Annual Report 2009

Report from the Head of Department 2
Welcome to Michael Schaepman and Jan Seibert 4
1 Main research activities 5
  1.1 Glaciology, Geomorphodynamics & Geochronology 7
  1.2 Soil Science and Biogeography 13
  1.3 Hydrology and Climate 15
  1.4 Human Geography 18
  1.5 Political Geography 25
  1.6 Economic Geography 31
  1.7 Remote Sensing Laboratories (RSL) 34
  1.8 Geographic Information Visualization Analysis (GIVA) 39
  1.9 Geographic Information Systems (GIS) 44
  1.10 Social and Industrial Ecology (SIE) 49
  1.11 sotomo 53
  1.12 Joint research projects 54
2 Promotion of young researchers 55
  2.1 Zurich Graduate School in Geography and other PhD programs 55
  2.2 Advancement of women 56
3 Departmental teaching activities 58
  3.1 Overview of admissions 58
  3.2 Innovative teaching concepts 59
  3.3 Quality management in teaching 60
  3.4 Study matters 60
  3.5 Geography Teacher Training 63
4 Academic services and functions 65
  4.1 Academic services 65
  4.2 Academic offices and functions held at UZH and MNF 69
  4.3 Public events and advanced training 70
5 The Departmental support unit 71
  5.1 Finance, administration and general infrastructure 71
  5.2 IT 72
  5.3 Corporate communication 73
  5.4 Library 74
  5.5 Graphics 75
6 MNF Fachbereich IV 76
  6.1 Studies coordination centre 76
  6.2 eLearning coordination 76
7 Geoteam 78
8 Presentations 80
9 Publications 94
10 PhD, Diploma and Master’s theses 105
11 List of Department staff (31 December 2009) 109
Report from the Head of Department

Photo: Jos Schmid, 2009
Report from the Head of Department

2009 has been an exciting and inspiring year! Jan Seibert joined our Department in February. His newly formed Unit for Hydrology and Climate (H₂K) is engaged in research into catchment hydrology and climate impacts on the water cycle. One month later, Michael Schaepman arrived and replaced Klaus Itten as head of the Remote Sensing Laboratories. At the same time, the MNF decided to make an attractive counter-offer to Benedikt Korf in response to an offer he had received from the University of Fribourg for a position as associate professor. On 1st November, he was promoted to Associate Professor. We are happy and relieved that Benedikt Korf decided to stay with us! Finally, we succeeded in appointing Christian Berndt to the chair for Economic Geography (replacement of Hans Elsasser), who will take up his post in March 2010.

Furthermore, Claudia Binder, who has been SNSF professor at the Department and head of the Social and Industrial Ecology Unit since 2006, was appointed Professor of System Science at the Institute for System Science, Innovation and Sustainability at the University of Graz; and Joris van Wezemael, a postdoc researcher at the Department and ETH CASE, accepted the University of Fribourg’s offer of a position as Associate Professor of Human Geography. Dirk Burghardt, a lecturer in the Department, took up his new position as Associate Professor of Cartography at TU Dresden. In summary, we brought both faculty search and tenure procedures to a successful end in 2009 and at the same time young researchers from the Department were able to advance their careers. The Department of Geography is in a strong position and ready for an exciting phase of research and teaching in the years to come.

One of the main items on our agenda is also to find a seamless replacement for W. Haeberli, who will retire in January 2012. The Department’s recommendation is to attribute the chair once more to the field of Glaciology and Geomorphology with a focus on high-mountain environments and the impacts of climate change. Furthermore, the Executive Board of the University approved an additional professorship in Remote Sensing for the year 2013.

Let me point out a few more highlights. One major step in 2009 was the launch of the Zurich Graduate School in Geography thanks to additional funding from the Bologna III program. Along with several research-oriented courses and workshops, the Graduate School organized a range of complementary skill courses. At the same time the International Graduate School North-South (IGS North-South) was launched by the NCCR North-South Network and is linked to the Zurich Graduate School. Our PhDs now have a wide range of opportunities to deepen and broaden their training, and care is also taken to ensure and enhance the quality of supervision.

In May 2009, the World Glacier Monitoring Service (WGMS) - an important international activity of a policy-related UN program - became officially embedded in the Department. The WGMS’s strengths are in glaciology, remote sensing, geographic information science, and development research. A corresponding contract was signed between GCOS Switzerland and the Geography Department / Faculty of Sciences of the University of Zurich.

Despite the vacant chair for Economic Geography and a variety of staff replacements, the Department was once more very successful in attracting extramural funding (2008: 5’417’000 CHF; 2009:
5’943’000 CHF), an indicator of the quality of our research and how highly it is rated externally. Successful post doctorate grant applications, the offers of professorships to three members of the Department and six completed PhDs are visible signs of the Department’s vitality and success even in turbulent times. However, once again, a new round of budget cuts affected the Department in 2009, even though the allocation from the Bologna funding pool was able to ease these problems to some degree.

Overall, student numbers remained stable. In the Autumn Semester 2009, there were 637 students enrolled as Geography majors. The number of first semester students majoring in Geography was almost the same as the previous year (2008: 123 students; 2009: 117). More than one third (37%) of all MNF final year students graduated with a degree in Geography: 89 students sat their final exams in 2009. For the first time we had more students completing a Master’s than a Diploma degree (21 Diploma and 68 Master). Lecturers have found teaching new and improved MSc courses a rewarding experience and this has been beneficial for the students too. Several groups are successfully developing and spreading e-learning tools. We will also investigate whether it is possible to offer specialized Master’s degrees and link into this promising network of graduate programs.

2009 was also a year of very sad events. On March 30, Ueli Frey, a promising student in the fourth semester, lost his life descending from the Eiger. On April 29, Heiri Leuthold passed away, unexpectedly as he was still in his prime. He studied and worked at the GIUZ for over 16 years and co-founded the sotomo group, an independent research unit that is well known all around Switzerland for its innovative analysis and visualizations of social geographic and political phenomena. Ueli’s and Heiri’s colleagues planted a pine and an oak in the Irchel Park in their memory.

I would like to thank the university authorities and especially the Faculty for their great support and also wish to express my thanks to all GIUZ colleagues, staff members and students for their commitment and efforts.

Ulrike Müller-Böker, Head of Department
Welcome to Michael Schaepman and Jan Seibert

Michael Schaepman holds an MSc (1993, specialization: experimental physics and computer science) and a PhD degree (1998, spectroscopy) in Geography from the University of Zurich. Following his PhD, he spent his Postdoc at the Optical Science Center of the University of Arizona (Tucson, AZ, USA). He was appointed project manager of the ESA APEX (Airborne Prism Experiment) spectrometer, a joint Swiss-Belgian project, in 2000. In 2003, he accepted a position as full professor of Geo-information Science and Remote Sensing at Wageningen University in the Netherlands. In 2005, he was appointed scientific manager of the Centre for Geo-Information (CGI) of Wageningen University and Research Centre. In 2009 he was appointed full professor of Remote Sensing at the University of Zurich. Michael’s interests are in the computational Earth sciences using remote sensing and physical models. Michael is a co-founder and board member of Netcetera Group AG in Zurich. He serves on several national and international boards focusing on the use of Earth observation instruments and methods. He has led and participated in several excursions and expeditions to interesting parts of the world, including Iran, the Sahara and Alaska. He is married to Gabriela Schaepman-Strub with whom he has two children.

Jan Seibert obtained his PhD from Uppsala University in 1999 and has since worked at Oregon State University, the Swedish University of Agricultural Sciences, and Stockholm University. His main research interest is hydrological modeling at different scales in combination with experimental studies. His current research interests include the use of catchment models for land-use and climate change impact studies, the further development of catchment models (including the use of runoff models as a base for water quality models), runoff generation processes and their representation in models, the problem of calibration and validation, uncertainty analysis and risk assessment, and the relations between topography and hydrological processes (including hydrological landscape analysis). Jan heads the new Hydrology and Climate Unit at GIUZ.

We wish them the best of luck and great success at GIUZ!
1 Main research activities

The highly specialized research the Department carries out under the overarching theme of ‘The Earth in accelerated change: habitats in the 21st century’ represents a strategic asset that has great potential to shed light on pioneering topics at the interface of geographic sub-disciplines. In order to analyze and develop strategies for the study of complex processes such as global climate change or globalization, the majority of geographers are members of both national and international inter- and trans-disciplinary research networks.

The research field of Physical Geography 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 extends this program with its focus on hydrology and climate. The research fields of Geographic Information Science and Remote Sensing aim to enable the development and visualization of space-time databases capable of capturing fast and complex spatial processes as they unfold. The Unit Remote Sensing Laboratories, with their new head, envisage an increased international scope with new projects focusing on biodiversity monitoring using remote sensing, global land degradation assessment, and photosynthesis research at various spatial and temporal scales. In the research field of Human Geography, the development-oriented research of the Human Geography Unit will continue to study how different people in different regions perceive and appropriate their natural and social environments, and will analyze how these social practices change or evolve over time. The focus of the Political Geography Unit will further be on spatial patterns and dynamics of violent conflict, development and statehood in a globalized world. The Economic Geography Unit, upon the appointment of its new chair, is expected to embark on a new path. Under the program title ‘Economy, Culture and Space’ C. Berndt plans to establish three main research areas: (i) Geographies of the Performatrice Economy, (ii) Work, Gender and Place and (iii) Mobile Commodities.
Data collection and maintenance work for the mass balance monitoring network on Findelen Glacier (Valais) – field campaign, October 2009.
1.1 Glaciology, Geomorphodynamics & Geochronology

Overview
Although the Unit’s ongoing research activities are in full swing, first steps were made to find a seamless replacement for W. Haeberli, who will retire in January 2012. The Department’s recommendation is to attribute the chair once more to the field of Glaciology and Geomorphology with a focus on high-mountain environments and the impacts of climate change.

Main research activities

Glaciology
W. Haeberli and C. Huggel have been heavily involved in policy-related assessment work on the impacts of climate change on cold regions (side event at the 3rd World Climate Conference WCC3 in Geneva on linking global and local perspectives for climate change adaptation and disaster risk reduction in mountain areas; FAO side event at the Conference of the COP15 parties in Copenhagen on climate change and mountains; IPCC expert meeting on detection and attribution at WMO Geneva; IPCC special report on extreme events; European Environment Agency expert meeting in Copenhagen on tipping elements in the climate system; and a review for the UNEP Climate Change Science Compendium). The Swiss Federal Council decided to provide long-term funding through GCOS Switzerland for the operations of the lead and coordination office of the World Glacier Monitoring Service (M. Zemp, I. Gaertner-Roer, and W. Haeberli). In August 2009 A. Brack, the Peruvian Minister of the Environment, visited the WGMS together with a delegation of other political representatives from Peru and Switzerland. During this visit, the delegation was given a presentation about international glacier monitoring and the corresponding data situation in South America as well as GIUZ’s ongoing projects in Peru.

The PERMOS network documents the status and long-term variations of permafrost in the Swiss Alps based on temperature and kinematics data. The network is jointly funded by the FOEN, the Swiss Academy for Sciences (SCNAT) and MeteoSwiss, and its office is based at GIUZ (J. Noetzli and D. Von der Muehll). The PERMOS Office’s efforts in 2009 focused on processing and homogenizing data sets as well as re-evaluating all monitoring sites. In addition to the aforementioned new installations and data acquisition, GIUZ’s 2009 contribution to the PERMOS network included the complete revision of the borehole station on the Murtèl rock glacier, as well as regular fieldwork to maintain boreholes and surface temperature loggers (S. Gruber, J. Noetzli, A. Hasler). The 3G group (C. Huggel and others) co-organized the International Workshop on Glacier, Permafrost and GLOF Hazards (10-12 November 2009) in Vienna, at which over 70 participants from nearly 20 countries discussed the current state of affairs and the most important challenges in the field of high-mountain hazards. M. Egli, D. Brandová, F. Kaiser, S. Ivy-Ochs, P. Cherubini and H. Gärtner initiated an International Geochronology Summer School. This summer school was held in September 2009 in Anzonico (Upper Leventina, Ticino). Students from many countries such as Russia, Netherlands, India, Italy, Switzerland, United Kingdom, Germany, Poland and Romania participated in this summer school and it was a great success. There are plans to repeat this summer school in 2010.
Glaciers
The ESA project ‘GlobGlacier’ (F. Paul, PhD H. Frey, PhD R. Le Bris) continued into a second phase that focuses mainly on data generation. Glacier data were created for several key regions (Alaska, Baffin Island, West Greenland, Alps, Kashmir) and are currently combined with digital elevation models to create the required glacier inventory information. The project progress is documented in several publications, which also highlight the close cooperation of the project with related international activities. A new EU-FP7 project called ‘ice2sea’ started in March 2009 (F. Paul, H. Machguth, T. Bolch). 3G’s contribution is structured in two sub-work packages that are related to the creation of glacier inventory data for most parts of the Arctic and the coupling of climate models to regional glacier models (mass balance, retreat scenarios). The work is carried out in close cooperation with the Geological Survey of Denmark and Greenland (GEUS) in Copenhagen (H. Machguth).

The project ‘CCGlinCH’ (F. Paul, PhD A. Linsbauer) continued with the successful modeling of the bed topography for all glaciers in Switzerland and a related digital elevation model of Switzerland without glaciers. Currently, statistical analysis of the results, detection of local overdeepenings in the glacier bed and validation activities are in progress. The coupling of individual modules to obtain more realistic scenarios of future glacier shrinkage has started. In October, a three-year scientific project entitled ‘Glacier Laserscanning Experiment Oberwallis’ was launched. The new project is run in close cooperation with the RSL and is funded through the Axpo Climate Network. It takes advantage of multi-temporal high-resolution digital elevation models derived from airborne laser scanning and multi-spectral and -directional optical images for scientific research and improved glacier monitoring. The digital elevation models (DEMs) derived from this work will provide a spatially distributed insight into the accumulation and ablation patterns; calibrated intensity data might also reveal facies-type distribution. Multi-angular aerial images are used to produce an enhanced 3D visualization of the DEMs for scientific and broader public presentations besides serving as an alternative source for comparing DEMs with LiDAR DEMs. A first flight and field campaign was carried out in the catchment of Findel and Adler glaciers near Zermatt, Switzerland (M. Zemp, PhD P. Joerg). Along with this new project, the mass balance measurements on the Findel and Adler glaciers have been continued and converted into a long-term measuring initiative (coordinated by N. Salzmann and A. Linsbauer, in collaboration with the University of Fribourg). For Storglaciären, Northern Sweden, length, area and volume changes are quantified from multitemporal aerial images (1959-1999) and are compared with glaciological mass-balance data (T. Koblert, M. Zemp, I. Gaertner-Roer).

Permafrost
Research within the transdisciplinary project ‘PERMASENSE’ funded by NCCR-MICS and the FOEN has been further expanded; a wireless sensor network set up to provide detailed measurements on cryosphere processes and rock movement on the Matterhorn at 3400 m a.m.s.l. is operating reliably. Numerical modeling, as well as laboratory cold-room experiments in Caen (France), supports the interpretation of measurements (S. Gruber, PhD A. Hasler). A further part of the PERMASENSE project, research has begun into improved exploitation of distributed datasets and distributed models concerning the mountain cryosphere (S. Gruber, R. Purves, PhD S. Gubler). In May 2009, the project ‘Sub-grid Parameterisation and Computation of the Mountain Cryosphere (CRYOSUB)’ was launched (S. Gruber,
PhD J. Fiddes). The aim of the project is to develop methods by which sub-grid surface process and sub-surface phenomena in complex mountain topography can be adequately resolved at the regional scale while drastically reducing computational cost. During the summer of 2009, 390 small temperature logging devices (iButtons) were distributed in the area of Corvatsch, Engadine, in order to measure near-surface temperatures at different topographic locations to support model validation (S. Gubler, J. Fiddes, S. Gruber). The development, refinement and testing of a coupled heat and water transfer scheme including frozen soil in the GEOTop model has made further progress and is an important step in modeling climatic impact on permafrost (S. Gruber, J. Noetzli, S. Gubler, L. Böckli, external PhD M. Dall’Amico, external PhD P. Pogliotti, in collaboration with R. Rigon, University Trento, Italy). A global mode of permafrost distribution at 30 arc-seconds resolution has been developed (S. Gruber). A first version of a database of permafrost evidence covering the entire Alps was designed and established as part of the ‘PermaNET’ Alpine-Space project (in collaboration with the SLF, M. Phillips). Statistical analysis of this data set was carried out in close collaboration with the University of Waterloo (Canada, A. Brenning), which forms the basis for a new statistical permafrost model for the Alpine arc. Also within the PermaNET project, more local and detailed permafrost investigation with numerical modeling studies were carried out for the Bavarian Alps (Germany, in collaboration with the Bavarian State Ministry for the Environment, LfU, A. v. Poschinger) and the Sonnblick region (Austria, collaboration with ZAMG, M. Staudinger, C. Riedel). A number of rock temperature loggers were installed for this purpose in the Zugspitze and Hochkalter areas (Germany) in summer 2009 (S. Gruber, J. Noetzli, PhD L. Böckli).

Terrestrial geodetic surveys on the Murtèl and Muragl rockglaciers in the Grisons were re-initiated in summer 2009, in order to quantify annual and seasonal kinematics and compare them to multi-annual measurements from remote sensing data (I. Gaertner-Roer). The surveys are conducted within the DFG project entitled ‘Monitoring and process analysis of permafrost creep and failure in changing temperature regimes’ and data are integrated into the Network for Permafrost Monitoring Switzerland (PERMOS). The existing geophysical monitoring network, which was set up within the project ‘Geophysical monitoring systems to assess and quantify ground ice evolution in mountain permafrost’ (PhD C. Hilbich, successfully completed in 2009) and is the part of the PERMOS network, was extended in summer 2009; new profiles for electrical resistivity monitoring were installed at Jungfraujoch (rock wall) and Flüela pass (talus slope). At the Murtèl rock glacier, a new profile with a very high spatial resolution was installed to investigate small-scale changes related to short-term weather anomalies in this rock glacier. Moreover, two sites of the existing network (Schilthorn and Stockhorn) were equipped with an automated monitoring system that allows daily measurements and thus a direct comparison of the evolution of electrical resistivities and borehole temperatures in future (C. Hilbich, in collaboration with the University of Fribourg and the PERMOS Network).

**Environmental dynamics and natural hazards**

In the SNSF project ‘Slope stability in perennially frozen and glacierized rock walls’ (C. Huggel, PhD L. Fischer) was successfully completed and provided important insights into the essential factors and processes influencing slope instabilities and rock avalanches using a multi-scale approach. The approach comprises statistical factor analyses of detachment zones on a regional scale, detailed topographic
change analyses for an entire rock wall and the re-analysis of a single rock avalanches based on numerical slope stability modeling. Within the ‘Rock-ice avalanches: a systematic investigation of the influence of ice’ project (C. Huggel, PhD D. Schneider, in cooperation with WSL, B. Mc Ardell, P. Bartelt) has progressed with laboratory experiments of rock-ice mixtures with a vertically rotating drum at the Department for Earth & Planetary Science in Berkeley, USA. The experiments help to understand the characteristics of mass movements containing ice better. A second research focus was on interpreting the seismic signals of large rock and ice avalanches in relation to dynamic avalanche modeling. The climate change adaptation programme between the Swiss and Peruvian governments, funded by the Swiss Agency for Development and Cooperation (SDC), including a Swiss scientific consortium of six research institutions led by GIUZ (C. Huggel, N. Salzmann), has prompted studies in various fields of climate change impacts and adaptation in the Andes mountain regions. A new cooperation agreement has been signed with the Universidad Agraria La Molina in Lima, Peru. The SDC-funded disaster risk reduction project focusing on landslide and volcano-glacier hazards and related early warning systems in Colombia (C. Huggel) has now entered its second phase, which is expected to be concluded by the end of 2010. The new HighNoon project, funded under the EU FP7 programme, was initiated in mid 2009 and focuses on the impacts of climate change on Himalayan glaciers and water resources in India (C. Huggel, in close collaboration with the Universities of Geneva and Berne (M. Stoffel), with a joint PhD R. Worni). In collaboration with the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna (J. Schneider), a new project was initiated to assess the risks of high-mountain hazards in Tajikistan (D. Schneider, C. Huggel).

Geochronology and landscape evolution
One major 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). 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 10Be, 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. The projects are under the main supervision of M. Egli.

Ursina Gloor (Geography Teacher Training group) started her PhD project on ‘Late Glacial and Holocene Landscape Evolution in Central Switzerland’ (M. Maisch, M. Egli, S. Yvy-Ochs and F. Renner). She will focus on the paleoglaciological reconstruction of Late Glacial moraine stages in the regions of
Reusstal, Sustenpass and Urserental by using also relative and absolute numerical dating techniques on selected landforms.

*Wilfried Haeberli and collaborators*
1.2 Soil Science and Biogeography

«Soil, the living skin of earth» was the title of a well-attended workshop during the Festival Science et Cité, basecamp09, held 1. – 10. May 2009 in Zurich. School children prepared pictures with natural colors from soil, watched earthworms at work, and explored nature’s living and mineral ingredients of soil with microscopes.
1.2 Soil Science and Biogeography

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. There were several highlights in 2009. We published seven papers in international refereed journals. In May, we organized an extremely popular workshop for school children to experience ‘Soil, the living skin of the Earth’ during the Festival ‘Science et Cité’, ‘basecamp 09’, held in Zurich. In October, we hosted a very focused workshop with 15 leading scientists from Europe and the USA (‘the Lake Constance think tank on global change and feedback from organic carbon dynamics’) held in Ittingen and funded by the European Science Foundation. Furthermore, we organized several scientific sessions during the European Geoscience Union Meeting in Vienna, the Swiss Geoscience Meeting in Neuchatel, and during the joint French, Swiss and Belgian Soil Science Conference in Strasbourg.

Main research activities
The study of organic matter turnover at the molecular level continues to be a major focus of our group. A. Hofmann successfully completed her PhD on effects of environmental factors in the dynamics of lignin in arable soils. Research in this area will continue during a new project that was initiated by A. Heim in collaboration with F. Hagedorn (WSL Birmensdorf) and M. Schmidt. This project will link the carbon and nitrogen cycles by using the isotopic label from a CO2 enrichment experiment to trace the carbon flux into both plant-derived and microbial-derived molecules in forest soils under nitrogen deposition. E. Eckmeier finished her postdoc project ‘A geoarchaeological approach to investigate human-environment interactions in the Valle Leventina’ and accepted a new position at the Weizman Institute in Israel. S. Abiven received funding from the SNSF Ambizione program and, along with two PhD projects (N. Nimisha, B. Maestrini), forms the Swiss Char Study Initiative (CSI Swiss). Future climate change will bring with it more wildfires, in European forests as elsewhere, 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 and the mechanisms driving the decomposition. CSI’s aim is to answer these questions and to track the fate of isotopically labeled char in Laegern, an experimental forest site northwest of Zurich. The group is also involved in research projects looking at the use of fire-derived carbon (biochar) in agriculture and its effects on soil fertility. M. Schneider examined the effect of the formation temperature on the chemical structure of fire-derived carbon in a project funded by the University Research Fund. In particular, he visited the lab of T. Dittmar, at the Florida State University, and developed a new method using high-performance liquid chromatography, in collaboration with R. Smittenberg of the Department of Geology, ETH.

C. Burga continued his permanent monitoring project of primary plant successions within the foreland of the Morteratsch glacier, and he continued the vegetation and plant diversity map of the Upper Engadine (Samedan-Maloja) with P. Leu as his scientific collaborator.

Michael Schmidt and collaborators
1.3 Hydrology and Climate

Students gauging discharge in the Reppisch for the course GEO 861, September 2009.

Photo: Jan Seibert, 2009
1.3 Hydrology and Climate

Overview

The newly formed group for hydrology and climate (H₂K) is engaged in research into catchment hydrology and the impacts of the climate on the water cycle. Climate variability and climate change are increasingly recognized as having significant implications for water resources. There is a wide range of issues including flooding, droughts, hydropower and drinking water supply. Understanding the impacts of climate variability on hydrology in a changing environment requires a knowledge of hydrologic processes, controlling factors and thresholds. We therefore combine experimental methods such as hydrometric measurements and natural water isotope tracer-based approaches with hydrological modeling. One of the main models used by H₂K is the HBV model currently being rewritten to meet current and future research and teaching needs better. The scales H₂K is studying range from hill slope scales to the national scale. H₂K mainly focuses on runoff generation, catchment dynamics and on runoff prediction in ungauged basins (PUB).

A new project on critical drought and low-flow conditions in Switzerland will start in 2010. This project, which is part of the SNSF-funded NRP 61 ‘Sustainable water management’, is carried out in cooperation with WSL, IAC and the University of Freiburg (D). A new PhD student will start in early 2010.

H₂K plans to intensify the ongoing exchange of knowledge and resources between the hydrological research institutions in the Zurich area (WSL, SLF, IAC, EAWAG and IFU) as well as other research groups at GIUZ. Interdisciplinary research is especially important for water-related research, as water issues require researchers to think beyond traditional scientific boundaries.

Main research activities

The goal of this year’s H₂K research program was mainly to define the group’s scientific focus, to build up the equipment required to start different projects and to start networking with the various hydrological groups that exist in the Zurich area.

The two current PhD positions have been filled without any predetermined project. The precise research goals are to be defined by the PhD students in discussion with J. Seibert. PhD student B. Fischer focused on water isotope hydrology during his Master at Delft University (NL) and his research goal was soon defined. He will look at runoff prediction with isotopic tracers, mainly in the national research catchments of Alpthal (SZ) and Rietholzbach (SG). The H₂K lab has been equipped with a new isotope-analyzer for water isotope analysis. PhD student M. Rinderer decided to concentrate on runoff dynamics within the two chosen research catchments in order to better understand hydrological functioning at different scales. Investigations into emerging hydrological patterns will indicate the dominant processes at work in different homogeneous land units, sub-catchments and watersheds. A catchment comparison should show the potential of applying catchment-specific findings to other similar catchments.

T. Ewen, H₂K’s Senior Researcher, analyzes the diurnal cycle of precipitation, temperature and runoff in the pre-alpine Rietholzbach (SG) catchment to investigate the contribution of snowmelt and
evapotranspiration to the total runoff. A further matter of interest is how these changed between 1976 and 2006 with particular reference to climate change relevant evidence. The aim is to apply this methodology to other catchment areas in Switzerland.

In cooperation with WSL and as part of the 4-year project 'Triggering of Rapid Mass Movements in Steep Terrain' (TRAMM), H2K has one ongoing Master thesis, where the spatial and temporal distribution of soil moisture is being investigated on a steep hill slope on the Rufiberg above Arth (SZ). This experiment is funded by the ETH’s Competence Center for Environment and Sustainability (CCES) and focuses mainly on different measurement techniques for such investigations, combining well-known, frequently applied methods (TDR, tensiometers and ground water monitoring) with newer techniques (electric resistivity tomography (ERT) and mobile surface TDR-measurements). More Master’s theses are planned for the phase after this current project, which starts in May 2010.

H2K plans to provide several more Master’s theses in 2010, most of them related to PhD projects and is encouraging more students to profit from the preparative year 2009. With the upcoming NRP 61 ‘Drought project’, which provides an additional PhD position for H2K, and the newly staffed post-doctoral position starting in January 2010, H2K hopes to continue its scientific efforts and the success it has already had.

Jan Seibert and collaborators
1.4 Human Geography

Excursion: Participant research methods and alpine pastoralism in the lower Surselva, Canton of Grisons.
1.4 Human Geography

Overview

The Human Geography Unit undertakes research into the question of how different people in different regions perceive and appropriate their natural and social environments, and analyses how these social practices change or 'develop' over time. The core themes of our research are:

- Migration, multi-local livelihoods and development,
- Rural living conditions, natural resource use and development processes,
- Conflicting social spaces and development.

The Unit conducts development-related research with the aim of contributing to sustainable development in both the global South and global North. Through the Development Study Group (DSGZ), coordination takes place with other South-oriented research groups at the Department.

Highlights of the year 2009 were the approval by the SNSF and the Swiss Agency for Development and Cooperation (SDC) for a third phase of the NCCR North-South (July 2009 – June 2013). The DSGZ remains one of only six Swiss partner institutions left within the NCCR North-South. Despite the expected reduction in funds that usually applies to NCCRs, we succeeded in maintaining funding at the same level. The project on incorporating risk maps into local-level planning in Switzerland (financed by KTI and jointly implemented with ZHAW Winterthur) was successfully completed with the publication of policy-oriented guidelines. Two major publications of the unit are the book 'Decentralisation Meets Local Complexity', jointly edited by U. Geiser and S. Rist, and 'Globalisierung' by N. Backhaus, a textbook on globalization for Bachelor’s students in Geography with the renowned Westermann publishing house.

Members of the Human Geography Unit actively presented their research at the 'Deutscher Geographentag' in Vienna. S. Landolt co-organized the international and interdisciplinary scientific conference ‘Gendertranscripts - Transformationen geschlechterbezogener Normierungs- und Aneignungsmodi’ held in September in Berne. Furthermore, members of the Unit made a great effort to share their knowledge with policy and practice by providing policy briefings for SDC, participating at the Regional Migration Forum in Central Asia, and being a discussant at the official launch of the Human Development Report 2009 at the United Nations office in Geneva. U. Müller completed his postdoc within the URPP Asia and Europe and started a career as consultant for communication in sustainable development.

Main research activities

Research under NCCR North-South Program

Institutions, livelihoods and conflicts (Phase 3 of NCCR-North-South)

Lead: U. Müller-Böker

The DSGZ started the third phase of the NCCR North-South in mid 2009. The 'Thematic Node 1' delves into institutions, livelihoods and conflicts. The new set-up has formalized a close partnership with the Swiss Peace Foundation. The different research projects provide the opportunity to intensify existing
partnerships (especially in South Asia), but also to explore new research networks, especially in Central Asia and East Africa. The overall objective is to carry out research into the dynamic and changing roles of political, social, economic and cultural institutions in order to understand how they regulate social interactions between and among individuals and groups (specifically regarding access to livelihood means, and peace and security), and to enable a broader acceptance and legitimacy of institutions relevant for sustainable development.

Members of the DSGZ and their partners in the South have launched three research projects:

- Contested rural development: New perspectives on 'non-state actors and movements' and the politics of livelihood-centered policies. Project lead: U. Geiser (DSGZ), R. Ramakumar (TIISS, India)

- Livelihood futures in resource-scarce areas and the quest for the inclusion of marginal groups. Project lead: B. Shahbaz (SDF/SDPI, Pakistan), S. Sharma (HNRS, Nepal); backstopping: U. Müller-Böker (DSGZ), A. Suleri (SDPI, Pakistan).

- Migration, knowledge and development: The role of knowledge and skills in the migration process in South and Central Asia. Project lead: S. Thieme (DSGZ), Anita Ghimire (HNRS, Nepal).

First planning workshops took place in Mumbai and Kathmandu.

Livelihood options and globalization (Phase 2 of NCCR-North-South)

Lead: U. Müller-Böker

The Phase 2 project ended in June 2009, but research activities are still ongoing. 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 issues are addressed through the following activities, which are based on research partnerships with organizations in the respective countries:

Research in Nepal

U. Müller-Böker, B. Upreti, G. Gurung, K. Pyakuryal, S. Sharma, P. Nepali (PhD), A. Ghimire (PhD)

www.nccr-nepal.org

There is deep resentment among Nepalese citizens about the inability of the state and its related institutions to support rural livelihoods and to address social exclusion, marginalization and governance failure. Further, the state’s policies, development strategies and establishment of institutions were much influenced by international organizations and donor agencies over a period of nearly 50 years. These controversial debates had been the entry points for research in Nepal. Its core interest is to understand the causes of failure of the state to respond to the livelihood needs of people and to analyze different rural livelihood strategies in marginalized areas of Nepal with their urban links, and to identify related institutions that support or hinder efforts of the poor to secure the means for improving their lives. Ongoing and nearly completed case studies deal with landlessness of socially excluded people (mainly Dalits), the current land policies, and with internally displaced persons.
Forest politics and livelihoods in Pakistan

U. Geiser, A. Suleri, B. Shahbaz, Sultan-i-Rome

Based on his PhD thesis, B. Shahbaz released a book entitled ‘Dilemmas in participatory forest management in Northwest Pakistan: A livelihoods perspective’. It attempts to underline the livelihoods perspective of participatory forest management initiatives in the North West Frontier Province of Pakistan. Sultan-i-Rome is compiling his insights into the historic dimension of forestry conflicts into a book. Emphasis was then laid on dialogues with practitioners within Pakistan (e.g. Federal Ministry of Environment; non-governmental organizations involved) as well as donors (e.g. SDC; Intercooperation). An action research project was launched to improve trust between forest users and the state through independent mediation.

Rural livelihoods and development in Northwest Pakistan

U. Geiser, A. Suleri, M. Jan, K. Siegmann, Sultan-i-Rome, J. Grünenfelder (PhD)

J. Grünenfelder emphasized the analysis of field data and writing the PhD thesis on the encounter between development practitioners and ‘villagers’. She also presented first findings at the ISS in De Hague. Due to the escalating political situation, M. Jan and K. Siegmann had to stop temporarily their action research on the impact of migration on the family members that remain in the villages, but were able to resume it towards end of the year. They also held a workshop in Peshawar on the impact of migration on families in sending areas. U. Geiser and Sultan-i-Rome continued the analysis of the root causes for the emergence of radical movements in the Swat valley. U. Geiser presented some first hypotheses at workshops in Edinburgh and Zurich.

Rural inequalities in India

U. Geiser, R. Ramakumar, C.P. Vinod (PhD), Indu K. (PhD)

R. Ramakumar is in the final stage of analyzing dense village-level data on agrarian change in Maharashtra, while C.P. Vinod is writing his PhD thesis on the contemporary challenges faced by tribal populations in northern Kerala. Indu K. has submitted her PhD thesis on rural industries in Kerala. Balz Strasser published a book entitled ‘“We are as flexible as rubber!” – Livelihood strategies, diversity and the local institutional setting of rubber smallholders in Kerala, South India.’ The book, which is linked to his PhD work in Kerala, addresses rubber cultivators who have been affected by trends such as trade liberalization, the reduced role of the state, and organizational reforms in the Indian natural rubber sector.

Pastoral livelihoods and institutional transformations in post-socialist rural Kyrgyzstan

U. Müller-Böker, B. Steimann (PhD)

This research concentrates on the processes of post-socialist transformation at the micro level, with special attention to actors and institutions involved in the use and management of alpine pastures. In his PhD study, B. Steimann analyzes the livelihood trajectories of different pastoral households and their interactions with various organizations and institutions, which have evolved from the collapse of the USSR and the subsequent privatization of the Kyrgyz agriculture. Empirical research in Kyrgyzstan was
completed by autumn 2008. Therefore the main focus in 2009 was on data analysis, writing up the thesis and publishing and presenting the first results in conferences and seminars both in Switzerland and abroad, as well as in the Kyrgyz media.

**Decentralization, social movements and natural resource management**

U. Geiser, S. Rist

This project brings together insights into the discourse and practice of decentralizing state functions, specifically in the field of natural resource management. U. Geiser and S. Rist (CDE) edited a peer-reviewed volume entitled ‘Decentralisation meets local complexity: local struggles, state decentralization and access to natural resources in South Asia and Latin America’. The book shows how political contestations within and between heterogeneous communities and the state produce complex and often unintended outcomes for the management of natural resources. In order to translate research findings for dialogues with practitioners, a policy brief entitled ‘Overcoming ambiguities in decentralisation’ came out in November.

**Sustaining livelihoods in trans-local and trans-national settings**

S. Thieme, S. Barbora

This ongoing NCCR N-S postdoc research project deals with the multi-local dimension of people’s livelihoods and investigates potentials and risks of this multi-locality. Case studies are being carried out in Central Asia and South Asia. Activities during 2009 dealt with analysis of data and synthesis of research findings. Findings were presented at the IMISCOE Conference and will soon be published in international peer-reviewed journals. An additional effort was made to establish a link between theory and practice by publishing policy briefing on ‘Making migration safer’ with joint authorship by migration researchers from the Nepal Research Group (A. Ghimire, G. Gurung) and practitioners from the SDC and by being a discussant at the official launching of the Human Development Report 2009 at the United Nations office in Geneva.

**Knowledge, power, politics**

C. Zingerli, A. Uzedá Vásquez, To Xuan Phuc

This NCCR North-South postdoc project deals with the political nature of knowledge in development research and policy, as well as knowledge-sharing between research, policy and practice. The project encompasses three complementary case studies conducted in Switzerland, Bolivia and Vietnam. Project activities during 2009 were mainly devoted to the analysis and synthesis as well as the presentation and publication of the results. The project team met for a workshop in Zurich in August 2009 in order to write up and complete articles together. The project will end in February 2010.

**Link between research and practice**

The NCCR North-South provides for supplementary so-called 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. The following projects associated with the Human Geography unit were completed or continued in 2009:

- Strengthening communication and trust between actors for sustainable forest governance in the NWFP of Pakistan (completed);
- Strengthening migrants' wives in rural north-west Pakistan (ongoing);
- Bridging the gap between research, policy and practice on land issues (ongoing);
- Hemp production for livelihood security in Dhabang and Mirul VDCs of Rolpa District (starting);
- Research based policy dialogues and advocacy for sustainable forest governance in Northwest Pakistan (starting).

SNSF, KTI, SDC and other projects

Views of the rural poor
S. Contzen (PhD), U. Geiser, U. Scheidegger (SSL), Research Fellow Partnership Program (SDC and ETHZ)
The project deals with the interface between development policies and rural livelihoods. It focuses on the implementation of the Honduran Poverty Reduction Strategy (PRS) at local level. During 2009, there were two field trips dedicated to a landscape and history mapping of the two study locations, a household survey and semi-structured interviews with local development brokers and politicians.

Migration, multi-local livelihoods and societal change in Far West Nepal
U. Müller-Böker, M. Junginger (PhD), ProDoc SNSF
The project aims at examining the multiple changes undergone by rural livelihoods in Nepal’s periphery and the role that multi-local networks of migrants play in shaping rural development, especially in localities that have experienced political violence. The project revives the project (suspended during conflict) on multi-local livelihoods in Far West Nepal. Fieldwork is ongoing.

Adaptive governance of natural hazards - the implementation of risk maps in Switzerland
U. Geiser, C. Schwank, KTI
Following the severe flooding of recent years, Swiss municipalities are preparing 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 (ZHAW), Winterthur - analyses the processes by which these risk maps are translated into protective measures. We apply an adaptive governance perspective, i.e. that policy implementation represents an arena of negotiation. The final report was published in October and a guideline for practitioners has been distributed to around 20 communes for feedback.

Landscapes and habitats of the Alps: Processes of perception
N. Backhaus, C. Reichler, M. Stremlow
The four-pole model of landscape perception established by N. Backhaus, C. Reichler and M. Stremlow 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 landscapes. Several research projects using the model have started in 2009, i.e. an analysis of A.T. Gersdorf’s journey to the Alps in 1786 and a transdisciplinary exhibition "Landschaft?" adapting to the model to urban and peri-urban contexts.
Appropriation of urban space by youth: Processes of negotiation of public space in Zurich
S. Landolt (PhD), N. Backhaus
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 and how their practices in public space influence the negotiation and production of public space. Moreover, the project analyses how the general public, actors of urban management and government manage emerging conflicts by using public space. In 2009, the main research activities were data interpretation, publishing articles and working towards a PhD monograph. Two highlights were a short-term visit (the MNF’s short mentoring program) at the Centre for Alcohol and Drug Research at the University of Aarhus, Copenhagen and the co-organization of the international and interdisciplinary scientific conference ‘Gendertranscripts - Transformationen geschlechterbezogener Normierungs- und Aneignungsmodi’ at the University of Berne in September.

Ulrike Müller-Böker and collaborators
1.5  Political Geography

Photo: Christine Bichsel, 2004

1.5 Political Geography

Overview
Political Geography is a relatively new research group within the Department of Geography. Our main fields of interests are in political geography (in particular violent conflict), political ecology (nature-society relations), development ethics and theoretical (philosophical and methodological) debates in human geography. We collaborate closely with colleagues from Human Geography, the sotomo group and an international network of scholars. These are some of our activities and highlights in 2009:


- Our group co-organized an international workshop on ’Space, contestation and the political’ in Zurich, 12-13 February (with Joris van Wezemael, ETHZ and Dave Featherstone, University of Glasgow, UK). More than 30 European scholars attended this workshop.

- The SNSF approved a new research project on ‘Living with violence in Nepal’ that will commence in January 2010 in close collaboration with Ulrike Müller-Böker, Theo Rauch and Bishnu Upreti and with Sarah Byrne as PhD researcher.

- Tobias Hagmann and B. Korf organized a panel on ‘Revisiting the African Frontier’ at the 3rd European Conference on African Studies (AEGIS) in Leipzig, in June. T. Hagmann also taught at the Rift Valley Institute’s second Horn of Africa course in Lamu, Kenya, which brought together an impressive group of Horn of Africa specialists.

- In June, the NGO Erklärung von Bern (EvB) published a ranking of the ethical practices of outdoor equipment companies, which is the result of collaboration between EvB and Mark Starmanns.

- Christine Bichsel joined our group as part of the University priority research programme ‘Asia and Europe’ in August. Christine has thrilled us with her stimulating interest in all kinds of theoretical questions.

- Our group has held two one-day retreat seminars, the first on ‘governmentality’ with Roland Bleiker as invited guest, the second on ‘Gramsci and his concept of hegemony’ with Alex Loftus from Royal Holloway as its invited guest.

- In September, Shahul H. Hasbullah from the Department of Geography, University of Peradeniya, Sri Lanka, joined our group once more as a visiting researcher to work on his project of Muslim geographies in eastern Sri Lanka.


- In October, the final report of a research conducted by the students of ‘Geo 842 Ethical Swiss – Wie ethisch korrekt ist Made in Switzerland?’ was presented in a public workshop that was jointly organized with five organizations working in the field. About 20 small fashion labels par-
participated in this workshop, including several well-known Swiss fashion designers. In November, M. Starmanns was invited to give expert input at a workshop of the Clean Clothes Campaign in Amsterdam.

- On 1st November, B. Korf was promoted to Associate Professor.
- C. Bichsel received a three-year fellowship of the SNSF Ambizione programme. She will start on January 2010 at the University of Fribourg.
- T. Hagmann successfully applied for an SNSF Advanced Researcher fellowship to go to the University of California at Berkeley. He also received a fellowship to go to the Woodrow Wilson Centre in Washington D.C.

**Main research activities**

Our research concentrates on three core themes:
- Geographies of violence,
- Moral geographies,
- 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 relations, resource conflicts, ‘new’ wars, state failure, ethical trading, and uneven development. At the same time, we collaborate and dialogue with policymakers 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

This edited volume compiles papers by eminent peace researchers and practitioners from Sri Lanka and elsewhere on aid and peace building in Sri Lanka after the 2002 ceasefire. In 2009, the editors undertook a final review and edit of the book chapters, updated some sections to incorporate recent developments in Sri Lanka, and submitted it to the publishers. It will appear in late 2010.

**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 current EPRDF government came to power 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 local service delivery. The objective of this research is to take stock of this literature and to assess ethnic-based decentralization from both the national and the local perspective. In addition to an extensive review of the literature by T. Hagmann, Master’s student Rony Emmenegger carried out fieldwork on the nexus of road construction and decentralized governance in Ethiopia.
DEVELOPMENT: Negotiating Rural Development at South Asia’s Frontier (SNSF- ProDoc)
B. Korf, B. Klem (PhD)
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 students. In Political Geography, Bart Klem is conducting his PhD under the working title ‘Antagonism between war and peace: violence, order and normalcy in eastern Sri Lanka’. The main field research will commence in early 2010 and focuses on the way the present transition from war to peace is negotiated between different political players and population groups. The region is a rural borderland that is subject to numerous pressures, which people juggle around on a day-to-day basis. Activities in 2009 centered on theoretical and conceptual work as well as reflecting on the turbulent developments in Sri Lanka this year. The first article – focusing on the Muslim population – was submitted to a peer-reviewed academic journal.

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, with funding from ESRC. The project funding came to an end in 2009, but many activities still continue within this network, which investigates linkages between aid, religion and conflict in the multi-ethnic and multi-religious east coast of Sri Lanka. In September 2009, Dr. S.H. Hasbullah from the University of Peradeniya in Sri Lanka joined our research group again and worked on his field material, while discussions were also held with Prof. Jonathan Spencer during his short visit to Zurich. In October 2009, Pluto Press signed a contract for a book with the title ‘Temple, Church, Mosque and Checkpoint: A collaborative ethnography of war and peace in eastern Sri Lanka’. B. Klem is continuing his research through funding from the Forschungskredit of the University of Zurich (January-February) and the Swiss National Science Foundation (since March; project DEVELOPMENT).

GIFT: Moral Geographies and the Tsunami Gift in Sri Lanka
Pia Hollenbach (PhD)
This PhD project is funded by the University Priority Research Program Asia and Europe (UFSP). It is based on three years of working experience in the tsunami rehabilitation and reconstruction process in Sri Lanka. Using gift theory and the concept of solidarity as an entry point for analysis, the project reveals the hidden ‘rules’ of humanitarian giving and how it creates an asymmetric relation of reciprocity and power. Furthermore, the project deconstructs how aid is used to transfer and create new ‘models of living’ and how the involved stakeholders govern and modify project goals and project participants in order to achieve their interests. In this context, the project traces the multi-local nodes of the aid chain and analyses the moral discourse and practices of giving and how these translate into concrete aid practices and rituals. Moreover the author will reflect on her own positions as an aid broker and researcher as she used to be involved in this field in different positions and with different expectations. The focus is to reflect on the ethnographic self and the ethics of work and research. Fieldwork 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
Pasture based extensive livestock production is the dominant land-use system in the Horn of Africa. There have been many studies on the proliferation of violent inter-group conflicts in the past two decades and these were synthesized in a research article. In addition, T. Hagmann and his colleague Chinwe Ifejika Speranza have worked on a special issue that looks at new avenues for pastoral development in sub-Saharan Africa. It is currently undergoing review.

STATE: Negotiating Statehood in Africa and Political Orders Beyond the Nation-state
T. Hagmann, D. Péclard
Academic and policy discourse nowadays portrays post-colonial African states in virtually pathological categories; they are perceived to be under threat of ‘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. As part of this process, T. Hagmann and Didier Péclard have pieced together and submitted a special issue composed of 10 contributions and entitled ‘Negotiating statehood’ to a peer-reviewed academic journal.

SUBJECTIVITY: Development, governmentality and subjectivity in Central Asia
C. Bichsel
The postdoctoral research project focuses on international aid to Central Asia. It analyses aid through the concept of governmentality as shaped by French philosopher Michel Foucault. The project explores how subjects are constituted in international aid in order to achieve specific forms of rule. It aims to provide a detailed empirical account of subject formation taking the example of Kyrgyzstani aid workers, as well as to explore the historical conditions that enable particular discursive expressions of personal transformation in international aid.

TRADE: How Ethical is Ethical Trade? Private Governance Networks in Global Value Chains
M. Starmanns (PhD)
Despite brands’ and retailers’ efforts to improve working conditions in global garment value chains, NGOs and trade unions often criticize the private governance of social standards as ineffective and illegitimate. To make trade more ethical, many corporate actors within global production networks join business or multi-stakeholder initiatives that implement standards in developing countries. This PhD tries to disentangle the politics of private regulation in global production networks. It analyzes the practices of private regulation, the arguments companies and private regulation institutions use to legitimize their corporate responsibility approaches, and how stakeholders criticize these strategies. The main aspects under analysis are their credibility, impact and root causes. More generally, this analysis might provide a framework that allows for differentiation between practices of private regulation and corporate responsibility in global production networks. The research is based on empirical data from global garment chains between Europe, India and Bangladesh. So far, two Master theses have been supervised as part of the TRADE project. The first analyzed how various Swiss companies implement social
standards, and the other one focuses on one specific Swiss company and analyzes the changes in this company in detail.

**YOUTH: State-making in Guinea and Youth as Political Actors**

M. Engeler (PhD)

This research project investigates the nexus between youth and state-making in Guinée Forestière, a marginal and understudied region of the West African state Guinea. The aim of this research is to produce an ethnography of both youth organizations and local state institutions as they appear in this particular region of Guinea. Since July, Michelle Engeler has been continuing her PhD at the University of Basel’s Department of Anthropology and the Centre for African Studies.

*Benedikt Korf and collaborators*
Excursion group in front of the remote Val di Lodrino and the mountains around the highest peak of the valley, «Poncione del Vènn» (Ticino).
1.6 Economic Geography

Overview
2009 was a year of transition for the Economic Geography Unit, since Prof. Dr. H. Elsasser retired at the end of January after 22 years of research and teaching. Until his succession in March 2010 by Prof. Dr. C. Berndt, the vacant chair has been temporarily assigned to his longstanding collaborator, Dr. A. Odermatt, who maintained the research focus on the fields of urban and regional development, housing and real estate markets, tourism, and gender studies over the reporting year. In 2010, the Economic Geography Unit will strike out on a new path. Under the programmatic title ‘Economy, Culture and Space’, C. Berndt plans to establish three thrusts to research: (i) Geographies of the Performative Economy, (ii) Work, Gender and Place and (iii) Mobile Commodities. In the meantime, the Unit’s main objectives have been to ensure its teaching and coaching obligations towards Bachelor’s and Master’s students, as well as completing ongoing research projects. However, due to the aforementioned process of transition, some longstanding and appreciated research assistants and lecturers have also departed such as C. Heye and P. Klaus who have both become partners in consulting firms in the private sector and J. E. Van Wezemael, who was appointed Professor of Human Geography in the Socio-Spatial Complexity Group at the University of Fribourg. Luckily enough, we were able to find three new research assistants, namely F. Boller, C. Robin and C. Schwank, who complete our team for the time being. Our highly dedicated staff and external lecturers and tutors enabled us to achieve these tasks adequately.

Main research activities
B. Abegg has continued to work on climate change and tourism. Based on his impact studies such as the well-known OECD report ‘Climate Change in the European Alps’, he has shifted his main interest to adaptation and mitigation measures/strategies. He focuses in particular on the adaptive capacity (determinants of adaptation) of major tourism stakeholders in the Alps (e.g. tourism associations, ski area operators, hoteliers). The corresponding policy implications are also part of his research activities. B. Abegg plays a leading role in an international project called ‘cc.alps: climate change – thinking one step further’. This project, managed by CIPRA International, aims to analyze climate response measures (adaptation and mitigation) in terms of their sustainability. In phase one, climate response measures were collected and evaluated. In phase two, examples of good practice will be communicated and further implementation facilitated in selected alpine pilot regions. B. Abegg is also involved in a project called ‘Lösungsansätze im Konfliktfeld erneuerbare Energien und Raumnutzung’, organized by ProClim – Forum for Climate and Global Change. He is, together with U. Neu (ProClim), responsible for the chapter about renewable energies and tourism. The report will be published in 2010.

The project ‘Sustainable design, management and appropriation of urban public parks’ focuses on three public neighborhood parks in the city of Zurich and aims to identify elements of design and planning as well as strategies of management and operation that foster a socially sustainable appropriation of public areas. E. Bühler directs the project in collaboration with S. Timpf, H. Kaspar and F. Ostermann. It is carried out as part of the NRP 54 ‘Sustainable Development of the Built Environment’. In 2009 project activities concentrated on the implementation and publication of the research results. A
special issue of ‘Geographica Helvetica’ (1, 2009; guest editor E. Bühler) contains a selection of the contributions that were presented at the ‘Sustainable public places’ symposium (June 1-3, 2007) sponsored by this project and the IGU Commission on Gender and Geography. A short version of the final project report (in German) and F. Ostermann’s dissertation (in English) can be downloaded from the project homepage. The publication of a book with the comprehensive project results is intended for 2010 as well as the completion of the PhD thesis of H. Kaspar.

The centerpiece of H. Kaspar’s PhD thesis is the question ‘How are urban parks experienced?’ Urban parks are spaces of contrasts and synchrony. On the one hand, they are neither ‘urban’ nor ‘nature’. On the other hand, parks are open spaces that are constantly re-constituted through social negotiations about space and use entitlements. These ambivalences and synchronies appear in the narratives of park users conducted in selected parks of the city of Zurich. The thesis will disclose these diverse perspectives and in doing so elaborate on the specifics of an ordinary urban space. Semi-structured interviews with park users form the data basis. They are analyzed with Grounded Theory coding procedures. The results were presented at the Deutscher Geographentag in Vienna this year.

Two subsequent projects followed the ‘Langstrasse – Gentrification or incumbent upgrading?’ research project that was conducted by A. Odermatt, C. Heye and C. Craviolini and finalized in 2009. In the context of two Master’s theses, C. Craviolini is analyzing two additional quarters of Zurich, the Seefeld quarter in respect to gentrification and housing market processes, and the Wiedikon quarter in respect of urban renaissance. The Economic Geography Unit collaborated on these two projects with the Institute of Sociology of the University of Zurich.

In the PhD project ‘Life Plans’, K. Schwiter analyzes the narratives of young adults from the German-speaking part of Switzerland about 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. Some first results were presented in September 2009 at the Annual Conference of the Swiss Sociological Association in Geneva.

*André Odermatt and collaborators*
1.7 Remote Sensing Laboratories (RSL)

Connecting science fields.

Photo: Damien Markulin, 2009
1.7 Remote Sensing Laboratories (RSL)

Overview
The most significant change for RSL was certainly the transition from Klaus Itten as former chair to Michael Schaepman as the new chair of RSL from the beginning of March 2009. The change went very smoothly in operational terms and Klaus Itten and his colleagues from RSL did an excellent job in preparing this period. RSL’s scientific focus experienced further broadening internationally, with new projects focusing on biodiversity monitoring using remote sensing, global land degradation assessment, and photosynthesis research at various spatial and temporal scales. The cooperation with Wageningen University (M. Schaepman’s former employers) also led to an increase in the number of international PhD students, of whom 10 will finish in the next 4 years, working partly in Switzerland and partly in the Netherlands. RSL’s focus will remain on the domains of measurements and products, and there will be increased attention paid to generating products that have an impact on policy. Remote sensing will be further established as a major focal point of research for the Faculty of Science at the University of Zurich.

Main research activities

Research Projects SARLab
Research in the SARLab has traditionally placed firm emphasis on the development of SAR image generation and analysis methods. The principal goal of these activities is to produce high-quality images and value-added products.

The focus of RSL’s ultra-wide-band SAR project was on bistatic processing with linear and non-linear transmitter flight tracks and a fixed receiving antenna installed on a mountain top. The application potential of bistatic data was investigated, e.g. the improvement in the signal-to-clutter ratio of hidden objects in forested areas. Furthermore, simulations were conducted to evaluate the capabilities of mono- and bistatic configurations to track moving objects. This required the further development of the existing SAR simulator, enabling the generation of SAR data based on a selectable bistatic geometry for the transmitter, receiver and scatterers, as well as the ability to process stepped-frequency monostatic data.

The existing modular SAR Processor (MSP) included the Range-Doppler, Omega-K and Extended Chirp Scaling focusing methods; these were supplemented by a new method, SPECAN. This algorithm was optimized for SAR data acquired by small airborne systems, such as those typically mounted on-board Unmanned Aerial Vehicles (UAVs). Investigations were carried out to guarantee the geometric and radiometric fidelity of these MSP products. For the first time, three-dimensional polarimetric SAR images of a forested area at both L- and P-band were obtained, and the locations of their major back-scattering contributions compared. The novel tomographic imaging approach that was adopted combines the Time-Domain Back-Projection technique and advanced multi-look beamforming methods such as the Capon and MUSIC beamformer.

In the field of airborne SAR interferometry, a new data acquisition campaign was carried out with the MEMPHIS SAR system, which is built and operated by the German Fraunhofer Institute for High
Frequency Physics and Radar Techniques. The main emphasis was placed on the improved quality of flight track data, sensor geometry and time synchronization. The availability of all this information of unprecedented quality allowed the implementation of motion compensation algorithms for this millimeter-wave radar system. First results show high image focusing quality and precise geolocation. These developments will allow the generation of precise digital height models based on multi-baseline data sets.

The SAR polarimetry studies were extended in two major directions. First, the polarimetric data simulation algorithms were improved to include more complex trees, as well as forest stands. The simulations are now comparable with real data and field measurements. First results show good agreement between simulated and estimated real polarimetric parameters. A second field of research was the estimation of forest structural parameters based on real field and SAR data using empirical models.

We also evaluated the inter-product radiometric consistency for ENVISAT ASAR high-resolution modes for the European Space Agency (ESA). Prototype SAR simulation and terrain-correction software was delivered, together with technical documents and manuals. Over three hundred ASAR wide-swath images of Switzerland from 2002 to 2009 were corrected for both geometric and radiometric terrain distortions. The resulting well-calibrated time-series showed a strong spring snowmelt signal. TerraSAR-X high-resolution and stripmap products were used to show that glacier movements can be detected under certain conditions. The high absolute geometric accuracy of TerraSAR-X was demonstrated, and improvements were made in atmospheric modeling. Current models and methods for the correction of atmospheric effects on SAR signals were refined. New methods for the extraction of ionospheric electron content and polarization (Faraday) rotation were proposed and simulations performed. Possible validation techniques for the proposed methods were described.

In LiDAR remote sensing, our research activities were split mainly between two international collaborations (with the University of Edinburgh in Scotland and INRA Avignon in France), stimulating both applied and basic research. A practical case study demonstrated that it is possible to map understory vegetation in fire-prone ecosystems using LiDAR intensity and height information. Furthermore, a modeling study was published that laid the foundation for active multi-spectral sensing of vegetation canopies, which simultaneously provides 3-D information on canopy physiology and structure. For the fifth consecutive year, specialized LiDAR modules were taught within the remote sensing curriculum at both undergraduate and postgraduate levels.

This work was jointly performed by the SARLab staff members: A. Barmettler, O. Frey, M. Frioud, D. Henke, M. Jehle, C. Magnard, E. Meier, F. Morsdorf, A. Schubert, D. Small and L. Zuberbühler. SARLab staff members performed 18 journal peer reviews and two research proposal reviews.

**Research Projects SpectroLab**

In 2009, the airborne imaging spectrometer (APEX) was subjected to intense experimentation designed to assess the instrument’s performance. The first APEX airborne campaign, which lasted 3 weeks, was held in June 2009 and covered Swiss and Belgian target areas. Pre- and post-flight measurement campaigns were organized for characterization and calibration purposes. Instrument data evaluation and finalization of the processing schemes are ongoing. The APEX-project is financed via PRODEX (Pro-
gramme de développement d’expériences scientifiques) and the Earth Observation Programme of the European Space Agency (ESA).

Within the FP7 project EUFAR (European Facilities for Airborne Research, 33 partners), RSL was part of the Joint Research Activity 2 (JRA2). JRA2 focuses on uncertainties and quality indicators for airborne spectrometer data. RSL contributed with (i) a generic introduction to sensor and data calibration and (ii) an APEX instrument-specific calibration description and associated uncertainty estimation of radiometric calibration using a Monte Carlo approach.

In 2007, RSL joined HYPER-I-NET (Hyperspectral Imaging Network) along with 15 other European partners. The network, funded by the FP6 Marie Curie Action for Research Training Networks, aims to bring together experts in imaging spectroscopy and forge scientific collaboration. In 2009, a large number of early-stage researchers (ESR) from network partners in Finland, the Netherlands and Italy visited RSL as part of the network’s Transfer of Knowledge (TOK) activities.

As part of an SNSF project on imaging spectroscopy, a first version of the ‘APEX vegetation processor’ was developed in 2009. This specific software is based on physical algorithms and allows the estimation of vegetation parameters (e.g. chlorophyll, water and dry mater content, or Leaf Area Index) from imaging spectroscopy data. The processor is designed as part of the APEX Processing and Archiving Facility (PAF). The second SNSF research topic on the development of operational remote sensing applications for the retrieval of inland water constituents was successfully finalized by demonstrating how MERIS satellite data can provide products for water quality monitoring of perialpine lakes carried out by local authorities in Switzerland and neighboring countries. This line of research was continued in the joint Belgian-Swiss MICAS (VITO and RSL) project designed to investigate the potential of APEX for the same purpose and was based on a field experiment carried out in June 2009.

The RSL field and laboratory goniometer system has proven to be a well-characterized and stable device for measurements of spectro-directional reflectance behavior of remote sensing targets. It permits the proper correction of directional effects in Earth observation data for improved derivation of Earth System Sciences products from remotely sensed data sets.

RSL’s SPECCHIO spectral database system was further developed in 2009. SPECCHIO is now recognized to be one of the most advanced spectral databases in the remote sensing community. The system is open to the public via the online database on http://www.specchio.ch.

RSL recognizes the important role of radiative transfer modeling in cutting-edge remote sensing research. Continuing in this vein, a Simple Model for Atmospheric Radiative Transfer (SMART) was developed in the context of ongoing aerosol-retrieval activities within the SpectroLab. SMART is very fast and easy to use, and is therefore an ideal alternative to available accurate models such as MODTRAN or 6S.

In 2009 RSL joined the FP6 EC project ECOCHANGE (Biodiversity and Ecosystem Changes in Europe, http://www.ecochange-project.eu/). It will assess whether it is possible to identify plant functional groups using quantitative indicators derived from local-scale airborne imaging spectroscopy data. At European level, the focus is on the improvement of MODIS satellite LAI/FPAR time series, which should support dynamic global vegetation modeling activities and increase fidelity of vegetation modelling scenarios.
The HYPER-SWISS-NET project, jointly funded by the Swiss University Conference and ETH-board, entered its second year and focused on the consolidation of the scientific design, the preparation of a conceptual outline for a teaching course, and the development of a database for algorithm development. During an extensive field campaign in June 2009, imaging data was acquired using the APEX instrument at four different test sites. Field investigations were carried out in parallel with partners from Humboldt Universität in Berlin.

As a follow-up of the ESA-funded CEFLES2 project, possibilities for the estimation and interpretation of the sun-induced chlorophyll fluorescence signal from optical measurements were investigated, together with partners from the Research Centre Jülich. Investigations are currently trying to link fluorescence signals to plant photosynthesis and related processes.

Since July 2009, RSL’s field and laboratory equipment and infrastructure is maintained and coordinated by a new lab technician. The position involves providing technical support in ongoing research projects and education.

SpectroLab staff were involved in 29 peer-reviewed journal papers and 31 conference proceedings published in 2009. Staff members performed 15 journal peer reviews, one industrial and two research proposal reviews and contributed to two book chapters. This work was jointly performed by SpectroLab staff members (E. Alberti, Y. Bühler, A. Damm, F. Dell’Endice, A. Hüni, P. D’Odorico, K. Itten, M. Kneubühler, B. Kötz, Z. Malenovsky, D. Markulin, D. Odermatt, M. Schaepman, D. Schläpfer, F. Seidel, B. Suhr, J. Weyermann).

National Point of Contact (NPOC)
The scientific NPOC at RSL was mainly involved in consulting activities, but also conducted research and development as part of its contract with the Swiss State Secretariat for Education and Research. The year 2009 was one of transition: T. Kellenberger and Y. Bühler left RSL in March and September respectively, with F. Seidel becoming the interim lead of the NPOC at RSL in the spring, and D. Treichler joining us in November.

The scientific NPOC again successfully procured a project of great importance for Switzerland. Swiss user needs concerning the upcoming initial operational phase of the large-scale European Commission and the ESA project ‘Global Monitoring for Environment and Security’ were evaluated under the authority of the Swiss Interdepartmental Coordination Committee for Space Issues (GMES-IKAR). The result of this work will potentially have a great impact on political decisions that would facilitate long-term access to remote sensing data and products for Switzerland. These activities were performed by NPOC staff members Y. Bühler, T. Kellenberger, F. Seidel and D. Treichler.

Michael Schaepman and collaborators
1.8 Geographic Information Visualization Analysis (GIVA)

Photo: Arzu Çöltekin, 2009

GIVA scholars at work.
1.8 Geographic Information Visualization Analysis (GIVA)

Overview

Despite the economical downturn, 2009 has been yet another year of growth and consolidation for the still young GIVA group. This year we have been kept equally busy writing significant research papers, securing external funding, pushing the research fronts forward along the funded project lines, and delivering talks and lectures locally, nationally and internationally. One notable change from previous years and an increasing burden is the considerable increase in peer review duties for all the group members, which resulted in about one review request (paper, proposal, tenure and promotion, etc.) per week on average over the past academic year. The group’s unique eye-tracking equipment has prompted researchers from within and outside the geographical community from around the globe to visit the team in order to learn more about this data-gathering method and to jump-start collaborations on respective empirical research threads with visuo-spatial displays. Along those topical lines, S. Fabrikant continued to co-organize sessions at the world’s largest gathering of geographers, the Association of American Geographers’ (AAG) annual meeting, which brought together over 7’000 people in Las Vegas this year. Her four respective sessions on cognitive issues in geographic information visualization featured 15 papers and averaged about 70 attendees per session. Together with Prof. Amy Lobben (University of Oregon) S. Fabrikant co-edited a special issue of ‘Cartographica’ featuring cognitive geo-visualization papers from the previous AAG meeting in Boston in 2008. Arzu Çöltekin was invited as a speaker and panelist to a special session on visual attention and efficient image coding at the IEEE Picture Coding Symposium 2009 in Chicago. Kenan Bektas of the GeoF group presented his first conference paper (co-authored with Arzu Çöltekin) at the True3D conference in Dresden and was later invited to submit it to Springer’s Lecture Notes in Geoinformation and Cartography.

T. Reichenbacher contributed work on the role of location in geographic relevance to an interdisciplinary workshop on Location and the Web associated with CHI 2009 in Boston. The GeoRel group also delivered a paper to the International Symposium on LBS & TeleCartography in Nottingham, where Paul Crease presented an overview of the GeoRel project.

F. Ostermann successfully defended his PhD thesis (advisor: Sabine Timpf) and took up postdoc positions with GIVA (GeoRap project) and GIS (Tripod project) in the Department. Anna-Katharina Lautenschütz spent one month with Prof. Mary Hegarty (PhD committee member) at the University of California Santa Barbara (UCSB) Psychology Department, developing human-subject testing procedures for her dissertation research. Anna-Katharina Lautenschütz also delivered a colloquium on her PhD project to the interdisciplinary spatial cognition research group at UCSB. J. Wilkening and Anna-Katharina Lautenschütz presented their dissertation projects at the international doctoral colloquium of the 9th International Conference of Spatial Information Theory (COSIT) 2009 in Aber Wrac’h, France.

Four of our Master’s graduates also played in the ‘Champions League of GIScience’ and had papers accepted for publication in first-rate peer-reviewed international journals or conference proceedings, as well as delivering talks at respected international venues. Cedric Gabathuler (advisor: S. Fabrikant) secured his own funding to spend several months at San Diego State University to work with his co-advisor Prof. André Skupin on his Master’s thesis, developing an online self-organizing mapping sys-
tem for Swiss census data. Cedric presented his Master’s thesis work at the AAG 2009 in Las Vegas and discussed with Dr. Waldo Tobler, Prof. em. from the University of California Santa Barbara and honorary professor of the University of Zurich the ramifications of the notion that ‘everything is related to everything else, but closer things are more related than distant things’... Cedric’s first co-authored paper with computer scientist Marc Kramis (University Konstanz) appeared in a special issue of the ISI-rated Cartography and Geographic Information Science (CaGIS) journal. Simone Garlandini (advisor: S. Fabrikant) presented the results of his Master’s thesis at the COSIT 2009 main conference and the corresponding paper appeared in Springer’s internationally peer-reviewed Lecture Notes in Computer Science (co-author: S. Fabrikant). Benedikt Heil (advisor: Tumasch Reichenbacher) presented his MSc thesis at the German-speaking Geographers’ meeting in Vienna. GIVA MSc students were also well represented at the International Cartographic Conference (ICC 2009) organized by the International Association of Cartography (ICA) in Santiago de Chile. Benedikt Heil (paper co-authored with T. Reichenbacher) and Silvio Zanola (paper co-authored with S. Fabrikant and Arzu Çöltekin) presented their Master's/Diploma theses research to a packed auditorium. We are equally happy to report that all our MSc graduates found fulfilling jobs in their field after graduation and we look forward to an equally successful new cohort!

**Main research activities**

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.

Scientific activities are centered on three research threads involving spatio-temporal analytics (i.e. geographic relevance modeling, moving object depictions and evaluations, 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 human-subject experiments). More detailed information on the various GIVA research projects can be found on respective web pages hosted by the UZH (see URLs listed below).

**PopEye 2: Visual Analytics of Spatio-Temporal Gaze Point Patterns in Eye Movements (SNSF)**

This is a 2-year continuation by PI S. Fabrikant of an initial 2-year SNSF-funded research program lead by PIs S. Fabrikant (GIVA) and R. Weibel (GIS) that 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. PhD student Anna-Katharina Lautenschütz focuses on the design of cognitively adequate visual analytics displays representing spatio-temporal data at fine-grained resolutions (e.g. GPS tracks) through empirical evaluation.
Animeye: How does animation work? Eye-movement analyses of dynamic geovisualization (US NSF/UZH)

This project initially funded by the U.S. NSF aims to develop cognitively inspired interactive and dynamic visuo-spatial displays for improved spatial inference and decision-making. Eye movement data collection has been completed this year at the University of California Santa Barbara and this line of research will now continue at the UZH only.

The effect of time pressure on map-based decision-making

How do people make decisions with maps in situations where time is of the essence (i.e. search and rescue)? In this new research project, PhD student Jan Wilkening (advisor: S. Fabrikant) empirically explores the effect of temporal constraints on the efficiency and effectiveness of spatial decision-making with visual displays. He tackles this under-researched area through a series of user experiments on digital maps with varying levels of interactivity and degrees of realism. The goal of this research is to identify design guidelines based on empirical data that might improve the effectiveness and efficiency of human decision-making with maps in time-pressure situations.

GeoRel: Geographic relevance in mobile applications (SNSF)

The project team under the lead of PI T. Reichenbacher investigates the role of geographic relevance in mobile applications taking a two-pronged approach. The first line of research (PhD student: Sefano 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: Paul Crease) is a new 3-year SNSF-funded project that aims to develop methods to represent and handle geographic relevance in mobile applications.

GeoF: Development and Implementation of Geofoveation (SNSF)

In this SNSF-funded project (PI Arzu Çöltekin), PhD student Kenan Bektas investigates the usefulness of biologically inspired level-of-detail methods (e.g. foveation) for geovisualization. This novel line of research is coined ‘geofoveation’. It includes the development and implementation of a geofoveation test bed with the aim of increasing the efficiency and effectiveness of geovisualization displays.

Relational urban studies – A triangulation of computational semantic analysis, social network analysis, and spatialization methods

This new line of research at the intersection of economical geography and geographic information visualization and analysis is funded partly by the Canton of Zurich and the UZH MNF. PhD student Marco Salvini investigates the potential of massively ‘crowd-sourced databases’ (e.g. Wikipedia) for the systematic analysis of urban systems, and in particular the space of flows within these systems. He is carrying out his project jointly with Prof. Céline Rozenblatt at the Geography Department of the Université de Lausanne (advisor: S. Fabrikant). Using his novel interdisciplinary methodological framework, Marco Salvini proposes the integration of theoretically sound quantitative methods from social science (i.e. social network analysis, computational linguistics) with computational approaches in GIScience and computer science (i.e. spatial analysis, geovisualization, and graph drawing). His framework is put through rigorous testing in a case study to uncover the latent structure of the Swiss city system and its embedment within the international urban system.
Swiss German Dialect Rap: For Tolerance and Respect

This interdisciplinary research project, under the auspices of the Stiftung Erziehung zur Toleranz (SET), together with the Pädagogische Hochschule Zürich (PHZH), is funded by the Lottery Fund of the Canton of Zurich. The aim of this endeavor is to scientifically evaluate an ongoing ‘Swiss German Dialect Rap’ competition being carried out at Swiss German public schools to teach and foster tolerance and respect amongst youth. The GIVA portion of this project lead by PI S. Fabrikant and postdoctoral researcher Frank Ostermann is to (i) analyze the content of generated rap songs with respect to their potential spatial context dependence (e.g. based on the socio-demographic school profiles and their neighborhood), and (ii) to visualize the research results for the general public using modern geographic information technology.

*Sara Fabrikant and collaborators*
1.9 Geographic Information Systems (GIS)

Participants of the Geomorphometry 2009 international conference.

Photo: Ross Purves, 2009
1.9 Geographic Information Systems (GIS)

Overview

2009 has been a year of achievements and renewal as former staff have moved on to new pastures and have been replaced by newcomers to our Unit. Dirk Burghardt took up his new position as an Associate Professor of Cartography at the Technical University of Dresden in March. His successor as lecturer in our Unit, Patrick Laube, started in June. Patrick returns to our Unit after earning his PhD degree here in 2005 and spending four years as a postdoctoral fellow at the University of Auckland (NZ) and the University of Melbourne (AUS). His overarching research interest is the processing of spatio-temporal information to get a better understanding of the dynamics of movement in natural and built environments. This has led him to develop techniques for movement pattern analysis in tracking data and in geosensor networks. Patrick leads the Environmental Geoinformatics group within the GIS Unit.

Another major staff change this year was the departure of Stephan Imfeld at the end of June. Stephan had worked at GIUZ for almost 15 years as a systems administrator, PhD student, postdoctoral fellow, and finally part-time researcher on the GIS-SNP project. He was the key driving force in initiating and successfully implementing the ‘GIS Sihlwald’ project, was instrumental in the GIS-SNP project, and also maintained the Oracle installation for the Department. For many years, he led a ‘double life’ between GIScience and medicine, the discipline in which he gained his second doctorate. He has now decided to move fully into medicine. Felix Hebeler, who had been a PhD student at the UZH and later a postdoc on his own project SuMo funded by the Forschungskredit of UZH, left us after five years to take up a job in industry. Finally, the third staff change saw our administrative assistant Elisabeth Cottier, after seven years of service, move to the Ethnographic Museum of the University of Zurich. She is replaced by Annica Scheiwiller, who joins us from the financial services sector. We are very grateful to our departing staff members Dirk Burghardt, Elisabeth Cottier, Felix Hebeler and Stephan Imfeld for their many important contributions, and we welcome Annica Scheiwiller and Patrick Laube to our team and wish them much success in their work.

The Unit’s work was presented in over 30 publications, half of which were journal articles. In the reporting year, Martin Tomko was awarded a UZH Forschungskredit grant which will fund his project ‘Exploring the Functional Structure of Urban Environments’ in 2010. Somayeh Dodge received an award from the Science Faculty’s Short Mentoring Stay Abroad program. This award partially funded a month-long research visit to Goce Trajcevski’s group at Northwestern University in Evanston (IL, USA).

Ross Purves and Ralph Straumann, together with Stefan Gruber from 3G, organized a very successful conference, ‘Geomorphometry’, which took place on the Irchel campus in August. Over 60 academics from all over the world were in attendance to discuss how information about landforms can be extracted and exploited from terrain models. The conference proceedings took the form of extended abstracts with full review, and a special issue of the open access journal ‘Hydrology and Earth Systems Science’ is planned for 2010. Martin Tomko co-organized a workshop on ‘Adaptation in Spatial Communication’ that was held in June in conjunction with the AGILE 2009 conference. A special issue of the Journal of Visual Languages and Computing is currently in production.
Patrick Laube and Ross Purves were invited to a week-long intensive workshop on computational geometry, where they worked on current problems with a diverse group of researchers in Vught, the Netherlands. Ross Purves and Robert Weibel were invited to a workshop organized by the Freiburg Institute of Advanced Studies in Germany on ‘Language, Space, and Geography’, where they worked intensively with linguists for three days on the possibilities of applying geographical techniques to linguistic research.

In a highly competitive process with an acceptance rate of 5%, a new COST Action ‘MOVE: Knowledge Discovery from Moving Objects’ had funding approved by the European COST (Cooperation in Science and Technology) program. COST funds large-scale, pan-European research networks. MOVE is chaired by Robert Weibel, started in October 2009 and will run for four years.

Together with the GI VA Unit, our Unit has been awarded the organization of the ‘GI Science 2010’, the leading research conference in our field. ‘GI Science 2010’ will take place on 14-17 September 2010 and will be a major focus of the activities of the two units over the coming year.

Main research activities

The research focus of the Geographic Information Systems Unit (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 generalization of spatial data and the development of innovative techniques within mobile information services. The second group, Digital Terrain Modeling, specializes in researching 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 domains of GIS for environmental monitoring, behavioral ecology, and protected areas. Within this group, research into the spatio-temporal analysis of moving objects (e.g. wild animals) forms an increasingly important focus. A total of ten research projects were undertaken by these three research groups in the reporting year, of which three received European Commission funding, one was funded through the SNSF, one through the University’s Research Fund, one through industry and two projects were funded by charitable foundations, as well as two internally funded PhD projects. One external PhD student is also working with the GIS Unit.

Digital Cartography and Mobile Systems Group

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. The two PhD students on the project, Pia Bereuter and Ramya Venkateswaran, completed their first year in 2009. Together, they developed a methodological framework for future generation mobile mapping scenarios and implemented a demonstrator prototype to ‘visualize’ the ideas of their project. The conceptual framework was presented at several workshops and conferences. In the reporting year, the students also presented and defended the research plans for their two PhD projects.
Project ORUS (COST/SER, Ordnance Survey)

ORUS aims to extract complex urban concepts from spatial databases and funds the PhD research of Patrick Lüscher. In the reporting year, an article was published on the use of ontologies and Bayesian inference in classifying residential house types in a spatial vector database. The approach was extended to further high-level semantic concepts, such as ‘residential area’ or ‘city centre’. A complete methodology was developed to formalize such semantic concepts and translate them into algorithms for extracting these concepts in real spatial data. This final stage of this PhD project, as well as its evaluation, is funded by the British national mapping agency Ordnance Survey.

COST Project MOVE

The main objective of this COST action (with the official acronym IC0903) is to establish a pan-European network of ICT researchers and application domain specialists to discuss broad theoretical underpinnings, facilitate development and showcase methods for knowledge discovery from massive amounts of moving object data. The kickoff meeting was held in October 2009, and the Action will last four years until October 2013. Currently, the main focus is on getting the Action off the ground, and on planning the activities for 2010, which will feature working group meetings, workshops, researcher exchange visits, and a summer school.

Digital Terrain Modelling Group

EU Project TRIPOD

2009 was the final year of the EU TRIPOD project. TRIPOD’s aim is to annotate and search images on the basis of their locations. In 2009, a complete system was implemented, integrating components from 10 partners to automatically generated keywords and captions for images. Research highlights included presentations at a number of conferences and professional events, including CEPIC, Europe’s largest meeting for professional photographers.

Extraction of semantics from elevation models

Ralph Straumann’s PhD project exploring the extraction of semantics from elevation models continued with a focus on the application of ontologically based methods. Ralph’s work was applied to an important geomorphological problem - sediment storage in the Alps - and Ralph and his co-supervisor Oliver Korup published a paper on this topic in 'Geology'.

SuMo - Investigation of Subscale Modelling Approaches

The Forschungskredit project SuMo by Felix Hebeler, a case study in mass balance modeling of ice sheets, was completed in early 2009 with the production of a final report and a number of related publications.

Environmental Geoinformatics Group

EU Project FIRE PARADOX

This project on ‘combating fire with fire’ was concluded in February 2009. Besides the public final reports, a final international conference was held on 23-26 February 2009 in Freiburg, Germany. Research at GIUZ was conducted in collaboration with RSL.
**GIS Swiss National Park (GIS-SNP)**

This project is part of a long-term collaboration between the Swiss National Park (SNP), the National Park’s research committee and the GIS Unit. It focuses on the implementation and support of spatial analysis in nature conservation institutions and research. In 2009 this collaboration resulted in two completed Master theses that were co-supervised by the two partner organizations. The GiStory project, which was initiated in 2008 and aimed to detect and monitor long-term landscape change in the SNP area over the past 100 years, made good progress in 2009 with the integration of historical image data sources, field surveying and photogrammetry.

**GIS Wildnispark Zürich**

GIS Wildnispark Zürich (formerly GIS Sihlwald) is a joint project between the GIS Unit and Wildnispark Zürich (Sihlwald), which became a park of national significance in 2009. Since 2008 GIS is an inherent part of the research, management and visitor information services in the park. The planning of in-field visitor information and a research project on visitor monitoring were two important tasks in 2009. Furthermore, GIS Wildnispark Zürich supported research and teaching activities within the department. Two Master theses on the monitoring of natural events in protected areas were supervised and the Wildnispark database was enhanced by processing and interpreting existing data (e.g. on habitat mapping) and by integrating new data.

**Analysis of Moving Objects**

Somayeh Dodge’s PhD project aims to develop methods for the spatio-temporal analysis of movement patterns in trajectory data generated by moving objects. In 2009, an algorithm was published for automatic segmentation and classification of trajectories into homogenous and similar parts. Furthermore, S. Dodge developed and refined a framework for assessing the similarity of trajectories, which was presented at ACM SIGSPATIAL and will form the focus of her final year of PhD research.

**External PhD Student**

Ruedi Haller is working in the Swiss National Park on the effects of uncertainties in the analysis of spatial data in wildlife studies. The work is based on a rich set of seven case studies and is nearing completion.

*Robert Weibel and collaborators*
Preparation for measurements of pesticide concentration on the clothes of a farmer in La Hoya, Columbia.
1.10 Social and Industrial Ecology (SIE)

Overview
The Social and Industrial Ecology Unit studies the question of transition towards sustainable development. Its focus is on analyzing 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 for analyzing human-environmental systems, modeling their interdependencies and assessing potential regulation strategies from a sustainability perspective.

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 Unit 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 carry out research in Switzerland and in various developing countries, mostly in Latin America.

The main change and challenge for the research unit is that Claudia R. Binder obtained a full professorship for Systems Science at the University of Graz. The SIE Unit will be dissolved by the end of March 2010 and two members, Dr. Glenda Garcia Santos and Giuseppe Feola, will stay at the Department until July and October 2010 respectively.

The main highlight of last year was that Prof. Dr. Elinor Ostrom, our research partner in the ALPS project, was awarded the Nobel Prize. Further highlights were:

- Regina Schöll finished her PhD thesis and the defense will take place in 2010;
- The development of a methodology and computer program to estimate the Sustainability Solution Space of regions, value added chains or economic sectors;
- The creation of a database as an interface between behavioral and spatially explicit risk assessment models.

Main research activities

SNSF Project (RHER)
The main goal of the project financed by the SNSF (project leader: C. R. Binder) is to contribute to interdisciplinary research in the area of sustainable rural development. The project is developing a simulation model consisting of a behavioral and a spatially explicit risk assessment component for deriving and assessing 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. In a first stage, farmers’ and experts’ mental models regarding the perception of risks to farmers’ livelihood were developed and compared. The SMMA was developed further last year to analyze people’s mental models of the future development of the region (Future SMMA). Finally, a Future Scenario Workshop was organized, in which the perspectives of farmers and experts were brought together and a consistent and consensual
future state of the region was developed (Dissertation: Regina Schöll). Two publications have been accepted and both have been submitted.

An integrated sociological-psychological model was developed (behavioral part of the simulation model) based on the results from the mental model approach. The model includes explanatory variables such as climate, soil quality, health, etc. which form a link to the environmental system model. The data from the survey performed in 2007 has given rise to two statistical models quantifying the factors affecting farmers’ behavior with respect to the use of protective equipment and the efficiency of pesticide use. The main factors positively affecting farmers’ decisions 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; age and organization of labor. One publication has already been accepted and two more have been submitted. The last publication will be a simulation model on the use/ non-use of protective equipment (PhD: Giuseppe Feola).

Second, we are adapting and further developing current risk assessment models to include occupational exposure and spatial distribution. One major challenge is to make the model applicable within usual risk boundary conditions of less developed countries such as low amount of resources and low data availability. To calibrate and validate the model, a field campaign was carried out in cooperation with ETHZ to measure (i) pesticide distribution into the different compartments (soil, water, air, plant) and on farmers; (ii) drift; and (iii) meteorological conditions and runoff in a selected sub-catchment. Pesticide distribution and drift were studied under different meteorological conditions using the weighting method and the Uranine tracer method. A fog collector was constructed in cooperation with Phys G3 to estimate the impact on humans due to inhalation. Furthermore meshes were positioned at 20 m intervals. Two meteorological stations were installed to measure weather conditions, and water outflow from the sub-catchment was measured every 15 minutes for 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, usually applied in a geological context, is a low-cost approach yielding high-quality results (postdocs: Dr. Glenda García Santos and Dr. Jing Yang).

Third, we programmed the interface between the behavioral and the risk assessment model for obtaining an interdisciplinary simulation model.

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

**Demand and supply of the mineral fraction of construction materials: A modeling 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 Buildings Office of the City of Zurich, and industry is to develop a decision support tool and recommendations for sustainable construction material management (project leaders: C. R. Binder and Hans-Jörg Althaus). Demand and supply of recycled mineral construction material (RMCM) should be matched in such a way as to produce the lowest possible environmental impact and the
greatest contribution to sustainable development. In a first stage, the demand will be simulated with agent-based modeling as a function of material quality, time, and place. In a second step, the supply of recycled mineral construction material will be modeled with dynamic material flow analysis over the period from now until 2100.

A survey was carried out in the canton of Geneva (an urban canton) and Vaud (a rural canton) in 2009 in order to expand and compare the 2008 survey (Zurich and Berne) to French-speaking Switzerland. The overall sample included the relevant stakeholder groups for civil and structural engineering processes, i.e. private (49), commercial (41) and public awarding authorities (85), architects (48), engineers (109) and contractors (72). The results show that stakeholders’ decisions are mainly influenced by the interactions among the stakeholder groups. The engineers’ decisions, determined by laws, norms and their experience, are the starting point of this interaction chain. The civil engineering sector demonstrated a broad acceptance of RMCM with 37% of decisions in favor of RMCM. In structural engineering, only public awarding authorities preferred RMCM to a higher amount (30%), whereas commercial and private awarding authorities mainly preferred conventional materials (90%). Furthermore, the awarding authorities’ decisions for sustainable construction in general have only a marginal influence on the later, more specific decisions about materials.

The project is realized in collaboration with the technology and society laboratory at the EMPA materials science and technology group (co-leader: Hans Jörg Althaus), FEDRO and FOEN (Dr. Robin Cartier).

**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: Claudia R. Binder, PI: Dominic Wittmer, Laura de Baan) is to analyze Switzerland’s phosphorous system in the year 2006, to put forward 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; and (iii) risk assessment and development of a monitoring tool. The 1st module (December 2007-March 2008) deals with the set-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.

The 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 quantified in 2009. Furthermore, a monitoring tool was developed which makes it possible to quantify various scenarios and test the impact of different technology developments. This tool is the basis for a new emerging joint project with Prof. Dr. Shinichiro Nakamura, University of Waseda, Tokyo.

**Analyzing and modeling transitions in socio-ecological system: The case of common grazed pastures in Swiss Alps**

This research project is funded by the SNSF. The aim of the project is to model the transition of communally owned alpine pastures as a social-ecological system. Based on two case studies - Grindelwald and Törlbel - we analyze and model the changes in pasture usage and its impacts on the cultural landscape. Special attention will be given to the role of local governance system and its capability to bal-
ance the system. The resulting SES model, will serve to assess scenarios together with stakeholders. In a transdisciplinary process, we will develop strategies for coping with future developments (e.g. agricultural liberalization). The project is expected to uncover the crucial factors for the sustainability of alpine pastoral systems, especially with regard to structural change.

The project leader is C. R. Binder and PhD student Ivo Baur started work in October. The 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 & K. Liechti); and the Institute of Environmental Decisions, ETHZ (B. Lehman).

*Claudia Binder and collaborators*
1.11 sotomo

Overview

The sotomo research unit is an independent corporation, which is associated with 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 behavior). sotomo lost one of its mainstays with the unexpected death of Heiri Leuthold in April 2009.

Main research activities

Challenges of future labor force immigration

A research project about the future of labor force immigration into the metropolitan region of Zurich was conducted throughout the whole of 2009. The project is funded by the Zürcher Kantonalbank (ZKB). It deals with forecasts for immigration and its expected impact on the economy, society and institutions. Special attention is paid to the spatial variations of these impacts. The research partners for this project are BASS from Berne and Fahrländer Partner AG Zürich.

A new definition for urban agglomerations

The goal of a research project commissioned by the Swiss Federal Statistical Office is to come up with a new definition of urban agglomerations and metropolitan areas. In this project, sotomo is collaborating with Ernst Basler + Partner AG and Fahrländer Partner AG. The project was completed in summer 2009.

Monitoring and analysis of political behavior in Switzerland

As in previous years, sotomo conducted numerous pieces of work analyzing the performance of political parties and federal MPs. Most of these studies are published in the major Swiss newspapers.

Social Area Analysis

Together with Fahrländer Partner AG, sotomo has further developed their ‘Nachfragersegmente NASE’ analysis tool. It was used for Social Area Analysis in neighborhoods in the canton of Zurich that suffer from aircraft noise and also for a comparative study of 28 Swiss cities.

Michael Hermann
1.12 Joint research projects

This section refers to collaborative projects that stretch across boundaries between individual units to highlight intra-departmental collaboration. Some ongoing joint research projects are:

- A new joint research project of 3G, RSL and H2K was launched to monitor glacial dynamics with LIDAR (M. Zemp, P. Jörg, F. Morsdorf, J. Seibert). Funding is provided by Axpo Climate Network.

- The SNSF ‘PopEye’ project, the EU ‘Tripod’ project and the EU ‘VisMaster’ coordinated action is being jointly worked on by GIS (R. Weibel, R. Purves) and GIVA (S. Fabrikant, A. Çöltekin, T. Reichenbacher).

- The Economic Geography (E. Bühler, PL and H. Kaspar) and GIVA (S. Fabrikant, S. Timpf, F. Ostermann) Units continued their collaboration on the NFP 54 project on ‘Sustainable design, management and appropriation of urban public parks’.

- The SNSF ProDoc project on ‘Negotiating Rural Development in South Asia’ is continuing and jointly conducted by Human Geography and Political Geography (U. Müller-Böker (PL), M. Junginger, B. Klem).

- Furthermore, these same two Units were successful with their joint SNSF project submission on “Living with violence in Nepal” (B. Korf -PL, U. Müller-Böker).

- Stefanie Gubler’s PhD thesis about the improved exploitation of distributed datasets and distributed models concerning the mountains cryosphere is being jointly supervised by 3G (S. Gruber) and GIS (R. Purves).

- Luzia Fischer’s PhD project on ’Slope stability in perennially frozen and glacierized rock walls’ was jointly supervised by 3G (C. Huggel) and GIS (R. Purves) and brought to a successful conclusion.

- The EU FIRE PARADOX research project (completed in February 2009) was run jointly by GIS and RSL.

It is common practise 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:

- Norina Andres’ MSc thesis: GIS in collaboration with 3G.

- Jonas Snozzi’s MSc thesis: GIS in collaboration with GIVA.

- Corinne Corradi’s MSc thesis ‘Access to health care among nomadic pastoralist in Chad – using the livelihoods approach’: jointly supervised by Human Geography and Political Geography.
2 Promotion of young researchers

The opportunities for PhDs and postdocs to develop their skills, capacities and knowledge are comprehensive and became further enhanced by an expansion in the range of training, mentoring and scientific exchange available.

64 PhD students are currently enrolled at the Department, 24 postdocs are third-party funded. The infrastructure is outstanding as is the Department’s embedding in highly specialized inter- and transdisciplinary projects and programs nationally and internationally. Young researchers are involved in teaching activities at different levels. One SNSF professor, Prof. Dr. Claudia Binder, was hosted at the Department. In October 2009 she was appointed full professor at the Karl Franzen Universität in Graz (Austria) and now chairs the Institute of Systems Sciences, Innovation and Sustainability Research (ISIS). This is a fantastic step in her career!

2.1 Zurich Graduate School in Geography and other PhD programs

2009 was the Zurich Graduate School in Geography’s first year. A comprehensive website was launched to provide information for potential and current PhD students (www.geo.uzh.ch/en/graduate-school), and an Advisory Board was set up with responsibility for discussing the courses and other services offered by the Graduate School. The Advisory Board includes direct representatives of PhD students (Mar-
tina Locher, Somayeh Dodge, Maximilian Schneider) and representatives of the Units of the Department (S. Fabrikant, M. Schmidt, B. Korf). Ross Purves is the Scientific Coordinator and U. Müller-Böker the School’s Director. A range of complementary skills courses were organized through the Graduate School to complement Promotionsseminar 1 and 2, the research-oriented courses and workshops. These included presentation and writing courses as well as a statistics course based on R open-source software. Finally, an afternoon workshop on supervision was held for all those involved in PhD supervision. The workshop, moderated by an external expert, discussed the results of an analysis of problems and successes in supervision from the perspectives of both PhD students and supervisors.

At the same time, the NCCR North-South Network launched the International Graduate School North-South (IGS North-South), which is linked to the Zurich Graduate School. Two three-day graduate seminars on critical reading and debating were held at the Department in February and March 2009 by Tania Murray Li and Anthony Bebbington, as well as one-day reading seminar retreat on social theory with an invited resource person.

In 2009, SOWAS (a peer-mentoring group of PhD students from the Human, Economic and Political Geography focusing on qualitative methods in the social sciences and on career development) organized various workshops on data analysis (e.g. peer analysis of interview transcripts), scientific writing (e.g. writing a monograph) and career building (e.g. academic and non-academic career planning; visiting fellowships). In June and November 2009 two retreats were devoted to academic writing. Most of these activities were organized by peers for peers, while non-peers have been invited to selected events. The peer-mentoring group – with financial support from the Faculty of Science - is as a successful instrument for the promotion of young academics and one way to contribute to gender equality in research.

Three PhD students benefited from the short-term mentoring program offered by the Faculty of Science and visited research institutes in US, Canada and Denmark. In addition, S. Landolt is a member of the Gender Graduierten Kolleg ‘Gender: Scripts and Prescripts’ in Berne/Fribourg.

### 2.2 Advancement of women

The ‘pyramid’ and ‘glass-ceiling’ structures in the Department’s ratio of male to female enrolment and employment are still very much in evidence. 42.4% of first semester enrolments was by women. Over the course of studies, the proportion of women drops to 32.8% of PhD candidates. Since the departure of SNFS professor Claudia Binder in October 2009, only two of the nine professors are female.

In some research fields, e.g. Hydrology or Remote Sensing, male researchers are often in the majority and obtaining a balanced composition is therefore a challenge. However, we are trying to achieve as good a gender balance as possible by actively encouraging female researchers and PhD students to apply for new positions.

The Department commits itself to creating a family-friendly environment and to take issues of equal partnership and family into account. Two appointment procedures considered the prospect of a dual career and attractive posts were created for the partners of the new professors with support from the Faculty of Science. At the same time we support mentoring programs that actively promote gender balance in PhD-level research, and members of the Department are actively involved in advocating the
advancement of women. The SOWAS peer-mentoring group is one such instrument. S. Fabrikant is on the advisory committee of the ‘FrauschafftWissen’ mentoring project, supported by the ‘UniFrauenstelle’ of the UZH under the auspices of the ‘Bundesprogramm Chancengleichheit zur Förderung von Nachwuchswissenschaftlerinnen’, and A. Çöltekin is a member of the IEEE Women in Engineering (WIE) group.

During consultation on the ‘Konzept universitäre Laufbahnen an der Universität Zürich’ (version August 20, 2009), PhD students and Postdocs (Mittelbau) expressed concern that the planned new scheme might have negative effects on gender equality (greater difficulties reconciling family and academic career due to the more rigorous time constraints planned). They suggested several changes. Furthermore, they asked for the effects of the new career scheme on gender equality after its implementation to be monitored.
3 Departmental teaching activities

3.1 Overview of admissions

The large number of students (there were 637 students majoring in Geography in the Autumn Semester 2009) proves that the University of Zurich is an attractive place to study Geography. The number of first semester students (majoring in Geography) was slightly lower than the previous year (2008: 123 students; 2009: 117 students). More than a third (37%) of all MNF final year students graduated with a degree in Geography.

In 2009, 22 Diploma, 68 Master’s, 93 Bachelor’s and 6 PhD students graduated from the Department. The Master’s students specialized as follows: 2 in General Geography (1 2B, 1 HGG), 13 in Geographic Information Science (8 GIS, 5 GIVA), 27 in Human and Economic Geography (14 HGG, 10 WGG, 3 PGG), 19 in Physical Geography (9 3G, 10 2B), and 7 in Remote Sensing (7 RSL).

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### Number of students supervised by Unit (number of degrees awarded by the Faculty in 2009)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Diploma</th>
<th>Master’s</th>
<th>PhDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G</td>
<td>5</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>2B</td>
<td>3</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>HGG</td>
<td>4</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>PGG</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>EGG</td>
<td>3</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>RSL</td>
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<td>2</td>
</tr>
<tr>
<td>GIVA</td>
<td>0</td>
<td>5</td>
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</tr>
<tr>
<td>GIS</td>
<td>2</td>
<td>8</td>
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<tr>
<td>SIE</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>68</td>
<td>6</td>
</tr>
</tbody>
</table>

### 3.2 Innovative teaching concepts

Several groups refined and extended their e-learning tools. In GEO225, the GIS Unit continued to offer its successful blended learning offering using the award-winning GITTA e-learning materials. GITTA materials are also partially used by some of the GIS Unit’s other courses. sotomo received a mandate to update and assist the e-learning project ‘Political processes in Switzerland’, which is part of the curriculum at the four main institutes of political sciences at Swiss universities in Geneva, Lausanne, Berne and Zurich. The GLOPP e-learning course was chosen as a test project for the University of Zurich pilot phase with eLERU. GLOPP is being evaluated as part of the newly established e-learning platform of the League of European Research Universities (LERU) to see if it can be integrated into the curriculum at the University of Geneva’s Department of Geography. During the Autumn Semester 2009, GIUZ students were given the opportunity to follow an e-learning course from Geneva for the second time.

The Human Geography Unit’s ‘active classroom’ project is funded as part of the University of Zurich’s ‘Initiative Interactive Learning’ (IIL) to develop new forms of interaction between students and lecturers. Implementation is planned for 2010. The new H2K Unit developed new courses in Hydrology, with theory implementation during field days, and demonstrations and experiments during the lectures actively engaging the students. Master’s courses are increasingly being taught in English throughout the Department.

The GIVA Unit taught the Integrative Project (S. Fahrländer and M. Salvini) with the topic ‘Wertbestimmende Standortfaktoren der Immobilien’. The following Integrative Project, which is conducted by 3B (A. Heim), started in the Autumn Semester with the objective of collecting and analyzing data about greenhouse gas emissions by our Department.

H. Escher took a group of highly motivated students on an overseas trip to Japan. The field trip focused on the economy (e.g. Tokyo), industry (e.g. automobile industry) and culture (traditional in comparison to modern). In addition, the Department offered various one and two-day excursions to allow students to link theory to practice. The range of offerings was enlarged by new field trips, i.e. on
migration and labor market integration in Zurich, or on participant research methods and alpine pastoralism in the lower Surselva. At the same time, innovative methods were successfully used to stimulate students’ interest during field trips, i.e. taking photos of agglomeration problems as the students perceived them (Zurich) or conducting and videoing an outdoor panel discussion on sustainable regional development held by students representing different interest groups (Andermatt).

3.3 Quality management in teaching
Quality in teaching is assessed by evaluating most classroom and field courses by means of questionnaires, OLAT online questionnaires and SWOT analysis. These give students the opportunity to voice and discuss their concerns and make suggestions for improvements to our teaching. The Department agreed to act as a pilot institution and test the University’s evaluation scheme, and the steering committee evaluated a good number of courses during the Spring Semester. We have used these course evaluations to refine and consolidate new teaching programs constantly over the reporting year. The teaching staff make continuous efforts to improve the quality management in teaching. For example, staff participated in the Novice 2 and 3 courses that are part of the Novice module on collaborative learning methods and lecturing by the Centre for University Teaching and Learning. The freshers started the newly organized curriculum in the Autumn Semester. The Bachelor’s curriculum was revised in order to integrate the Department’s new units. Another objective has been to harmonize the size of the compulsory modules and to reduce the number of exams.

3.4 Study matters
We were very glad that André Odermatt took charge of the Economy Geography Unit after the retirement of Prof. Hans Elsasser. He and his team, as well as U. Müller-Böker as faculty member, guaranteed that all lectures, seminars and exams went according to plan, and they will also bridge the vacancy until the new Professor Christian Berndt joins the Department in March 2010.

The Master’s exams are now successfully established and were held for the second year. The schedule for presentations and defenses is managed by Paolo Psarellis. About 32 students are still studying according to the old Diploma system.

A new rule was set up for the still large number of pre-Bologna students from the Faculty of Philosophy. Students minoring in Geography have to complete their course by the time they take their Major exam at the Faculty of Philosophy.

Measures were taken with a view to compliance with the rules for admission to the BSc thesis module. It had already been decided that students would have to pass the compulsory modules of the Bachelor curriculum. Therefore, students registering for the BSc thesis module have now to register in OLAT as well as in the ‘Modulbuchungstool’ to allow the necessary checks to be made. There was also a discussion about the preconditions for Master’s courses. This is also relevant for students arriving at UZH from foreign universities. So far students were allowed to follow Master’s courses in GIS and GIVA without any specific previous qualifications.

A subgroup of the committee was concerned with the harmonization of the organization of exams. The members decided on guidelines such as controlling student ID at the entrance and personalizing the exam paper(s) with individual labels as well as on various templates.
In SS09, the Office of the Vice President for Arts and Social Sciences conducted a first test run to assess lectures and seminars at the GIUZ. The goal is to implement this assessment scheme throughout the University on a periodical basis. A standardized format for the different types of courses was filled in electronically by the students and statistically analyzed by the Vice Presidents’ Office as well as feedback from the relevant GIUZ lecturers.

Starting in AS09, ETH students following modules at the University have been required to register through a ‘request form’ and book their modules at UZH and vise versa so that examination results can be handled better.

Planning in case there was a pandemic was another subject tackled under study matters and included GIUZ employees, especially the support units. Michael Ziege described how lectures should be recorded if many students were unable to attend or if the lecturer was sick. The primary goal was to ensure that both teaching and examinations could run their normal course. Last but not least, one change that affects the whole of Irchel is that the UZH central office now centrally manages lecture halls. In AS2010, the timetable will be adapted to the sharply defined two-hour slot scheme that the UZH has now implemented.

**Student advisory team**

In addition to the regular and varied advisory services available to students (person to person, via e-mail and phone), the team worked on many applications (2009: 54, 2008: 51) and on 20 enrolment requests for Master’s courses (2008: 11). Nine of these are from foreign universities (seven from Germany alone). The ‘Kanzlei’ grants new students provisional admission until we have verified their records to check that they have completed the compulsory modules and how similar these are to our own modules. Several information events were also organized for lecturers and students. Alongside its daily business, the team also participated in the committee of study affairs (Ausschuss Lehre). The information on the website concerning academic studies has been updated.

Marco Salvini, a longstanding member of staff, left the team at the end of January (fortunately he still works at the GIUZ as a PhD student at GIVA). He was replaced by Nicola Kugelmeier. Daniela Vordermann left the team at the end of November and Amalia Schneider at the end of December, both having completed their MSc degree. Andri Moll took over their tasks. He started at the beginning of November and things are going extremely well. From now on the team will accomplish their tasks on a combined 70% rather than on a fulltime basis. We are very grateful to our departing staff members Marco Salvini, Amalia Schneider and Daniela Vordermann and we welcome Nicola Kugelmeier and Andri Moll and wish them best of luck and success.

The student advisory team organized the following events in 2009:

- Information for new Master’s students (‘Informationsveranstaltung Master’), 09.03.2009;
- Information for high school graduates (‘Studieninformationstage’), 02-03.09.2009;
- Information for freshers (‘Erstsemestrige’), 11.09.2009;

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**Yvonne Scheidegger Jung and the student advisory team**
3.5 Geography Teacher Training

Geography teacher students from the PHZH on the Morteratsch glacier hike in front of the Piz Bernina, October 2009.

Photo: Max Maisch, 2009
3.5 Geography Teacher Training

After Prof. Dr. Kurt Graf’s retirement (he had served for more than 40 years at the Department of Geography and as Head of Teacher Training) our group was transformed into a new structure. Max Maisch is now Head of Unit and responsible for all teaching aspects in the field of Physical Geography, whereas André Odermatt is in charge of all matters relating to Human Geography. These two main research fields in Geography are to be well balanced and equally integrated within our programs for Geography teacher students coming from the Pedagogical High School of Zurich (PHZH).

M. Maisch’s scientific focus is on Alpine Geomorphology and Glacier History, and he therefore works closely with the 3G Physical Geography research group. Ursina Gloor started her PhD-project on ‘Late Glacial and Holocene Landscape Evolution in Central Switzerland’ (project by M. Maisch, M. Egli, S. Yvy-Ochs and F. Renner). A. Odermatt’s projects are dedicated to urban and regional development, housing and public spaces. He is involved in various seminars and lectures in the research field of Economic Geography, i.e. on ‘The Geography of Switzerland’, an optional module chosen by most PHZH students. He has also been interim head of the Economic Geography Unit since February 2009 and will remain so until the position is newly assigned in March 2010.

The Units new acronym, GTT (Geography Teacher Training), underlines the whole spectrum of educational objectives of classroom teaching at both Secondary level I (Volksschule) and Secondary level II (Mittelschule). Within the PHZH, the GTT group is expected to offer a prescribed set of mandatory lectures, practical exercises (to be taught in parallel groups) and excursions that all have to be offered in a modular and ECTS-compatible way. A series of written examinations has to be organized every semester. Tobias Hagman (Africa) and Ueli Brunner (Arabian Peninsula) both gave special regional geography lectures accompanied by a complementary course by Monika Reuschenbach and Stefan Baumann (PHZH) with a distinct didactical perspective.

In 2009 about 60 students (20 Bachelor’s and 40 Master’s / diploma students) from the PHZH took part in lectures and practical exercises we thought relevant for classroom geography. Field trips took us to different places, ranging from the city of Zurich and sites in the Emmental, the Rigi and the Reusstal up to high alpine environments such as the Göscheneralp and the Upper Engadine.

As part of the Advanced Studies in Secondary and Higher Education course (MAS SHE), A. Odermatt was responsible for large parts of the new teaching program, which focuses on the interplay between scientific and didactic aspects of Geography. The autumn module, with its cycle of lectures on current research questions and debates, took place for the third time. It was accompanied by a seminar. All of them received increasingly positive feedback. One important ongoing project in 2009 was HSGYM (Arbeitsgruppe Hochschule-Gymnasium). A. Odermatt is a member of the Geography working group. Several hundred high school teachers and lecturers from the University of Zurich, the ETH Zurich and two universities of applied sciences analyzed the interface between high schools and the universities, and formulated recommendations for 19 subjects. The final report was published in spring 2009 (cf. http://www.educ.ethz.ch/hsgym) and got a lot of media coverage. The process of implementing the recommendations in the different subject started in 2009 and will take until 2012. The working groups play a crucial role in a process like this that takes place at the interface of universities and high schools.
The GTT team consists of M. Maisch and A. Odermatt, who both work fulltime, and two new halftime assistants, Florian Boller (since June 2009) and Ursina Gloor (since October 2009) with a special focus on Economic Geography and Physical Geography respectively. The part-time secretaries Andrea Arnold-Küng (20%) and Madeleine Fitze (30%, occasionally 50%) form the administrative part of the GTT team. Each semester six teaching assistants support us. In 2009 there were (in alphabetical order): Fabienne Bauer, Nora Egli, Martin Glaus, Nadine Landert, Lars Mellert, Martin Rotta, Kaspar Wetter and Seraina Winkler.

We offer our heartfelt thanks to Kurt Graf for his long-lasting efforts as former head of the Teacher Training group. We would like to express our thanks to the PHZH and the Department of Geography for providing us with the necessary resources to establish and equip the new GTT group.

External Collaborations

In 2009 Max Maisch designed a new poster series on ‘Glaciers of the World – Glaciers of Switzerland’ together with experts from the Pedagogical High School in Berne (PH Bern, Institut für Bildungsmedien IBM). He is also working on a new textbook entitled ‘Glacier School’ for Secondary Level II. In June M. Maisch organized a field trip to the Bernina region as part of continuous education for high school teachers (Gymnasiallehrer) on behalf of the IGB (Institut für Gymnasial- und Berufspädagogik). He was also asked to collaborate on special museum exhibitions and multifaceted nature trails (Luzern, Rhonegletscher, Saas Fee, Maloja) as a glaciology expert. Max Maisch is president of the GEGZ (Geogr. Ethnographische Gesellschaft Zürich) and member of the Scientific Advisory Committee of the UNESCO World Heritage Swiss Tectonic Arena Sardona. In summer 2009, A. Odermatt was selected to be a member of the Swiss UNESCO commission, where he sits on the ‘Education for Sustainability’ working group. A. Odermatt also acted as an expert for reviewing and validating the new geography curricula at the Kantonsschule Zug.

Max Maisch & André Odermatt and collaborators
4  Academic services and functions

4.1  Academic services

In 2009, the World Glacier Monitoring Service (WGMS) was able to secure long-term funding for the service at the GIUZ. Having decided that Switzerland should participate in the UNFCCC-related Global Climate Observing System (GCOS), the Swiss Federal Council granted long-term funding through GCOS Switzerland to run the lead and coordination office for the World Glacier Monitoring Service. A corresponding contract was signed between GCOS Switzerland and the Geography Department/Faculty of Sciences of the University of Zurich. The International Association of Cryospheric Sciences (IACS) within the International Union of Geodesy and Geophysics gladly accepted this Swiss offer and asked the institute to start looking for a replacement for Wilfried Haeberli, the current director of WGMS, in due time (2010).

Furthermore, the Department provides various academic services to third parties, e.g. the NPOC for Swisstopo and the office of the PERMOS network, which documents the status and long-term variations of permafrost in the Swiss Alps based on temperature and kinematics data as well as a dating laboratory. Academics from the Department are members of editorial boards, research associates, and members of expert groups and commissions. More detail can be found below alongside the relevant Unit.

Glaciology, Geomorphodynamics and Geochronology

W. Haeberli is director of the World Glacier Monitoring Service, a member of Terrestrial Panel for Climate within the Global Climate Observing System and of the IPCC expert group on detection and attribution, and president of the ‘Beratendes Organ für Umweltforschung’ (BAFU). M. Egli is secretary of Swiss Soil Science Society, and C. Huggel is a member of IPCC expert group on extreme events. The Geochronology laboratory (\(^{14}\text{C},^{10}\text{Be}\)) services analyzed quite a large number of samples was done using the AMS technique. Around 80% of these samples were dated for external customers. The Liquid Scintillation Counter is now operational.


Soil Science and Biogeography

S. Abiven is manager of the young section of the French Soil Science Society (A.F.E.S.) and a board member of ‘Cafés scientifiques Université de Neuchatel’, which aims to make science more accessible.
C. Burga is vice-president of the ASG and of the ‘R. Tüxen Gesellschaft für Vegetationskunde’ in Hannover, as well as being a GIUZ delegate at the ASG and AG Geotope Switzerland and a board member of Mountain Research & Development and Gredleriana (Natural History Museum Bozen). M. Schmidt is member of the steering committee of an ESF-funded research-networking program MOLTER on isotopic and organic chemistry exploration of terrestrial ecosystems and soils. The Unit performed reviews for the following journals: Biogeochemistry, European Journal of Forest Research, Journal of Forest Research, Organic Geochemistry, Soil Biology and Biochemistry, Soil Science Society of America Journal, Biology and Fertility of Soils, Etudes et Gestion des Sols, Geoderma, Agriculture, Ecosystems and Environment, Catena, and Global Biogeochemical Cycles. Furthermore, academics from the Unit are members of various editorial boards and expert groups.

**Hydrology and Climate**

J. Seibert reviewed papers submitted to major hydrological journals such as Journal of Hydrology, Hydrological Processes, Water Resources Research, Ecological Modelling, Computers & Geosciences, International Journal of Geographical Information Science, and Hydrology and Earth System Science. He also reviewed research proposals for NERC, SIDA and FORMAS. He is an editorial board member for Hydrology and Earth Science Systems, and Geography Compass as well as associate editor for Water Resources Research. He acted as an external reviewer for two PhD projects.

**Human Geography**

U. Müller-Böker is on the UZH’s Steering Committee North-South and on the BoD of NCCR North-South, a member of ‘Fachkommission’ Gender Studies at UZH and of the directing board of URPP Asia and Europe. N. Backhaus is a member of the research commission of the Swiss National Park. U. Geiser represents the GIUZ in the KFPE and is a research fellow at the Sustainable Development Policy Institute (Pakistan).

Members of the unit refereed articles for International Migration & World Development, Anthology on sustainable development, Mountain Research & Development, Nature & Culture, and Geographica Helvetica. U. Müller-Böker was engaged in appointment and tenure-track procedures in Germany and Switzerland, and examined research proposals for SNSF and the Volkswagenstiftung. N. Backhaus did likewise for the Swiss State Secretariat for Education and Research and for the German Project Management Agency on Environment, Culture, Sustainability.

**Political Geography**

The Unit organized an international conference on ‘Space, Contestation and the Political’ in collaboration with the ETH and the University of Glasgow. M. Starmanns acted as an advisor to the NGO ‘Erklärung von Bern’, as well as working with an international organization on social standards in global sourcing and a fashion company on social and ecological standards in the fashion industry.

Economic Geography
H. Elsasser remains president of the Senior Citizens’ University after his retirement. He reviewed projects for the Sandoz Foundation, ‘Österreichisches Bundesministerium für Wissenschaft und Forschung’, ‘Deutsche Gesellschaft für Asienkunde’, and A. Odermatt did the same for a COST project. E. Bühler is a member of the university network aiming to establish an interdisciplinary collaboration in research and teaching in Islamic Studies and Gender Studies, as well as being on the steering committee of the IGU Commission on Gender and Geography and acting as an expert for gender-mainstreaming planning processes of a new public park by the Zurich municipality. H. Kaspar is a member of the steering committee for a touring exhibition on the use of urban public spaces initiated by the Equal Opportunities Commission of the city of Zurich. K. Schwiter participated in a public roundtable discussion on successful work-life balance for men and took part in the project day on work-life balance - future role models as an expert. B. Abegg acted as an expert on a Delphi method survey for the EU ‘ClimAlpTour’ project. K. Schwiter is MP in the canton of Schwyz and A. Odermatt MP in the city of Zurich. Members of the Unit refereed articles for the J. of Climatic Change, J. of Sustainable Tourism, and Tourism Review.

Remote Sensing Laboratories
RSL staff members gave ETHZ lectures on global land degradation monitoring (M. Schaepman), imaging spectroscopy (M. Kneubühler), as well as several on SAR, LIDAR and spaceborne reconnaissance (E. Meier). A presentation on the Airborne Prism Experiment (APEX) was given to visiting members of Delft University of Technology (NL) (E. Alberti).

M. Schaepman is chair of the ISPRS Working Group VII/I and a member of the ISPRS Science Advisory Council, the scientific council of ITC (NL), and the PE&RC (NL) and Life Science Zurich graduate schools. He is president elect of the Swiss Commission for Remote Sensing, chairman of the User Support Space Research program of the Dutch Organization for Scientific Research, and serves on several conference committees (ESA, IEEE, EARSel, SPIE and ISPRS). M. Kneubühler is secretary of SCRS/SKS and ISPRS Working Group VII/I. He is the Swiss ESA-DOSTAG delegate. E. Meier is a member of the ESA Category-1 Advisory Group, the TerraSAR-X Science Committee and of the scientific committee of the EUSAR conference. Along with F. Morsdorf, he is a board member of the Swiss Society of Photogrammetry, Image Analysis and Remote Sensing. D. Small is a member of the scientific committee for ESA’s FRINGE ’09 conference. F. Seidel is a member of the Swiss Interdepartmental Working Group on Remote Sensing and the GMES working group of the Swiss Interdepartmental Coordination Committee for Space Issues.


Reviews for research funding agencies: European Space Agency (ESA), EUFAR N2TAC, National Environment Research Council NERC, Australian Government, Department of the Environment, Water, Heritage and Arts, Netherlands Organization for Scientific Research NOW, National Science Foundation NSF, USA, University of Natural Resources and Applied Life Sciences Vienna, ETH Zürich, Wageningen University, American Society for Photogrammetry and Remote Sensing, University of Trier, University of Helsinki, European Commission, Forschungszentrum Jülich and Tehran University.

**Geographic Information Visualization and Analysis**


Reviews for research funding agencies: Austrian Science Fund, U.S. National Science Foundation, 'Österreichische Geographische Gesellschaft'.

**Geographic Information Systems**

The Unit manages the University’s educational site license for GIS software products of ESRI and Intergraph. It funded specialist training in Oracle database management and administration for selected staff from the Department’s IT group, thereby investing in sustainable database support for teaching and research in the Department. Data collected during the GIS Swiss National Park and GIS Wildnispark Zürich projects was made available for research projects conducted by a variety of institutions including ETH, WSL, HSR and HSW. Data collected by GIS Wildnispark Zürich was made available for use in planning and management work by ‘Grün Stadt Zürich’.

R. Weibel is a member of the editorial board of the Int. Journal of Geographical Information Science, Geoinformatica, and Journal of Spatial Information Science. He is a member of the Swiss National Park Research Committee, the Scientific Advisory Board of the Landscape Forum of Switzerland and the Commission on Map Generalization and Multiple Representation of the Int. Cartographic Association. He served on the program committees for AGILE 2009 and COSIT 2009.
R. Purves served as chair of the Symposium on Geomorphometry and as co-chair of LOCWEB 2009 (at CHI 2009). He was on the program committees for the AGILE 2009 conference and the International Snow Science Workshop 2009.


Full-paper reviews were carried for a variety of conferences: AGILE 2009, AGILE Workshop on Adaptation in Spatial Communication, ACM MEDES, COSIT 2009, Geomorphometry 2009, Computational Geoinformatics (ICCSA 2009), Workshop on Location and Web (LOCWEB ’09), 3rd Workshop on Behaviour Monitoring and Interpretation (BMI’09), ISPRS Workshop on Quality, Scale and Analysis Aspects of City Models, and COSIT Workshop on Presenting Spatial Information: Granularity, Relevance, and Integration.

Reviews for research funding agencies: Academy of Finland, Australian Research Council (ARC), Fonds Wetenschappelijk Onderzoek (FWO) Flanders, the Netherlands Organisation for Scientific Research (NWO) and the Israel Science Foundation.

R. Weibel serves on the school board of the ‘Literargymnasium Rämibühl’ and is a member of the GIS working group of the Swiss Association of Geography Teachers. R. Purves is chair of the Snow and Avalanche Foundation of Scotland and secretary of the Inter-university Partnership on Earth Observation and Geoinformatics (IPEG).

Social and Industrial Ecology
C. Binder is an editorial board member of the J. of Industrial Ecology, Secretary of International Society of Industrial Ecology, a member of KFPE and on the Board of Advisors for the Institute of Social Ecology (Austria), co-organizer of the International Conference on Industrial Ecology, a reviewer for grant applications of the ‘Jeune Chercheur’ and ‘Echange Universitaire’, and the ‘Jubiläumsfonds’ (Austrian Nationalbank). Reviews were carried out for: Environmental Management, Ecological Economics, Environment & Development Economics, Waste Management, J. of Cleaner Production, Risk Analysis, and Progress in Industrial Ecology.

4.2 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: Commission of International Relations (U. Müller-Böker), Supervisory Committee Main Library (G. Seitz), Senior Citizens’ University (H. Elsasser), Association of Private Lecturers (N. Backhaus).
Faculty (MNF): Faculty Assembly, representative of the scientific staff of GIUZ in MNF (S. Gruber), Extended Faculty Board (U. Müller-Böker), Faculty Board (U. Müller-Böker), chair Fachbereich IV (U. Müller-Böker); Studies Commission (W. Haeberli & Y. Scheidegger Jung), Research Commission (S. Fabrikant), Commission for Career Development (M. Schmidt), Commission for Public Relations (M.
4.3 Public events and advanced training

The GIUZ contributed to ‘basecamp09’ from 1st – 10th May and ‘Nacht der Forschung’ on 25th September. The former was an exhibition at the Turbinenplatz in Zurich where people could go on a 3D stereoscopic journey of various places around Switzerland with GoogleEarth, observe a soil profile including living worms and paint with colors produced from different soils, or watch a commented film about migration in Kyrgyzstan. School classes were also guided around the exhibition. The second event located near Bellevue was a great success and attracted many visitors. GIUZ contributed the subject of melting glaciers or sensor techniques within permafrost, among other things.

Members of the Department were frequently questioned by the media (newspapers, radio and TV). Two television reports one on Swiss TV’s ‘Einstein’ programme about GIUZ research activities ‘Umweltüberwachung aus der Luft (A. Züblin, September 17, 2009)’ and one on ZDF’s ‘Abenteuer Wissen’ programme about permafrost measurements in the Jungfrau region (S. Gruber, August 26, 2009). Bart Klem gave interviews about the political situation in Sri Lanka to Dutch Business News Radio on 18 and 20 May 2009. He was also interviewed about the same issues by Dutch radio stations NOS on 19 May and by VPRO on 20 May. Articles by A. Hierstein (Landvermessung von weit oben), T. Hagmann (Schweizer Engagement für “Alatanta” ist heuchlerisch) were published in the Neue Zürcher Zeitung am Sonntag, one article by T. Hagmann (La Suisse se bat contre les pirates après avoir abandonné la Somalie) in Le Temps. Various stories were covered by ‘UZH News’, e.g. S. Haller-Brem: Die Erde neu vermessen; S. Landolt: Jugendliche und Alkohol ‘Manchmal tragen sie mich heim’.

Members of the Department offered or contributed to the following basic and advanced training courses:


– International Geochronology Summer School in Anzonico (Upper Leventina, Ticino) in collaboration with ETHZ and WSL in September 2009. Students from Russia, the Netherlands, India, Italy, Switzerland, the United Kingdom, Germany, Poland and Romania took part and made the event a great success. A repeat of this Summer School is planned for 2010: M. Egli, D. Brandova, S. Ivy-Ochs, K. F. Kaiser, H. Gärtner and P. Cherubini.

– FP6-Hyper-I-Net (RTN) summer school in Pavia, Italy, 08-11.11.2009: ‘Data Processing: From hyperspectral images to information.’ RSL was involved with the following tutorial contributions. A. Hueni: Hands-on session on 6S, MODO, and SPECCHIO; F. Dell’Endice: Tutorial on Calibration of imaging spectrometers; D. Schläpfer: Tutorial on Imaging Spectroscopy Data Preprocessing: From Data Calibration to Atmospheric Correction.

– Supervision of six PhD students of Human Geography’s partner institutions in Nepal, India, Pakistan and Mexico as part of NCCR North-South: U. Müller-Böker, U. Geiser and S. Thieme.
5 The Departmental support unit

5.1 Finance, administration and general infrastructure

In 2009, operating expenses were CHF 16’076 million, of which CHF 5’944 million (37 %) were third-party funded. This represents an increase of CHF 1’103’000 in operating expenses and CHF 527’000 in third-party funding compared to 2008. As a result of the Department’s growth and the successful third-party fundraising the increase absorbed the general budget cutback in 2009 of 1,5% of the global budget.

Over and above operating expenses, 71’000 CHF were spent on larger investments (e.g. IT, laboratory and research equipment) and 292’000 CHF on equipment (equipment funds).

<table>
<thead>
<tr>
<th>Expenses GIUZ in 1’000s of CHF</th>
<th>Year 2008</th>
<th>Year 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Without university overheads)</td>
<td>Total</td>
<td>Of which third-party funding</td>
</tr>
<tr>
<td>Tangibles (material &amp; small investments)</td>
<td>1’751</td>
<td>882</td>
</tr>
<tr>
<td>Personnel costs (without professors &amp; social overhead)</td>
<td>9’727</td>
<td>3’861</td>
</tr>
<tr>
<td><strong>Sum operating result 2 (Betriebsergebnis 2)</strong></td>
<td>11’478</td>
<td>4’743</td>
</tr>
<tr>
<td>Personnel costs (professors &amp; social contributions)</td>
<td>3’495</td>
<td>674</td>
</tr>
<tr>
<td><strong>Sum operating result 3 (Betriebsergebnis 3)</strong></td>
<td>14’973</td>
<td>5’417</td>
</tr>
<tr>
<td>Investment funds (Investitionskredit IK, over kCHF 10)</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Equipment funds (Einrichtungskredit EK)</td>
<td>86</td>
<td></td>
</tr>
</tbody>
</table>

Office space

Due to the Department’s growth and the arrival of new people, several rooms were renovated and refurbished over the course of the year. At the same time the storage rooms in the basement were systematically cleared. The coffee-room (Y25L11) is glowing in new splendor. The room is equipped with an Italian coffee machine and a cosy reading corner and has become a popular meeting centre for Department staff.
Car Pool
A new transportation scheme has had to be established since the University abandoned their car pool. The Department now uses Mobility Car Sharing, which has proven suitable for many field activities. The Department acquired a second-hand van and a light truck for special needs. Both are equipped with a trailer coupling. Financial compensation to cover these additional costs has been defined and approved by the Faculty and the University. To reduce the climate impact, the following guidelines were defined for using the car pool. Whenever possible use public transport! If this is not possible, hire a mobility car! Only for declared special needs should one use the Department’s vehicle.

Departmental office
In addition to the present responsibilities of financial, staffing and organizational matters the main office took over the following tasks:

- The Department’s Key Management (in collaboration with the central services of the University);
- Administration of the new Graduate School of Geography;
- Supporting Master’s exams: Managing “Mastervereinbarungen” and taking control of the duration, point of delivery and redistribution of the Master’s theses, as well as organizing exams.

Special thanks goes to Margrit Wüst and Paolo Psarellis for their readiness to take over these additional new tasks.

Ruth Hunkeler-Wittleder

5.2 IT
The IT team was able to staff all the available positions during 2009 and thereby add the finishing touches to the composition of the new IT team, a project that started back in 2007. Gabriela Schweikert joined the team in January and is mainly dealing with the Department’s Windows infrastructure. Kaspar Schiess, who joined in July, brings software engineering skills to the team and leverages the automation efforts within the group.

A major disaster on August 10 brought down almost the entire GIUZ IT infrastructure. Our two redundant LDAP servers got corrupted due to a power outage. Additionally, an unnoticed software bug led to corrupt backups on tape. LDAP data had to be reconstructed from what remained of the binary data. Only 5 days later, a blown fuse and a burnt wall outlet in server room K47a lead to more downtime on several servers. Since then the power distribution in the server room has been completely renewed and two UPS devices have been ordered. The LDAP server software has been replaced and backups are done as text files now.

Print accounting has been established starting in June 2009 and the old network printers have been completely replaced by 6 Sharp Multifunctional Printers (MFPs). Students have a free quota per term and have the possibility to buy additional copies. While the figures are not fully comparable yet (the sampling period for the new print center solution is only 6 months now), they are promising: the
number of black & white prints fell from 53'000 to 46'000 pages per month (-13%). The number of color prints decreased, both in absolute terms - from 28'000 to 21'000 pages/month (-25%) - and in relative terms; 30% of all prints are now colored, while this figure was 35% with the previous printing solution. Around 5% of all submitted pages (3'500 pages/month) are not collected within 12 hours and are therefore automatically deleted from the print queue. The students’ account for 20% of the b/w and 5% of the color prints. All together, direct printing costs could be reduced by 10% compared to the old printing solution while the level of service was significantly improved. Although we still fight with stability problems on the software side, the maintenance work has markedly decreased with the new printing solution. Furthermore, power consumption decreased drastically with the new printers (less devices and up-to-date energy management) from 13.7kW per day to 2.1kW/24h (-84%).

Above and beyond troubleshooting and keeping the everyday IT infrastructure up and running, the main tasks during the year were as follows:

- The e-mail infrastructure has been made more reliable (redundant SMTP frontend servers) and faster (new IMAP server with local disk space). The coupling of mail and home directories has been removed.
- Introduction of a Secure Global Desktop solution, permitting remote access to all classes of servers (Windows, Solaris) without the need for any additional software (VPN and Remote Desktop). All that’s required is a Java enabled web browser.
- Extension of the virtualization infrastructure. New hardware nodes were added and two VMWare ESXi servers now provide virtual Windows Guest Operating Systems. The IT team currently runs 40 servers directly on hardware, and 60 virtualized servers.
- Enhancement of the backup solution for Mac OS X clients (better reporting).
- Increase of the automation degree (Windows Deployment server allows easy setup of Windows hosts and a new configuration management systems allows automated UNIX server setup and maintenance).
- Consolidation of storage environment, decommissioning of the old raid systems underway.
- A new Windows Terminal server cluster for staff leads to a better separation of research/admin and student course workloads.
- Replacement of NIS+ with LDAP as a directory server proceeded. The Linux LDAP integration was completed and new LDAP servers have been set up.
- The replacement of Mac G3 and G4 hardware with Intel-based Macs further proceeded and will be completed next year.
- It is possible to borrow PC and Mac notebooks now.

Patrick Marchi and Thomas Werschlein

5.3 Corporate communication
Two people from each ‘Fachbereich’ sit on the MNF communications committee. Y. Scheidegger Jung and Prof. M. Schaepman represent the GIUZ on this committee. The committee comes up with PR ideas
and shares information about events within the various institutes. A subgroup developed the concept of
the information event for scholars (MaturandenInformationsTage: MIT2010), which will take place in
March 2010.

The website (http://www.geo.uzh.ch) was maintained continuously. The Units, the advisory board
and the library keep the information for students, researchers and external visitors up-to-date and im-
proved the entry point for people looking for information.

The GIUZ newsletter was published on a two-monthly base to provide information about current
management affairs, approved projects, dates and deadlines of student affairs, and other departmental
news. A new section called ‘Who is who’ has been added to the Newsletter since the November edition
that allows employees to give brief updates about their work.

N. Backhaus and Y. Scheidegger Jung are in charge of communications and press releases. As
well as looking after daily business, the team worked very closely with the working group for the central
organization of module exams. Drawing on N. Backhaus’ experience, it was possible to align the propo-
sitions for centralizing. Moreover, the communications team enhanced the application form for admis-
sion to the Master’s thesis and both N. Backhaus and Y. Scheidegger Jung were back-stoppers for or-
ganizational questions about the trip to Japan. In addition, they coordinated and released the Depart-
ment’s new posters in H-floor together with Martin Steinmann.

N. Backhaus was elected to join Gary Seitz and Yvonne Scheidegger Jung in the GIUZ Ombud-
steam as a replacement for K. Itten.

Norman Backhaus and Yvonne Scheidegger Jung

5.4 Library
One consequence of the increasing digitalization and mechanization in modern libraries is the increased
need for advisory services and training. Users are instructed about the various ways in which they can
search for information. This is done both in the physical library and online.

The library website (http://www.geo.uzh.ch/en/library/) has expanded its services. It functions
more than ever as a gateway for complex information research in Geography and serves as the first
point of access. The pages are full of guides and tools for finding scientific research information. We
continued our courses in information literacy. Students were taught how to find relevant information
during a weeklong course with three hours’ teaching per day. The lecture has been integrated into the
University website that deals with ‘Überfachliche Kompetenzen’.

We continued to store all publications of the department in ZORA. ZORA (Zurich Open Repository
and Archive) provides open and worldwide access to the research and scholarly output of the University
of Zurich. Members of the Department are requested to give one copy of every publication to the li-
brary. We will include any form of document in the IDS and ZORA catalogue und archive them. This will
expand the worldwide visibility of the Department of Geography’s publications, leading to higher cita-
tion rates and hence a higher rating.

74
The integration of the complete Remote Sensing Library is nearly finished. All former LB publications are now part of the IDS library system.

This year the catalogued collection for the University of Zurich increased by 3’148 new entries. The list with the new acquisitions can be found on the website. 137’268 items are now registered in the catalogue. The library also holds about 200 current journals. A growing number of them can be accessed online. It is taking an increasing amount of time to make all these journals accessible.

1’800 users borrowed 5’000 items. This has been a slight fall in the number of users and a reduction in borrowing compared to last year, which can be explained by the growing access to electronic publications and our users’ improved knowledge about how to carry out an exact search. The online accessible documents and databases have been improved. The ‘Search Portal’ provides a quick, easy and personalized interface which can metasearch for information in a variety of information resources, such as catalogues, reference databases, digital repositories, or subject-based Web gateways.

Again the library would like to thank everybody for the books and maps they have given.

**Opening times of the library:** 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.

Borrowing maps: during opening times (only for use in the Department).

The public area is open daily from 8 am to 5 pm.

*Gary Seitz and team*

### 5.5 Graphics

The Department’s graphic designer carried out a great deal of design work in many different areas. Only a few shall be mentioned here. In the area of web design, the Gitta eLearning project was developed jointly with the GIS Unit. A website was designed for the Development Study Group (DSGZ) and it is now in the programming phase. A brand new logo was created for the 2B Unit and the RSL Unit’s existing one is being refreshed. A brochure for the research being done by the GIUZ’s SIE Unit (about pesticides in Columbia) has been developed into a final report. A vegetation map of the Upper Engadine is currently in production and huge posters have been designed as part of the RSL’s SAR-Memphis-Sensor project as presents for collaborators such as the Swiss Army, Fraunhofer Department, and pilots.

In collaboration with the Students Advisory team, the designer developed a new layout for posters representing the Department and the individual units on H floor. The design matches the website layout and colors. The design of the application forms for Master’s thesis and exams for students with a foreign language and the forms for evaluating Master’s thesis have also been harmonized. They are now in PDF format, which means they can now be processed electronically. The cover of the study guide (Wegleitung) for students starting the new BSc curriculum in the Autumn Semester 2009 was also redesigned, as was the study guide for Master’s students.

*Martin Steinmann*
6 MNF Fachbereich IV

The Geosciences IV Fachbereich 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. Division IV coordinators are therefore responsible for all three Departments.

6.1 Studies coordination centre

2009 was a year of reforms. The reforms of the BSc Geography courses that had been decided the previous year were implemented in the Autumn Semester. This entailed adding several new structures to the University’s administration system (SAP) and also meant adjusting some aspects of Geography minor as well as Earth Sciences major. The gradual introduction of the new course will make further adjustments necessary over the next two years. The Earth Sciences course has run into difficulties because of the low number of MNF students taking it as a major. We recognized that we needed to act and various future options were discussed during the year. The Earth Sciences courses that are currently on offer at Swiss universities lead us to believe that we can optimize this course and make it more attractive. For the first time ever, we actively promoted the existing course at the Student Information Day. We are confident that the combination of a higher profile and a clear and attractive future course will have a positive effect over the coming years.

Despite protests, room bookings on the Irchel campus now have to be made centrally and public rooms can no longer be booked through the campus itself. We still haven’t completely adapted to the new room planning procedures and have yet to find a way of solving problems efficiently.

The University of Zurich’s IT Service were unable to make any progress on their ‘semester planning tool’ project this year. We have introduced and tested some improvements in module bookings, and these will be implemented in the Spring Semester 2010.

Module booking was reorganized for the Autumn Semester. All students must now register for the module in the place where it is due to be taught. Another change is that the respective exam regulations of the body organizing the exam (UZH or ETH) now apply. This rule should make things easier for students and allow teachers and lecturers to provide the students with clearer information.

Philippe Meuret

6.2 eLearning coordination

Michael Ziege was appointed new e-learning coordinator at the MNF Geoscience division in August 2009. This function had previously been held by Petra Kauer-Ott, who has now taken up a challenging position at SWITCH.

The year was marked by the 10th anniversary of OLAT, the online training platform largely developed by the University of Zurich. The main celebration was held on OLAT User Day, but several ‘unconferenced’ sessions also took place, where the attendees spoke of their experiences of using the platform (currently version 6.2) and about future plans. OLAT is pleased that it is attracting an increasing number of visitors. There are currently over 40,000 registered users and over 2,200 courses available online.
Also for eLML, the e-learning content creation language for lecturers and cooperators, 2009 proved a successful year. This project, originally founded by the GIS Unit of the Department of Geography, once again won a price in the Online Education field, the Swiss Open Source Award. Michael Ziege gave two courses to University lecturers and collaborators this year on how to teach eLML. The series will continue in 2010 and will hopefully help lecturers to create and organize their eLearning content in a more efficient way.

A new e-learning strategy was also developed during the year. The draft will be presented to the Executive Board of the University by the end of the year. The new strategy will be built on the present one, which was introduced in 2003. The paper will be written by CATA, the Department of Computer-Assisted Teaching and Assessment, and discussed at regularly meetings of the University of Zurich’s eLearning coordinators.

Michael Ziege
Geoteam

The Spring Semester began with the student councils legendary skiing weekend, which was once again held in Wildhaus. There were a particularly large number of first year students and it provided a good opportunity to make new friends! Despite the cold and foggy weather, we all enjoyed our weekend off. The heavy snowfall was also a good thing as it guaranteed lots of nice downhill rides! After a very tasty spaghetti meal, we spent the evening playing cards and having fun together!

Our first task of the Spring Semester 2009 was to find and induct successors for the Geoteam members who had graduated in the summer and left the Geoteam. The aim was to have new members from different semesters and a good gender balance. We are pleased to welcome Sandro Blumer, Severin Brunhold, Ivo Heeb, Charlotte Huber, Hannah Locher, Marcel Pauli, Jan Sennekamp and Marco Walser onto the Geoteam. The first Geoteam meeting with our new members in May addressed the subject of the Dobar (Thursday Bar) and the distribution of duties and responsibilities to the new members of the Geoteam.

Sandro Blumer and Oliver Frei represent students on the teaching committee and at the INVERS meetings. We have also decided to improve the communication between the GIUZ, the Geoteam and the students by setting up a new office that will be responsible for communication. Marco Walser has agreed to take on this task. The new assignment of Severin Brunhold, an amateur photographer, is to take good pictures of Geoteam events. Ivo Heeb and Hannah Locher are assisting Silvan Christen in his tasks as treasurer and Jan Sennekamp is helping Beat Meile to organize the Dobars.

The panel discussion about possible job perspectives in Geography organized during the Spring Semester by Max Boxleitner and Oliver Frei was a great success! The panelists informed the interested students, who came in large numbers, about professional possibilities as a geographer, their different career paths and answered all kinds of questions. This event has proved very popular during the last two years and that is why we decided to include it on the list of events for next year as well.

The faculty association’s summer included various Dobars, which took place on 9 Thursdays, instead of the 5 dates that were initially planned. As this fall was especially mild, we were able to organize 4 Dobars in September and October. Many people, not only Geographers, but also a lot of new faces, seemed to appreciate this. Once again, the Dobar season was a great success! As a new task, we want to improve Geoteam’s donation policies because the Dobar will remain a non-profit event. The profits turned out to be higher and higher every Thursday and we need to look after them properly. We hereby encourage you to read the recent article in the GIUZ Newsletter of January 2010, which lists the different organizations that benefit from our donations.

In addition, the student council continued to fund the two internships at the Swiss National Park’s Infomobil. It has not yet been decided what our commitment to this programme will be in the future. Two of last year’s Bachelor’s students made the most of this offer, but in general there was relatively little demand for them.
Freshers’ day was held on the last Friday before the beginning of the Autumn Semester, where guided tours around the university campus took place as well as an aperitif with helpers from different semesters, who answered newcomers’ questions about studying Geography at the GIUZ.

This year’s hiking weekend took us to the Aletsch glacier, where we enjoyed the great view while also getting some exercise. Only a few students took part, but those who joined in had a great time! As for next year, we have come to the conclusion that an announcement about the hiking weekend needs to be put up on the notice board earlier to make sure there are more participants.

The legendary annual ‘Geofäscht’ took place in November at the Dynamo under the pseudonym “Klimax”. As usual, the third-semester students were responsible for organizing it and they certainly met everybody’s expectations! The party was greatly appreciated and a total success. Another annual highlight - especially for freshers - was Santa Claus’ visit during a lecture.

In summary, we can say that 2009 has been a very satisfactory year. The semester and the Dobars all passed too quickly and we are looking forward to next year, which will throw up its fair share of new tasks and challenges. Some of the more important ones are the student council’s donation policy, as mentioned above. We would also like to improve communication and cooperation between students and GIUZ. A first step has been taken by creating the communications office and, with Marco Walser in charge, we are confident that further improvements will be made.

Geoteam
8 Presentations

Abegg, B.: *Snowmaking is not enough*. 7th International Symposium on Tourism and Sustainability "Travel and Tourism in the Age of Climate Change: Robust Findings, Key Uncertainties", Eastbourne, UK, 08.- 10.07.2009.

Abegg, B.: *Climate change and tourism*. Gastvorlesung im Rahmen der Veranstaltung "Introduction to Global Environmental Change", Department of Geosciences, University of Fribourg, Switzerland, 18.11.2009.


Abegg, B.: *Klimaänderung und Tourismus*. Senioren-Universität, Zürich, Switzerland, 26.05.2009.


Bühler, E.: *Maternity insurance legislation in Switzerland. Regulating the intersection between paid and unpaid work*. Conference of the IGU Commission on Gender and Geography on "Post-socialism, neo-liberalism - old and new gendered societies and policies", Szeged, Hungary, 22.-24.05.2009.


Bühler, Y.: *Rapid mapping of avalanches using remote sensing data*. Invited Talk at Leica Geosystems AG, Heerbrugg, Switzerland, 15.05.2009.


Çöltekin, A.: Stereoscopic vision and visualization for three-dimensional geographic information. General Meeting of the Inter-University Partnership for Earth Observation and Geoinformatics. University of Zurich, Switzerland, 12.06.2009.

Çöltekin, A.: Space-variant image coding for stereoscopic media. Speaker and panelist in special session on visual attention and efficient image coding, picture coding symposium, Illinois, USA, 06.-08.05.2009.


Craviolini, Ch., Heye C., Odermatt, A.: Zurich's Langstrasse quarter in the context of gentrification and urban housing market processes. ENHR Conference, Prague, Czech Republic, 28.06. - 01.07.2009.


Crease P., De Sabbata S., Reichenbacher T.: The concept of geographic relevance. 6th International Symposium on LBS and TeleCartography, CGS, University of Nottingham, UK, 02.-04.09.2009.


Damm, A.: Biochemical and structural characterization of single trees using radiative transfer models. 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.

Damm, A.: Data availability and first results from canopy fluorescence day courses over corn. CEFLES2 - Final presentation meeting, Noordwijk, Netherlands, 11.-13.03.2009.

Dell Endice, F.: Sensing earth surface with the APEX Airborne imaging spectrometer. 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.


Eckmeier, E.: Charded organic matter in soils as an indicator for the change of natural to cultural landscapes. Radiocarbon and Archaeology. 5th International Symposium, Zurich, Switzerland, 27.03.2008.


Fabrikant, S. I.: Surfing the data tsunami with spatial metaphors. 7th FP’s Workshop on Visualization of Controversies "Macospol", Ecole Polytechnique Fédérale de Lausanne, Switzerland, 14.05.2009.
Fabrikant, S. I.: Designing cognitively inspired geovisualization displays. 9th TheoQuant Meeting, Dijon, France, 04.-06.03.2009.


Fabrikant, S. I.: Visuo-spatial displays: geographic information visualization and analysis. Lecture, History Department, RWTH Aachen, Germany, 01.12.09.


Favilli, F.: Reconstructing Lateglacial and early Holocene landscape history using different dating techniques - examples from eastern Switzerland and northern Italy. AMS Seminar, Ion Beam Physics Group, ETH Zurich, Switzerland, 15.04.2009.


Favilli, F.: Application of dating techniques in the Alpine environment. Suoli e humus degli ambienti alpini; seminario nazionale, Trento, Italy, 01.-03.07.2009.


Feola, G., Binder, C. R.: Not by education alone: in search for intervention strategies which can promote a more sustainable pesticide use among smallholding farmers. 8th Biennial Conference on Environmental Psychology, Zurich, Switzerland, 06.-09.08.2009.

Feola, G., Binder, C. R.: The integrative agent-centred (IAC) framework as a conceptual tool to investigate transition processes in local agricultural systems. First European Conference on Sustainability Transitions: Dynamics and Governance of Transitions to Sustainability, Amsterdam, Netherlands, 04.-06.06.2009.


Fitze, M., Maisch, M., Schmidt, R., Schoeneich, Ph.: The Great Lake Davos and the giant current ripples of Filisur, Graubünden, Switzerland. 7th Swiss Geoscience Meeting, Neuchâtel, Switzerland, 21.11.2009.


Geiser, U.: Contested visions of ‘development’: reading Talibinanisation in northwest Pakistan through notions of (multiple) resistance and the m challenge of taking a stance. Space, Contestation and the Political: A Workshop on Planning, Development and Resistance, ETH Zurich, Switzerland, 12.02.2009.


Gubler, S.: A concept for the joint interpretation of distributed measurements and numerical models of the mountain cryosphere. NCCR MICS Workshop, EPFL, Lausanne, Switzerland, 09.-10.06.2009.


Haeberli, W.: Accelerated worldwide glacier shrinkage. Colloquio de Ingenieros del Peru, Huaraz, Peru, 09.05.2009.


Haeberli, W.: Climate change impacts on high mountain regions - a perspective from the European Alps. Department of Geography and Environmental Studies, Carleton University, Ottawa, Canada, 27.03.2009.


Haeberli, W.: Accelerated worldwide glacier shrinkage and the formation of new lakes. Facultad de Ingenieria Civil, Huaraz, Peru, 10.05.2009.

84

Haeberli, W.: *Alpen ohne Eis?* Geographisches Institut, Universität Hamburg, Germany, 26.01.2009.


Haeberli, W.: *Accelerated worldwide glacier shrinkage*. Instituto Geofísico del Peru, Lima, Peru, 03.05.2009.


Haeberli, W.: *Climate change and high-mountain regions - adaptation strategies for the Alps*. Meeting of Minds: Decision Makers from Asian and Alpine Mountain Countries Sharing Policy Experiences in Regional Cooperation for Sustainable Mountain Development, inWEnt and ICIMOD, Feldafing, Germany, 01.10.2009.


Haeberli, W.: *Accelerated worldwide glacier shrinkage*. Universidad Catholica, Lima, Peru, 05.05.2009.

Haeberli, W.: *Accelerated worldwide glacier shrinkage*. Universidad Nacional Agraria La Molina, Lima, Peru, 04.05.2009.


Hilbich, C.: Operationelle geophysikalische Monitoring Netzwerke im Permafrost. AK Permafrost, Kloster B ronnbach, Germany, 05.-06.11.2009.


Hilbich, C.: Geophysical monitoring systems to assess and quantify ground ice evolution in mountain permafrost. PhD defense, University of Jena, Germany, 20.5.2009.


Hofmann, A.: Lignin dynamics in arable soils as determined by 13C natural abundance. Promotionskolloquium, University of Zurich, Switzerland, 30.10.2009.


Hueni, A.: SPECCHIO: A free spectral data management and processing system. SPIE Optics and Photonics, San Diego, California, USA, 02.-06.08.2009.


Huggel, C.: An integrated cross-sector and cross-institution approach to reduce climate change induced disaster effects in a South American context. International Congress on Climate Change, Copenhagen, Denmark, 10.-12.03.2009.


Itten, K.: The emergence of imaging spectrometry in Europe. 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.


Klaus, Ph.: New metropolitan mainstream - methods and visions. 19th INURA Conference, Istanbul, Turkey, 02.07.2009.

Klaus, Ph.: Zwischennutzungen: Areale der Kreativwirtschaft. Creative Wednesday, Zurich, Switzerland, 25.03.2009.

Klaus, Ph.: Kulturelle und ökonomische Transformationen im urbanen Kontext. Institut für Gegenwartskunst, Zurich, Switzerland, 25.06.2009.

Klaus, Ph.: Stadtentwicklung Zürich seit 1989 - Analysen und Kommentare. Seminar der HCU Hamburg, Zurich, Switzerland, 04.06.2009.

Klaus, Ph.: Zone imaginaire: eine neue Sicht auf die Zwischennutzung. Tagung KTI, IRAP, Hochschule Rapperswil, Switzerland, 03.02.2009.


Kneubühler, M.: Comparison of a hyperspectral classification method implemented in two remote sensing software packages. 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.


Landolt, S.: *Drinking practices of youths: production of space and gender.* Centre for Alcohol and Drug Research, University of Aarhus, Copenhagen, Denmark, 24.11.2009.


Laurent, V.: *Simulation of forest radiance at top-of-atmosphere level using coupled radiative transfer models.* 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.


Linsbauer, A.: *CCHydro - contribution of GIUZ, PhD project CC-GlinCH.* CCHydro project meeting, Berne, Switzerland, 09.10.2009.


Lüscher, P.: *An ontology-modelling approach to urban spatial data enrichment.* IPEG Kolloquium, Zurich, Switzerland, 12.06.2009.


Mavris, C.: Initial stages of soil and clay minerals formation - Case Study: Morteratsch proglacial area (SE Switzerland). 14th International Clay Conference, Castellaneta Mare, Italy, 14.-20.06.2009.


Meier, E.: LiDAR, synthetic aperture radar and spaceborne reconnaissance. Vorlesungsreihe Geomatik, MILAK/ETH Zurich, Switzerland, Frühjahrssemester 2009.


Noetzli, J.: 3D-Modellierung von Untergrundtemperaturen im Gebirge. AK Permafrost, Kloster Bronnbach, Germany, 05.-06.11.2009.

Noetzli, J.: Coupling the models GEOptop (2-D surface) and COMSOL (3-D subsurface) in a case study for the Swiss borehole site Schilthorn. EGU General Assembly, Vienna, Austria, 19.-24.04.2009.

Näscher, L.: *Brucellosis and mobility: the others matter*. Open Day of the NCCR North-South Regional Coordina-

Odermatt, A.: *Polarisierung der Wohnungswirtschaft in städtischen Räumen: Loft oder sozialer Wohnungsbau? -

Odermatt, A.: *Zürich - Reurbanisierung im Lichte von Wohnungsmarkt- und Segregationsprozessen*. Geogra-
phisch-Ethnographische Gesellschaft Zürich, Switzerland, 30.09.2009.

Odermatt, A.: *Democratic innovation - What can we learn from Zurich?* Workshop der Forschungsstelle C2D der
Universität Zürich in Aarau "Democratic Innovation - What we can learn from Montevideo", Zurich, Switzerland,
20.03.2009.

Odermatt, D.: *Long-term validation of MERIS algorithms for prealpine lakes*. 6th EARSeL SIG Workshop on Im-
age Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.

Odermatt, D.: *Remote sensing applications in prealpine lakes*. EAWAG, Kastanienbaum, Switzerland,

Odermatt, D.: *Standardized sea floor and water depth mapping using optical airborne and satellite data*. IEEE

Odermatt, D.: *Calibration, parameterization and application of MERIS water constituent algorithms for prealpine
lakes*. IEEE International Geoscience and Remote Sensing Symposium 2009, Cape Town, South Africa,
12.-17.07.2009.

Ostermann, F.: *Indicators for socially sustainable park use*. 14th CORP Conference on Regional Planning, Sitges,
Spain, 24.04.2009.

Ostermann, F.: *Appropriation of public park space - a GIS-based case study*. 17th GIS Research UK conference,
Durham, UK, 02.04.2009.

Ostermann, F.: *Visualization of human space appropriation in urban public parks*. GeoViz 2009, Hamburg, Ger-
many, 05.03.2009.

Ostermann, F.: *Modeling, analyzing and visualizing human space appropriation*. Promotionskolloquium, Univer-
sity of Zurich, Switzerland, 09.01.2009.

Paul, F.: *GIS-based modelling of glacier bed topography using glacier outlines and a DEM: GlabTop*. Alpine Glaci-
ology Meeting, Innsbruck, Austria, 26.-27.02.2009.

Paul, F.: *Die Folgen der Klimaveränderung*. Basecamp09, Zurich, Switzerland, 09.05.2009.

Paul, F.: *GlobGlacier: Mapping the worlds glaciers and icecaps from space*. CryoClim Meeting, Oslo, Norway,
30.11.2009.

Paul, F.: *A new glacier inventory on southern Baffin Island, Canada, from ASTER data: II. data analysis, glacier

Paul, F.: *A new glacier inventory on southern Baffin Island, Canada, from ASTER data: I. methods, challenges and

Paul, F.: *A new inventory of local glaciers for a part of West Greenland: methods, challenges and changes*. EGU

Paul, F.: *On the use of satellite data for global glacier monitoring: theory and examples*. ETH Zurich, Institute of
Cartography, Zurich, Switzerland, 24.03.2009.

Paul, F.: *Satellitenbeobachtungen von Gletschern und Eiskappen*. GCOS Rundtisch, MeteoSchweiz, Zurich, Swit-
zerland, 28.01.2009.

Paul, F.: *Impacts of climate change on high-mountain glaciers in the Alps: observations and results from modeling
studies*. High mountain glaciers and challenges caused by climate change, Tromsø, Norway, 08.-10.06.2009.

Joint Assembly, Montreal, Canada, 19.-29.07.2009.

Paul, F.: *Monitoring area changes of Norwegian glaciers using Landsat imagery - an overview*. MOCA, IAMAS-
IAPSO - IACS Joint Assembly, Montreal, Canada, 19.-29.07.2009.

Paul, F.: *Mapping the world's glaciers from space: first results from the project GlobGlacier*. MOCA, IAMAS-
IAPSO - IACS Joint Assembly, Montreal, Canada, 19.-29.07.2009.

Paul, F.: *Spatial variability of glacier surface elevation changes from 1985 to 1999 in Switzerland*. Research Se-
minar at VAW/ETHZ, Zurich, Switzerland, 19.02.2009.

Pichler, B.: *Characterization of biochar and their impact on soil fertility*. 7th Swiss Geoscience Meeting, Neuchâ-
tel, Switzerland, 21.11.2009.
Purves, R.: *Using crowd sourcing to explore the semantics of place*. 1st EuroSDR Workshop on Crowd Sourcing for Updating National Databases, Berne, Switzerland, 20.08.2009.


Purves, R.: *Describing the space and place of digital cities through volunteered geographic information*. Workshop dealing with the Contribution of Geovisualization to the concept of the Digital City, Hamburg, Germany, 03.03.2009.


Salzmann, N.: *Providing scientific baseline for climate change adaptation strategies for the Peruvian tropical Andes region*. IARU International Scientific Congress on Climate Change, Copenhagen, Denmark, 10.-12.03.2009.


Schaepman, M.: *Imaging spectroscopy for natural resources*. University of Tehran, Faculty of Natural Resources, Tehran, Iran, 22.09.2009.


Straumann, R. K.: Extraction of valley floors and characterisation of valleyness from a DEM. General Meeting of IPEG (Inter-university Partnership for Earth Observation and Geoinformatics), Department of Geography, University of Zurich, Switzerland, 12.06.2009.


Thieme, S.: The other Silk Road: film presentation. Basecamp09, University of Zurich, Switzerland, 06.05.2009.


Thieme, S.: Coming home? Patterns and characteristics of return migration in Kyrgyzstan. IMISCOE International Conference on Defining the State-of-the-Art on Remittances and Return, Maastricht, Netherlands, 15.05.2009.


Tomko, M.: Identification of practically visible spatial objects in natural environments. 12th AGILE International Conference on Geographic Information Science, Hannover, Germany, 02.-05.06.2009.


Weyermann, J.: Land cover classification concept for anisotropy correction in hyperspectral imagery. 6th EARSeL SIG Workshop on Imaging Spectroscopy, Tel-Aviv, Israel, 16.-19.03.2009.

Weyermann, J.: Spectral Angle Mapper (SAM) for anisotropy class indexing in imaging spectrometry data. SPIE Optics and Photonics, San Diego, California, USA, 02.-06.08.2009.


Zemp, M.: Climate change in the Alps - impact on glaciers. 5th International Meeting 'Rete Montagna', Chiavenna, Italy, and Castasegna, Switzerland, 29.-30.05.2009.


Zingerli, C.: Sociology of research for development: on producing and sharing "relevant" knowledge for development. North-South Centre Colloquium "Selected Aspects of Sustainable Development", ETH Zurich, Switzerland, 12.-14.05.2009.


9 Publications

Books


Edited Books


Textbooks


Original works (reviewed)


Original works (not reviewed)


Further contributions (reviewed)


Further contributions (not reviewed)


Newspaper articles


10 PhD, Diploma and Master’s theses
(validated by the faculty in 2009)

PhD theses

Diploma theses


**Master’s theses**


Garlandini, Simone (2008): Perceptual salience and thematic relevance in 2D map displays.


Gouskov, Boris (2009): Welchen Einfluss hat Trockenheit während der Wachstumsperiode auf die chemische Zusammensetzung der Streu und deren Abbaubarkeit?


Isenring, Michael (2008): Oil and globalisation: issues for the beginning of the 21st century: How an increased oil price may become a new trade barrier.


11 List of Department staff (31 December 2009)

Faculty Members
Haeberli Wilfried, Prof. Dr.
Glaciology, Geomorphodynamics and Geochronology (3G)
Schmidt Michael, Prof. Dr.
Soil Science and Biogeography (2B)
Seibert Jan, Prof. Dr.
Hydrology and Climate (H2K)
Müller-Böker Ulrike, Prof. Dr., Director of Dept.
Human Geography (HGG)
Korf Benedikt, Prof. Dr.
Political Geography (PGG)

Academic Heads of Units (Wiss. Abteilungsleitende)
HGG: Backhaus Norman, PD Dr.
RSL: Meier Erich, Dr.

Lecturers and Senior Research Associates (Oberassistierende und Wiss. Mitarbeitende)
3G: Brandová Dagmar, Dr.
Egli Markus, PD Dr. (3G/2B)
Gruber Stephan, Dr.
Hilbich, Christin, Dr.
Huggel Christian, Dr.
Machguth, Horst, Dr.
Nötzli, Jeannette, Dr.
Pau, Frank, Dr.
Salzmann Nadine, Dr.

2B: Burga Conradin, Prof. Dr.

H2K: Ewen Tracy, Dr.

HGG: Geiser Urs, Dr.
Thieme Susan, Dr.

Teaching and Research Associates (Assistierende)
3G: Fischer Mauro
Meister Irina

Bernardo Maestrini, M.Sc.

Rinderer Michael, dipl. geogr.
Kauer Sereina
Vis Marc, dipl. biol.

HGG: Grünenfelder Julia, dipl. geogr.
Landolt Sara, dipl. geogr.
Locher Martina, dipl. geogr.
Schoch Nadia, M.Sc.

PGG: Bichsel Christine, Dr.
Starmanos Mark, dipl. geogr.

WGG: Boller Florian, dipl. geogr.
Craviolini Christoph, dipl. geogr.

N.N.,
Economic Geography (WGG)
Schaepman Michael, Prof. Dr.
Remote Sensing Laboratories (RSL)
Fabrikant Sara Irina, Prof. Dr.
Geographic Information Visualization Analysis (GIVA)
Weibel Robert, Prof. Dr.
Geographic Information Systems (GIS)
Binder Signer Claudia, Prof. Dr., SNSF professor
Social and Industrial Ecology (SIE)
Administration
GIUZ: Hunkeler-Wittleder Ruth, Admin. director
Scheidegger Jung Yvonne, Dr., Head of teaching administration and corporate communications
Kugelmeier Nicola, Student advisor
Moll Andri, Student advisor
Schneider Sieber Amalia, Student advisor
Psarellis Paolo, Secretary
Wüst-Jakober Margrit, Secretary
Fitze Madeleine, M.Sc., Reporting
Japp Lukas, Secretary
HGG: Fritschi Astrid, dipl. geogr., Assistant**
Kohler Regina, Secretary
PGG/WGG: Assef Perscheng, Secretary
RSL: Altorfer Sandra, Secretary
Ott Rita, Secretary**
GIVA: Büschlen Lisa, Secretary
GIS: Scheiwiller Annica, Secretary
SIE: Cottier Elisabeth, Secretary
GT: Arnold-Küng Andrea, Secretary
Fitze Madeleine, M.Sc., Secretary
3G/2B/H2K: Grüter Helene, Secretary
Nietlispach Elisabeth, Secretary

Technical Services
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Hilf Michael, Lab assistant
Kägi Bruno, Head of lab
Marchi Patrick, Computer scientist
Markulin Damien, Technician
Schiess Kaspar, Computer scientist
Schweikert Gabi, Computer scientist
Soleymani Kohler Roya, Computer scientist
Steinmann Martin, Graphic designer
Werschlein Thomas, dipl. geogr. Computer scientist
Woodhatch Ivan L., Lab assistant

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Grossmann-Maggetti Barbara, dipl. geogr., Librarian
Soppelsa-Wagner Edith, Librarian mbA
Stoupa Iva, Librarian mbA
Volkart Regula, Dr., Scientific librarian

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Ziege Michael, dipl. biochem., Coordination e-learning

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Böhlert Ralph, dipl. geogr.*
Bolch Tobias, Dr.**
Favilli Filippo, M.Sc.**
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Huggel Christian, Dr.*
Ivy Ochs Susan, Dr.*
Joerg Philip, dipl. geogr.**
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Le Bris Raymond*
Linsbauer Andreas, dipl. geogr.**
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Salzmann Nadine, Dr.*
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Zemper Richard, Dr.*
Zemp Michael, Dr.*
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Nimisha Nimisha, M.Sc.*
HGG: Bitzi Barbara**
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Geiser Urs, Dr.*
Junginger Mathias, dipl. geogr.*/**
Schwank Claude, dipl. geogr.**
Steimann Bernd, dipl. geogr.*
Thieme Susan, Dr.*
Zingerli Claudia, Dr.*
PGG: Klem Bart*
Pia Hollenbach**
WGG: Kaspar Heidi, dipl. geogr.*
RSL: Alberti Edoardo, Dr.*
Barmettler Arnold, El. Ing. ETH**
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Dell’Endice Francesco, M.Sc.**
D’Odorico Petra, M.Sc.**
Frey Othmar, dipl. Ing. ETH**
Frioud Max, Dr.*
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Baumann Stefan, dipl. geogr.
Berger Burger Heidi, Dipl. Arch. ETH
Brian Mc Ardell, Dr.
Brugger Ernst A., Prof. Dr.
Brunner Ueli, Dr.
Bürki Rolf, Dr.
Capaul Urs, Dr.
Cherubini Paolo, Dr.
Edelkraut Kunz Kirsten, Dr.
Eichenberger Susann, Dr.
Escher Hermann, Dr.
Fahrländer Stefan, Dr.
Fischer Urs, Dr.
Geiger Alain, Dr.
Güsewell Sabine, Dr.
Hagedorn Frank, Dr.
Hanser Christian, Dr.
Hauck Christian, Dr.
Heinrich Christoph A., Prof. Dr.
Hunziker Marcel, Dr.
Hoeck Hendrick, Dr.
Kääb Andreas, Prof. Dr.
Kaiser Klaus Felix, PD Dr.
Keller Oskar, PD Dr.
Klaus Philippe, Dr.
Kuster Jürg, Dr.
Lichtenegger Jürg, Dr.
Lüscher Peter, Dr.
Meier Kruker Verena, Prof. Dr.
Meile Rolf, lic. phil.II
Pazeller Adalbert, dipl. Ing.
Pronk Marco, Dr.
Reuschenbach Monika, Prof. Dr.
Rauch Theodor, Prof. Dr.
Ribaux Claude, lic. phil.
Rixen Christian, Dr.
Sauer Matthias, Dr.
Schläpfer Daniel, Dr.
Schmid Annette, Dr.
Seneviratne Sonia Isabelle, Prof. Dr.
Siegwolf Rolf, Dr.
Tarnutzer Andreas, Dr.
Vettiger Barbara, Dr.
Vonder Mühl Daniel, Dr.
Wachter Daniel, Prof. Dr.
Wieler Rainer, Prof. Dr.
Wüest Marc, Dr.

GIS: Bereuter Pia, dipl. geogr.*
Lüscher Patrick, dipl. geogr.**
Ostermann Frank, Dr.**
Schmidt Ronald, Mag. Geogr.
Tomko Martin, Dr.**
Venkateswaran Ramya, M.Sc.*

SIE: Baur Ivo*
Feola Giuseppe, M.Sc.*
Garcia Santos Glenda, Dr.*
Lesmes Camilo, M.Sc.**
Mrotzek Maxmimilian, Dr.**
Schmid Alfons, M.Sc.**

* SNSF
**Other projects (research funded by third parties)