Klem, M. Juninger
The SNSF has approved a ProDoc research module on Negotiating Rural Development in South Asia that is jointly conducted by Political and Human Geography and hosts two PhD studies. In Political Geography, B. Klem is conducting his PhD on Religion, Conflict and Development in Sri Lanka. The project will start in early 2009.

**STATE: Negotiating Statehood in Africa and Political Orders Beyond the Nation-state**
T. Hagmann, D. Péclard, M. V. Hoehne
Academic and policy discourse nowadays portrays post-colonial African states in virtually pathological categories; they are perceived to be threatened by ‘collapse’, ‘failure’, ‘fragility’ and ‘weakness’. Following a systematic critique of the state failure debate, the objective is to come up with an alternative framework for the study of political orders within and beyond the nation-state in contemporary Africa. Research concentrates on the negotiation of statehood in dynamic post-conflict contexts as well as a reflection on the political geography of the local statehood.

**TRADE: How Ethical is Ethical Trade? Private Governance Networks in Global Value Chains**
M. Starmanns
Despite brands’ and retailers’ efforts to improve working conditions in global garment value chains, NGOs and trade unions often criticise the private governance of social standards for being ineffective and illegitimate. To make trade more ethical, many corporate actors within global value chains build up networks to co-operate with their stakeholders from civil society. This PhD examines, how such networks might contribute to making global trade more ethical, focusing on questions of democratic legitimacy and power relations. The research is based on empirical data from global garment chains between Europe, India and Bangladesh.

**YOUTH: State making in Guinea and Youth as Political Actors**
M. Engeler
This PhD research project looks at the nexus between youth and state making in Guinée Forestière, a marginal and understudied region of the West African state Guinea. The recent conflicts in Sierra Leone, Liberia and Côte d’Ivoire have often been interpreted as youth crises or generational conflicts. However, youth has rarely been related to the state and, more particularly, processes of state making and state formation. This holds particularly true for Guinea, whose political dynamics have been influenced by the past civil wars in neighbouring Sierra Leone, Liberia and Côte d’Ivoire. The aim of this research is to produce an ethnographic study
of both youth organisations and local state institutions as they are manifest in this particular region of Guinea. Both youth and the state are conceptualized as social actors that express and reproduce material realities and symbolic imaginaries in their daily lives. Of particular interest are the social processes by which youth involves in state making and/or fulfils key state roles.

_Benedikt Korf and collaborators_
1.5 Economic Geography
General Overview
The research focus of the *Economic Geography* unit lies in the fields of urban and regional development, housing and real estate markets, tourism, and gender studies.

Main research activities and scientific progress
As part of the NRP 54 ‘Sustainable Development of the Built Environment’ E. Bühler directed the research project “Sustainable design, management and appropriation of urban public parks”. Focusing on three specific urban parks in the city of Zurich this project aims at identifying elements of design and planning as well as strategies of management and operation that foster a socially sustainable appropriation of public areas. These research objectives shall be achieved by a combination of quantitative and qualitative methods and in a collaboration of the units of economic geography (PhD-student H. Kaspar and E. Bühler) and GIVA (PhD-student F. Ostermann and S. Timpf, Augsburg). The public administration unit ‘Grün Stadt Zürich’ of the municipality supports the project. Its results will contribute to the performance measurement of public goods and services in the city of Zurich. The results of the project were presented and discussed at several local, national and international workshops and meetings during 2008.

In the PhD project ‘Life Plans’, K. Schwiter analyses the narratives of young adults from the German-speaking part of Switzerland on their life plans. It focuses on collective norms and values as well as on related concepts of masculinity and femininity. The project is part of the interdisciplinary PhD programme ‘Gender in Motion’ at the University of Basel. In August 2008, first results were presented at the Annual Conference of the Royal Geographic Society in London.

Climate change and winter tourism is still a topic of major importance. After the publication of an OECD report by Abegg et al. (2007), our research gained unprecedented attention. As a result B. Abegg and H. Elsasser were able to present their findings on numerous occasions. The audience was the scientific community, the tourism industry and also the general public. We have since continued our research activities. The focus, however, has shifted from impact to perception, adaptation and mitigation strategies. Some examples of this are a nationwide survey of Swiss ski area operators and a detailed examination of existing and planned adaptation and mitigation strategies in tourism. In addition, several research groups in Switzerland and abroad have called on their expertise.

The zone*imaginaire* project by P. Klaus and A. Odermatt – analysing potential temporary uses for former industrial areas in the cities of Aarau, Winterthur and Zurich – was successfully completed. The project leaders are preparing a publication and a public event for 2009.

After being commissioned by the Zurich city council’s Department of Urban Development (Stadtentwicklung Stadt Zürich), A. Odermatt, C. Heye and C. Craviolini analysed the development of Zurich’s Langstrasse area in the period from 1990 to 2007 in the ‘Langstrasse – Gentrification or incumbent upgrading?’ research project. By means of statistical analysis of census and register data as well as by interviews, it studied recent changes in the social structure, housing market and employment structure of this neighbourhood. The main objective of this project was to provide basic information in order to make statements about the potential or actual expulsion of specific population groups or activities. The results indicate that expulsion is taking place due to construction and reconstruction activities, which is still spatially limited to a number of buildings, but is
overall far more pronounced in this particular district than in the city as a whole. The findings met with a great deal of interest and were published in major national newspapers.

*Hans Elsasser and collaborators*
1.6 Remote Sensing Laboratories (RSL)
General Overview

2008 was a year of transition, of reviewing the past, searching for and marking out the position we are now in, and evaluating upcoming changes that will come with the handing-over of activities to my successor. In that sense we had a number of discussion rounds with Michael Schaepman, who was elected by the University Council on 19 May 2008 to take up his duties in March 2009. For the staff, the continuation of their activities and employment were the most important issues. At the end of 2008, solutions could be found to all these questions so as to allow a smooth transition on 1st March 2009. I am very much indebted to Michael Schaepman for these constructive interaction and discussions.

Our research strategy continued to be effective and produced a number of excellent papers and results in all our laboratories. APEX’s successful first flight was a major event, delivering the first airborne image data on 21 October 2008. There is still plenty of work to be done, yet it was rewarding to see that most calculations and simulations were based on the correct assumptions. Edoardo Alberti, Francesco Dell’Endice, Daniel Schläpfer and Andy Hueni deserve great credit for this success.

The whole Spectrolab has concentrated on the arrival of APEX and the need to develop new level 3 and 4 products and the accompanying processing modules. Silvia Huber, Jürg Schopfer and Achilleas Psomas received their doctoral degree after a successful defence of their respective theses. Benjamin Koetz rejoined the Spectrolab team after one-and-a-half years at ESA-ESRIN to manage the Hyper-Swiss-Net project funded by SUK and ETH. Later in the year, Alexander Damm from Berlin reinforced the team as a post-doc researcher in the field of hyperspectral vegetation analysis.

After 15 years of research, Daniel Schläpfer left RSL at the end of 2008 to fully concentrate on his teaching assignment and his company, 'ReSe'. Daniel was instrumental at the time we were writing up the requirements for APEX. He calculated the driver applications’ SNR requirements and the performance necessities for the system, and later simulated test cases and assessed the experimental results. In addition, he taught classes in spectrometry for many years. I would like to thank Daniel for his outstanding work that has definitely made a major contribution to our good international scientific standing. I am very happy that he is willing to support the APEX team as an expert on a contractual basis in the future.

Tobias Kellenberger will leave RSL at the end of February 2009 to take up new and challenging duties at swisstopo. He has been with my division for the last 21 years, first as an assistant, then as a research associate and as my deputy as head of the Applied Remote Sensing division, and has since 2000 been leader of the LACOMMLab and the scientific NPOC within RSL. Tobias assisted and later independently carried out exercises for students in Remote Sensing II and III. He managed his own course in Remote Sensing IV and , the advanced course on classification and analysis as part of the Bologna GEO 444 System. His students have appreciated his excellent teaching abilities and how he helped them to bridge the gap between theory and practice. In his lab activities, he stressed the applicability of remote sensing technology. He was a key person and a major logistical aid for both the Department and RSL. The RSL team and the students will certainly miss him. We wish him much satisfaction in his future job in Wabern, and all the best in his personal life. One of the LACOMMLab’s major achievements under Tobias Kellenberger’s guidance was the successful publication of the report on ‘Significance of Earth Observation for Switzerland 2008’, a major undertaking initiated by the Swiss Commission for Remote Sensing.
There were no changes in SARLab staffing. The existing experienced personnel made significant advances in their research. Calibration/validation activities continued to be extended with the partners, ESA (Envisat), JAXA (ALOS) and DLR (TerraSAR-X). The most innovative new development in airborne SAR data processing was perhaps the addition of bistatic processing capability. Tomographic processing, multibaseline interferometry, and polarimetric SAR processing all made significant progress. New concepts in LIDAR processing and the worldwide first direct measurement of tropospheric path delay effects on satellite radar signals demonstrated the SARLab’s continuing drive for innovation.

In this — my last yearly report in my current position — I bid farewell to the Department of Geography and the University of Zurich. It has been a tremendous challenge and joy to work here for the last 40 years. I wish readers of this yearly report, my successor, my former employees and friends, and my colleagues at the Department all the very best for a prosperous future!

*Klaus Itten*

**Main research activities and scientific progress**

RSL research projects are summarised below for the three research groups SARLab, SpectroLab and LACCOMMLab and its NPOC.

**Research projects SARLAB**

E. Meier, D. Small

In 2008, a geometric and radiometric quality control of the three focusing methods of our Modular SAR Processor (MSP) was performed, comparing Extended Chirp Scaling, Range-Doppler and Omega-K methods. The investigations validated the consistency between these methods. Important partner institutions in this were our data providers, which included ESA, DLR, JAXA, FGAN and NASA (M. Frioud).

In the field of airborne SAR interferometry, the multi-baseline interferometric processing of MEMPHIS data was extended to include its high-resolution mode (~0.2 m spatial resolution). The software was successfully tested on data acquired during a campaign that took place in Switzerland in May 2008. Improvements in the processing of navigation data resulted in better phase correction and geocoding (C. Magnard). Further developments were made in SAR tomography. A combined 3D focusing approach based on time-domain back-projection and the Capon beam-former was implemented, its focusing performance evaluated and its improved suppression of sidelobes observed, as compared to the standard time-domain beam-former (O. Frey). The studies in the field of SAR polarimetry were continued with data from a number of polarimetric SAR sensors (E-SAR, ALOS PALSAR). Based on these real datasets, the coherence simulation of SAR data was further developed since last year. This year the main task was to implement an option to simulate the backscatter of vegetation, especially forests. The forest modelling is based on fractal tree models; the backscatter is modeled using a full wave approach (L. Zuberbühler).

Reports were delivered to ESA that summarised the excellent relative and absolute geometric prediction accuracy of Envisat/ASAR products achieved using transponder measurements from 2008 as well as detailed methodological descriptions of the steps necessary for highly accurate geolocation of Envisat/ASAR products and dependence on state vector accuracy. Prototype software for normalisation of terrain influences on SAR image radiometry was demonstrated using Envisat/ASAR and ALOS/PALSAR data, and installed at ESA. New
software was written to make the ingestion of TerraSAR-X and Radarsat-2 products possible, enabling derivation of value-added products (A. Schubert, D. Small).

Calibration campaigns were carried out, placing corner reflectors in the field to estimate geometric prediction accuracy using data products from the German TerraSAR-X satellite. In a unique experiment, trihedral corner reflectors were placed high up in the Alps and in adjacent valley locations to highlight atmospheric refraction-induced path length variations. Using the corner reflector measurements, we were able to more accurately model tropospheric contributions within the TerraSAR-X processor. Advances in the estimation of ionospheric effects on radar signals were also made. The effects of Faraday rotation were simulated for spaceborne SAR images and compared to real data (ALOS-PALSAR) - good agreement was found (M. Jehle).

The Swedish CARABAS (low frequency radio-wave) SAR system came to Switzerland in late 2007 for a flight campaign. In 2008, the first results using the extensive data set were evaluated. RSL’s ultra-wide-band SAR processor was extended to process SAR data from non-linear (including circular) flight tracks. Additionally, promising first results were obtained from focusing bistatic (two-antenna) and dual-polarised data sets (A. Barmettler).

In the field of LIDAR remote sensing, the collaborative work within the European FireParadox project continued. The research focused on the derivation of vertical fuel stratification maps. In addition, modelling of a new multi-spectral LIDAR instrument was carried out in close co-operation with the University of Edinburgh. Several journal publications, prepared together with our foreign partners, were submitted or are in preparation (F. Morsdorf).

**Research Projects SpectroLab**

M. Kneubühler

In early 2008, further tests on the APEX instrument subunits were carried out by the industrial team (RUAG Aerospace, OIP, Netcetera). In parallel, the opto-electronic subunit underwent final assembly and alignment operations. In April 2008, the subunits were delivered to the industry (RUAG Aerospace, Emmen) for tests at the system level. These activities included extended evaluation of the optical performance of the sensor at the Calibration Home Base (CHB), and completion of the air-worthiness certification procedure for the Dornier DO-228. First outcomes of the system tests showed clear possibility for improvements and further fine tuning that led to a new iteration of the system tests held in October 2008, comprising a dedicated imaging flight and a series of activities at the CHB for pre- and post-flight optical performance assessment. The data acquired during this latest experience are currently under analysis and will provide indications of the instrument behaviour under working conditions. Until early 2009, the instrument will be prepared for the upcoming acceptance procedures to be ready in summer 2009. At the same time, the software for testing, characterization and calibration activities, the CHB Test Master (CTM), was developed and successfully tested throughout the various CHB campaigns, finishing in early 2009. Version 0.7 of the Processing and Archiving Facility (PAF) software package was released in March 2008. A new version integrating the CTM processor is under development. Also in March, the second APEX Science Product Day took place at RSL with the objective of stimulating the discussion around new and advanced scientific products using the APEX instrument. The APEX-project is financed via PRODEX (Programme de développement d’expériences scienti-

The EU Hyressa project (FP6, Infrastructures, Accompanying Measures) was successfully terminated in February 2008. The project clearly showed the need to build and coordinate a European network of imaging spectrometry facilities and to define user-driven requirements for the community. Following on from this, Hyressa and EUFAR started to join forces on airborne research in FP7 from 2008 to 2012. The kick-off meeting of the joint FP7 EUFAR project (33 partners) took place in September 2008 (K. Itten, M. Kneubühler, A. Hüni).

In February 2008, the European project HYPER-I-NET (Hyperspectral Imaging Network, FP6 Marie Curie Research Training Network) entered into its second year. Petra D’Odorico continued her PhD on the topic of sensor calibration and validation, jointly supervised by RSL, Kayser-Threde (DE) and Specim (FI). The second Hyper-I-Net summer school at Wageningen University (NL) took place in September 2008 and brought together more than 100 young and senior researchers in earth science and applications using imaging spectroscopy (K. Itten, P. D’Odorico, M. Kneubühler, E. Alberti, F. Dell’Endice, A. Hüni).

RSL’s field and laboratory goniometer system has proven to be a well-characterized and stable instrument for measuring the spectro-directional reflectance behaviour of remote sensing targets. The recently updated field setup allows simultaneous measurements of the target reflected radiance on the one hand and the incoming diffuse directional component on the other (by mounting two identical ASD field spectrometers on to the goniometer). This has greatly improved the retrieval of object-inherent spectro-directional target properties. J. Schopfer successfully completed his PhD thesis on Spectrodirectional Ground-Based Remote Sensing sing Dual-View Goniometry. In March 2008, J. Weyermann started his PhD thesis dealing with BRDF correction of hyperspectral imagery (J. Schopfer, J. Weyermann, M. Kneubühler, A. Hüni, K. Itten).

As part of the SNSF project on ‘Investigation of Imaging Spectrometry as an Earth Observation Method for Environmental Analysis’, Silvia Huber completed her PhD thesis on Estimation of Ecologically Relevant Land Cover Variables from Imaging Spectroscopy. As for the second research topic within the SNF project dealing with the development of operational methods for the retrieval of water constituents in Swiss and European inland waters, activities are progressing well. An automated retrieval scheme was implemented for time series of MERIS full resolution data sets in collaboration with EOMAP (DE) (D. Odermatt, M. Kneubühler, J. Nieke, K. Itten). The activities prepare for algorithm development for environmental research within the upcoming APEX Science Center. A joint Belgian-Swiss project MICAS (VITO and RSL) on ‘Monitoring Inland and Coastal Waters with the APEX Sensor’ will start in January 2009 (K. Itten, D. Odermatt).

RSL recently identified the need for a spectral database. The SPECCHIO system is a solution for the storage and management of spectroradiometer data based on a relational database. SPECCHIO is currently being used for scientific and educational purposes at RSL and has been locally installed by a number of other research institutes. RSL maintains an online version of the database accessible to the general public, with automatic account generation being offered on the SPECCHIO website (http://www.specchio.ch). The SPECCHIO system remains under continual development and will soon feature flexible post-processing options (A. Hüni, M. Kneubühler, J. Schopfer).
In close collaboration with WSL (N. Zimmermann), the assessment of seasonal variability of dry meadows using hyperspectral data and analysis techniques was investigated. A. Psomas successfully concluded his PhD thesis on Hyperspectral Remote Sensing for Ecological Analyses of Grassland Ecosystems.

The recently started Hyper-Swiss-Net project aims at developing and supporting the scientific expertise and infrastructure in Switzerland for the exploitation of imaging spectrometry technology for different Earth observation applications. After the Kick-off in August, a detailed scientific design of the project was prepared. The project team, which comprises three Swiss universities and three ETHZ institutes, is jointly funded by the Swiss University Conference and the ETH Board (K. Itten, B. Koetz, M. Kneubühler).

Within the NASA project ‘Model Inversion of Multiple-Sensor Data For Forest Biophysical Parameters Retrieval’, several modelling studies were conducted to explore the synergy of RADAR, LIDAR and multi-directional optical data to describe the 3-D structure of forests. Further, various field campaigns and remote sensing data sets have been compiled to assess the potential of the RTM retrieval based on the multi-sensor approach. The project is a research opportunity funded by NASA in collaboration with the University of Maryland and NASA-GSFC (B. Koetz).

RSL is contributing to the fourth phase of the RAdiation transfer Model Intercomparison (RAMI) with the parameterisation of an ‘actual canopy’ scene to emulate a more realistic environment for this benchmarking exercise. The parameterisation of the scene was based on actual airborne and field measurements acquired in the Swiss National Park (B. Koetz, F. Morsdorf).

The SpectroLab is involved in PI activities for the European Compact High Resolution Imaging Spectrometer (CHRIS) onboard PROBA and for MERIS on ENVISAT. The assessment of the heterogeneity of vegetated surfaces and improved retrievals of ecologically relevant variables from multi-angular CHRIS data was investigated further in two-core study sites in Switzerland, one on the Swiss plateau and another in the Swiss National Park. A considerable number of spectro-directional data sets have been recorded over these study sites since 2003, allowing assessment of ecological processes over time. Recently, it has been shown that information retrieval from multi-angular data is superior to monodirectional approaches (M. Kneubühler, B. Kötz, S. Huber, J. Schopfer).

Research Projects LACOMMLab
T. Kellenberger

The focus and work of the Lacommlab is best described as bridging the gap between earth observation data, techniques and scientists on the one hand and geodata product users and customers on the other. The variety of our bridging contributions is shown by projects in various research fields, such as archaeological mapping with ADS40 data in Rheinau (ZH), mapping of land-use change in Roldan (Argentina) using Landsat data, monitoring of forest dynamics in the canton of Glarus using aerial images, change analysis of peri-urban agricultural land-use patterns in Hanoi using Quickbird data, and cave entrance detection in central Switzerland using thermal aerial images (T. Kellenberger et al.).

A further bridging landmark this year was the release of the report on the ‘Significance of Earth Observation for Switzerland’, representing the position of the Swiss Commission for Remote Sensing (SCRS), the scientific union of remote sensing research institutions within the Swiss Academy of Sciences (SCNAT). This report describes the state of the art of earth observation in Switzerland using remote sensing methods and
identifies the benefits for Swiss users, the research community and industry. The report supports decision-makers - politicians, research entities and industry - in strengthening and increasing their activities in national and international contexts to support Swiss needs and potential in the important field of remote sensing and earth observation. The report was initiated and edited by T. Kellenberger, SCRS chair and head of LACOMMLab.

The rapid detection and mapping of avalanche deposits is important for forecasting avalanches, verifying warning products, hazard mapping and decision-makers, as well as to calibrate and validate avalanche models. Current observations by individual experts in the field provide isolated information with very limited coverage. To evaluate the potential importance of remote sensing data for avalanche deposit detection and mapping, a successful flight and field campaign was carried out in the area of Davos (GR) with the digital airborne Scanner ADS40. The encouraging results of this study led to a joint research project with the Swiss Institute for Snow and Avalanche Research (SLF) (Y. Bühler, T. Kellenberger).

The chemical and biochemical substances used to protect roofs and frontages are considerable pollutants if they are washed out into the groundwater. Students participating in the GEO444 Master’s course in ‘Classification and Analysis’ completed a preliminary study for the Swiss Federal Institute of Aquatic Science and Technology (EAWAG) on the potential of airborne digital scanner data to distinguish different roofing materials within the test site of Rheinau. A second project within this module investigated loess erosion within the Qingyang province in the plateau region of northern China. The students performed a change detection analysis using Landsat satellite data to map the loss of land and the effects on rural settlement patterns. The results of this study are used within a joint project involving Chinese and Swiss scientists (sinoswiss). A third project within this master module mapped the extremely sensitive and rare Welwitschia plants (Welwitschia mirabilis) in the Namibian desert. The students used satellite data with high spatial resolution from the sensors to assess the potential of satellite data as a non-invasive Ikonos and Quickbird mapping technique (Y. Bühler, T. Kellenberger).

The newest generation of SAR satellite sensors can acquire data with a high spatial resolution of about one metre pixel size, independently of weather and sunlight conditions. To evaluate the potential of the TerraSAR-X sensor in the mapping of urban structures such as buildings, streets and parks, two images taken over Zurich in spring were analysed using an object-oriented classification approach (Y. Bühler, T. Kellenberger).

Highly resolved optical satellite data are well suited for mapping and monitoring urban features and infrastructure in remote and inaccessible areas. A comprehensive study over the city and region of Prizren in Kosovo explored the benefits and limits of Quickbird and Ikonos data for detecting and mapping surface features with an optimized object-oriented approach. The study was carried out on behalf of Swiss authorities in the context of the Swiss KFOR troops in Kosovo (A. Psomas, T. Kellenberger).

NPOC

T. Kellenberger

The scientific National Point of Contact (NPOC) for satellite images at the Remote Sensing Laboratories carried out consulting, research and development activities in accordance with its framework agreement with the Swiss State Secretariat for Education and Research. The assessment report on the potential use of upcoming
Kopernikus/GMES (Global Monitoring for Environment and Security) data products for the Swiss government was recognised by the Swiss Federal Council within the new Swiss Space-Policy. This success emphasises the importance of the scientific NPOC in setting the stage for greater joint Swiss/international projects in the future (T. Kellenberger, F. Seidel, Y. Bühler).

The scientific NPOC’s annual project for 2008 was to address the long-standing lack of a compendium of earth observation activities within Switzerland. We were able to set up a database containing in-depth information about Swiss institutions with reference to remote sensing. It covers scientific entities and service providers as well as the space industry (F. Seidel, T. Kellenberger).

Scientific efforts in the field of rapid detection and mapping of snow avalanches by means of airborne line-scanning sensors continued and led to some promising results. Close collaborations with the Institute for Snow and Avalanche Research (SLF/WSL) and Leica Geosystems were established, leading to a successful field campaign in early 2008 (Y. Bühler, T. Kellenberger).

Growing NPOC expertise has pushed back the current boundaries of cutting-edge research in the area of efficient atmospheric radiation transfer modelling. The potential use of this research for global-change monitoring applications provides enormous benefits to society (F. Seidel).

*Klaus Itten and collaborators*
1.7 Geographic Information Visualization Analysis (GIVA)
General Overview

The research focus at the Geographic Information Visualization and Analysis (GIVA) unit lies at the interface of geographic information science, geovisual analytics, and spatial cognition research with the aim of improving spatial inference and decision-making in society through the dissemination of cognitively adequate geographic information technology.

Main research activities and scientific progress

Scientific activities are centred on four research threads involving spatio-temporal analytics (i.e. relevance modelling, moving object representations, vague concepts formalization, spatialization, human navigation, etc.), interface design of large and small interactive displays (i.e., mobile cartography and location-based services, 3D stereoscopic wall displays, dynamic and interactive exploratory visualization tools, etc.), including fundamental empirical evaluations of developed visualizations and tools based on theoretical underpinnings from geography, psychology and cognitive science (i.e., eye-tracking studies and other experiments on human subjects). Specific externally funded research activities in the past year included:

PopEye: Visual Analytics of Spatio-Temporal Gaze Point Patterns in Eye Movements (SNSF)

This 3-year SNSF-funded research programme led by S. Fabrikant (GIVA) and R. Weibel (GIS) aims to develop visual analytics methods and data exploration tools for the effective depiction and analysis of time-referenced spatial data sets at high resolution. One line of research emphasises spatio-temporal analytics methods (S. Dodge, a PhD student in the GIS unit), while the second focuses on the design of cognitively adequate visual analytics displays through empirical evaluation (A.-K. Lautenschütz, GIVA PhD student). In this past year, ideas for a conceptual framework of movement visualizations were presented at the AGILE 2008 in Girona (Spain). Additionally, qualitative methods were used to identify the most important cognitive elements that enhance the effective visual depiction and analysis of spatio-temporal data. Resulting from this, we are currently developing an experimental design to test the influence of context on users’ understanding of movement behaviour from visualizations.

Animeye: How does animation work? Eye-movement analyses of dynamic geovisualization (US NSF/UZH)

Graduate student researcher Stacy Rebich at UCSB supervised qualitative data analysis of verbal reports collected during eye movement experiments together with undergraduate students at UCSB. This line of research is continuing at the UZH, where incoming PhD student Jan Wilkening contributed in the past year to the development of a novel visual analytics application. This tool allows researchers to explore user interactions synchronized with eye movements and this helps to improve the understanding of how people interact with animated and static displays representing spatio-temporal processes.

VISPA: Visualisierung der Raumaneignung in öffentlichen Parks (SNSF)

VISPA is one research arm of the ‘Sustainable Design Management and Appropriation of Urban Public Parks’ project led by E. Bühler and S. Timpf, under the auspices of the SNSF’s NFP 54. Frank Ostermann has
successfully completed his PhD studies. His dissertation deals with visualizing the spatio-temporal behaviour of park visitors and developing visual geoanalytics methods for the quantitative analysis of vague spatial concepts, such as space appropriation.

**GeoRel: Geographic relevance in mobile applications (SNSF)**
This new research project started in December 2008 under the leadership of PI T. Reichenbacher. The project team investigates the role of geographic relevance in mobile applications taking a two-pronged approach. The first line of research (PhD student: S. De Sabbata) funded by the canton of Zurich, seeks to assess the relevance of geographic objects in mobile usage contexts. The second strand (PhD student: P. Crease) is a new 3-year SNSF-funded project aimed at developing methods to represent and handle geographic relevance in mobile applications.

**GeoF: Development and Implementation of Geofoveation (SNSF)**
This SNSF funded project will get into full swing in January 2009 under PI Arzu Çöltekin and incoming PhD student Kenan Bektas. His dissertation deals with exploring the usefulness of biologically inspired level-of-detail methods (e.g., foveation) for geovisualization. This novel line of research is coined ‘geofoveation’. It will include the development and implementation of a geofoveation test-bed with the aim of increasing the efficiency and effectiveness of geovisualization displays.

**Swiss German Dialect Rap: For Tolerance and Respect**
This interdisciplinary research project, under the auspices of the Stiftung Erziehung zur Toleranz (SET) and carried out together with the Pädagogische Hochschule Zürich (PHZH), is funded by the Lottery Fund of the canton of Zurich. The aim of this endeavour is to scientifically evaluate an ongoing ‘Swiss German Dialect Rap’ competition held in Swiss German public schools to teach and foster tolerance and respect amongst youth. The aim of the GIVA portion of this project lead by PI S. Fabrikant and post-doc F. Ostermann is to i) analyse the content of the rap songs with respect to their potential spatial context dependence (e.g., based on the socio-demographic school profiles and their neighbourhood), and ii) help the general public visualize the research results using modern geographic information technology.

An additional research highlight, supported through UZH funding in 2008, included the extension of a student project submitted by Master’s students Benedikt Heil and Simone Garlandini for the GEO453 GIScience seminar lead by Arzu Çöltekin on ‘Eye Movement Research in Geovisualization’. This seminar project lead to a paper being accepted for the international AutoCarto 2008 conference (USA), and this was presented in a keynote speech by Arzu Çöltekin in Shepherdstown, West Virginia (USA). The paper was subsequently selected for inclusion in a special issue of Cartography and Geographic Information Science that will appear in 2009.

*Sara Fabrikant and collaborators*
1.8 Geographic Information Systems (GIS)
General Overview

2008 was another productive year for the GIS Unit. The group’s work was presented in over 40 journals, conference proceedings and books. Dirk Burghardt, one of the lecturers in our group, has been appointed Associate Professor of Cartography at the Technical University of Dresden, while Alistair Edwards, a post-doc, has been appointed as a Spatial Analysis Coordinator with the Department for Communities and Local Government in the UK. Felix Hebeler and Syed Awase Khirni both successfully defended their PhD dissertations. Demonstrating the quality of the work carried out by our MSc students, Lorenz Dolder and Andrea Ryffel were runners-up in the 2008 SGAG Award from the Swiss Association of Applied Geography. The large national e-learning project GITTA, of which Robert Weibel was project leader, was one of the winners of the 2008 Medida Prix, the largest and most important award in media didactics in Europe. Ralph Straumann won the ESRI Travel Award at the GiScience 2008 conference in Park City, UT/USA for his joint paper with Ross Purves. Patrick Lüscher’s joint paper with Robert Weibel and William Mackaness (University of Edinburgh) was selected as best paper at Spatial Data Handling 2008, and a paper on which Ross Purves and Alistair Edwards were co-authors with Jason Dykes and Jo Wood (City University) won a prize for best paper at GISRUK 2008.

A new SNSF Project (GenW2), concerned with on-the-fly integration of heterogeneous content in multi-representation databases and real-time map generalisation for small displays on portable devices started in September. GenW2 continues the successful research themes initiated through the preceding EU WebPark and SNSF DEGEN projects, investigating methods that form the basis and ingredients of mobile information systems, and catering to current developments in mobile computing. The project links in with research into the relevance of information items in location-based services, carried out in the GIVA Unit under the leadership of Tumasch Reichenbacher. Another important theme of the Unit’s research is geographic information retrieval. In this field, the EU project TRIPOD entered its second year and generated a stream of research prototypes and publications. Ross Purves organised the fifth edition of the International Workshop on Geographic Information Retrieval (GIR’08), a workshop series that he successfully launched together with Christopher Jones in 2004. This year, the workshop was held in conjunction with the ACM Conference on Information and Knowledge Management (CIKM ’08) at Napa Valley. Robert Weibel organised the fifth edition of the Dagstuhl Seminar on Computational Cartography at the computer science research center at Schloss Dagstuhl (D), on the topic of ‘Representation, Analysis and Visualization of Moving Objects’. The work of the Unit was also amply represented at international conferences with full paper review, including four papers being accepted for the GiScience 2008 conference. We look forward to a similarly productive year in 2009.

Main research activities and scientific progress

The research focus of the Geographic Information Systems Division (GIS) lies in the development of fundamental methods and techniques in Geographic Information Science, as well as their application in the environment and especially in protected areas. This research is carried out within three research groups. The first of these groups, Digital Cartography and Mobile Systems, focuses on methods for the automated generalisation of spatial data and the development of innovative techniques within mobile information services. The second group, Digital Terrain Modelling, specialises in research on the impacts of topographic uncertainty, methods to extract and represent semantics from terrain data and the emerging field of
geographic information retrieval. The third research group, Environmental Geoinformatics, focuses on the fields of GIS for wild animals and protected areas. Research into the spatio-temporal analysis of moving objects (e.g. wild animals) forms an increasingly important focus of this group’s work. These three research groups ran a total of ten research projects during the reporting year, two of them receiving European Commission funding, one funded through the Swiss National Science Foundation, one through Swiss federal participation in the European’s Commission COST programme, one through the University Research Fund, one through industry and two projects funded by charitable foundations, together with two internally funded PhD projects and two external PhD students.

**Digital Cartography and Mobile Systems Group**

**DEGEN**

In the reporting year the former SNSF project ‘Data enrichment for automated generalization’ (DEGEN) was continued by a short-term project funded by the Ordnance Survey of Great Britain (Britain’s national mapping agency). The service-oriented architecture for automated map generalization developed in M. Neun’s PhD project was modified to ensure it was compatible with the Open Geospatial Consortium’s WPS (Web Processing Services) international standard. The software is now available as open source.

**COST ORUS Project**

ORUS aims to extract complex urban concepts from spatial databases and funds PhD research by P. Lüscher. An approach combining formal definitions with statistical pattern recognition methods was developed in order to allow instantiation of formally defined concepts (e.g. ’terraced house’, ‘semi-detached house’, ’residential area’) from real data. Current work focuses on the extension of the research platform and further evaluation of the approach in collaboration with the Ordnance Survey (UK).

**SNSF Project GenW2**

GenW2 pursues the development of methods for web and wireless mapping with a focus on the integration of heterogeneous information and on-the-fly generalization. Two PhD students, P. Bereuter und R. Venkateswaran, started the project in September with a thorough literature study. The first aim is to develop a methodological framework for future generation mobile mapping scenarios. The framework covers the complete communication flow from data capturing and integration to user modelling, generalization and visualization. Thus it helps to structure research tasks and facilitate collaboration with others. A further theme was the development of a typology of methods for information filtering.

**Digital Terrain Modelling Group**

**EU Project TRIPOD**

The EU project TRIPOD continued in its second year in 2008. TRIPOD’s aim is to annotate and search images on the basis of their locations. As well as developing a conceptual ontology describing image content further and linking it to spatial data, methods to identify relevant objects from large volumes of spatial data were researched and published in several papers.
Extraction of semantics from elevation models
R. Straumann’s PhD project exploring the extraction of semantics from elevation models continued with a focus on the extraction of valleys and valley floors from terrain models, and the application of these extracted landforms as part of geomorphometric analysis.

SuMo - Investigation of Subscale Modelling Approaches - a case study in mass balance modelling of ice sheets
F. Hebeler’s post-doctoral project SuMo, funded by the University Research Fund, investigates subscale modelling approaches for the representation of mass balance processes at a variety of different scales. The project focuses on methods for either parametrically representing mass balance or implementing subscale models of mass balance over the entire model domain and at locations where subscale processes are thought to be most important.

Environmental Geoinformatics Group
EU Project FIRE PARADOX
The GIUZ team, consisting of the GIS and RSL units, concentrated on the following issues during 2008. It carried out a consistency check of the full-waveform processing methodology and the faulty data from Helica OGS was replaced with newly processed data. Additional geo-referencing for the shrub layer (based on INRA field data) was undertaken and introduced to vertical fuel stratification.

GIS Swiss National Park (GIS-SNP)
This project is part of a long-term collaboration between the Swiss National Park, the National Park’s research committee and the GIS Unit. Its focus is on the implementation and support of spatial analysis in nature conservation institutions and research. In 2008 the GIS-SNP concentrated on implementing a new geodata infrastructure for researchers in the SNP. The GiStory project’s second focus was on detecting and monitoring long-term landscape change over the past 100 years in the park area.

GIS Sihlwald
GIS Sihlwald is a joint project between the GIS Unit and Grün Stadt Zürich. In 2008, it became an inherent part of the research, management and provision of visitor information in the Sihlwald regional park. The GIS Sihlwald supported research and teaching activities at GIUZ. A number of Master’s and Diploma theses have been supervised and supplied with data, and an excursion to the Sihlwald was organised. The Sihlwald database was enhanced by processing and interpreting existing data (e.g. aerial photographs) and by integrating new data.

Analysis of Moving Objects
S. Dodge’s PhD project is linked to the SNSF PopEye project pursued in the GIVA Unit under the supervision of S. Fabrikant. It aims to develop methods for the spatio-temporal analysis of movement patterns in trajectory data generated by moving objects. In 2008, a systematic framework of movement patterns was published and
an algorithm was developed for the automatic segmentation and classification of trajectories into homogenous parts.

**External PhD Students**
In cooperation with the Mountain Hydrology research unit at WSL, L. Bernhard’s PhD project focuses on estimating the influence of climate change on the water cycle in forest ecosystems. R. Haller is working on the effects of uncertainties in the analysis of spatial data in wildlife studies in the Swiss National Park.

*Robert Weibel and collaborators*
1.9 Social and Industrial Ecology (SIE)
General Overview
The Social and Industrial Ecology Unit investigates questions of the transition towards sustainable development. The focus is on analysing the relationship between human action and the environment. We base our research on the concepts of social and industrial ecology and develop inter- and transdisciplinary methods to analyse human-environmental systems, modelling their interdependencies and assessing potential regulation strategies from a perspective of sustainability. We study the following questions: How do human actions affect the environment? Which factors affect human actions? How can strategies be developed and assessed together with the involved agents?

The division is structured in three methodological areas: (i) decision-making models (mental models, agent-based models and statistical models); (ii) environmental process models (material flow analysis, spatially explicit risk-assessment models) and (iii) integrative approaches (interdisciplinary simulation models, sustainability assessment, and transdisciplinary system and scenario elaboration). The thematic priorities are sustainable rural development and sustainable regional resource management. We perform research in Switzerland and in various developing countries, mostly in Latin America.

Main research activities and scientific progress
SNSF-Project (RHER): Reducing human health and environmental risks from pesticide use: Integrating decision-making with spatial risk assessment models: the case of Vereda la Hoya, Colombia.

The main goal of the project funded by the SNSF (project leader: C. Binder) is to contribute to interdisciplinary research in the area of sustainable rural development. The project develops a simulation model consisting of a behavioural and a spatially explicit risk-assessment component to derive and assess strategies to reduce the human health and environmental risks from pesticide use. The study area is Vereda la Hoya in Boyaca, a rural area in the Colombian Andes. As a first step, farmers’ and experts’ mental models and perception of the risks to farmers’ livelihoods were developed and compared (method development: Structural Mental Model Approach - SMMA). The SMMA was further developed last year to analyse people’s mental models of the future development of the region (Future SMMA). Finally, a Future Scenario Workshop was organised, in which the perspectives of farmers and experts were brought together in order to agree upon a coherent future state of the region (PhD R. Schöll). Based on the results of the mental model approach, an integrated sociological-psychological model was developed (behavioural part of the simulation model). The model includes explanatory variables such as climate, soil quality, health, etc. which provide the link with the environmental system model. The data from the survey, which was carried out in 2007, have generated two statistical models that quantify the factors affecting farmers’ use of protective equipment and the efficiency of pesticide use. The main factors determining whether farmers decide to use protective equipment are: prescriptive norms (reading, understanding and following the instructions on the package); descriptive norms (what farmers think other farmers do); the perceived negative health effects of pesticide exposure; and the age and organisation of labour. Two publications are in preparation, which present the results of the statistical models of protective equipment and pesticide use respectively. It is planned to submit these at the beginning of 2009 (PhD: G. Feola).

Secondly, we are adapting and continuing to develop current risk-assessment models to include occupational exposure and spatial distribution. One major challenge is to make the model applicable to risk
boundary conditions commonly encountered in less developed countries such as a lack of resources and low data availability. A joint field campaign with ETHZ was carried out to calibrate and validate the model and to measure (i) pesticide distribution in the different compartments (soil, water, air, plant) and on applicators, (ii) drift, and (iii) meteorological conditions and run-off in a selected sub-catchment. Pesticide distribution and drift were studied under different meteorological conditions using the weight method and the Uranine tracer method. To estimate the impact on humans through inhaling, two passive collectors were constructed in cooperation with Phys G3 and installed at the site. Furthermore, two nets were positioned in a vertical position 20 metres away. Two meteorological stations were installed to measure the weather conditions. Discharge from the sub-catchment was measured using an ISCO-7600 water sampler every 10 minutes over one week. Preliminary results show that (i) our relatively simple, spatially explicit hydrological model is able to model the water flows; and (ii) the tracer method commonly used in a geological context is a low-cost approach that yields high quality results (Post-docs: G. García Santos and Jing Yang).

Thirdly, we will programme the interface between the behavioural and the risk assessment model to obtain an interdisciplinary simulation model in 2009.

The project is being performed in collaboration with UNIBOYACA, Colombia (J. Diaz); Kiel University (Awudu Abdulai); International Potato Centre Peru (Charles Crissman); ETHZ (Christoph Schär, Roland Scholz); and Syngenta (Switzerland and Colombia), as well as with the Colombian Ministry of Health.

Demand and supply of the mineral fraction of construction materials: a modelling tool to support decision-making processes

The aim of the project financed by the Federal Roads Office (FEDRO), the Federal Office for the Environment (FOEN), the City of Zurich Buildings Office, and industry is to develop a decision support tool and recommendations for sustainable construction material management (Project leaders: C. Binder and H.-J. Althaus). Demand and supply of recycled mineral construction material (RMCM) should be matched in such a way that there is minimal environmental impact and the highest outcome in terms of sustainable development. Based on the premise that demand for recycled mineral construction material controls its supply, the demand will first be simulated using agent-based modelling in terms of material quality, time, and place. As a second step, the supply of recycled mineral construction material will be modelled using dynamic material flow analysis over the period between now and 2100.

In 2008, surveys were carried out in the canton of Zurich (an urban canton) and in Berne (a rural canton). It included the relevant stakeholder groups for civil and structural engineering processes i.e. private (33), commercial (37) and public contracting authorities (60), architects (31), engineers (80) and contractors (70). First results indicate that the decision-making and behaviour of private and public contracting authorities in terms of their demand for RMCM were significantly different. The project is being carried out in collaboration with the technology and society laboratory at the EMPA materials science and technology institute (H.-J. Althaus, co-leader), FEDRO, and FOEN (R. Cartier).

Sustainability assessment of the milk value-added chain in Switzerland

The goal of this project funded by the Swiss Office of Agriculture (Project leader: C. Binder, PI: J. Steinberger) is to develop a sustainability assessment instrument, a computer-based tool, which combines the powerful
insights gained from industrial ecology with transdisciplinary methodologies to guide research, policy and action towards sustainability. This project formalises a robust and flexible methodology for combining industrial ecology (natural science) and multi-stakeholder transdisciplinary methods (social science). We developed the methodology for the milk value-added chain in Switzerland. It includes four steps: (i) Material, energy and monetary flow analysis of the value chain, definition of an agent network; (ii) Indicator development for assessing the value added chain from a sustainability perspective, (iii) Sustainability assessment, including the analysis of the relationship among indicators and development of a sustainability solution space; and (iv) Assessment of current trends and scenarios of the value-added chain.

In 2007, we developed the transdisciplinary methodological approach and the computer-based tool to set the sustainability solution space and to assess the weaknesses and strengths of the value-added chain. As the methodology was designed as a generic one, we expect it to be applicable to a variety of problem areas, including both geographical regions and economic sectors, as a research and policy-guiding tool. The project finished in March 2008. It was performed together with the Federal Office of Agriculture; the Institute of Environmental Decisions, ETHZ (B. Lehman); the Swiss College of Agriculture (C. Studer); Emmi Switzerland (M. Willimann); Coop (S. Anschwander); and Seed Sustainability.

Phosphorus flows in Switzerland: status, risks and options for action

The goal of this research project funded by the Swiss Federal Office for the Environment (FOEN) (project leader: C. Binder, PI: D. Wittmer, L. de Baan) is to analyse the phosphorous system of Switzerland for the year 2006, to propose strategies to improve the management of flows, and to develop a monitoring system to quantify the potential risks and effectiveness of the proposed strategies. The project includes three modules: (i) analysis of the status quo; (ii) development of a phosphorous management system; (ii) risk assessment and development of a monitoring tool. The 1st module (December 2007 - March 2008) concerns the setting-up of the Swiss phosphorus system and the quantification of flows and stocks and their uncertainties. The core method used for the project is Material Flow Analysis. The phosphorus model is processed using STAN software. A first model of the phosphorous flows in Switzerland was obtained in 2008, which for the first time considered the uncertainties in all the flows involved. Based on the absolute and relative uncertainties, the set of flows was determined that should be estimated in greater depth and monitored over time. Furthermore, 5 scenarios for improving the phosphorous system (organic waste collection; sewage sludge recycling; animal meal as animal feed; animal meal as fertilizer; and maximum recycling) were developed and will be discussed with FOEN.

Analyzing and modelling transitions in socio-ecological system: the case of common grazing pastures in the Swiss Alps

This research project started in December 2007 and aims to analyse changes in pasture management systems in the Swiss Alps. We will investigate changes in high mountain areas managed in communal tenure by comparing two case study regions. As a first step, we will characterise, analyse, and model the transitions in pasture management systems in the Swiss Alps, with special focus on how institutions have developed and adapted. Then as a second step, we will develop, in a transdisciplinary process, scenarios and strategies for coping with upcoming challenges such as climate change and market liberalisation. L. de Baan started her PhD
thesis in April 2008 and has already had the opportunity to present the conceptual framework of the project in an international conference. This project will be carried out in collaboration with the Workshop in Political Theory and Policy Analysis, Indiana University (E. Ostrom); the Centre for Development and Environment, University of Berne (U. Wiesmann); and the Institute of Environmental Decisions, ETHZ (B. Lehman).

*Claudia Binder and collaborators*


1.10 sotomo

General overview
The sotomo research unit is an independent corporation connected to the Department of Geography and its Political Geography unit. sotomo combines research with application and transfer activities such as consulting, contract research, or analysis on demand. The two main thematic focuses are quantitative social geography (social area analysis, segregation analysis, urban studies) and political geography (regional political mentalities, values, and political behaviour).

Main research activities and scientific progress
Completion of e-learning project on democratic decision-making
In summer 2008, the project ‘Political processes in Switzerland’ funded by the Swiss Virtual Campus (SVC) ran out. The e-learning course that had been developed on democratic decision-making and political behaviour in the Swiss political system is now well-tested and integrated into the curriculum of the four main institutes of political sciences at the Swiss universities of Geneva, Lausanne, Berne and Zurich. sotomo has been commissioned to update and support the course in the coming years.

Challenges of future labour force immigration
A new research project about the future of labour force immigration into the Zurich metropolitan area was launched. The Zürcher Kantonalbank (ZKB) funds the project. It deals with forecasting immigration and its expected impact on economy, society and institutions. Special attention is paid to the spatial variations of these impacts. Our research partner for this project is BASS (Büro für arbeits- und sozialpolitische Studien) in Berne.

A new definition of urban agglomerations
The goal of this contract research project is to come up with and design a new definition for urban agglomerations and metropolitan areas for the Swiss Federal Statistical Office. sotomo is working on this project with Ernst Basler + Partner AG and Fahrländer Partner AG.

Monitoring and analysis of political behaviour in Switzerland
As in previous years, sotomo has done a great deal of analysis of the performance of political parties and members in the national parliament. Most of these studies have been published in the major Swiss newspapers.

Michael Hermann and Heiri Leuthold
1.11 Joint research projects

This section refers to collaborative projects that reach beyond the boundaries of a single unit that highlight intra-departmental networks. Ongoing joint research projects include the following:

- The RSL and the GIS unit continued their collaboration on the EU PARADOX fire-modelling project.
- The SNSF PopEye project, the EU project Tripod and the EU coordinated action VisMaster is being jointly worked on by GIS (R. Weibel, R. Purves) and GIVA (S. Fabrikant).
- Joint supervision of L. Fischer’s PhD on ‘Extraction of objects from a sheer rock face based on LiDAR data: development of new methods using the Monte Rosa east face as an example’ by GIS (R. Purves) and 3G (C. Huggel).
- The PhD thesis of S. Gubler is being jointly supervised by 3G (S. Gruber) and GIS (R. Purves).
- The SNSF has approved a ProDoc research module on Negotiating Rural Development in South Asia that is jointly conducted by Human and Political Geography and hosts two PhD studies.
- 3G members supported the SIE project RHER by designing and constructing fog collectors for field work in Columbia.

It is common practice at GIUZ to co-supervise Diploma and Master’s theses — and this is occasionally a stimulus for joint research projects and an opportunity for scientific exchange. Some examples are given below:

- MSc theses Isabelle Aberegg: 3G (M. Egli) in collaboration with GIS (R. Purves).
- MSc thesis Curdin Derungs: GIS in collaboration with GIVA.
- MSc thesis Marco Zuan: GIS in collaboration with Physical Geography (3G).
- MSc thesis Stefan Salzmann: jointly supervised by Human Geography and Economic Geography.
- The LACOMMLab (RSL) and Economic Geography collaborated by supervising various Diploma and Master’s theses.
1.12 Promotion of young researchers

The Department regards promoting the next academic generation so that they can become national and international players in research or on the job market as one of its main tasks.

There are currently about 60 PhD students enrolled at the Department (36% female); 20 post-docs are funded by third parties, and one SNSF-professor is hosted. Both infrastructure and the embedding in highly specialised, national and international, inter- and transdisciplinary projects and programmes are outstanding. Internal and external supervisors and mentors help students to develop their expertise. Young researchers are committed and involved in teaching activities at various different levels.

PhD students and degrees

- **Number of men**
- **Number of women**
- Total number of PhD degrees
- Number of PhD degrees women
Special attention is paid to the advancement of women. For example, Sara Fabrikant is in the advisory committee of the ‘FrauschafftWissen’ mentoring project, supported by the UZH’s ‘UniFrauenstelle’ under the auspices of the ‘Bundesprogrammes Chancengleichheit zur Förderung von Nachwuchswissenschaftlerinnen’. Hans Elsasser represented the MNF in the Gender Equality Commission. Arzu Çöltekin is a member of the IEEE Women in Engineering (WIE) group. Sara Landolt is a member of the Gender Graduierten Kolleg, Scripts and Prescripts, Berne/Fribourg. Claudia Binder is a member of the ‘Fach Frauen Umwelt’.

In March 2008, the ‘SOWAS’ (Sozialwissenschaftlicher Austausch/Social Science Exchange) peer-mentoring group was launched by PhD students from the Human, Economic and Political Geography units. The group also includes PhD students from the Department of Management, Technology and Economics at ETHZ. ‘SOWAS’ focuses on qualitative methods in the social sciences and on career development for both female and male PhD students. The MNF finances this mentoring project. In 2008, ‘SOWAS’ organised numerous presentations and workshops on reading and writing, particular research methods and on career-building. While most activities were organised by peers for peers, selected events were open to non-peers as well. The peer group will continue its activities for another year.

The specialised PhD programme ‘Development Studies: Global Change and Sustainable Development’ was launched by the Development Study Group. Scientific writing courses were offered in 2008 and scientific lectures are on the agenda for spring 2009. A major step in 2009 will be the launch of the Zurich Graduate School in Geography. The Graduate School’s objectives include presenting the full breadth of research within the Department to graduates, providing opportunities for successful networking and career development, improving writing skills, developing useful transferable skills, and providing opportunities for supervisors to discuss and develop supervisory skills. The Graduate School will set out to meet these objectives through bespoke courses, seminars and an annual PhD conference to which graduate students, supervisors and key thinkers in geography will be invited. In addition, a joint inter-university doctoral programme on ‘Global Change, Innovation and Sustainable Development’ has been started with funding from the ProDoc scheme (SNSF). The cooperation project, which comprises a training module and research modules, creates a permanent structure among the participating universities for research partnerships with the South.

Two post-docs were offered and accepted faculty positions, and a professorship was offered to the SNSF professor as well as to an assistant professor at GIUZ.
2 Departmental teaching activities

2.1 Overview on admissions

The large number of students (in the Autumn Semester 2008 there were 640 students majoring in Geography) proves that the University of Zurich is an attractive place to study geography. The number of first semester students (majoring in geography) was slightly higher than in the previous year (2007: 120 students; 2008: 123 students). Roughly half of all MNF final year students graduated with a degree in geography.
In 2008, 69 Diploma, 20 Master’s, 61 Bachelor’s and nine PhD students graduated from the Department. The Master’s students specialised as follows: four in General Geography (1 2B, 2 EGG, 1 RSL), four in Geographic Information Science (4 GIS), six in Human and Economic Geography (2 HGG, 1 PGG, 2 WGG, 1 SIE), two in Physical Geography (2 3G), and four in Remote Sensing (4 RSL).

### Number of students supervised by unit (number of degrees given by the faculty in 2008)

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<th>Diploma</th>
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### 2.2 Innovative teaching concepts

Teaching new and improved MSc courses has been a rewarding experience for the lecturers and was beneficial for the students. In 2008, the first cohort of students received their MSc degrees.

Several groups are successfully developing and spreading e-learning tools. The large national e-learning project GITTA (Project leader: R. Weibel) won a 2008 Medida Prix, the largest and most important award in media didactics in Europe. The Cartouche e-learning project, focusing on the development of innovative multimedia cartography e-learning materials, has now been completed. The content is available as an ‘open educational resource’ (www.e-cartouche.ch). The e-learning course GLOPP (globalisation and people living in poverty: www.glopp.ch) by the Human Geography unit was chosen as a test project for the League of European Research Universities (eLERU). eLERU is currently establishing an e-learning platform, which provides students at eLERU partner institutions with a variety of distance learning courses. As a first step, an exchange was established with the Dept. of Geography at the University of Geneva. During the autumn semester 2008, GIUZ students had the possibility of following an e-learning course from Geneva.

The GIS software GeoMedia Pro by Intergraph, Inc. was used for the first time for practical exercises, complementing the other GIS software packages the Department uses for teaching and research. In GIVA’s Seminar in GIScience (T. Reichenbacher), which centers on ‘Mobile Geovisualisation and Human-Computer Interaction’, students independently carried out empirical studies of mobile geovisualisation usability on devices such as an iPhone, a PDA and a Playstation Portable.

The SIE unit taught the Integrative Project (C. Binder, G. Feola Ch. Knöri), which was performed in collaboration with Entsorgung und Recycling Zürich (ERZ, represented by Urs Pauli, its deputy director). The goal was to analyse the viability of establishing a second-hand market in Zurich to re-use goods that are brought to the ERZ recycling area for incineration. The students’ propositions are now being followed up by the ERZ. The following Integrative Project – conducted by GIVA (St. Fahrländer, M. Salvini, S. Fabrikant) - started in the autumn semester with the objective of developing a model to quantify real estate within Switzerland using micro-parameters.
The Political Geography unit (T. Hagmann and B. Korf) offered the newly designed Master’s course in 'Political Geography', which received positive feedback from students. "Disziplingeschichte" (Geo410), the sole mandatory course on the Master’s curriculum, has been restructured. All research fields contribute to this course whose aim is to introduce students to the principles and methods of the different research fields and cultures. Unfortunately the students did not always honour these efforts with their presence.

The 3G unit introduced two new excursions (Nordjura, Steingletscher) and a new field course on natural hazards (Lauterbrunnen, with WSL). M. Egli, D. Brandová, C. Kaiser, S. Ivy-Ochs, P. Cherubini and H. Gärtner have initiated an international Geochronology Summer School, which will be held for the first time in 2009.

The ‘Auslandsexkursion’ led a group of highly motivated students to Thailand under the guidance of Dr. Marco Pronk, Prof. Dr. Dietrich Schmidt-Vogt (AIT Bangkok), N. Backhaus and U. Müller-Böker. The excursion focused on human-environment interactions in Bangkok, and in the southeast and north of Thailand, and the students visited ancient temple sites, hypermodern shopping complexes, factories, slums, etc. They were introduced to royal projects that are based on the concept of a self-sufficient economy, to various systems of shifting cultivation, and of course to Thai culture.

2.3 Quality management in teaching
Quality in teaching is assessed by using questionnaires and OLAT online questionnaires to evaluate most of the courses. Furthermore, students are offered possibilities to discuss their concerns and make suggestions on how to improve the teaching at our Department. Using these evaluations of the various courses, the development of new teaching programmes has been continuously refined and consolidated during the reporting year. Teaching staff are making constant efforts to improve the quality management in teaching by taking courses in subjects like ‘Advanced training in development of competence rasters and rubrics to improve the quality of teaching’ (introduced in Human Geography by N. Backhaus).

The main goal of such evaluations is to optimise both the content and the form of the courses on offer. The University is planning to introduce an evaluation system for the whole university, and the Department agreed to participate in a pilot in the spring semester of 2009.
2.4 Teacher training
Secondary School Level Geography
The Pedagogical High School of Zurich (PHZH) was established in autumn 2001. Currently, there are about 824 future teachers (secondary school level I) studying at the PHZH. In 2008, about 60 students from the PHZH completed their studies in Geography at the Department. They are entitled to a Master’s degree from the PHZH, which makes it possible for them to choose another professional career as well. We are responsible for teaching, exams and administrative tasks.

Teacher Training for Secondary School Level I (Volksschule)
In our educational programme in Geography, we organised practical courses lasting two hours per week during the spring semester and again in the autumn. In addition, we organised about 15 field trips to various Swiss regions. Normally around 25 students take part, and each student has to complete three field trips. Hermann Escher gave a special regional geography lecture on Japan and this was accompanied by a complementary course by Stefan Baumann with a more didactical focus. Furthermore, we ran a week-long compact course on climate change and landscape evolution in the Engadin and Bergell area in 2008 (M. Maisch). The didactic concept on ‘Places of Sustainability in Cities: An Outdoor-Teaching Approach’, developed by André Odermatt and Katja Brundiers, was approved by the Swiss Commission of UNESCO as an ‘Activity within the UN Decade of Education for Sustainability’ in 2008.

Teacher Training for Secondary School Level II (Mittelschule)
The Master of Advanced Studies in Secondary and Higher Education (MAS SHE) for Geography has been established and the curriculum finalised. B. Vettiger, S. Hesske and H.-R. Volkart are the main responsible persons for this section’s curriculum with a didactic focus and special exams. M. Van Daalen (ETH) and A. Odermatt (UZH) manage the teaching programme that focuses on the interplay of scientific and didactic aspects in geography. The Department is the main contributor to this programme. The modular sequences of excursions and regional geography were on offer for the first time last spring. The autumn module, with its cycle of lectures on current research questions and debates, took place for the second time. It was accompanied by a seminar. All of them received positive feedback.

Another important project in 2008 was HSGYM (Arbeitsgruppe Hochschule-Gymnasium, see www.educ.ethz.ch/hsgym/). Several hundred high school teachers and lecturers from the University of Zurich, the ETH Zürich and two universities of applied sciences analysed the interface between high schools and the university, and formulated recommendations for 19 subjects. A. Odermatt is a member of the geography working group. The results will be published in 2009.

Exams
The exams, which take place at the end of each semester, test the students’ knowledge in Human Geography, Physical Geography and the practical courses. Around 100 students participated in the corresponding exam in May and 60 students in December. Besides our main task as instructors of secondary school teachers, we are engaged as experts in the exams of high school teachers (MAS SHE). Thirty geography exams took place at several high schools in Zurich, Winterthur, Dübendorf and Wetzikon in 2008. Last but not least, we also participate at final exams in high schools, inspecting oral tests and overseeing manuscripts.
**External Collaborations**

M. Maisch’s exhibition on glaciers in central Switzerland, which was presented at the Glacier Garden Museum in Lucerne, was extended for one more year until the end of September 2009. Together with the PH Bern (Pedagogical High School, Institut für Bildungsmedien), M. Maisch developed a poster series along with a new teachers’ schoolbook on glaciers and climate change (for secondary school level II).

**Staff**

Our team includes Kurt Graf, Max Maisch and André Odermatt, as well as Andrea Arnold (part-time). During A. Arnold’s four-month maternity leave, we were glad to have the assistance of Madeleine Fitze. Fortunately, she will continue working in our team part-time. Claude Benz, Linda Ettlin, Michael Graf, Turi Humbel, Marina Heiz, David Huber, Manuela Lässer and Daniel Sturzenegger have been assisting the PHZH students during their practical geography exercises. Overall, our load of administrative tasks, meetings und consultancy has substantially increased. Monika Reuschenbach, supported by Stefan Baumann and Stefan Padberg, managed the PHZH’s geography division.

*Kurt Graf, Max Maisch and André Odermatt*
3 Academic services and functions

3.1 Academic services
The Department provides various academic services to third parties, e.g. the NPOC for Swisstopo and the World Glacier Monitoring Service (WGMS) as well as a dating laboratory. Furthermore, academics from the Department are members of editorial boards, research associates, and members of expert groups and commissions. More detail can be found below.

Glaciology, Geomorphodynamics and Geochronology
W. Haeberli is director of the UNEP, UNESCO, IACS/IUGG and FAGS/ICSU World Glacier Monitoring Service, a member of the Terrestrial Panel for Climate within the Global Climate Observing System, and president of the ‘Beratendes Organ für Umweltforschung’ (BAFU). M. Hoelzle is president of the Schweizerische Gesellschaft für Schnee, Eis und Permafrost and vice-president of the Expertenkommission Kryosphäre of ScNat. M. Maisch is president of the GEGZ, M. Egli secretary of the Swiss Soil Science Society.

The Geochronology laboratory carried out a large number of analyses. The Liquid Scintillation Counter was reactivated. One-third of the samples dated were for foreign institutions. Other samples came from our own projects or from other cantonal and archaeological services.


Soil Science and Biogeography
M. Schmidt is on the steering committee of the MOLTER research networking programme (ESF; 2008-2013). C. Burga is vice-president of ASG and of R. Tüxen Gesellschaft für Vegetationskunde, a GIUZ delegate at the ASG and AG Geotope Switzerland. S. Abiven is manager and a member of the board of the youth section of the French Soil Science Society, and a charter member of the organizational board of ‘Cafés scientifiques Université de Neuchatel’.

unit are members of editorial boards, expert groups and committees such as search and other university committees for the Naturforschende Gesellschaft Zürich, SNSF, and DFG.

**Human Geography**

U. Müller-Böker is on the UZH’s North-South Steering Committee (established 2008) and on the NCCR North-South BoD. She sat on 5 search committees. N. Backhaus was elected to the Swiss National Park’s research committee. U. Müller served as an expert for the Interreg IV B Alpine Space project proposal ‘ADEPTMedia – Advancing Environmental Protection and Sustainable Development through Media Competence’. U. Geiser represents the GIUZ on the Committee for Research Partnerships with Developing Countries (KFPE), and is a research fellow at the Sustainable Development Policy Institute (Pakistan).

Members of the unit refereed articles for *American Sociological Review, International Migration, Journal of Ecotourism, Mobilities, Mountain Research & Development*, and *Geographica Helvetica*. U. Müller-Böker was engaged in appointment and tenure-track procedures in Germany and Switzerland, examined research proposals of SNSF and Research Council of Norway, and was a member of the Joint Research Partnership (SNFS) evaluation panel. N. Backhaus and U. Müller-Böker evaluated several PhD and habilitation proposals within the UPRP Asia & Europe.

**Political Geography**

T. Hagmann und B. Korf gave a lecture on the ‘Geography of Violence’ at the military academy (ETHZ), and provided input to the training course for Swiss army officers on the topic of resource conflicts. B. Klem gave lectures and courses at the University of Belgrade, the European Peace University in Austria, and the Centre for Conflict Studies at Utrecht University. He gave a lecture for UN representatives on the political situation in Sri Lanka at the Conflict Prevention and Peace Forum (CPPF).


**Economic Geography**

H. Elsasser was member of the Swiss National Park (Scnat) research committee and is president of the senior citizens’ university. E. Bühler, H. Kaspar and K. Schwiter are members of the Academic Forum of the Centre for Gender Studies. E. Bühler is a member of the IGU Commission on Gender and Geography steering committee and a lecturer at the University of Basel. The unit guided excursions for students from Berne, Bochum, Jena and Nijmegen. H. Elsasser and A. Odermatt evaluated several external PhD and Master’s theses (ETHZ, Universities of Berne, Basel and Dresden). H. Elsasser performed evaluations for the Foundation Sandoz. P. Klaus was invited as first critical referee for the lecture ‘Raum für die Gemeinschaft’. He was appointed by MA CUREM and MA Kulturmanagement ZHAW. A. Odermatt is a Zurich city councilor and was invited by the city of Zurich as a research expert for round table talks on ‘Planen und Bauen für die Stadt von morgen’ K. Schwiter is a councilor in the canton of Schwyz.

**Remote Sensing Laboratories**

T. Kellenberger is chair of the Swiss Committee for Remote Sensing (SCRS) of the Scnat. He is a member of the executive board of the Platform Geosciences of Scnat and member of the Swiss Interdepartmental Working Group Remote Sensing (IDA-Fern) and the GMES (Global Monitoring for Environment and Security) working group of the Swiss Interdepartmental Coordination Committee for Space Issues. M. Kneubühler acts as a Swiss representative to ESA DOSTAG, as Secretary of the Swiss Committee for Remote Sensing and of ISPRS-Comm. VII WG Spectral Signatures. E. Meier is a member of the ESA Category-One Advisory Group and of the TerraSAR-X Science Committee, a board member of the Swiss Society of Photogrammetry, Image Analysis and Remote Sensing, and member of the technical committee for the EUSAR’08 conference. David Small is a member of the ESA Quality Working Group for Envisat/ASAR-Data. The RSL unit has taught at the ETHZ with MILAK and the Geomatics programme (E. Meier), as well as on the subject of ‘Imaging spectroscopy and hyperspectral imaging’ at the Satellitenfernerkundung seminar (M. Kneubühler).

SpectroLab staff members performed 9 journal reviews and two research proposal reviews. SARLab reviewed 14 papers from various internationally recognized organizations and publishers, including *IEEE TGRS, IEEE GRSL, the International Journal of Remote Sensing by the International Society for Photogrammetry and Remote Sensing (ISPRS)*, Elsevier Publications, and Category One proposals from the European Space Agency (ESA).

**Geographic Information Visualization and Analysis**

S. Fabrikant is member of the ‘Interuniversitäre Partnerschaft (UZH/ETHZ) für Erdbeobachtung und Geoinformatik (IPEG)’, a committee member of dissertations at UCSB, IKA ETHZ, TU München and Aalborg University, and a member of a search committee at ETHZ. She is editorial board member of *Cartographica, Computers, Environment and Urban Systems, Revue Internationale de Géomatique, Transactions in GIS* and programme committee member for the Conference on Advanced Geographic Information Systems & Web Services, AGILE 2008, GIScience 2008 and IV 2008. She organized sessions and workshops for the US NSF Spatial Intelligence and Learning Center, AGILE 2008, the Cartography Specialty Group Student Paper Competition and the Annual Meeting of the Assoc. of American Geographers. A. Çöltekin is a member of the Commission on Geovisualization of the ICA, the Commission V of ISPRS and the FIG Commission on Education. T. Reichenbacher is a member of the Commission on Geovisualization of ICA. He lectured at the Technikum Kärnten on ‘User Interface Design’ and at the University of the Armed Forces, Munich.


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Geographic Information Systems
The unit manages the University’s educational site licence for GIS software products from ESRI and Intergraph. Data collected in the projects ‘GIS Swiss National Park’ and ‘GIS Sihlwald’ were made available for research projects at ETHZ, WSL, HSR, HSW and GrünStadt Zürich.

R. Weibel is a member of the GIS working group of the Swiss Association of Geography Teachers, of editorial boards and commissions (Int. Journal of Geographical Information Science, GeoInformatica, Int. Cartographic Association), of scientific advisory boards and committees (Landscape Forum of Switzerland, AGILE 2008, Conference on Spatial Information Theory, Int. Workshop on Web and Wireless) and of IPEG. R. Purves was chair of the Int. Workshop on Geographic Information Retrieval, a member of scientific committees (AGILE 2008, Spatial Data Handling 2008, Workshop on Place, GIScience 2008), organizer of the Workshop on Location and the Web, and Secretary of IPEG. He is chair of the Snow and Avalanche Foundation of Scotland. D. Burghardt is a member of the expert group on technology for the Swiss Organization for Geoinformation. R. Schmidt advises other UZH institutes, has organized introductory GIS courses and participated in a scoping study on a national geodata warehouse for Swiss protected areas of national importance for the Federal Environment Office.


Social and Industrial Ecology
C. Binder is member of the BoDs of the USITAWI Network for Sustainability and of the newly founded Sustainability TV. She is an editorial board member of the Journal of Industrial Ecology, secretary and board member of the International Society of Industrial Ecology, a member of the Commission for Research Partnerships with Developing Countries (KFPE) and the International Board of Advisors for the Institute of Social Ecology (Austria), co-organizer of the International Conference on Industrial Ecology, a scientific committee member of the International Conference on Life Cycle Management, and assessor for grant applications of the Jeune Chercheur and Echange Universitaire of SDC. Members of the unit reviewed for Waste Management, Journal of Cleaner Production and Risk Analysis. C. Binder was reviewer for the Jubiläumsfonds and the Österreichische Nationalbank.
3.2 Academic offices and functions held at UZH and MNF

Professors and other members of the Department are represented in various bodies of the university and faculty:

**University**

Senate, Committee on International Relations (U. Müller-Böker), E-Learning Council (K. Itten), Supervisory Committee Main Library (G. Seitz), Senior Citizen’s University (H. Elsasser), Gender Equality Commission (H. Elsasser), MNF Information Technology Committee (K. Itten), Association of the Privatdozierenden (N. Backhaus), University Priority Research Programme Asia and Europe: Executive Committee (U. Müller-Böker & N. Backhaus), Control Commission of the Human Resource Project ‘Case Management’ (R. Hunkeler-Wittleder).

**Faculty (MNF)**

Faculty Assembly, representative of the scientific staff of GIUZ in MNF (C. Heye), Extended Faculty Board (U. Müller-Böker), Faculty Board (U. Müller-Böker), Study Committee (W. Haeberli & Y. Scheidegger Jung), Research Committee (S. Fabrikant), Committee for Career Development (M. Schmidt), Committee for Public Relations (Y. Scheidegger Jung), Committee for Teacher Education (K. Itten), FBIV Student Ombudsperson (K. Itten), 175th anniversary of the University of Zurich (Y. Scheidegger Jung), Working group HSGYM (A. Odermatt).

3.3 Public events and advanced training

The ‘Zürcher Geographisches Kolloquium’ with the umbrella theme ‘Globaler Wandel – Herausforderungen für die Geographie’ offered a range of innovative and enlightening presentations. H. Elsasser and K. Itten coordinated this event.

In April, the University of Zurich celebrated its 175th anniversary under the slogan ‘Wissen teilen’ (Sharing Knowledge). Many activities were first tested at the day of the Faculty of Mathematics and Natural Sciences. The event at the location Irchel tackled the subject ‘Natur.wissen.schaft. Staunen. Erleben. Begreifen’. It was a great success - many people visited the bazaar where there were lots of experiments and posters, and came to attend the exciting lectures. Statements such as “I would like to have more time, I didn’t have time to see everything” were reported to us. The GIUZ was well presented and its members were easy to spot with their blue T-Shirts showing the world map on the back. Further activities were eLearning presentations among others by GLOPP at Bellevue and the showcase with its different sights of, at and about geography of the Campus Promenade.
The following advanced training events (courses, excursions and practical) were organized by members of the Department in 2008:

- Contribution to the ten-day NCCR North-South Integrated Training Course for PhD students from Asia, Africa, Latin America and Switzerland, Costa Rica, August 2008: U. Müller-Böker and S. Thieme
- Supervision of six PhD students from partner institutions of Human Geography in Nepal, India, Pakistan and Mexico within the framework of NCCR North-South: U. Müller-Böker, U. Geiser and S. Thieme
- Introduction of the e-learning course on ‘Globalisation and livelihood options of people living in poverty (GLOPP)’ to lecturers and students of the Department of Social Sciences, University of Khon Kaen, Khon Kaen (Thailand): N. Backhaus
- Three short courses, aiming to jumpstart the use of GIS by other institutes at the University (Environmental Sciences, Political Sciences, History): R. Schmidt
- Two GIS short continuing education courses on ‘Satellite Images in Geography Teaching’ for high school teachers (with the ‘Weiterbildungszentrum’ WBZ): R. Schmidt
- Two workshops at the national GIS/SIT 2008 conference on ‘Mobile GIS’ and ‘Open Software’: D. Burghardt
4 The Departmental support unit

4.1 Finance, administration and general infrastructure

The operating expenses amounted in 2008 to 14.973 million CHF, of which 5.417 million CHF (36 %) were third-party funded. Compared to 2007, this represents an increase of 981 kCHF in operating expenses and 676 kCHF in third-party funding respectively. In addition to the operating expenses, 64 kCHF was spent on larger investments (e.g. IT, laboratory and research equipment). In comparison with 2007, re-investment decreased by almost 40 % (39 kCHF).

<table>
<thead>
<tr>
<th>Expenses GIUZ in kCHF</th>
<th>Year 2007</th>
<th>Year 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Of which third-party funding</td>
</tr>
<tr>
<td>Tangibles (material &amp; small investments)</td>
<td>1'828</td>
<td>666</td>
</tr>
<tr>
<td>Personnel costs (without professors &amp; social overhead)</td>
<td>8'877</td>
<td>3'468</td>
</tr>
<tr>
<td><strong>Sum operating result 2</strong> (Betriebsergebnis 2)</td>
<td><strong>10'705</strong></td>
<td><strong>4'134</strong></td>
</tr>
<tr>
<td>Personnel costs (professors &amp; social contributions)</td>
<td>3'287</td>
<td>607</td>
</tr>
<tr>
<td><strong>Sum operating result 3</strong> (Betriebsergebnis 3)</td>
<td><strong>13'992</strong></td>
<td><strong>4'741</strong></td>
</tr>
<tr>
<td>Investments (over 10 kCHF)</td>
<td>103</td>
<td>64</td>
</tr>
</tbody>
</table>

(Expenses without University overheads)

Office Space

The University established a new system to monitor the occupancy of its buildings. For this purpose, the acquisition of data for the Department of Geography took place in February 2008. The conclusion is that there is a good occupancy rate, which leaves us with only limited scope to absorb the Department’s growth over the next three years. In order to manage this lack of space efficiently, we prepared a new allocation concept that will be implemented in 2009, and a taskforce was set up (W. Haeberli, R. Weibel and R. Hunkeler).

Car Pool

At the beginning of 2008, the University cancelled the possibility to use vehicles belonging to the Technical Services UZI. Departmental staff members were instructed to hire cars from Mobility Car Sharing. This led to additional financial costs, since we had been able to use the UZI vehicles free of charge. Due to the special needs of our Department, Mobility Car Sharing vehicles are not suitable for many field activities. A taskforce comprising W. Haeberli, S. Gruber and R. Hunkeler was established in order to define our requirements and find possible solutions.
The negotiations with the chief financial officer of the University made it possible to acquire one van and one light truck, both of which are equipped with a trailer coupling; these will be available to the Department in 2009. In addition to the vehicles, financial compensation to cover the additional costs has been defined, but this still has to be approved by the Faculty.

Everybody involved had to put in a great amount of effort, and special thanks go to S. Gruber. All in all, the Department found a successful solution, which will be implemented and organized in detail in 2009.

**Study room for Master and Diploma students (Y23G10)**

A former computer room is now available for students working on their Master’s or Diploma thesis. For this reason the room has been cleared and partly refurnished, and some artwork has been provided (see chapter 4.5). There are still seven Sunray thin clients available. The maximum capacity is 25 workplaces, each equipped with access to our GIUZ-net in order to connect laptop computers. The students’ feedback to the new facility was highly positive, and the good attendance illustrates the need of the study room G10.

*Ruth Hunkeler-Wittleder*

### 4.2 IT

The process of assembling the new IT team started in 2007 and continued in 2008. After more than 40 years’ service, Dr. Guido Dorigo retired and left the Department in August 2008. In July, we welcomed Roya Soleymani Kohler to our team. Roya, besides providing general support to the team and being part of development projects, takes care of all clients and of purchasing the hard- and software for the Department.

The main tasks during the year were as follows:

- One focus was on the ongoing consolidation of the storage environment. The new and simplified storage layout with personal home-, shared group- and exchange-oriented box-space took shape.
- During the year, a new 2-node Solaris x86 based Sunray cluster replaced the old 3-node Solaris SPARC cluster, increasing the performance of our thin-client infrastructure significantly. In line with the ever-increasing number of concurrent sessions on our terminal servers, a third Windows Terminal server was added to the course cluster. At peak times, we have to handle over 80 sessions on the Windows cluster.
- In order to support projects and workgroups with a simple, yet powerful documentation and collaboration tool, we are providing individual Wiki instances now. By the end of the year, we already had 20 active Wikis.
- It is now possible to apply for Linux virtual servers with varying levels of support (fully/partly managed by the IT group or with full root access).
- A great deal of work was involved in evaluating and testing a new follow-me print centre solution, with various internal test implementations from three different suppliers. The solution was implemented with three devices by the end of the year.
- A new server room in K47b with a powerful air-conditioning system supports our efforts to bring more redundancy and resilience to the whole IT setup.
• A shortage of IP addresses could be circumvented by introducing a new private network for all of our Sunray Thin Clients, therefore freeing up around 100 public routable IP addresses.

• The old Helios server, also known as "Unix Server for Mac", was finally switched off, thereby significantly reducing the inter-operability issues between OS X and Windows.

• At the end of the year, the IT group provided information about all the new matters and changes at a two-hour "IT Info Meeting". The good feedback we received will encourage us to repeat this type of knowledge exchange at regular intervals.

Patrick Marchi and Thomas Werschlein

4.3 Corporate communication
The GIUZ contributed with exhibitions, events and excursions to the various festivities of the 175th anniversary of the university (see also chapter 3.3.). Sibylle Sautier coordinated and organized all these activities for our Department.

The launch of the new GIUZ website (http://www.geo.uzh.ch) was an important milestone in 2008 to improve the Department’s internal and external communications. After an intensive phase of preparation the newly developed and redesigned website was successively implemented. The layout is based on the University's design guidelines, and the technology of content publication is based on Typo3. The GIUZ newsletter was published on a two-monthly base, providing information about current management affairs, acquired projects, dates and deadlines of study affairs, and other departmental news.

N. Backhaus and Y. Scheidegger, who are in charge of communication and press releases, coordinated and released the Department’s new flyer 'Das Geographiestudium – Lebensräume im 21. Jahrhundert’ and published articles in 'ALPHA – der Kadermarkt der Schweiz', namely ‘Freizeit’ (H. Elsasser) and ‘Glokalisierung’ (N. Backhaus). They furthermore facilitated the implementation of the new database for the open access library of UZH (ZORA) and improved the information provided to lecturers about deadlines, experiments, examinations, or information events.

Yvonne Scheidegger Jung

4.4 Library
One of our main tasks in 2008 was the deposition of all publications by members of the Department at ZORA. ZORA (Zurich Open Repository and Archive) provides an open and worldwide access to the research and scholarly output of the University of Zurich.

We continued to offer courses in information literacy. Students were taught three hours daily during one week on how to find relevant information. The lecture has been published on the university website that deals with ‘Überfachliche Kompetenzen’. Increasing digitalization and mechanization leads to an expansion of advisory and training services. Users are instructed in the various possibilities to search for information in the physical library as well as online. The library website (http://www.geo.uzh.ch/en/library/) has been redesigned
and has increased its services. Its function as gateway for complex information research in geography has been extended. The web pages provide much guidance and various instruments to find the information people need for their research.

Over the last year, 2000 users have borrowed 5100 items. This is a slight increase in terms of users and a reduction in the number of items borrowed compared to last year, which can be explained by the growing access to electronic publications and our users’ better knowledge of how to carry out a precise search. The number of documents and databases accessible online is growing. In 2008 the collection, catalogued in the IDS University of Zurich, has increased by 2266 new entries. The list with the new acquisitions can be found on the website. 134120 items are now registered in the catalogue. In addition, the library holds about 200 current journals. A growing number of them can be accessed online. More time has been allocated to make these journals accessible. The Search Portal is providing a quick, easy and personalized interface which can do a metasearch of a variety of information resources, such as catalogues, reference databases, digital repositories, or subject-based web gateways. The integration of about 10000 items from the Remote Sensing Library has been completed. Once more the library would like to thank everybody for donated books and maps.

The Department’s staff members are requested to give one copy of every publication to the library. We are going to include documents of any format into the IDS catalogue and archive them. This will expand the worldwide visibility of publications by members of the Department of Geography, which will lead to higher citation rates and therefore to a higher rating.

**Library opening times**
Monday to Friday: 8.45 – 11.15 and 13.30 - 16.00
Special opening times (public holidays etc.) will be announced early in the library and on the website.
Lending maps: during the opening times (only for use in the Department).
The public area is open daily from 8.00 to 17.00

*Gary Seitz and staff*

**4.5 Graphics**
The Department’s designer is responsible for tasks and projects that cover the whole spectrum of visual communication, and include skills and knowledge in design, cartography, typography, image processing and web design.

For the UZH’s 175th anniversary celebrations, the many posters, electronic presentations and experiments were designed and produced following the University’s guidelines. For example, the RSL stand, attracted visitors with a huge puzzle that was based on squares of a satellite image of Europe. This image was processed, glued onto wallboard and laminated. Many visitors enjoyed the puzzle and teamwork developed quite spontaneously. The blue GIUZ T-Shirts were also refined graphically and reproduced especially for this event.

We designed logos for scientific projects, books, publications, articles and maps. The processes were accompanied from draft through to communication and production by the printing press. Examples of this
work are a vegetation map of the area of Monte Caslano in Ticino, cartographic work for a research project in Sri Lanka and Pakistan, and the retouched version of a satellite map of Sihlwald, as well as the student information flyer and the annual report itself.

A special task was to develop an artwork concept for the Master’s students’ work room (G10). Two big satellite images were chosen, processed and placed on a wallboard. A picture postcard was produced as a side product and used for season’s greetings.

Designing for electronic media is gaining in importance, e.g. layout for web pages, processing images and pictures for websites, and usability implementations for blended learning (eLearning) like GLOPP. Beside the digital media, the printed matter is also important for posters, maps and expositions. This year a big plotter (A0) with improved print quality could be achieved.

Last but not least, the designer gives frequent advice on the whole Adobe CS3/4 software pack with a focus on image processing in Photoshop or layout in InDesign – and he is always ready to do so!

Martin Steinmann

4.6 Study matters

We recorded a pleasing increase in the number of admissions requests for Master’s studies in geography in the wake of Bologna. These requests are by students from foreign universities and countries as well as by ETHZ students. The fact that the ‘Kanzlei’ had frequently allowed students to enrol, who should have been excluded due to our study rules, led to serious problems. However, in the meantime the ‘Kanzlei’ will give new students provisional admission until the Department verifies the transcript of records.

Master’s exams took place in May and November with an increasing amount of students (more than 20). The Master’s exams consist of a public presentation followed by a disputation in front of a small examination team, so that each Master’s exam session takes a whole week. About 50 students are still studying according to the old diploma system and although the number of diploma exams is decreasing, these exams have to be carried out too. Ongoing refinements are being made to how exams are organized. There have been relatively few adjustments to the Bachelor’s study programme and, for the first time, the first semester courses in Human Geography and Physical Geography were successfully run as half-semester courses.

The committee of study affairs is engaged with the refinement of the Bachelor’s programme for some months now. In order to integrate the courses of the Department’s new units into the Bachelor’s programme, some changes in the curriculum are planned. The structure of the mandatory modules will be based on all three research fields. Each field will contribute 6 ETCS per semester. The new structure will be introduced for students starting their studies in autumn 2009.
Changes in study rules
The Department assembly (InVers) decided to carry out Master’s exams four times a year instead of only twice. This gives both the students and their advisors more flexibility. A further change was the decision to provide only one period in September for students to retake Bachelor’s exams.

Student advisory team
In addition to the regular and multi-faceted advisory services for students (person to person, via e-mail and phone), the team worked on many applications (51) and on eleven requests related to Master’s studies. Furthermore, information events were organized for lecturers and students. Next to the daily business, the team took part in the committee of study affairs (Ausschuss Lehre).

The information on the website concerning academic studies was fully reorganized and will be subsequently upgraded and updated. Last but not least, the study advisory team organized the Department’s annual excursion to the market garden in Schinznach Dorf with its old steam train.

Sibylle Sautier, who stood in for Y. Scheidegger Jung, left the team at the end of April. At the end of August, Nicole Holliger also left the team and now works as geography teacher at the secondary school in Mutschellen. Daniela Vordermann took over her job and is responsible for student exchange affairs, maintaining the website and updating notice boards.

The student advisory team organized the following events in 2008:
• Information for new Master’s students, 03.03.2008;
• Information for high school graduates (‘Maturandentag’), 03.-04.09.2008;
• Information for freshmen (‘Erstsemestrige’), 12.09.2008;
• Information about Bachelor’s thesis, 10.12.2008;
• Interaction with students about the planned revision of the Bachelor’s curriculum, 06.11.2008.

Yvonne Scheidegger Jung and the student advisory team
5 MNF Fachbereich IV

The Fachbereich (Division) IV Geosciences of the Faculty of Sciences at the University of Zurich (UZH) consists of the Department of Geography, the Institute of Environmental Sciences and the Department of Earth Sciences. The Division IV coordination centres are therefore responsible for three Departments.

5.1 Studies coordination centre

2008 was marked by the optimization of the processes for handling lecture planning, student enrolment, and lecturers’ electronic access to subscribed students. The module booking system, implemented in SAP, which was inherited from the autumn semester of 2007, has been refined and completed. All lecturers received a personal login for the lecturers’ portal to view enrolled students and send emails to participants. The first step was finally accomplished, but we are still waiting for the most important lecture-planning functions.

Despite their differing requirements, all UZH faculties and the information services (ID) once again agreed on common lecture-planning software to be implemented for the existing lecturers’ portal. The design phase was finalized in January 2009. Unfortunately, implementation by ID is currently suspended due to there being various projects with higher priority until 2010. The repeated suspension of the implementation of lecture-planning tools leads to increased workloads for the teaching coordinators; there are mistakes, and incorrect information inevitably and unfortunately falls through the cracks.

The Department of Geography evaluated the Bachelor’s curriculum and the reforms planned for the autumn semester 2009. This reform will have some impact on the Bachelor’s and Master’s curriculum at the Department of Earth Sciences and has to be well planned.

Philippe Meuret

5.2 eLearning coordination

There were an exceptional number of public activities in 2008. They started in January with the stand at the exhibition at the NET/ELC-Jahrestagung, where different eLearning products developed by the Division IV were presented to a specialist public.

This was followed in March by the parcours des wissens – an event designed for a general public. At the ‘Online lernen’ stand, we gave lecturers the possibility to demonstrate their learning materials and courses, and to discuss with visitors. We also presented the application of eLearning in three talks (besser lernen@uzh) to a grateful audience (P. Kauer-Ott, S. Mandel, T. Zimmermann & different lecturers). eLearning@GeoWiss visualized use cases from geography and life sciences at the first OLAT conference.

P. Kauer-Ott developed an online quiz for the faculty day together with K. Niffeler (Division Biology) and lecturers. The quiz contains current research questions, and the intention was to give an overview of ongoing research in a playful way. On April 19th, more than 100 people took part in the quiz on our Wissenspool MNF stand, and one of them was the lucky winner of an iPod touch.

In the middle of year, the Swiss Virtual Campus GLOPP and pp/s projects (as well as other projects of ours) had to deliver their final reporting. The federal SVC programmeme closed its doors after eight years’ work
and having developed about 112 courses. The SVC GITTA project continued its success and won two prestigious awards in 2008 (CATCON Gold Award together with eLML, and second place at the Medida Prix). The prize money will be invested in networking and translation. I would like to take this opportunity to thank the SVC team and all the members of the projects and support centres for their excellent work!

In the autumn semester, seven students were able to participate for the first time in the eLearning distance course in Human Ecology developed by the University of Geneva (in the context of e-Leru). In the future, our institutes will hopefully also give external students the possibility to register for our specialized eLearning courses (e.g. GLOPP) and to receive the related credit points.

The UZH support centre changed its organizational structure during 2008 (ELC & MELS = CATA). This has no effect on the collaboration with and between eLearning coordinators - they remain the principal contact for lecturers.

P. Kauer-Ott participated in several online conferences organized by eduhub (switch) which dealt with interesting subjects for a specialized public. She also continued her cooperation with the ‘eLearning competency network’ and the ‘OLAT usability group’. As in in previous years, OLAT support and instruction have been the priorities in the eLearning@GeoWiss work. Course administration, troubleshooting, updates, translation into XML, planning and production of different media, testing and evaluation were all constant elements of the daily agenda.

The GIUZ website was redesigned this year, and P. Kauer-Ott also has revised her part and added some useful information. Finally, at the end of 2008, the geowiki (PmWiki) was moved onto another server, and the service is now available continuously. In 2009, eLearning@GeoWiss will encourage lecturers to start new projects within the Initiative Interaktives Lernen and to update, enhance and expand their courses!

Petra Kauer-Ott
The spring semester began with the faculty association’s legendary skiing weekend. Around 80 geographers enjoyed the sunny weather and slushy pistes in Wildhaus. The evening we spent there together was fun and highly amusing! The first Geoteam meeting in February tackled the subjects of the Dobar, the new distribution of posts to new members of Geoteam, and the Geoscope. We decided that the Dobar could no longer be used as a platform for other interests in the future apart from when these were not-for-profit events organized by GIUZ members. Betti Weibel and Lea Felber handed over responsibility for the Dobar to Tom Wider. Jonas Snozzi also took on the task of sitting on the Department assembly. Lukas Beck handed over the office of treasurer to Silvan Christen. The Geoscope was separated from the faculty association because the Geoscope editorial staff had founded an independent association.

The changes in personnel were officially ratified at the AGM held on 3rd March 2008. Bettina Marbot, Florian Frank, Jonas Snozzi, Silvan Christen, Thomas Wider and Thierry Bossard were elected new members of the Geoteam. Lukas Beck, Lea Felber and Bettina Weibel announced that they would be resigning as of the end of the spring term 2008. Rony Emmenegger and Stefania di Roca announced that they would be stepping down with immediate effect. All of the departing members received much grateful applause! Jonas Snozzi was elected new president of the Geoteam from the end of the spring term 2008. We would like to thank him. Vanessa and Lea Pfister were unanimously re-elected as auditors. Rahel Nüssli will be taking a semester off, although he is not leaving the Geoteam.

The round-table discussion organised during the spring semester by Rahel Nüssli was a total success! The guest geographers informed the many interested students about the professional world and answered their many questions. This event proved very popular and will certainly be repeated next year, in a larger lecture theatre if possible. It would also be good if there were a few female speakers participating!

The faculty association’s summer was marked by the various Dobars. It proved a good decision to organise the Dobars on five Thursdays instead of every week. Two of the dates were in September, i.e. at the very beginning of the autumn semester. All GIUZ students were also invited to a summer party (a bigger Dobar) to celebrate the end of the spring semester and to raise a toast to some time without exams.

In addition, the faculty association continued to fund the two work experience posts at the Swiss National Park’s Infomobil. The walking weekend again took us to the same place while the stags were rutting and this made for a fascinating weekend. It is not clear how our commitment to this programme will look in the future. The posts were taken up by two geographers, but in general there was relatively little demand for them.

Fresher’s day was held on the Friday before the beginning of the autumn semester. The faculty association organized guided tours around the university campus as well as an aperitif. Helpers who had already studied for several semesters were available to answer any questions. It seems to have been a good decision to move this event from the first Monday of the semester to the Friday before it began.

The legendary “Geoparty” took place in November at the Dynamo. As usual, the third-semester students were responsible for organizing it. The party was greatly appreciated and a total success. As usual too, the first-semester-students got a visit from Santa Claus in December.
2008 was a very satisfactory year. The months and the Dobars passed quickly and we are looking forward to the coming year. There will certainly be changes in personnel because various members of the faculty association will have completed their Bachelor’s degrees in the summer and will take a year out. We would also like to express our hopes that a replacement for the professor of Economic Geography can be found quickly.

The faculty association would like to thank all its helpers for their efforts and their support in 2008. The Dobars would not have been possible without all these people. Which brings us to our message for 2009 – please continue to give us a helping hand! On the agenda for 2009 will be the skiing weekend (21.- 22.02.2009).

Bettina Marbot
7 Presentations


Abegg, B.: Climate Change and Tourism. Introduction to Global Environmental Change, Department of Geosciences, University of Fribourg, Fribourg, Switzerland, 12.11.2008.


Backhaus, N.: Was ist Globalisierung? Seniorenuniversität der Universität Zürich, Zurich, Switzerland, 27.05.2008.


Backhaus, N.: Rainforests, from local to global commons: a case study from Malaysia (poster). International Association for the Study of Commons (IASC), Governing Shared Resources: Connecting Local Experience to Global Challenges, Cheltenham, UK, 14.07.2008.


Barbora, S., Thieme, S.: The other Silk Road: film presentation and discussion of documentary. Silk Road House, University of Berkeley, USA, 06.04.2008.


Binder C.R.: Pesticide management: Integration of social and environmental aspects. Seminar series, Institute of Environmental Sciences, University of Zurich, Switzerland, 09.04.2008.


Bühler, E.: Between alternative and mainstream lifestyles. Skateboarders, streetbikers and gender in Zurich. 31st International Geographical Union Congress, Tunis, Tunisia, 12.-15.08.08


Bühler, Y.: Rapid avalanche detection using optical remote sensing data (poster). 5th EARSeL Workshop, Remote Sensing of Snow and Glaciers, Department of Geography, University of Berne, Switzerland, 11.02.2008.

Bühler, Y.: Rapid mapping of avalanches using remote sensing data. WSL Institute for Snow and Avalanche Research (SLF), Davos, Switzerland, 20.03.2008.


Burghardt, D.: Location Based Services oder GIS macht mobil. Habilitationsvortrag, Zurich, Switzerland, 29.05.2008.

Burghardt, D.: Mobile GIS. GIS/SIT Workshop, Zurich, Switzerland, 10.06.2008.


Burki, V.: Little Ice Age to present glacial sediment evacuation rate of the Bødalsbreen glacier. 33th International Geological Congress, Oslo, Norway, 13.08.2008.


Dell’Endice, F.: CAL/VAL APEX Activities. APEX Day, University of Zurich, Zurich, Switzerland, 04.03.2008.

Dell’Endice, F.: APEX: from DN to A. Specim Presentation, University of Zurich, Zurich, Switzerland, 06.03.2008.


Eckmeier, E.: Charred organic matter in soils and the change from natural to cultural landscapes in NW-Germany (poster). 37th Symposium on Archæometry, Siena, Italy, 12.-16.05.2008.


Fischer, L.: *Comparison of LiDAR and aerial photogrammetry for terrain analyses in steep high-mountain areas: Monte Rosa east face.* GriaAlp Meeting, Zurich, Switzerland, 13.-14.11.2008.


Frey, H.: *The ice ridge at Murtèl/Corvatsch: Studying a (c)old archive (poster).* 6th Swiss Geoscience Meeting, Lugano, Switzerland, 21.-22.11.2008.


Geiser, U.: *Talibans or ‘local civil society’? Questioning recent struggles in the ‘social space between household and the state’ in Swat, Northwest Pakistan.* British Association of South Asian Studies (BASAS), 22nd Annual Conference, University of Leicester, UK, 26-29.03.2008.


Gruber, S.: High mountains, high technology and high hopes. 6th SNF NCCR-MICS Scientific Conference, Zurich, Switzerland, 21.-23.01.2008.


Gruber, S.: Etat actuel de la recherche sur le permafrost. PERMAdataROC (Interreg III A Alcotra No. 196) Séminaire finale, Courmayeur, Italy, 16.05.2008.


Haeberli, W.: Alpen ohne Eis? SAC Sektion Blümlisalp, Thun, Switzerland, 03.03.2008.


Haeberli, W.: Gletscher im Treibhaus der Erde. MNF-Tag UZH175, University of Zurich, Zurich, Switzerland, 19.04.2008.


Huber, S.: Estimation of ecologically relevant land cover variables from imaging spectroscopy. PhD Defense, University of Zurich, Zurich, Switzerland, 19.03.2008.

Hueni, A.: SPECCHIO: a system for storing and sharing spectroradiometer data. IPEG, University of Zurich, Zurich, Switzerland, 15.02.2008.

Hueni, A.: Operational processing of hyperspectral imagery. IDL und ENVI Workshop ETH Zuerich, Zurich, Switzerland, 08.05.2008.


Itten, K.: Fernerkundung der Erde. Planungsgruppe Unterengstringen, University of Zurich, Zurich, Switzerland, 18.03.2008.


Joos, O.: Reduced contribution of fresh litter to CO$_2$-efflux during drought (poster). 9th Swiss Global Change Day, Berne, Switzerland, 01.04.2008.


Joos, O.: Reduced contribution of fresh litter to CO₂-efflux during drought (poster). 6th CarboEurope Meeting, Jena, Germany, 26.-29.09.2008.


Kellenberger, T.W.: Neue Fernerkundungsanwendungen mit der ADS40 - u.a. am Beispiel der Archäologie. GIS/SIT 2008 - scientific program of the SGPBF, 'Erdbeobachtung und Fernerkennung', University of Zurich, Zurich, Switzerland, 12.06.2008.

Kellenberger, T.W.: Potential of the ADS40 aerial scanner for archaeological prospection in Rheinau, Switzerland (poster). XXist ISPRS Congress, Beijing, China, 08.07.2008.

Klaus, Ph.: Der urbane Kontext kulturwirtschaftlicher Entwicklung. Forschungsseminar Sozialgeographie, University of Jena, Germany, 25.01.2008.

Klaus, Ph.: Kontexte urbaner Kulturproduktion. Tagung Neue Kulturgeographie V, University of Jena, Germany, 26.01.2008.

Klaus, Ph.: Zürcher Kreativwirtschaft: Kontexte und Entwicklungen. Soziologie für ArchitektInnen, ETHZ Zürich, Switzerland, 07.03.2008.

Klaus, Ph.: Creative industries: Basics, contexts, developments. Masterstudiengang Architektur Fachhochschule Bern, Burgdorf, Switzerland, 10.03.2008.

Klaus, Ph.: Urban contexts of cultural production. Università degli Studi Firenze, Italy, 08.04.2008.


Klaus, Ph.: Cultural Production. From the Global to the Local. Zürcher Hochschule für angewandte Wissenschaften ZHAW, Winterthur, Switzerland, 01.10.2008.

Klaus, Ph.: The New Metropolitan Mainstream. Constitution of a new Discourse about the City. 18th INURA Conference, Athens, Greece, 06.10.2008.


Klem, B.: Civil-military relations. Lecture for representatives from the Serbian armed forces and the Faculty of Military Sciences of the University of Belgrade, Belgrade, Serbia, 25.01.2008.


Kneubühler, M.: Spectro-directional CHRIS/PROBA data over two Swiss test sites for improved estimation of biophysical and -chemical variables - five years of activities. ISPRS Congress, Beijing, China, 04.07.2008.


Morsdorf, F.: LIDAR remote sensing and imaging spectrometry for wildfire risk assessment and forest management. Young Scientists in Contest (YSC) at International Disaster and Risk Conference (IDRC), Davos, Switzerland, 28.08.2008.


Noetzli, J.: Was ist, wenn der Permafrost taut? Bernese Polytechnical College (Berner Fachhochschule BFH-AHB), Biel, Switzerland, 29.05.2008.

Noetzli, J.: Modeling transient three-dimensional temperature fields in mountain permafrost. PhD Defense, University of Zurich, Zurich, Switzerland, 04.06.2008.


Paul, F.: GlobGlacier: A new DUE project by ESA. First GlobGlacier user group meeting, Zurich, Switzerland, 04.-05.02.2008.


Paul, F.: The future of Alpine glaciers as simulated by a regional climate model. 12th Alpine Glaciology Meeting (AGM), Grenoble, France, 06.-07.03.2008.

Paul, F.: GlobGlacier: A new ESA project to map the world's glaciers and ice caps from space. 12th Alpine Glaciology Meeting (AGM), Grenoble, France, 06.-07.03.2008.


Purves, R.S.: Exploiting volunteered Geographic Information to describe place. GISRUK, Manchester, UK, 03.04.2008.


Purves, R.S.: Spatial autocorrelation and toponym ambiguity. GIR 08, Napa Valley, USA, 30.10.2008.


Schmidt, M.W.I.: Soil organic matter turnover and global change - combining $^{13}$C-labeling and molecular marker information on lignin and fire-derived carbon. Colloquium, UFZ Leipzig, Germany, 06.02.2008.

Schmidt, M.W.I.: Can we estimate soil organic matter turnover by combining $^{13}$C isotopic and molecular marker information in field experiments? Trying a synthesis on fire-derived (black) carbon, lipids, lignins and sugars. Colloquium Max-Planck-Institute for Biogeochemistry, Jena, Germany, 08.02.2008.


Schmidt, R.: Silvwald Data Center – Wie der Silvwald in den Computer kam. GIS Gruppe Volkswirtschaftsdepartement, University of Zurich, Zurich, Switzerland, 08.05.2008.


Steimann, B.: *Making a living in transition: the role of the local institutional context for pasture-based livelihoods in post-socialist rural Kyrgyzstan*. Colloquium ‘Selected Aspects of Sustainable Development’, North-South Centre, ETH Zurich, Zurich, Switzerland, 08.05.2008.


Thieme, S.: *Theorising working experiences of Kyrgyz in Russia: livelihoods in an undocumented but accepted world*. International Geographers Union (IGU), Workshop on Theoretical Approaches in Labour Geographies, Department of Sociology and Human Geography, University of Oslo, Norway, 15.05.2008.


Tomko, M.: *Categorical Prominence and the Characteristic Description of Regions*. Semantic Web meets Geospatial Applications, held in conjunction with AGILE 2008, Girona, Spain, 05.-08.05.2008.


Uzeda, A., Zingerli, C., To, P.X.: *Knowledge, power, politics: knowledge dynamics in technological innovation for Bolivian agriculture*. Site Visit NCCR North-South, JACS South America (SAM), La Paz, Bolivia, 27.4.2008.


Weyermann, J.: *Architecture for an empirical-based BRDF correction module for hyperspectral imagery (poster)*. Zukunftskolleg Summer-School on "Observing and Understanding Earth", Constance University, Constance, Germany, 15.07.2008.


8 Publications

Books


Edited Books


Dissertations and Habilitations


Huber Gharib, S. (2008): Estimation of ecologically relevant land cover variables from imaging spectroscopy. Dissertation University of Zurich, Faculty of Science, Zurich.

Junker, B. (2008): The social perspective on river restorations: understanding a neglected aspect of sustainable river management. Dissertation University of Zurich, Faculty of Science, Zurich.


Journal articles (reviewed)


Book Sections and Conference Proceedings (reviewed)


Technical Reports


Newspapers Articles


9 PhD, Diploma and Master’s theses (validated by the faculty in 2008)

**PhD theses**


Huber Gharib, Silvia (2008): Estimation of ecologically relevant land cover variables from imaging spectroscopy.

Junker, Berit (2008): The social perspective on river restorations - understanding a neglected aspect of sustainable river management.

Machguth, Horst (2008): On the use of RCM data and grided climatologies for regional scale mass balance modeling in high mountain topography, the example of the Swiss Alps.


**Diploma theses**


Frey, David (2008): "Dezentrale Besiedlung" - Raumplanerische Leitvorstellung oder politisches Wunschbild?

Fritschi, Astrid (2008): Local perceptions of environmental changes — Case study in the Ayuquila Watershed, Western Mexico.


Holliger, Nicole (2008): Phaeozeme in den inneralpinen Trockentälern?


Leuthardt, Andreas (2008): Modellierung von Gletscherbetten mit GIS.


Müller, Lukas (2008): Borderline livelihoods: a case study from southern Chiapas/Mexico.
Svoboda, Felix (2008): Herstellung eines Gletscherinventars auf Cumberland Peninsula (Baffin Island) Kanada, mittels Fernerkundungsdaten und GIS.
Wächli, Florian (2008): The contribution of private sector development to pro-poor growth: a baseline study for Swiss-contact projects in Ecuador.

Master theses
Nydegger, Dania (2008): Land Cover and Leaf Area Index Classification with Support Vector Machines.
Department staff list (31 December 2008)

Heads of units
Haeberli Wilfried, Prof. Dr.
Glaciology, Geomorphodynamics and Geochronology (3G)
Schmidt Michael, Prof. Dr.
Soil Science and Biogeography (2B)
Müller-Böker Ulrike, Prof. Dr., Director of Dept.
Human Geography (HGG)
Korf Benedikt, Prof. Dr. Ass professor
Political Geography (PGG)
Elsasser Hans, Prof. Dr.
Economic Geography (WGG)

Academic heads of units
HGG: Backhaus Norman, PD Dr.
RSL: Meier Erich, Dr.

Lecturers and senior research associates
3G: Brandová Dagmar, Dr.
Egli Markus, PD Dr. (3G/2B)
Gruber Stefan, Dr.
Huggel Christian, Dr.
Paul Frank, Dr.
Salzmann Nadine, Dr.
RSL: Albert Edoardo, Dr.
Kellenberger Tobias, Dr.
Kneubühler Mathias, Dr.
Small David, Dr.

GIVA: Çöltekin Arzu, Dr.
Reichenbacher Tumasch, Dr.

GIS: Burghardt Dirk, PD Dr.
Purves Ross, Dr.

TT: Maisch Max, Prof. Dr.
Odermatt André, Dr.

Teaching and research associates
3G: Böckli Lorenz, dipl. geogr.
Meister Irina
Nötzli Jeannette, Dr.
Wirz Vanessa
RSL: Isenring Michael
Odermatt Daniel, dipl. geogr.

WGG: Craviolini Christoph, dipl. geogr.
Heye Corinna, Dr.
Klaus Philipp, Dr.
Schwiter Karin, dipl. geogr.
Wyss Rahel, dipl. geogr.

PGG: Engeler Michelle, MA
Starmanns Mark, dipl. geogr.

HGG: Grünenfelder Julia, dipl. geogr.
Junginger Mathias, dipl. geogr.
Landolt Sara, dipl. geogr.
Meier Matthias
Meyer Patricia, dipl. geogr.
Schwank Claude, dipl. geogr.

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Odermatt Daniel, dipl. geogr.
Schopfer Jürg, dipl. geogr.

GIVA: De Sabbata Stefano, M.Sc.
Keller Denise
Salvini Marco, M.Sc.  
Schito Joram  
Wilkening Jan Henrik, dipl. geogr.

**Administration**

GIUZ: Hunkeler-Wittleder Ruth, Admin. director  
Scheidegger Jung Yvonne, Dr., Head of teaching administration and corporate communications  
Eckmeier Eileen, Dr., Reporting  
Salvini Marco, Student advisor  
Schneider Sieber Amalia, Student advisor  
Psarellis Paolo, Secretary  
Wüst-Jakober Margrit, Secretary  

3G/2B: Grüter Helene, Secretary  
Nietlispach Elisabeth, Secretary

**Technical services**

Bachmann Andreas, Dr., Computer scientist  
Hilf Michael, Lab assistant  
Kägi Bruno, Head of lab  
Marchi Patrick, Computer scientist  
Soleymani Kohler Roya, Computer scientist

**Library**

Seitz Gareth, dipl. geogr., Head of library  
Bortolomai-Saluz Françoise, Librarian  
Grossmann-Maggetti Barbara, Librarian

**Fachbereich IV coordination**

Kauer-Ott Petra, dipl. geogr., Coordination e-learning  
Meuret Philippe, dipl. geogr., Coordination studies

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Frey Holger, dipl. geogr.**  
Gärtnner-Isabella, Dr.*  
Gubler Stefanie, dipl. Math.*  
Hasler Andreas, dipl. geogr.**  
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Steimann Bernd, dipl. geogr.*  
Zingerli Claudia, Dr.**

PGG: Pia Hollenbach**  
Klem Bart**

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Henke Daniel, dipl. Inf.**
Hüni Andreas, M. Phil (Sc)**
Jehle Michael, dipl. Ing.**
Kötz Benjamin, Dr.**
Magnard Christophe**
Morsdorf Felix, Dr.**
Nieke Jens, Dr.**
Schläpfer Daniel, Dr.**
Schubert Adrian, Dr.**
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Zuberbühler Lukas**

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Imfeld Stephan, Dr.**
Lüscher Patrick, dipl. geogr.**
Tomko Martin, Dr.**
Venkateswaran Ramya, M.Sc.*

SIE: De Baan Laura, M.Sc. ETH**
Feola Giuseppe, M.Sc.*
Garcia Santos Glenda, Dr.*
Schmid Alfons, M.Sc.*
Schöll Regina, M.Sc. ETH**
Yang Jing, Dr.*

* SNSF  ** Other projects

External lecturers
Bader Stephan, Dr.
Baumann Stefan, dipl. geogr.
Berger Burger Heidi, Dipl. Arch. ETH
Bernasconi-Green Gretchen, PD Dr.
Brugger Ernst A., Prof. Dr.
Bürki Rolf, Dr.
Capaul Urs, Dr.
Cherubini Paolo, Dr.
Edelkraut Kunz Kirsten, Dr.
Eichenberger Susann, Dr.
Escher Hermann, Dr.
Fahländer Stefan, Dr.
Fischer Urs, Dr.
Geiger Alain, Dr.
Güsewell Sabine, Dr.
Häberli Verena
Hagedorn Frank, Dr.
Hanser Christian, Dr.
Hauck Christian, Dr.
Heinrich Christoph A., Prof. Dr.

Hunziker Marcel, Dr.
Ivy Ochs Susan Denise, Dr.
Kääb Andreas, Prof. Dr.
Kaiser Klaus Felix, PD Dr.
Keller Oskar, PD Dr.
Kuster Jürg, Dr.
Meier Kuiker Verena, Prof. Dr.
Meile Rolf, lic. phil.II
Pazeller Adalbert, dipl. Ing.
Pronk Marco, Dr.
Rauch Theodor, Prof. Dr.
Saurer Matthias, Dr.
Schär Christoph, Dr.
Schläpfer Daniel, Dr.
Seneviratne Sonia Isabelle, Dr.
Siegwolf Rolf, Dr.
Tarnutzer Andreas, Dr.
Vonder Mühll Daniel, Dr.
Wieler Rainer, Prof. Dr.
Wüest Marc, Dr.
Geographische Informationssysteme
Robert Weibel

Geographische Informationsvisualisierung & Analyse
Sara Irina Fabrikant

Glaziologie, Geomorphodynamik & Geochronologie
Wilfried Haeberli

Bodenkunde & Biogeographie
Michael Schmidt

Wirtschaftsgeographie
Hans Elsasser

Admin/IT
Ruth Hunkeler

Lehre / Wissensmanagement
Yvonne Scheidegger

Humangeographie
Ulrike Müller-Böker

Politische Geographie
Benedikt Korf

Fernerkundung
Klaus Itten

Direktion

Physische Geographie

Support

Forschung und Lehre

WA: Wiss. Abteilungsleiter
OA: Oberassistent/in
WM: Wiss. Mitarbeiter/in
A: Assistent/in
P: Projektmitarbeiter/in
E: EDV
B: Bibliothek
G: Grafiker
L: Laborant/in
O: Organisator
S: Sekretär/in

Universitäre Stellen
Universitäres Stellenbuch
Drittmittelstellen

1Etatstelle

Adjunkt

Fachbereich IV

Admin / IT / Lehre / Wissensmanagement

Lehre / Wissensmanagement

Studienkoordination

E- Learning

Geschäftsführerin

Mathematik und Informatik

Stand: 31. Dezember 2008

Geographisches Institut der Universität Zürich, 2008