Annual Report
2010

University of Zurich
Department of Geography
Cover picture: Mounting GPS devices in the Matter Valley (VS) above Herbriggen for the measurement of slope movements in Alpine permafrost in the framework of the newly started X-Sense project; Photo: V. Wirz, 2010
Report from the Head of Department

2010 has seen a dynamic Department of Geography (short: GIUZ), with many new faces arriving. In March, C. Berndt started his position as full professor on the Chair of Economic Geography, after a vacancy of one year following Hans Elsasser’s retirement in January 2009. Given the important role of economic geography among the branches of geography, with its high attraction to students and its great potential to liaise with other parts of geography, it was a great relief to see this vacancy being filled relatively quickly. At this point, I’d like to thank those within the Economic Geography Unit as well as its ‘sister units’ who helped bridge the gap, putting in a considerable effort to ensure the ball was not dropped during this interregnum. C. Berndt’s arrival also brought new researchers at the postdoctoral and doctoral level, and with them new ideas. Similarly, the effect of M. Schaepman’s and J. Seibert’s groups accelerating to ‘full speed’, after having started their positions last year, caused many more new faces to appear. Likewise, last year’s promotion of B. Korf to associate professor became noticeable this year, with several members added to the Political Geography Unit. And, finally, many new research projects were granted to the remaining units in GIUZ, hence causing even more hires of postdoctoral and doctoral researchers. All in all, 2010 has witnessed an unusually large influx of new intellectual talent, particularly at the young end of the age scale. My quick and entirely unscientific estimate is that the current median age of employees at GIUZ is somewhere around thirty years. Certainly, the atmosphere in the Department has benefited from this, with a young and dynamic feel.

The Department is currently involved in the search process to replace W. Haeberli as head of the Glaciology, Geomorphodynamics and Geochronology Unit. At the time of writing, interviews with shortlisted candidates have been conducted and the Search Committee is currently requesting assessments from external referees. We are currently still on schedule for a seamless replacement in February 2012.

Further on the hiring front, the Faculty of Science (MNF) and the Executive Board of UZH have given the green light for a new tenure-track assistant professor (APTT) position in Remote Sensing, to be filled by fall 2012. The Structure Committee, which is tasked with drafting the announcement of the position and which precedes the Search Committee, has been formed and will soon gather for its first meeting. Related to this are our current efforts to make an attractive counter-offer to J. Seibert, who has received an offer from the University of Uppsala, Sweden for a professor position. We are still confident that we can convince J. Seibert to stay in Zurich, and I trust to be able to report next year on our success.

Apart from all the incoming personnel, we have also had staff members leaving GIUZ, many of them after completing their degree or fixed term contract. Most notably, A. Odermatt has been elected to the City Council of the City of Zurich. He started his term this summer, and is now heading the Construction and Housing Department (Hochbaudepartement) — very appropriately, given that his research focus at GIUZ was on urban development, in particular in the housing and real estate markets, and gentrification. Besides A. Odermatt, C. Nielsen, who also undertook PhD research in H. Elsasser’s unit in the 1990s, was also elected this spring as councilor. Two members of the City Council from the same unit: Does that mean economic geography provides the optimal training ground for politicians?

During the reporting year, the Zurich Graduate School in Geography lived through its second year and has very rapidly consolidated to become one of the key cross-linking elements in the Department. A new course on Principles and Theory in Geography was introduced as part of the compulsory courses for doctoral
candidates. The course this year was devoted to the role of scale across geographic research, and consequently was co-taught by staff from the PGG, 3G and GIS units. The annual retreat of the Graduate School in November once again was a highly successful event and featured, besides great student talks, a keynote by Prof. M. Carey from the University of Oregon, as well as a panel discussion about the possible role(s) of Earth System Science for our discipline.

Another instrument that we hope will stimulate collaboration between different units across GIUZ is the Innovations-Pool, or InnoPool, which was conceived this year and which will provide seed money to cross-unit projects that hopefully will evolve into larger, self-funded projects later on. The first call for proposals has been issued, and a first round of projects should start next spring. I hope to be able to report on the first success stories in next year’s annual report.

While last year, the World Glacier Monitoring Service (WGMS) became officially integrated into GIUZ, this year saw the official hand-over of the Directorship of WGMS from W. Haeberli to M. Zemp, celebrated at the occasion of a well-attended symposium on Science and Monitoring of the Cryosphere in early December. This event was the last in a series of over half a dozen international conferences and workshops that were organized by GIUZ researchers at UZH in 2010. The largest and most prominent of these events was GIScience 2010, the 2010 edition of the premier research conference series in geographic information science, organized by the GIVA and GIS units. More than a dozen workshops, summer schools, and special sessions were organized by GIUZ members at other venues in Switzerland and abroad. Evidently, GIUZ staff are contributing more than their fair share to facilitating international communication in science, contributing to our institution’s reputation on the world stage.

While in other natural science curricula, such as chemistry, physics, and biology, student numbers this year showed a significant increase (recovering from a dip in recent years), student numbers in geography have remained on a stable, high plateau. In the fall semester of 2010, 595 students were enrolled as geography majors. The number of first semester students majoring in geography was almost the same as the previous year (2009: 117 students; 2010: 101). More than one third (35.3% or 86 of 244) of all MNF Bachelor’s students graduated with a degree in Geography. Adding to these BSc graduates were 70 MSc Students (33.3% of MNF) and 7 Diploma students completing their degree. The number of international MSc Students (mainly from Germany) is slowly increasing, but is still relatively low. Given the high number of successful MSc Students in geography, we have so far not really felt an urgent need to tap into the reservoir of international students on a bigger scale. Over the next years, however, we intend to improve the attractiveness of our curricula for international students as well as students from related disciplines, partly by exploring options for Specialized Masters degree programs. The focus will particularly be on attracting highly talented students, and also on offering special options for research-oriented students with a BSc degree from GIUZ.

The Department was once more very successful in attracting extramural funding (2009: CHF 5’943’000; 2010: CHF 5’669’000). I’m proud of that figure and see it as a clear indicator of the quality of our research and how highly it is rated externally. We should, however, not forget that it is currently easier to obtain extramural funding in Switzerland than abroad. And we should not forget that our base funding is also considerably higher than at comparable foreign universities — particularly in times when in some countries, budget cuts of 10, 20 and up to 40 % are not uncommon, while our budget remained virtually untouched. This special situation of Swiss universities holds of course across all disciplines and institutes in our country. However,
it means that we should not only keep an eye on our (impressive) absolute income figures, but we also pay attention to the efficiency with which we invest the funds made available to us, and the productivity (e.g. per researcher, per unit) that is generated through this influx of finances.

I’d like to end this report by expressing my gratitude. First, I’d like to thank warmly U. Müller-Böker, from whom I ‘inherited’ not only the function of Head of Department this August, but also a very well-organized department and whose advice still helps me so much. I would like to thank the authorities of the University of Zurich and especially the Faculty of Science for their continued great support, and our taxpayers for entrusting us with such generous funds. In 2010, eight staff members celebrated employment service anniversaries. Special thanks go to these staff members for their long-term dedication for our department.

30 years:
Bruno Kägi

25 years:
Dr. Elisabeth Bühler-Conrad

20 years:
Ivan Woodhatch

15 years:
Prof. Dr. Wilfried Haeberli
Elisabeth Nietlispach

10 years:
Sandra Altorfer
Regina Kohler-Allemann

And, last but certainly not least, I wish to express my gratitude to all staff members and students of GIUZ for their continued commitment and efforts.

Robert Weibel, Head of Department
Welcome to Christian Berndt

Christian Berndt obtained his PhD (1998) from the University of Cambridge (UK) and spent his Postdoc years at the University of Eichstaett-Ingolstadt and the University of California Los Angeles. In 2004 he was appointed professor of Economic Geography at the University of Frankfurt and accepted the position as full professor of Economic Geography at the University of Zurich in 2010. Christian’s project as an economic geographer is to rethink the way the spatial economy is conceptualized and represented. The best way to achieve this is to engage with activities and processes that are considered as marginal or that are hidden from our view. Empirically he has longstanding interests in the geographies of labor (e.g. labor migration, low-wage service employment, industrial labor in the global south), and transnational productions systems and commodity flows (e.g. offshoring and outsourcing, agricultural commodity chains).

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

Research in the Department is carried out under the overarching theme of *The Earth in accelerated change: habitats in the 21st century* and 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 Performative Economy, (ii) Work, Gender and Place and (iii) Mobile Commodities.

<table>
<thead>
<tr>
<th>Physical Geography</th>
<th>Human Geography</th>
<th>Remote Sensing and Geographic Information Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glaciology, Geomorphodynamics</td>
<td>Human Geography</td>
<td>Remote Sensing</td>
</tr>
<tr>
<td>Geochronology</td>
<td>Ulrike Müller-Böker</td>
<td>Michael Schaepman</td>
</tr>
<tr>
<td>Wilfried Haeberli</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Science and Biogeography</td>
<td>Economic Geography</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>Michael Schmidt</td>
<td>Christian Berndt</td>
<td>Robert Weibel</td>
</tr>
<tr>
<td>Hydrology and Climate</td>
<td>Political Geography</td>
<td>Geographic Information Visualization and Analysis</td>
</tr>
<tr>
<td>Jan Seibert</td>
<td>Benedikt Korf</td>
<td>Sara Irina Fabrikant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Corvatsch (Upper Engadine GR): Installation of new rock temperature measurement devices in the scope of the Swiss Permafrost Monitoring Project PERMOS on Corvatsch, Engadine.
Overview

Recognition of the strength and success of the unit was again extraordinary. The Intergovernmental Panel on Climate Change (IPCC) nominated F. Paul (Working Group I) and C. Huggel (Working Group II) as lead authors for its 5th Assessment Report to be issued in 2013/2014. The University provided additional funding to support this important task. Furthermore, C. Huggel was a member of the Swiss Delegation at the Conference of the Parties COP16 in Cancún, Mexico. M. Egli was promoted to the degree of a Titularprofessor by the Faculty and the University, and W. Haeberli received a medalla de honor from the town of Carhuaz for his assistance and consultancy in case of a flood-wave from an ice/rock-avalanche into a new lake in the Cordillera Blanca, Peru.

The year 2010 also saw the start of important new collaborative projects within large networks at national and international levels: The transdisciplinary and policy-oriented investigation of new lakes in deglaciating regions of the Swiss Alps (new project NELAK) is carried out within the National Research Program 61 on sustainable water management, technological developments concerning measurements of slope movements in Alpine permafrost (new project X-sense) are part of the large nano-tera.ch program and worldwide, space-born glacier observations (new project Glaciers_cci) are performed within the Climate Change Initiative of ESA and the Global Climate Observing System (GCOS) with its Essential Climate Variables (ECV).

At the same time, transitions steadily but surely take place. Based on a competitive international search procedure, M. Zemp became director of the World Glacier Monitoring Service and successor of W. Haeberli, who had led the internationally coordinated glacier observations for 27 years. A Symposium on December 8 with international experts and representatives of involved international organizations (UNEP, WMO, IACS, and GCOS) marked the transition. The procedure for the succession of Wilfried Haeberli in his faculty position is also well underway. Six top candidates have already given presentations. They apply for a position with a highly active and internationally recognized research unit in the field of integrative high-mountain research.

Main research activities

Glaciers

The ESA project GlobGlacier (PhDs H. Frey and R. Le Bris, F. Paul) was successfully completed in October 2010. A final user group meeting was held in Zermatt with over 30 attendees and some media coverage (NZZ, ESA webpage, GCOS Switzerland). The satellite-derived data products (glacier inventory data, late summer snowlines, elevation changes, and velocity fields) will fill an important gap in global data coverage and the created documents provide thorough documentation and guidelines for all processing steps for the interested glaciological community. A promotional DVD for the project has been created. An international consortium (F. Paul, science lead and T. Bolch, project manager) was successful in bidding for the follow-up project, the Glaciers_cci. This new project is part of the ESA Climate Change Initiative (CCI) and focuses on the monitoring of Essential Climate Variables (ECVs) from spaceborne sensors. The project started in November 2010 with a three year budget of 1.8 M Euro.

The EU-FP7 project ice2sea (PhD P. Rastner, F. Paul, T. Bolch, H. Machguth) focused on the mapping of the local glaciers and icecaps on Greenland from Landsat data. First results from coupling regional climate model output to a distributed mass balance model for local icecaps on Greenland were obtained. In the project
CCGlinCH (PhD A. Linsbauer, F. Paul) the geomorphometric analysis of the digital elevation model of the Swiss Alps without glaciers was completed and the input of glacier retreat scenarios for the hydrological model PREVAH refined. The analysis revealed that most of the ice in the Swiss Alps is situated above comparably low elevation bedrock and several hundred overdeepenings > 1ha exist. In the first year of the project Glacier Laserscanning Experiment Oberwallis (joint project of 3G and RSL) laserscanning flights at Findelengletscher were successfully carried out in April and September 2010 (PhD P. Jörg, M. Zemp). All campaigns were coordinated and complemented by field work on Findelen- and Adlergletscher within the regular mass balance monitoring program of the Universities of Fribourg and Zurich (N. Salzmann, A. Linsbauer). First results were presented at scientific conferences, as well as at the public exhibition 2° Weather, Humans and Their Climate in Basel.

In 2010 the World Glacier Monitoring Service (WGMS) started its first operational year under long-term funding through the Swiss GCOS Office at the Federal Office of Meteorology and Climatology MeteoSwiss (W. Haeberli, M. Zemp, I. Gärtner-Roer). The main tasks of the service in 2010 were the handover of the WGMS directorship from W. Haeberli to M. Zemp following a corresponding international/competitive search procedure, the completion of the operational staff, the compilation of worldwide glacier fluctuation data for 2008, and the organization of the WGMS General Assembly of the National Correspondents. At this meeting in September, international experts for glacier monitoring convened at Riffelalp/Zermatt, Switzerland. They reviewed the glacier data compiled over the past 150 years, discussed the challenges of the 21st century, presented latest results from in-situ and remotely sensed observations, and came up with key tasks for the glacier monitoring community during the coming decade.

Permafrost
The field sites of the trans-disciplinary project Permasense funded by NCCR-MICS and FOEN at Jungfraujoch and Matterhorn reliably yield data in near real-time and have partly been expanded. Focused on distributed measurements of rock temperature, electrical conductivity and crack dilatation, these wireless sensor networks have transmitted over 100 Mio data points (PhD A. Hasler and S. Gruber; in collaboration with J. Beutel, ETH Computer Engineering). Based on those data, new insight was gained into rock movement related to temperature variations and phase change of water as well as on the thermal behavior of heterogeneous rock walls. Based on cold-room experiments and numerical modeling, important aspects of thaw in ice-filled rock clefts have been highlighted, which may be an important mechanism in the triggering of rock fall from permafrost walls (PhD A. Hasler, S. Gruber). In a pilot study on Jungfraujoch, the measurement of acoustic emissions in a rock face yielded first insight into weathering activity and signal characteristics. Based on this, a system for the distributed monitoring of acoustic emissions is currently designed (S. Gruber, collaboration with J. Beutel, ETH Computer Engineering). The resulting data will be used to investigate freezing-induced damage mechanics under natural conditions (L. Girard, S. Gruber, in collaboration with D. Amitrano, University of Grenoble).

In March, the three-year nano-tera.ch funded project X-Sense was launched together with ETH, FOEN and Gamma Remote Sensing. In this inter-disciplinary project, better understanding and modeling capability with respect to slope instability in permafrost as well as better monitoring technology are pursued. Initially, a small fleet of continuous GPS loggers has been designed for the year-round monitoring of slope movement (PhD V. Wirz, S. Gruber, collaboration with J. Beutel, ETH Computer Engineering and A. Geiger ETH Geodesy).
Based on DInSAR data, photo interpretation and field work, twelve priority sites for installation have been documented and prepared for installation in winter. The open-source model GEOtop has been further improved for the effective simulation of snow cover, ground temperatures and ground freezing in high-mountain environments (S. Endrizzi, S. Gruber). An efficient scripting interface supports one-dimensional validation and uncertainty studies as well as distributed case studies (S. Gubler, L. Boeckli, J. Noetzli, and S. Endrizzi).

The first year of iButton data has been collected yielding over 370 ground temperature time series (PhDs J. Fiddes and S. Gubler, S. Gruber). Completed by episodic measurements of snow depth and snow water equivalent, this dataset is employed for investigations of model uncertainty and scaling issues in model validation. Uncertainties in short and long wave radiation parameterizations, which constitute a major source of uncertainty in distributed cryosphere models have been investigated and quantified (PhD S. Gubler, R. Purves, S. Gruber). In the joint use of models and distributed measurements, the knowledge of the spatio-temporal distribution of model uncertainty can be important to optimize measurement campaigns. In the SNF-funded project CRYOSUB, a prototype system for the efficient computation of cryosphere phenomena over large mountain regions has been developed and is currently being tested (PhD J. Fiddes, S. Gruber).

Based on a database of permafrost evidences realized in the framework of the project PermaNET, a statistical model of permafrost distribution for the entire Alpine arc has been derived and is currently turned into a final data product (PhD L. Boeckli, C. Gschwend, J. Noetzli, S. Gruber; in collaboration with A. Brenning, University of Waterloo, Canada). Related to the same project, field measurements of rock temperature have been collected around Zugspitze and in the National Park Berchtesgaden, Germany (L. Böckli, collaboration with A. v. Poschinger). This supports modeling case studies around the summits of Zugspitze and Hochkalter, Germany as well as Hoher Sonnblick, Austria (L. Boeckli, J. Noetzli, S. Endrizzi, and S. Gruber). A similar modeling case study including validation using field data has been started for the Aiguille du Midi in the Mont Blanc area, where the highest boreholes in rock permafrost have been drilled last year (J. Noetzli, in collaboration with P. Deline and L. Ravanel, University of Savoy).

The PERMOS network celebrated its 10th anniversary this year; it documents the status and long-term variations of permafrost in the Swiss Alps based on temperature, geophysics 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. Vonder Muehll). Major efforts of the PERMOS Office in 2010 were related to integration, processing and storage of the data and the standardization of site instrumentation and long-term monitoring strategies. In addition, funds for the next four-year period through the established partnership of the financing partners have been secured.

As a PERMOS partner institution GIUZ performed regular field work at the sites for the maintenance of which it is responsible. Temperature data are provided and processed from boreholes and near-surface data loggers at the sites Corvatsch, Schilthorn and Jungfraujoch. Conversion of the Schilthorn borehole station to the newest PERMOS standard has been initiated (J. Noetzli, L. Boeckli, S. Gruber, A. Hasler). Geophysical monitoring has been continued at six sites (C. Hilbich). After the installation of the first automatic electrical resistivity instrument on Schilthorn in 2009, a second system was successfully installed at the Stockhorn, allowing for daily measurements and a direct comparison of the evolution of electrical resistivities and borehole temperatures in future (C. Hilbich, in collaboration with C. Hauck, Univ. Fribourg). Kinematic monitoring of creeping permafrost continued at the rockglaciers Murtel/Corvatsch, Muragl, as well as in the Turtmanntal (I.
Gärtner-Roer). A new monitoring network (ground surface temperatures and geodetic survey) was established on Furggwanghorn rockglacier (Turtmannatal, Valais), where the Institute for Geotechnical Engineering, (IGT, ETH Zurich, Prof. S. Springman) has started a new boreholes program. In addition, ground surface temperature devices were also placed on a rockglacier in Svalbard, in order to start a comparison of creeping landforms in the Alps and Northern Europe with colleagues in Norway (K. Isaksen, I. Berthling). With colleagues from Poland and Norway an Association of Polar Early Career Scientists (APECS) Working Group on Cold Regions Sediment Budgets was started.

Environmental dynamics and natural hazards
The project NELAK will study new lakes forming in de-glaciating high mountains of the Swiss Alps (W. Haeberli, C. Huggel, and M. Künzler) started within the framework of the National Research Program 61 on sustainable water management. As a transdisciplinary, policy-oriented research project in collaboration with A. Schleiss (EPFL Lausanne), H.R. Müller and Th. Lehmann (University of Bern) and M. Bütler (lawyer) and in close contact with stakeholders from the energy sector, tourism industry, landscape protection and political authorities it aims at investigating natural hazards, the hydropower potential, tourism aspects and legal questions connected to such water bodies most likely developing within the coming decades already and to create a knowledge basis for future planning and decision taking.

W. Haeberli was involved as expert for high-mountain hazard prevention in a case of an ice-/rock avalanche from Nevado Hualcán into a recently formed lake (Laguna 513), triggering a floodwave and debris flow near the town of Carhuaz, Cordillera Blanca, Peru, and in a governmental symposium in Santiago de Chile and field trip about floods from lake outbursts at Colonia Glacier, Northern Patagonian Icefield in the context of plans for important hydropower development.

The SNF project rock-ice avalanches: a systematic investigation of the influence of ice (PhD D. Schneid-der, C. Huggel, W. Haeberli), in cooperation with WSL (B. McArdell/P. Bartelt) has been successfully concluded. The laboratory experiments from the previous year at the University of California, Berkeley, were complemented by additional experiments with a smaller rotating drum at the Institute for Alpine Natural Hazards at the BOKU University in Vienna. The focus was on the influence of ice on basal friction as well as pore water pressure effects, which evolve when ice is melting. Flow transformations from dry granular flows to debris flows and finally to hyper concentrated flows have well been observed and measured. The experimental series have significantly contributed to an improved quantitative understanding of the effect of ice in mass movement such as rock-ice avalanches, which is important both for numerical modeling and hazard assessments.

The collaboration with the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna (J. Schneider) within the TajHaz project on assessing hazards and risks from high-mountain hazards in Tajikistan has been concluded (D. Schneider, C. Huggel). In addition to modeling studies an exchange in applied science between Tajik, Austrian, Italian and Swiss experts has been organized.

The climate change adaptation programme PACC between the Swiss and Peruvian governments, funded by the Swiss Agency for Development and Cooperation (SDC), has entered the third year. UZH (C. Huggel, N. Salzmann) thereby leads a Swiss scientific consortium of six research institutions. Among the diverse activities, a postgraduate course on climate change has been initiated within a consortium of four universities in Peru and UZH. The first multi-disciplinary studies have been concluded and should now build a basis to implement climate change adaptation measures.
Within the SDC funded disaster risk reduction project on landslide and volcano-glacier hazards in Colombia (C. Huggel) an early warning systems has been designed and installed; after a period of testing it is now running operationally. The Swiss support of the project concluded at the end of 2010.

For the EU FP7 funded HighNoon project (R. Worni, H. Frey, and C. Huggel, in collaboration with the University of Geneva) field work has been conducted in relation with glacier lake outburst floods GLOF in Argentina and the Indian Himalaya, and new GLOF modelling techniques for moraine-dammed lakes have been applied. Furthermore, important synergies in terms of glacier mapping are generated with the ESA GlobGlacier project (H. Frey, R. Le Bris, and F. Paul).

Nagra (U. Fischer) and GIUZ (W. Haeberli) together organized an international workshop on possibilities to numerically model glacier erosion in relation with planned repositories for highly active nuclear waste, which must remain isolated from the biosphere during one million years, i.e. a number of future ice ages with large piedmont glaciers possibly advancing to or even over the envisaged sites.

Geochronology and landscape evolution
A main 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).

Two PhD projects (R. Boehlert: Reconstructing Late glacial and Early Holocene landscape Evolution Using a Combination of Numerical and Relative Dating Methods – Examples from Eastern Switzerland and Eastern France and F. Favilli: Soil and Alpine landscape evolution since the Late glacial and early/mid Holocene in Val di Sole (Trentino, Italy)) were completed this year. The PhD thesis of C. Mavris (Initial stages of soil and clay mineral formation), funded by the SNF, is continuing with the involvement of the ISSDS (Florence), University of Florence, IGT (ETHZ) and the University of Michigan (Ann Arbor, US). Some more projects have started: 1) soil chronosequences of the Wind River Range (Wyoming) using geochemical mass balances and numerical dating techniques (ChronoRange; collaboration with the University of Northern Iowa), 2) Reconstruction of fire frequency and landscape history in the Etna region using a combined methodological approach: evidences from charcoals, soils and dendrochronology (EtnaFire; collaboration with the WSL, Universities of Florence and Palermo), 3) the Influence of permafrost on chemical and physical weathering (PermaWeather). Furthermore a 1-year Postdoc (F. Favilli) was financed from the project (Clay)Mineralogical investigations of forest soils of the canton of Zurich (collaboration with the canton of ZH).

Wilfried Haeberli and collaborators
The development and building of this instrument needed many helping minds and hands from different institutions, including Dr. Samuel Abiven, Mirjam Studer, Ivan Woodhatch (GIUZ), Dr. Rolf Siegwolf (PSI), and Reto Maier the physics workshop.
Overview

The Soil Science and Biogeography Unit seeks to understand how global change affects the multiple interactions of vegetation and soil, especially the turnover of soil organic matter. The year 2010 started with C. Burga being ERASMUS guest professor at the University of Hannover, and M. Schmidt being on sabbatical leave at the University of California at Berkeley. New persons to join the team were D. Wiedemeier, M. Griepentrog and R. Smittenberg. Also, we built up a new tool to study the carbon cycle in the plant-soil system. MICE (Multi-Isotope labeling in Controlled Environments) is an automated plant growing system, which allows the labeling of biomass with stable isotopes. Furthermore, we organized scientific sessions during the European Geosciences Union Meeting and at the Swiss Geoscience Meeting in Fribourg.

Main research activities

The study of organic matter turnover at the molecular level continues to be a major focus of our group. Several new persons joined the team. In his PhD project D. Wiedemeier will develop new spectroscopic and molecular tools to reconstruct fire history from lake sediments and soils. We hope that these new techniques will deliver a more accurate and more detailed picture of the fire history, and D. Wiedemeier worked for several months in at the Australian National University in Canberra at the palaeo-ecology group to collect samples. M. Griepentrog also started his PhD project on environmental factors in the dynamics of lignin in forest soils initiated by A. Heim in collaboration with F. Hagedorn (WSL Birmensdorf) and M. Schmidt. This project links the carbon and nitrogen cycles by using the isotopic label from a CO$_2$ enrichment experiment to trace the carbon flux into both plant-derived and microbial-derived molecules in forest soils under nitrogen deposition. In October R. Smittenberg started as a senior scientist. Previously, he worked at the Geological Institute of the ETH where he finished the Biglink project, a detailed multidisciplinary study of the initial phase of weathering and ecosystem development, including carbon dynamics, after deglaciation of a glacier forefield. He also continued collaboration and co-mentoring of M. Schneider who developed a new method using high-performance liquid chromatography to assess the formation temperature on the chemical structure of fire-derived carbon in a project funded by the University Research Fund.

S. Abiven continued as SNF Ambizione funded senior scientist and, along with two PhD projects (N. Singh, B. Maestrini), leads the Swiss Char Study Initiative (CSI Swiss). Future climate change will bring with it more wildfires, in European forests and 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 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.

We built a new tool to study the carbon cycle in the plant and soil system in collaboration with R. Siegwolf (Paul-Scherrer-Institute) and with support from the physics workshop. Multi-Isotopes labeling chambers in Controlled Environments (MICE) is an automated plant growing system, which allows labeling of biomass with stable isotopes – the first of its kind worldwide. This tool could become a major research platform for different teams, within the department, and beyond.

C. Burga continued a monitoring project of primary plant successions within the foreland of the Morteratsch glacier in collaboration with B. Krüsi (ZHAW), M. Egli and M. Wernli (ZHAW), and published a synopsis
paper on the results in Flora 205 (2010), 561-57, and completed the vegetation and plant diversity map of the Upper Engadin.

Several guests came to work in our laboratory for several months, e.g. A. Crane-Droesch (PhD researcher from the University of California at Berkeley, USA), F. Santos (PhD researcher from the City University of New York, USA). A. McBeath (PhD researcher from the University of Adelaide, Australia).

GIUZ’s Integrated Project evaluated the greenhouse gas emissions caused by the daily business of the Department. The team consisted of 17 students, supervised by A. Heim and M. Nauser, and they found out that the majority of emissions originated from travel to conferences, meetings and excursions. The report will serve as a basis in developing a strategy to reduce the Department’s greenhouse gas emissions.

*Michael Schmidt and collaborators*
Tipping bucket installation to measure subsurface runoff at the Rufiberg (SZ) test site.

Photo: P. Seibert, 2010
Overview

The research activities in the group on Hydrology and Climate (H,K) have two foci. One is experimental work on runoff generation processes; the other is modelling of climate impacts on hydrology. These foci are obviously linked; improved process understanding leads to better models and modelling helps to quantify which observations might be most valuable.

Research projects during the past year have included the linkage between flow pathways, catchment transit times and streamflow chemistry, as well as the evaluation of the value of limited amounts of data in hydrological catchment models. Besides experimental field work in the Alptal (SZ) we are also involved in the ongoing Northwatch project, which aims at comparing runoff generation, streamflow chemistry and ecology in a number of snow-dominated catchments. Another concrete project was the use of glacial mass balances to constrain a hydrological model. In the NFP-61 project DROUGHT-CH we are looking on low flow conditions in Swiss catchments. In another project on the quantification of climate change impacts on hydrology, we are working with question on how to best use RCM-simulations in hydrological models.

Main research activities

Runoff generation in pre-alpine catchments (Alptal, SZ und Rietholzbach, SG)

An important research area for the H,K group is located in Alptal (SZ) where several hydrologic studies on catchment hydrology are carried out. PhD Student M. Rinderer is concentrating on hydrologic connectivity, scaling and the soil/groundwater dynamic in the present creeks in the Zwäcken-research watershed and its sub-catchments. During 2010 a measurement concept for groundwater and runoff measurements was developed which was finally approved in July by the cantonal administration. Summer and autumn months were then dedicated to field installations. In total 53 groundwater wells and seven runoff gauging stations were installed to be able to collect distributed groundwater level and discharge data. With this data, storage-runoff relations on different spatial and temporal scales in a pre-alpine area are derived.

PhD Student B. Fischer is mainly focusing on the isotope signal distribution of precipitation and runoff in the Zwäcken catchment and its seven sub-catchments in Alptal. Therefore a series of tipping bucket rain gauges and automatic water samplers for rainfall and runoff were installed during the field season. The extracted samples were then analyzed in the H,K stable isotope lab. The isotope study is aiming at giving insight in occurring processes and their spatial variability on sub-catchment level.

To give further insight into the spatial and temporal soil moisture distribution along the Erlenbach in Alptal, a Master’s thesis was carried out by A. Kollegger. A hand held Time Domain Reflectometer (TDR) probe was used to qualitatively classify the soil moisture content. Her study aims at finding a correlation between the superficial soil moisture pattern and topography, as well as vegetation cover in Alptal.

In addition to these activities, we further developed plans for measurements in the pre-alpine Rietholzbach catchment (SG). Based on existing data Senior Researcher T. Ewen analyzed diurnal cycles in runoff. This study has also been extended to a number of catchments over Switzerland to better understand the contribution of diurnal snowmelt and evapotranspiration to runoff. Additionally, changes in both snowmelt and evapotranspiration over the observational period are being investigated.
**Snow hydrology (Wägital, SZ and other locations)**

R. Smith is working on a project with data collected in the Wägital catchment, utilizing a 70 year distributed snowpack dataset to investigate climate change impacts on snow accumulation and melt processes in relation to topographic variability. The project is currently focused on back-casting long-term snowpack changes, but will also focus on forecasting long-term changes using climate change scenarios.

T. Ewen is, in collaboration with David Small at RSL, working on using satellite radar imagery to determine the distribution of wet or melting snow for a number of catchments. This will provide additional information to constrain different catchment models.

**Drought-CH (NRP-61)**

PhD Student M. Staudinger is part of the SNF funded NRP-61 project ‘drought-CH’, which aims to set-up an early recognition system for droughts in Switzerland. This project is a collaboration of UZH, ETH, WSL and the University of Freiburg (D). Together with her PhD partner from Freiburg M. Staudinger systematically investigates a number of Swiss hydrological catchments on their sensitivity of low flow conditions. Therefore biweekly water samples are taken in the selected Swiss catchments during three years which will then be evaluated in the H,K isotope laboratory. The aim of the study is to build up a conceptual hydrologic model for drought conditions, including water isotope information.

A Diploma thesis was carried out by E. Cerwinka to investigate the occurrence of drought periods in past decades, especially during the heat wave in summer 2003, which has also caught Switzerland’s attention to assess such extreme events. To monitor drought periods in different countries several meteorological drought indices have been developed. With these methods it was possible to visualize spatial patterns for the occurrence of precipitation anomalies. In the course of this work, the temporal and spatial appearance of hydrological and meteorological drought periods in Swiss catchments was analyzed by applying different indices. The drought indicators were calculated for three homogenous regions and were tested for spatial and temporal coherence by means of several drought events. Indications were found that a meteorological drought season is not necessarily followed by a hydrological one. Drought periods are not an exceptional effect from recent years but have also occurred regularly during past decades. Especially between 1950 and 1980 times with strong precipitation deficits occurred consistently. A vulnerability classification for dry weather conditions and low flow seasons of the chosen catchments by the means of the mentioned indices were achieved. The findings showed a specific drought effect in the past for the regions Jura, midlands and eastern Switzerland, which were affected most by the meteorological and hydrological drought periods.

**Hillslope Hydrology (Rufiberg, SZ)**

In the framework of the TRAMM project (Triggering of Rapid Mass Movements in steep terrain) a process study in collaboration with different research groups from WSL, ETH Zurich, EPF Lausanne and GIUZ has been carried out by MSc. S. Kauer, Post Doctoral Researcher P. Schneider and PhD Student C. Brönnimann (EPF Lausanne) at the Rufiberg test site in the Northern pre-alps of central Switzerland. The aim of this study was to better understand the hillslope system and the involved hydrological processes of the test site, and thus allowing better predictions for similar settings in the long term. The Rufiberg has a long history of shallow landslides and all dispositions for the occurrence of such mass movements are met at this steep test site (30° average inclination). The hydrological conditions are assumed to be crucial for triggering potential landslides.
Therefore, we are monitoring the spatial and temporal soil moisture distribution with TDR probes, the groundwater table with groundwater wells and subsurface storm flow in a trench. These measurements were complemented with an electric resistivity tomography profile to obtain information about soil thickness, bedrock lithology and the saturation pattern of the soil. Finally, we evaluated the influence of precipitation and groundwater table increase on the occurrence and amount of subsurface storm flow.

**Modelling/Programming**

The conversion and adaptation of the hydrological runoff model HBV from the programming language VB6 to VB.NET was programmer M. Vis’ main project for 2010. The beta version has been released, tested successfully and is now available online. More hydrologic tools have been created for the existing software Whitebox Geospatial Analysis Tool which are utilized for estimating the contributing area, topographic indices, filling sinks etc. For teaching purposes he also converted a hydrologic multi-user game, called Irrigania from a desktop to a web application.

**NorthWatch**

During 2010 the NorthWatch project continued with workshops (Sweden and Scotland) and first Northwatch publications. NorthWatch is a highly interdisciplinary project which will examine long-term data from experimental catchments spanning different hydro-climatic zones within the northern region to assess the integrated physical, chemical and biological response of northern watershed ecosystems to climatic change. This will be achieved through inter-catchment comparison by a team of leading international scientists affiliated with seven other universities in the USA, Canada, Scotland, Sweden and Switzerland. The work is intended to examine some of the variable responses to climate change observed at different experimental sites in the northern temperate zone. This will also provide a basis for extrapolating understanding to larger watersheds where climate change impacts are of more relevance to environmental managers.

**Data Model Development**

Post Doctoral Researcher P. Schneider is focusing on developing a new data model which comprises sensor data, sampling data and metadata to meet the requirements from experimentalists and modelers in environmental science. Emphasis is placed on acquiring data from sensing and sampling generated at experimental research sites as well as by governmental monitoring networks. A web-based platform offers access to data, metadata and data quality through a single query. In most cases metadata are not provided in digital format and thus not shared with project partners or the science community. We clearly recognize a data management problem in environmental sciences, which will increase with the growing number of online sensor networks.

**Outlook**

A new project was granted by SNF in fall 2010. The project will contribute towards assessing climate-change impacts on the temporal variability of catchment runoff, floods and droughts in Switzerland. The study will be based on Regional Climate Model (RCM) results from the ENSEMBLES project and a conceptual hydrological model. The particular objectives of the project are 1) to evaluate and further develop different approaches correcting the output from global and regional climate models for hydrological predictions. The evaluation will be based on an integrated evaluation of different climate variables through catchment modeling and subsequent statistical analyses, 2) to improve the capability for predicting climate change impacts on runoff and its variability, as well as both droughts and floods, and 3) to estimate and evaluate the combined uncertainties of the
simulation of catchment-scale impacts of climate change. A new PhD Student for this project will start during 2011.

Jan Seibert and collaborators
1.4 Human Geography (HGG)

Interview training in Simen National Park, Ethiopia.

Photo: K. Hurni, 2010
Overview
The Unit conducts theory-led research on development and social change and its consequences with the aim of contributing to sustainable development in both the global South and global North. The core research themes are:

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

Among the highlights in 2010 were the successful completions of a number of projects: C. Zingerli’s post-doc on Knowledge, power and politics, S. Thieme on Sustaining livelihoods in trans-local and transnational settings. B. Steimann, A. Ghimire und C. Vinod gained their doctorate. Members and South partners of the Unit commenced five new projects within the Phase 3 of the NCCR North-South. The completed as well as the new projects of the NCCR were positively evaluated by the international Review Panel (Site Visit in Ethiopia, September 2010). M. Bishokarma received a PhD scholarship from URPP Asia Europe. E. Pörtner joined the unit for his PhD, replacing S. Landolt, who in turn replaced A. Odermatt at the Geography Teacher Training (GTT). B. Bitzi joined the GTT and the Unit as PhD candidate.

Besides doing research, members of the Unit made great efforts in sharing their knowledge with the general public. They for example commented in radio and newspapers on recent political upheavals in Kyrgyzstan, the flooding in Pakistan as well as providing expertise on ‘youths’ in debates on drug prevention in Switzerland and Germany. As members of a Swiss Advisory Group on Poverty they support (e.g. through policy briefs) the Federal Councilor in her assignment as a member of the Global Sustainability Panel of UN Secretary General.

Last but not least, as of June 2010, the inter-university agreement to establish the International Graduate School North-South (IGS North-South) has been signed by all parties. It forms a follow-up structure to the NCCR North-South and is a shared endeavor of the Universities of Bern, Basel, and Zurich (in charge: Development Study Group of the Department of Geography) together with the Swiss Tropical and Public Health Institute and Swisspeace. The objective of the IGS North-South is to structurally establish an inter-university North-South Graduate School that functions as an internationally recognized network of excellence on issues of global change, innovation, and sustainable development and to strengthen worldwide partnerships via targeted research, education, and advisory projects involving multiple partners in Switzerland working in cooperation with partner institutions in the ‘Global South’.

Main research activities

Research under NCCR North-South Program

Institutions, livelihoods and conflicts (Phase 3 of NCCR-North-South)
Lead: U. Müller-Böker

The Thematic Node 1 of the NCCR North-South delves into institutions, livelihoods and conflicts. 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 broad-
er acceptance and legitimacy of institutions relevant for sustainable development. In 2010 several research projects have been launched and concretized by members of the DSGZ and their partners in the South.

**Contested rural development - new perspectives on 'non-state actors and movements' and the politics of livelihood-centered policies**

U. Geiser, R. Ramakumar (TISS, India), Awanish K., S. Lieberherr

This new project examines alternative visions of development as suggested by various grassroots movements that critique state-sanctioned models and claim to offer solutions for improving rural peoples’ access to livelihood means. As an initial step to further refine research questions, ‘Position Papers’ have now been compiled in India (Maharashtra, by Awanish K.), Nepal (by P. Manandhar), Pakistan (by Khadim Hussain), Sri Lanka (by S. Bastian), and Bolivia (by G. Rojas-Ortuste). Based on these insights, two new PhD Students started their work in September: A. Kumar (Tata Institute of Social Science, Mumbai) on the role of caste-based movements in Maharashtra, and S. Lieberherr (GIUZ) on the role of farmers’ organizations and movements in Maharashtra, India.

**Livelihood futures in resource-scarce areas**

B. Shahbaz (SDF/SDPI, Pakistan), S. Sharma (HNRSC, Nepal), U. Müller-Böker, A. Suleri (SDPI, Pakistan), M. Locher, R. M. Amir, N. Kumar

The project aims at developing scenarios for alternative opportunities to secure the livelihoods of groups in resource-scarce, marginal areas that are vulnerable to exclusion. The project explores options such as new patterns of resource distribution, alternative employment opportunities and social safety nets. In Pakistan, initial research has revealed the emergence of ‘social safety nets’ that are specifically offered to ‘excluded’ sections of the society. R.M. Amir investigates poverty eradication programs and interventions providing alternative options to the poor in Northwestern highlands of Pakistan. In Nepal various new livelihood opportunities are emerging in the post-conflict setting. In the Far Western region, N. Kumar plans to elucidate the food entitlement and food security programs. M. Locher delves into transnational land deals and local livelihoods in Tanzania. The investment in agricultural sector and land acquisition by international actors has opened-up a new avenue of income generation, but entails also livelihood risks.

**Migration and development: the role of knowledge and skills in the migration process in South and Central Asia**

S. Thieme, A. Ghimire, C. Hatcher, J. Samanchina

Drawing on various case studies – in South Asia, Central Asia, and Switzerland – this newly started research aims to achieve a more differentiated understanding of the relationship between migration and development, particularly surrounding circulation of knowledge and skills, as well as to generate evidence-based recommendations for supporting migrants’ ability to effect positive change. Two new PhD Students started their research by September 2010. C. Hatcher is going to work on internal migration and the *propiska* regime, a body of legislation that was historically enacted to restrict migration within the Former Soviet Union and remains in force in Kyrgyzstan today. He is particularly interested in understanding how migrants learn to negotiate and reshape the law in order for them to exercise their ‘right to the city’ and their right to participate in the appropriation of urban space. J. Samanchina (Bishkek Humanitarian University) will look at student migration of Kyrgyzstanis in Turkey.
Poverty-oriented development policy beyond the Millennium Development Goals
U. Geiser, A. Q. Suleri, D. Pécuard, St. Rist, B. Steimann

With 2015 fast approaching, many working towards the *Millennium Development Goals* realize how far out of reach they remain. Disillusionment is giving way to critical reflection, and the contours of a new critical discourse on global poverty and development are beginning to emerge. The project is examining emerging critical debates, which are likely to shape development policy and interventions for years to come. In a first step, such debates are documented within selected countries, i.e. Switzerland (by B. Steimann), Pakistan (by A. Q. Suleri), Nepal (by S. Sharma), India (by R. Ramakumar), Ethiopia (by A. Amsalu), Ivory Coast (by F. Kinds), Costa Rica (by M. Perez), and Bolivia. In addition, B. Steimann compiles an overview on debates at global level. These overviews will help to define core dimensions characterizing emerging debates, to be critically assessed in light of *NCCR North-South* own research findings. This is to lead to recommendations for a global post-2015 agenda firmly rooted in global and local experiences with poverty, poverty alleviation, and visions of well-being.

Mobility and migration: confusing terms, varying regional relevance, conflicting policies?
E. Schelling, S. Thieme, K. Grabs

Policymakers and development organizations see great potential in migration as a way of reducing poverty and promoting development, particularly in migrants’ countries of origin. However, region-specific knowledge of the factors limiting or supporting migrants’ contribution to development is needed. A new field of ‘mobilities research’ has arisen, encompassing complex studies of global and local movements of people, objects, capital, and information. Particularly in developing countries, people’s level of mobility determines their access to health services, education, employment, and various resources. This recently launched project draws on NCCR North-South study results in West Africa, South Asia, Central Asia, and Europe to compare and contrast the nature and handling of migration and mobility in each region. By identifying commonalities, differences, and gaps in knowledge, the researchers aim to enhance the debates and policymaking shaping people’s mobility, particularly that of vulnerable populations – pastoralists or migrant workers – whose well-being depends on their ability to be mobile.

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 were still ongoing in 2010. Conceptually, the project applied a livelihood perspective, focusing on institutional issues of (contested) access to assets and people’s entitlement to benefit from assets. These issues were addressed through the following activities:

Institutions, conflicts and livelihood realities in Nepal (www.nccr-nepal.org)
U. Müller-Böker, B. Upreti, K. Pyakuryal, S. Sharma, P. Nepali, A. Ghimire

The core of different case studies and syntheses was to analyze different rural livelihood strategies 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. A volume edited by B. Upreti and U. Müller-Böker examined the conceptual links between livelihood insecurity and social conflict in the Nepalese society. The contributions of Nepalese academic and non-academic scholars aimed to test the explanatory power of the different livelihood approaches in their field of research or practical experience. A. Ghimire successfully defended her PhD thesis on the livelihoods of
the internally displaced people in urban areas. P. Nepali submitted his PhD study on landlessness of socially excluded people. One action research project tests hemp production for livelihood security in Rolpa District and a second project aims to bridge the gap between research, policy and practice on land issues.

**Forest politics and livelihoods in Pakistan (www.nccr-pakistan.org)**
U. Geiser, A. Suleri, B. Shahbaz, Sultan-i-Rome
The nearly completed edited volume on *Forests, livelihoods and power relations in north-west Pakistan* provides research insights from the last years. The manuscript on forest history in Swat (Sultan-i-Rome) has been accepted for publication by Oxford University Press, Karachi. Emphasis is now on dialogues with practitioners within Pakistan (e.g. Federal Ministry of Environment; non-governmental organizations) as well as donors (e.g. 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 (www.nccr-pakistan.org)**
U. Geiser, A. Suleri, M. Jan, K. Siegmann, J. Grünenfelder
J. Grünenfelder’s research explores the interfaces between development practitioners and ‘villagers’ in rural Northwest Pakistan. In 2010, highlights were a presentation at the *Equality, Diversity and Inclusion* conference in Vienna and a short-term mentoring visit to the Brock University, Canada. M. Jan and K. Siegmann completed their action research on the impact of migration on the family members that remain in the villages.

**Rural inequalities in India**
U. Geiser, R. Ramakumar, C.P. Vinod, Indu K.
R. Ramakumar is in the final stage of analyzing dense village-level data on agrarian change in Maharashtra. In October, C.P. Vinod successfully defended his PhD thesis on the contemporary challenges faced by tribal populations in northern Kerala, at the University of Kannur in Kerala. Indu K. has submitted her PhD thesis on rural industries in Kerala to the Centre for Development Studies, Thiruvananthapuram, Kerala.

**Agro-pastoral livelihoods and institutional transformations in post-socialist rural Kyrgyzstan**
B. Steimann, U. Müller-Böker
This research concentrated on processes of post-socialist transformation at the micro level, with special attention to actors and institutions involved in agro-pastoral production and the reproduction of social inequalities. In his PhD study, B. Steimann analyzed the livelihoods of different rural 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. B. Steimann successfully defended his thesis in November 2010 and published selected results in scientific journals and the Swiss media.

**Sustaining livelihoods in trans-local and trans-national settings**
S. Thieme, S. Barbora
This Postdoc research project was completed by June 2010 and dealt with the multi-local dimension of people’s livelihoods and potentials and risks of this multi-locality. Case studies were carried out in Central Asia and South Asia. Activities during 2010 dealt with further publication of results such as the interlinkages between migration and animal husbandry as competing or complementary livelihood strategies as well as conceptual debates on the gendered interface between social capital and vulnerability.
Knowledge, power, politics
C. Zingerli, A. Uzeda Vásquez, T. Xuan Phuc
This Postdoc project focused on the political nature of knowledge in development research and policy, as well as knowledge-sharing between research, policy and practice. The project was completed in February 2010. Activities in 2010 were devoted to presentations, reports and publications, among them *A sociology of research partnerships for sustainable development* and *Changing development discourses over four decades of Swiss-Bolivian Development Cooperation*.

SNSF, KTI, SDC and other projects

On the quest for development – the Gorkhaland movement in West Bengal/India
M. Bishokarma, URPP Asia Europe
The Gorkhaland movement is demanding an independent state within the Indian Union for people who migrated from Nepal to Darjeeling during the British Raj. It is assumed that the demand for development serves as a constituting element of a *Gorkha identity*. The study aims to analyze the history, (contested) aims and strategies of the movement and to identify the different meanings of ‘development’ used by different actors.

Migration, multi-local livelihoods and societal change in Far West Nepal
U. Müller-Böker, M. Junginger, E. Pörtner, ProDoc SNSF
In Nepal labor migration, both international and internal, has always been an important feature of rural life. The aim of this study is to gain in-depth understanding of prevalent migration processes in Far West Nepal’s hill zone and its social and economic impact on people’s livelihoods in a post-conflict context. First results show that the prevalent migration patterns are governed by social relationships and that migration practices open up spaces for the transformation of traditional social institutions, such as the caste system. A case study in the adjacent lowland addressed intergenerational linkages between internal and international migration of rural-to-urban migrants.

Landscapes and habitats of the Alps: processes of perception
N. Backhaus, C. Reichler, M. Stremlow
The project, based on the four-pole model of landscape perception established by N. Backhaus, C. Reichler and M. Stremlow continued its activities. An analysis of A.T. Gersdorf’s journey to the Alps in 1786 was completed as well as its adaptation to urban and peri-urban contexts. An exhibition ‘Landschaft?’ questioning everyday perceptions of landscapes for 2011 is under preparation.

‘Malaysia as a home’: sustainable landscape development, environmental perception and practice
N. Backhaus, SNFS
The project aims at analyzing landscape changes and their perception in non-western contexts. SNSF funds for a short-term visit to the University Utara Malaysia (UUM) were approved and the joint research project will focus on critical landscape changes in Malaysia with an emphasis on ethnic differences.
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 on settled areas potentially at risk from natural hazards. The research - jointly implemented with the Centre for Urban Landscape, Zürcher Hochschule für Angewandte Wissenschaften - analyzed the governance processes by which these risk maps are translated into protective measures. An edited book on the project insights is nearing completion.

Appropriation of urban space by youths in Zurich
S. Landolt, 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 explores 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, it analyzed how the general public, actors of urban management and government solve emerging conflicts in public space. In 2010, highlights were a short-term visit at the Centre for Alcohol and Drug Research at the University of Aarhus, Copenhagen and several invitations to present results of the PhD project to experts (such as the German Federal Ministry of Health).

Views of the rural poor
S. Contzen, U. Geiser, U. Scheidegger (SSL), Research Fellow Partnership Program (SDC)
The project deals with the implementation of the Honduran Poverty Reduction Strategy (PRS) in two rural municipalities in western Honduras. It focuses on the livelihoods of rural poor and the political space for poverty reduction open to them in the frame of the PRS and other development interventions. During 2010, one four-month field trip was dedicated to qualitative livelihood interviews with poor rural households; and first results were presented at an international Central America conference in Brazil.

Ulrike Müller-Böker and collaborators
Bridge over the Bheri river in Surkhet district, Nepal.

Photo: S. Byrne, 2010

1.5 Political Geography (PGG)
Overview

**Political Geography** is a relatively new research group at 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, methodological) debates in human geography. 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 maintain dialogue with policy makers and development practitioners and establish partnerships with academics from the global South. We collaborate closely with colleagues from Human and Economic Geography, the sotomo group and an international network of scholars.

Our main highlights in 2010:

- Several people have joined the group in 2010: S. Byrne and D. Johnson started as PhD Students on 1 January; R. Emmenegger started as PhD Student on 1 July and Dr. T. Raeymaekers, formerly Conflict Research Group (CRG), University of Ghent, joined us as Research Associate on 1 October. A great welcome!
- T. Raeymaekers co-organized a workshop titled *Bringing the margins back in: war making and state making in the borderlands* with B. Korf, T. Hagmann (GIUZ) and J. Goodhand (SOAS) on 12-14 February in Ghent, Belgium.
- B. Klem and B. Korf co-organized the academic roundtable *Sri Lanka in Transition* in Utrecht, the Netherlands, in May, which was attended by many leading European scholars in Sri Lanka studies as well as numerous PhD students who presented fresh field findings.
- Several researchers of our unit went to extended field work abroad (B. Klem: Sri Lanka [February-May]; D. Johnson: Sri Lanka [April; December]; P. Hollenbach: Sri Lanka [November 09-February], B. Korf: Sri Lanka [February]; S. Byrne: Nepal [September-November])
- In May, M. Starmanns successfully defended his PhD at the University of Cologne. Congratulations!
- The unit organized or co-organized three internal reading seminars: on territoriality (June 7, with O. Graefe, C. Bichsel, University of Fribourg), on the developmental state (June 9, Einsiedeln) and on the anthropology of the state (Zurich). We co-organized with HGG the Zurich Lecture & Seminar in Development Geography with Professor S. Corbridge, LSE in November.
- B. Korf co-organized with C. Barnett, Open University (UK) and R. Lippuner, University of Jena, a Panel on ‘Geographies of rationality’ at the Annual Conference of the Royal Geographic Society – Institute of British Geographers (RGS-IBG) in London, 1 September 2010.
- The PhD Students of Political and Human Geography have joined hands to create a peer group on Development, Politics and Conflict (DEPOT). The group will serve as a platform for exchanges, mutual feedback, guest lectures, and other joint activities.
T. Hagmann went on a Public Scholar fellowship to the Woodrow-Wilson Centre in Washington D.C.; he will remain a research associate linked to our unit.

M. Starmanns launched a blog *Follow Ethical Fashion* in which he reflects critically on issues like CSR and Ethical Fashion. In the first three months the blog has an average of 800 visits a month.

**Main research activities**

**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 ceasefire in 2002. In 2010, the editors have done a final review and edit of the book chapters. The book will be published in January 2011 (Routledge, London).

**BORDERLANDS: Bringing the margins back in: war making and state making in the borderlands**  
(T. Raeymaekers, B. Korf, T. Hagmann with J. Goodhand, SOAS)  
This project challenges the received wisdom about contemporary state formation as a centrally guided, top down process. Instead it looks at today’s borderlands as key sites of contestation and negotiation that are central to state-making processes. Taking case studies from Africa and Asia, it gives a central place to the everyday experience with violent conflict and state formation at the border, and the way these affect the making and unmaking of political configurations. In a first step, a workshop was conducted in Ghent in February 2010 where more than a dozen invited papers were discussed. A selection of these papers will be compiled in an edited volume to be submitted to Palgrave in 2011.

**DECENTRALIZATION: Decentralization to the household: The case of the garee misoma in state-led rural road construction**  
(R. Emmenegger, T. Hagmann)  
Ethiopia has embarked on a radical reform of decentralization since the coming to power of the current EPRDF government in 1991. Recently, this newly established four-tiered administrative/decentralized structure has been strengthened by the creation of garee in the Oromia region. A garee consists of a group of households, which is mobilized for development purposes. Its establishment has been accompanied by considerable controversy. While critics describe the garee as a mechanism of control and repression, the government presents it as an answer to popular demand for development. Guided by anthropology and sociology of development, this research explores the role of garee in state-led development activities, particularly rural road construction. Field work has been conducted in 2009; data analysis was mainly conducted in 2010.

**DEVELOPMENT: Negotiating Rural Development at South Asia’s Frontier** *(SNF- ProDoc; jointly with Ulrike Müller-Böker, Human Geography)*  
(U. Müller-Böker, B. Korf, B. Klem, M. Junginger)  
The SNF ProDoc research module on Negotiating Rural Development in South Asia is a joint project with Human Geography and hosts two PhD studies, of which one is in Political Geography. B. Klem’s PhD research focuses on the war and post-war transition in eastern Sri Lanka. It takes on a range of interconnected political, ethnic and development issues that feature saliently in this transition. Within this broad canvas of issues,
it focuses on the role of the civil service, political entrepreneurs, and religious leaders. In 2010, B. Klem conducted three months of fieldwork in Sri Lanka and started to draft and submit PhD papers. On a more thematic note, he co-organized a reading and debating seminar on the Anthropology of the State literature, a topic that will be developed further in the coming period. A first article on ‘Islam, politics and violence’ is forthcoming in the Journal of Asian Studies.

**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 which was funded by ESRC. The project funding came to an end in 2009, but many activities are continuing in this network, which investigates linkages between aid, religion and conflict in the multi-ethnic and multi-religious east coast of Sri Lanka. From July to September 2010, Dr. S.H. Hasbullah, University of Peradeniya, 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. The research group continues to work on a joint book project [in preparation for Pluto Press] with the title *Temple, Church, Mosque and Checkpoint: A collaborative ethnography of war and peace in eastern Sri Lanka*.

**GIFT: Moral Geographies and the Tsunami Gift in Sri Lanka**  
(P. Hollenbach)

This PhD project is funded by the University Priority Research Program Asia and Europe (UFSP). The project 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, the research examines hidden ‘rules’ of humanitarian giving and how it creates an asymmetric relation of reciprocity and power. 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 moral discourse and practices of giving and how these translate into concrete aid practices and rituals. Field work is conducted in Sri Lanka and Germany.

**OLYMPIC: Swiss Olympic**  
(M. Starmanns)

The project *Political Corporate Social Responsibility (CSR) at Swiss Olympic* aimed at developing a strategy that makes Swiss Olympics’ procurement more sustainable. Swiss Olympic is the governing body of Swiss sport organizations. The project develops a CSR concept for sustainable procurement that follows a discursive approach. ‘Political CSR’ tries to avoid green washing by fully and honestly embracing CSR. Following a Habermasian concept of democracy, one of the key ideas of ‘political CSR’ is to set standards in a globalized economy in a discursive way, i.e., to involve stakeholders in a very transparent way. We thus invite stakeholders to comment the concept and guidelines - and later publish all comments and arguments, to make transparent which comments could be implemented and which ones could not.
PASTORALISM: Pastoral Conflicts in the Horn of Africa and Pastoral Development in sub-Saharan Africa
(T. Hagmann, C. Ifejika-Speranza, DIE)
Pasture based extensive livestock production is the dominant land use system in the Horn of Africa. Studies on the proliferation of violent inter-group conflicts in the past two decades have proliferated. Tobias Hagmann and Chinwe Ifejika Speranza have edited a special issue that looks at new avenues for pastoral development in sub-Saharan Africa and which has been in European Journal of Development Research in November.

STATE: Negotiating Statehood in Africa and Political Orders Beyond the Nation-state
(T. Hagmann, D. Péclard, swisspeace)
Academic and policy discourse nowadays portrays post-colonial African states in virtually pathological categories; they are perceived to be threatened by ‘collapse’, ‘failure’, ‘fragility’ and ‘weakness’. Following a systematic critique of the state failure debate, the objective is to come up with an alternative framework for the study of political orders within and beyond the nation-state in contemporary Africa. In this process T. Hagmann and D. Péclard have co-edited a themed issue on ‘Negotiating Statehood in Africa’, which has appeared in the journal Development and Change. The same collection is to appear in 2011 as an edited volume by Blackwell-Wiley.

(T. Hagmann, Woodrow Wilson Center)
This project elaborates a comparative study of key political and state-building processes in the Republic of Somaliland (Northern Somalia), the autonomous Republic of Puntland (Northeast Somalia), south-central Somalia, the Somali region of Ethiopia or Ogaden and the Northeastern Province of Kenya (Somali region of Kenya). While Somalia is commonly associated with state collapse, recent empirical research demonstrates that numerous state and non-state governance arrangements have emerged in these different Somali entities since the outbreak of the Somali civil war in 1991. The proposed study will provide key insights into the variations of Somali statehood and the reasons why some of these political entities became successful state-builders (Somaliland, Northeastern Province of Kenya) while others produced mixed results (Ethiopia’s Somali region, Puntland) or failed completely (south-central Somalia).

ETHICAL TRADE: Corporate Social Responsibility in Global Garment Production Networks.
(M. Starmanns)
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 analyzed are the credibility, the impact and the root causes. On a more general level the analysis might offer a framework that allows differentiating 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 MA theses have been supervised as part of the ETHICAL TRADE project. The first analyzed how various Swiss companies implement social standards, and the other one focuses on one specific Swiss company and analyses changes in this company in detail.
VIOLENCE: Living with Violence: Rural Livelihoods in Mid-Western Nepal During and After the Maoist People's War
(S. Byrne, B. Korf, U. Müller-Böker, T. Rauch, B.R. Upreti)
This SNF-funded research project investigates the impacts of different forms of violence, coercion and control on rural livelihoods in Mid-Western Nepal during and after the Maoist conflict. It studies how different social groups and individuals navigate through the difficult social and political terrain of rural Nepal. The initial focus is on understanding the strategies developed by local state and non-state development workers, as well as local businesspeople, for dealing with insecurity, negotiating access and mobility, delivering services - in other words, strategies to continue working. S. Byrne conducted two months of field work in Surkhet and Kathmandu in September- November.

Benedikt Korf and collaborators
Economic Geography crew at their Christmas dinner.
Overview

After a long interim period following the retirement of H. Elsasser, C. Berndt started as the new Head of the Economic Geography Research Unit on March 1st. In addition to everyday commitments (i.e. teaching) the first semester was used to (1) reorganize the group personally, (2) develop our research agenda and (3) adjust the teaching portfolio administered by economic geography.

During the first two semesters we gradually reorganized the group personally, striving for a mix of established and new staff. Concerning the latter, P. Goeke started his position as Wissenschaftlicher Mitarbeiter on March 1st, P. Latzke assumed his post as assistant on August 1st and J. Herrigel began her term as PhD Student on 1st September. In November we advertised a two year Postdoc position internationally, negotiations with the successful candidate are still ongoing.

With regard to research our aim is to contribute to the growing international and interdisciplinary body of research that seeks to offer alternatives to orthodox conceptualizations of the economy. We get our inspiration from a variety of heterodox approaches, including poststructuralism, political economy, systems theory and gender studies. We apply these perspectives with the aim to caution against overtly general representations of contemporary globalization processes, stressing the paradoxical and uneven realities of global capitalism. Empirically, our work focuses on the geographies of global production, on labor markets, and on the gendered nature of the global economy. We study these phenomena both in the global north and the global south, with special emphasis on Switzerland, Germany and North America.

Our aim is to create a stimulating intellectual environment, fostering an internal culture that enables open scientific debate and discussion. To this end, we introduced a regular ‘discussion forum’, allowing a mix of activities, starting from presentations of group members or external guests, the discussion of stimulating scholarly texts, the critical engagement with papers or grant proposals at an early stage etc. In addition to this, individual highlights include:

- C. Berndt started a five year stint as a member of the editorial board of Transactions of the Institute of British geographers in February.
- P. Goeke applied successfully as a leading applicant for a grant by the German Research Association (DFG) (with Johannes Wirths). From 2010 until 2013 the DFG will fund two workshops of the research network with 15 members from Germany, Austria and Switzerland. The network is about systems theory and geography.
- K. Schwiter successfully defended her PhD thesis Lebensentwürfe. Junge Erwachsene im Spannungsfeld zwischen Individualisierung und Geschlechternormen at the University of Basel and was awarded a summa cum laude. In her PhD project, she analyzed the narratives of young Swiss adults on their life plans. The project was part of the interdisciplinary PhD program Gender in Motion at the University of Basel. Results were presented at the Annual Conference of the Royal Geographic Society in London. The monograph will be released in May 2011 by Campus Publishers.
- E. Bühler is a member of a recently established research collaboration between the Geography Departments of the Universities of Zurich and Bern. Together with Professor D. Wastl-Walter (PL) and PD Y. Riaño (PR) she successfully applied for a research project in the framework of the NRP 60 Understanding inequalities of access to the labor market: The intersection of gender and ethnicity.
Finally, the Economic Geography teaching syllabus was adjusted, taking account of the shifting research interests of the group and offering a more varied choice for Bachelor’s and Master’s students. For instance, we introduced a new project-oriented course (GEO 313) at the Bachelor level with the aim of confronting students with practical work earlier than was hitherto the case. The first course focused on low-wage service work in the Zurich region, permitting an engagement with the immediate regional environment.

**Main research activities**

**Understanding inequalities of access to the labor market: The intersection of gender and ethnicity**

*Duration: 2010-2012 (Funding: SNF, NRP 60; E. Bühler, Y. Riaño & D. Wastl-Walter (PL) Dep. of Geography, University of Bern)*

This joint research project between the geography departments of the universities of Zurich and Bern (PL Bern) is carried out in the framework of the National Research Program NRP 60 *Gender Equality*. An important aim is to understand how women’s access to the labor market is related to the various arrangements made with their household partners regarding division of housework and paid employment. Three sets of questions will be examined in order to contribute to a better understanding of the intersection of gender and ethnicity creating different situations of inequality in the field of work: (a) how the intersection of gender and ethnicity/national origin generates unequal access to paid employment; (b) the extent to which individuals succeed in applying, maintaining and further developing their professional qualifications in the labor market, (c) the strategies that individuals devise to apply and acquire new professional qualifications. The analysis will combine macro- and micro perspectives and apply quantitative and qualitative methods.

**Clean Cities, Dirty Work? Geographies of Commercial Cleaning in Frankfurt and Nuremberg**

*Duration 2010-2012 (Funding WISAG AG; C. Berndt and P. Latzke)*

How are clean places being produced? This is the main question of this research project. ‘Cleaning’ would be the gut reaction, but this is far too shortsighted. Clean rooms are an integral part of our immaterial knowledge economy, whether materialized in consumer spaces such as urban entertainment centers, hotels or the inner city, or the shiny offices of highly specialized service firms. The work that is invested into these spaces is normally done invisibly and literally put out of sight, given that in the perfect world of the knowledge economy, dirt and waste are a threat to smoothly operating value chains and urban spectacles. It is in this context that this research project seeks to lift the veil, focusing on the workers, and putting emphasis on daily cleaning practices, the disciplinary regime of formal and informal rules and norms, and the way in which daily work has changed as a brave new world of immaterial production and symbolic consumption turns its back on those who literally perform contemporary urban geographies with their hands. A first round of field work has been conducted in the Frankfurt region in spring and summer 2010.

**Life Plans. Young Adults caught between Individuality and Gendered Norms.**

*Duration 2005-2010 (K. Schwiter)*

How do young adults plan their lives? What do they expect from their futures? How do they anticipate their working careers? Do they consider having children? How would they want to organize work and care in their future families? And to what extent do their expectations (re)produce gendered norms? The study took a dis-
course theoretical perspective and explored these questions by analyzing narrative interviews with young adults aged 24 to 26 in the German speaking part of Switzerland. The project was completed with K. Schwiter’s PhD defense in May 2010.

**Performing regional (dis-)integration: Transnational markets, mobile commodities and bordered north-south differences**

Ongoing (C. Berndt and M. Boeckler)

Being implicated in an ambivalent play of both border crossing and drawing, global commodity chains are an ideal organizational field to analyze the fundamental paradox of global connectivity. Approaching the ‘contingentization’ of borders from a perspective informed by the performativity approach to markets, our research starts from the assumption that this paradox is particularly salient in the context of commodity chains which connect the global south with the global north. Taking the example of selected agro-commodities and two border regions (Morocco/EU and Mexico/USA), we follow the links and heterogeneous associations that stretch from the border to the fields, supermarket shelves and standardization agencies to migrant labor, quality control apparatuses and so forth. By reading commodity chains from their literal limits, that is, from the border and from the margins, we focus on an element of this global assemblage that is normally taken for granted and excluded from academic and public discourse. Fieldwork has been conducted in spring in Baja California (Mexicali region, San Quintín). A paper summarizing the interim findings, both empirically and conceptually, has accepted for publication by Environment and Planning A and is due to be published in 2011. In December first steps have been undertaken to set up an international and interdisciplinary research collaboration with J. Bair (University of Colorado, Boulder, USA) and M. Werner, York University, Canada.

**Continuity and Change of Gender Inequalities in Educational and Vocational Pathways. A Mixed Methods Study**

Duration 2010-2012 (K. Schwiter)

The Swiss occupational structure is highly segregated by gender. Men rarely work as nurses; women hardly ever become bank directors. While other gender inequalities attenuate, occupational segregation shows a marked persistence. Furthermore, it is distinctly higher in Switzerland than in most other countries of the OECD. This project investigates the reasons for gendered occupational segregation by analyzing educational and vocational pathways in Switzerland. It builds on the quantitative longitudinal data of the TREE survey, which monitored the occupational pathways of a cohort of 6000 school leavers from 2000 to 2010. It combines the quantitative analyses with qualitative interviews with a number of the surveyed young adults. The project is funded by the National Research Program 60 of the Swiss National Science Foundation. It is hosted at the University of Basel and chaired by A. Maihofer and M. Bergman.

**Sustainable design, management and appropriation of urban public parks**

Duration 2005-2010 (Funding SNF: NFP 54; E. Bühler, H. Kaspar, F. Ostermann, S. Timpf)

Public parks are an element of the built environment and as such they can be attributed a high social sustainability potential. As nature-oriented green and free spaces they contribute to the quality of life in cities in many ways. As public spaces, parks are principally accessible to everyone in today’s democratic societies. However, the normative logics of equal access do not mean that de facto no processes of social exclusion are taking place in public free spaces. In this project, we investigate how neighborhood parks in the city of Zurich are appropriated by
visitors and ask for processes of inclusion / exclusion. It aims at identifying elements of design and planning as well as strategies of management and operation that foster a socially sustainable appropriation of public areas. The results were published as book in 2010 as ‘Sozial nachhaltige Parkanlagen’ (vdf Verlag).

**Material Economic Geographies**
Ongoing (C. Berndt)
The starting point of this ongoing theoretical endeavor is the observation that explanations in the social sciences often do not explain anything at all. What happens instead is the mobilization of conceptual black boxes as final objects, that is, entities that are taken for granted and are rarely reflected upon. Within the subdiscipline of Economic Geography there are many examples, as a rule shared with other disciplines, such as the market, the firm, the value chain, labor and so on. For some time now a transdisciplinary movement has emerged whose representatives take issue with this approach. Rather than starting with an imagination of our world as a mosaic of clearly limited and demarcated pre-given entities (economy, society, state, market, firm, individual subject etc.), the key question is to understand the processes and operations that qualify persons, organizations or things as being ‘economic’. Regardless of their intellectual background, contributions look at the rationalities, frames of action and technologies which render things, behaviors and processes ‘economic’. Conceptualized as being the result of multifaceted processes of economization, shared understandings of what it is to be ‘economic’ are always precarious and therefore open to contestation. A second progress report in Progress in Human Geography has been accepted for publication and is due to be published in paper in 2011 (with M. Boeckler). A paper dealing with the financial crisis was submitted to Zeitschrift für Wirtschaftsgeographie is currently being reviewed. In December a chapter contribution to the revised edition of ‘A Companion to Economic Geography’ will be finalized and submitted for review.

**Systems theory in Geography**
Ongoing (P. Goeke)
Systems theory is not a single theory but rather a scientific program. As such it integrates modern theorems about systems, insights from cybernetics and evolution theory to name but a few. It is both a social theory and a theory of society. It cultivates a radical constructivism and assumes at the same time that the operations within society, i.e. communications are real. The only quasi-ontological assumption is: systems exist. System theory practices what it preaches: the reduction of complexity – at the cost of very high new internal complexity. The reduced complexity is not excluded complexity, but rather ‘sublated’ complexity. P. Goeke and colleagues submit in all modesty that systems theory is able to open up new factual possibilities of scientific investigation and reflection within geography. Systems theory allows introducing topics and problems from the theory and is thus less driven by normative outrage and the zeitgeist and works more systematically than other theories.

**Creative Politics**
2010-2013 (Funding: DFG; with P. Goeke and P. Lindner)
Being part of a wider research focus on Neoliberal Urban Governance this project investigates the policy implications of the increasing attention of what has been termed creative industries in larger cities. The main aim is to analyze whether a new policy field (creative politics) has emerged in the wake of engagement with the economic activities comprising the creative industries and to how this links with a more general trend towards
a mobilization of diversity in a neoliberal policy context. Having just started, a PhD Student has been hired and first empirical steps have been undertaken. In addition to this, a number of integrative workshops with the members of the whole research network following the initiation of the joint collaborative project in May.

**Project Networks – Structures of the next society?**  
(P. Goeke, since 2008)

New forms of project cooperation can be seen in different contexts. The so-called *City Ambassadors* in Frankfurt/Main who are funded by the large foundation *Stiftung Polytechnische Gesellschaft* or the learning network *Trainees escort Pupil* funded by state institutions are just two examples. Networks within the creative industries are other more prominent examples. They all demonstrate how traditional principles of organizations are replaced by new principles such as heterarchy or open and more flexible borders. These new forms can be labeled as project networks. The term project indicates that the task is unique and usually limited. Network points to the fact that differentiated and highly specialized units join together without giving up their independence. The leading research question is whether these observable changes herald the structures of the next society. The questions are dealt within the framework of systems and organization theory.

*Christian Berndt and collaborators*
APEX ready for installation in the DLR DO-228 aircraft (left). The optical unit (189 kg) is lifted with a hand-operated crane into the aircraft. The (blackened) entrance slit is easily visible below the baffle (40 cm).
Overview
We continue to set our focus on developing, within the whole value added processing chain in remote sensing, products that are of relevance for a larger user community. The currently established technology mix using active and passive remote sensing approaches in combination with a multi-scale approach led to some promising activities. We contribute by linking in-situ observations with air- and spaceborne measurements to a more holistic view of the System Earth. The focus is on approaching complete observational systems. This approach allows smart combinations of technologies and methods covering typical land surface processes at their relevant (spatial, spectral, and temporal) scales. Substantial data acquisition efforts were performed in 2010, allowing solid product generation with validated ground measurements. These efforts included technologies, such as spectroscopy, SAR, and LIDAR. Important contributions and progress have been made to improve the quality of land surface oriented Essential Climate Variables (ECVs) as defined by GCOS.

Instrumented approaches and observations took much of the time in 2010. Several highly complex campaigns were carried out in the course of 2010, including SAR campaigns using non-linear flight tracks and tomographic approaches, combined multi-spectral and –temporal LIDAR campaigns, as well as airborne spectrometer campaigns over a large diversity of natural and man-made test sites. Despite the large infrastructure efforts needed for such campaigns, data collection and processing has been optimized and RSL is well positioned to provide regional scale state-of-the-art data of all three technologies, including products.

RSL has set its focus on ‘measurements’, ‘products’ and ‘policy’. In particular we have made substantial inroads in the policy part during 2010. Various invitations to participate at high level decision boards (GEO, WMO, CEOS, GCOS, ESA, EC, etc.) have been realized and methods developed at RSL have found their way into large upcoming satellite projects (e.g. ESA GMES Sentinel-2, ESA Earth Explorers FLEX, SpeCL, and TRUTHS). A main focus will now be on the generation of scientific products using remote sensing data in 2011. Primary interest will be on physically based modeling and retrieval of structural, physical and chemical variables of the biotic and biotic environment. Inverse problems will also be an important focus, including the optimization of ill-conditioned and ill-posed approaches. In order to better understand coupled systems, further emphasis will be put on previously unknown or poorly described feedback mechanisms at the interfaces of the biosphere, cryosphere, exosphere and atmosphere. This will also require robust processing and preprocessing algorithms of the highest standards, including coupled sensor-atmosphere and sensor-geometry/radiometry models.

The Faculty of Science has agreed to implement an assistant professor tenure track of remote sensing at the RSL. This process will be a substantial chance for RSL to broaden expertise and competencies in remote sensing in Zurich. Finally, we have been very honored by the fact that the Faculty of Science (MNF) of the University of Zurich has awarded an honorary doctorate to Prof. Dr. Susan L. Ustin from the University of California in Davis (USA).
Research Projects SARLab

SARLab’s research activities are focused mainly on the development of SAR image generation and analysis methods. The ongoing aim is to lay the groundwork for new products and applications. Within the framework of RSL’s ultra-wide-band project, bistatic, dual-polarimetric images of a test site in Switzerland acquired with FOI’s CARABAS sensor were investigated with the goal of classifying urban and natural scatterers. The data were also used to develop an algorithm making use of the low-frequency penetration ability of the sensor to map glacier volume. A three dimensional processor that takes refractivity into account was implemented. It locates the depth of the glacier’s maximum backscatter response at each pixel position, providing information on the glacier bed topography. Additionally, a moving object tracking algorithm was developed for highway vehicle tracking using a Ka-band UAV-mounted sensor. For the last few years a long-term goal has been the extension of the functionality of the Modular SAR Processor (MSP), aiming to process SAR data from highly agile platforms. In this context, new procedures covering different steps of image focusing were developed. These include a new algorithm for performing Range Cell Migration Correction (RCMC) as well as several methods for the evaluation of Doppler shifts. These algorithms were successfully applied to the processing of millimeter-wave data of a UAV system.

During 2010 we managed to obtain SAR raw data from a new kind of sensor for the first time, namely a Frequency Modulated Continuous Wave SAR system (FMCW-SAR). Preliminary results of focusing these data look promising. A novel three dimensional polarimetric time-domain processor was developed based on multi-look beam forming methods, aimed at mapping forest volumes in both L band (for canopy layer and ground level detection) and P-band (for good foliage penetration). The processor was evaluated for different forest structural types, and was validated using LIDAR ground truth data. It shows a good potential for estimating forest heights. Two SAR data acquisition campaigns were carried out, one with the new DLR F-SAR sensor and the other with the MEMPHIS sensor from the Fraunhofer FHR institute. The objectives of the F-SAR campaign lie in the fields of polarimetry, moving target identification and SAR focusing for circular flight tracks. With MEMPHIS, a circular polarimetric antenna was used for the first time. Both campaigns were carried out over the same test sites within a 10-day window. The first results from both campaigns look very promising.

In the field of airborne interferometric SAR, an algorithm combining information from the navigation data with multisquint processing of the interferometric SAR data was implemented in order to correct phase errors in the azimuth direction. Using this new correction for MEMPHIS interferometric data, digital elevation models could be generated with an accuracy of 0.6 m (1 sigma). Through polarimetric SAR analysis, realistic simulations of radar backscatter from forested areas were achieved. It was shown that simulations of typical Swiss forest stands can be feasibly implemented, with the backscatter characteristics showing good agreement with real acquisitions. These characteristics included features specific to certain structural parameters, strengthening the evidence for the validity of the modeling algorithms used. The emphasis within our spaceborne SAR activities is on geometric and radiometric quality control for Europe’s ENVISAT ASAR instrument and the Japanese Aerospace Agency’s (JAXA) ALOS PALSAR radar, helping to ensure the highest possible imaging quality from these systems. The inter-product radiometric consistency of ASAR and the geometric consistency PALSAR products were analyzed and reported to ESA. Further tests were made on ASAR data after the ENVISAT satellite was transferred to a new orbit in October.
Two application-driven goals were pursued, aiming to support hydrological models and improve biomass estimation. First, nearly four hundred ASAR Wide Swath images covering Switzerland were processed for the years 2002 to 2010. A strong height-dependent springtime melt signal is being studied as a possible input to hydrological models. Second, the first L-band mosaic of Switzerland was generated, using 31 PALSAR images acquired with dual-polarization. The radiometric calibration was of such high quality that no boundaries between adjacent tracks or frames were visible in the mosaic. This data set will be used to evaluate potential for biomass estimation in Swiss forests.

The 2010 meeting of the calibration/validation SAR group of the committee on Earth observation satellites (CEOS) was organized and held at RSL from Aug. 25 through 27. A variety of papers were presented on current and future satellites, radiometric terrain correction, calibration standards, and calibration methods. One session was devoted to results from the German TanDEM-X mission where two radar satellites are for the first time flying in close formation to generate a height model for the Earth using SAR interferometry. New geometric quality indicators for SAR images were proposed to ESA in the form of a report and a presentation at the CEOS workshop. The CEOS SAR subgroup recommended to its ruling body, the CEOS working group on calibration and validation (WGCV), that terrain-normalized radar backscatter should be included as a standard product in the future.

In 2010 two SARLab members were presented with awards:

- A. Faes received the Karl-Kraus Nachwuchsförderpreis 2010 für Photogrammetrie, Fernerkundung und Geoinformation for her Master’s project on glacier movement estimation using TerraSAR-X data. It was presented to her by the German, Austrian and Swiss Photogrammetry and Remote Sensing Societies during the Dreiländertagung workshop in Vienna.

- O. Frei was awarded the third prize Student Paper Award at the EUSAR 2010 conference in Aachen, Germany, for his work, entitled 3D SAR Imaging of a Forest Using Airborne MB-SAR Data at L- and P-Band: Data Processing and Analysis. Over 500 scientists from about 30 countries participated in this conference. This work was jointly performed by the SARLab staff members: O. Frey, M. Frioud, D. Henke, C. Magnard, E. Meier, E. Mendez, A. Schubert, D. Small and L. Zuberbühler.

SARLab staff members peer-reviewed 17 journal papers, 2 project proposals and tens of abstracts for the international EUSAR 2010, IGARSS 2010 and CEOS SAR conferences.

### Research Projects SpectroLab

The Airborne Prism EXperiment (APEX) is currently in the final stages preceding formal ESA acceptance. Instrument upgrades have been installed and performance tests were carried out in an extensive flight campaign in June/July 2010. The data acquisition took place over selected and well characterized vicarious calibration sites in Belgium and Switzerland. Results have been reported to ESA and close-out of phase C/D is expected by the end of 2010 or beginning of 2011.

Within the FP7 project EUFAR (European Facilities for Airborne Research, 33 partners) RSL takes part in the Joint Research Activity 2 (JRA2). JRA2 focuses on uncertainties and quality indicators for airborne spectrometer data. RSL contributed with the implementation of both common and APEX specific quality indicators and metadata parameters within the APEX Processing and Archiving Facility. In 2007, RSL joined HYPER-I-NET (Hyperspectral Imaging Network) together with 15 European partners. The network, funded by the FP6 Marie
The Curie Action for Research Training Networks, aims to bring together experts in imaging spectroscopy and forge scientific collaboration. During the 2010 Hyper-I-Net summer school, RSL organised a field spectrometer intercomparison experiment involving 15 devices at DLR’s calibration home base in Oberpfaffenhofen. This unique dataset is currently being analysed.

In the context of the Belgian-Swiss MICAS project, surprisingly large differences were found in the evaluation of two independent water-atmosphere radiative transfer models considered for the APEX water processor. The thorough investigation of the models revealed shortcomings in a widely used approach. Future efforts will emphasise a broad review and improvement of shortcomings using anisotropic scattering approaches. The results of the study will be used to elaborate conclusions relevant in the design of monitoring programmes according to the European Water Framework Directive or similar Swiss regulations.

The RSL field and laboratory goniometer system has been proven to be a well characterised and stable device for measurements of spectro-directional reflectance behaviour of remote sensing targets. Its field setup allows for simultaneous measurements of the target reflected radiance on the one hand and the incoming diffuse directional component on the other. This setup paves the way to proper correction of directional effects in Earth observation data for improved derivation of Earth System Science products from remotely sensed data sets.

RSL’s spectral database system SPECCHIO was further developed during 2010. The main focus was on the implementation of (a) support for new instruments, (b) enhancement of the metadata parameters and (c) improving the search and visualisation functionality. SPECCHIO is now recognised as one of the most advanced systems in the field of spectral databases within the remote sensing community. The system remains open to the public via the online database on http://www.specchio.ch and via project specific databases with access restricted to research partners on http://specchio-pub.geo.uzh.ch.

Radiative transfer in the atmosphere and its modelling are very important for climate and remote sensing research. The fast and Simple Model for Atmospheric Radiative Transfer (SMART) was expanded, validated and published in 2010. Furthermore, a new version (iSMART) was developed specifically for the retrieval of atmospheric particles from remote sensing data and its application using APEX data shows promising results.

In 2010 RSL continued to scientifically contribute to the FP6 EC project ECOCHANGE (Biodiversity and Ecosystem Changes in Europe, http://www.ecochange-project.eu/). The airborne spectrometer products of specific vegetation optical indices and quantitative estimates of the leaf chlorophyll content and leaf area index were provided by RSL to analyse the functional diversity of Alpine grassland ecosystems in Switzerland and France. The possibility of using local scale airborne spectrometer data at sub-metre spatial resolution to retrieve plant functional traits and to assess plant functional diversity is currently being investigated.

A new project of the European Space Agency (ESA), called Sentinels for Science (SEN4SCI, http://www.geo.uzh.ch/microsite/sen4sci/) was awarded to RSL in May 2010. The main objective of SEN4SCI is to enable ESA to facilitate a more complete exploitation of the scientific potential of the GMES satellite fleet represented by Sentinel 1-2-3 (http://www.esa.int/esaLP/SEM097EH11TF_LPgemes_0.html) in the Land-Ocean-Cryosphere (LOC) disciplines. The final deliverable of the project is a roadmap of six new Sentinel LOC scientific products, including their processing chains and validation schemes. Within the framework of SEN4SCI, the Sentinel Scientific Products for Land, Ocean, and Cryosphere: Assessment & Consolidation Workshop will be organized for a broad scientific remote sensing community in Frascati (Italy) between 22-25 March 2011.
The Swiss University Conference and ETH-board funded Hyper-Swiss-Net project entered into its third year. The project focuses on consolidation of the scientific design, development of a teaching course and dedicated algorithms for parameter retrieval from APEX imaging spectroscopy (IS) data. In this context, the APEX vegetation processor was further developed within the RSL-project module. During an extensive field campaign in June 2010, APEX IS-data were acquired. Field investigations were carried out in parallel to calibrate and validate APEX data and algorithms.

As a follow-up of the ESA funded CEFLES2 project in 2007, several aspects regarding the estimation and interpretation of the sun-induced chlorophyll fluorescence signal from optical measurements have been investigated together with partners from the German Research Centre Jülich, Freie Universität Berlin and University of Milano-Bicocca. The focus of the work in 2010 was on evaluation of uncertainties in fluorescence retrieval, i.e. the impact of instrument characteristics, observation geometry, and atmospheric properties on the accuracy of the fluorescence retrieval.

RSL substantially extended its field and laboratory equipment, including a high-resolution Ocean Optics JAZ Spectrometer for fluorescence measurements, a thermal camera and several high-accuracy field GPS devices. A dedicated fixation table (breadboard) and corresponding fixation elements were acquired for RSL’s new instrument laboratory, which will be used for calibration of the spectrometers and for laboratory measurements, including but not limited to vegetation samples and soil probes.

SpectroLab staff were involved in 21 peer reviewed journal papers and 19 conference proceedings contributions published in 2010. Staff members performed exhaustive article peer reviews, four research proposal reviews, as well as conference abstracts and full paper reviews for several international conferences in 2010. This work was jointly performed by the SpectroLab staff members (E. Alberti, A. Damm, A. Faes, G. García-Santos, A. Hüni, P. D’Odorico, F. Dell’Endice, M. Jehle, M. Kneubühler, Z. Malenovský, D. Markulin, D. Odermatt, Y. Rezaei, M. Schaepman, L. Suárez, D. Schläpfer, F. Seidel, D. Treichler, S. von Büren, J. Weyermann).

Research Projects LiDAR Group

Having been established as a new research area at RSL, this year’s work in the area of airborne and terrestrial laser scanning was focused mainly on acquiring data and projects for answering pure and applied research questions in the biosphere and cryosphere. A total of six airborne laser scanning (ALS) campaigns were carried out in Switzerland, with a diverse set of target applications. For instance, larger areas in the canton of the Grisons were covered in order to define and establish new biophysical products in operational forest inventory. In the GLAXPO project (a joint venture of 3G and RSL), the last set of the multi-temporal ALS data was acquired on the Findel Glacier, contributing to more accurate mass balance estimates and a spatially explicit description of snow-accumulation. RSL has as well acquired its first multi-temporal ALS dataset of a deciduous forest and a first multi-spectral ALS dataset. Both open exciting prospects for research for 2011. The LiDAR group at RSL has led and participated in international efforts for space research: we led a proposal aiming at a larger ESA project targeted at simulation of satellite signals based on an accurate description of the three-dimensional distribution of vegetation and participated in a proposal for a future ESA earth explorer based on multi-spectral LiDAR technology. In addition to providing talks at various national and international workshops, a paper was published in a highly ranked remote sensing journal, which focusing on vertical stratification in terrestrial ecosystems. Members of the LiDAR group provided abstract reviews for the Dreiländertagung of SGPF.
DGPF and OVG. These activities were performed by members of the LiDAR group, F. Morsdorf and P. Jörg, with support from other RSL staff members.

**National Point of Contact (NPOC)**
The scientific NPOC was mainly involved in consulting, research and development activities in accordance with its mandate from the Swiss Space Office at the State Secretariat for Education and Research. In continuation of a 2009 study, the scientific NPOC investigated 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 (GMES). This work serves as a basis for political decisions concerning long-term access to remote sensing products for Switzerland.

RSL and in particular the scientific NPOC conducted a complete user study on *Geoinformation needs in the Department of Foreign Affairs*. Members of the GIUZ Human Geography unit contributed to the preparations for the interviews.

The *Swiss Commission on Remote Sensing* (SKF) asked the scientific NPOC to carry out a study on Swiss test sites for remote sensing needs. General requirements and specifications as well as information on available sites are currently being consolidated in cooperation with Swiss exponents in remote sensing.

The NPOC at swisstopo and RSL significantly supported UNITAR/UNOSAT in a joint rapid response to the Haiti earthquake during their engagement in the damage assessment on behalf of UN, World Bank and others. These activities were performed by NPOC staff members F. Seidel and D. Treichler, with support from other RSL staff members.

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

Early training of future GIVA Scientists.

Photo: S.I. Fabrikant, 2010
Overview

While GIWA members kept busy pursuing the bleeding edge of research, teaching and service in Geographic Information Visualization and Analysis, one landmark event stood out prominently in 2010: Together with the GIS group we organized, hosted, and pro-actively participated in the World Cup of GIScience, the Sixth International Conference on Geographic Information Science (http://www.giscience2010.org/) held at the UZH Irchel campus in mid September. Over 350 researchers from all over the world gathered to discuss the fundamentals of GIScience, share ideas, methods, and tools in workshops, oral sessions, and plenary events.

A. Çöltekin (3DGI group) organized and held an international workshop on virtual globes at the AutoCarto 2010 conference in Orlando, Florida (USA), in collaboration with K. C. Clarke (UCSB). While in Florida, she took the opportunity to deliver an invited talk at the College of Engineering and Computer Science colloquium series at Florida Atlantic University. She was elected to be the scientific secretary for the ISPRS working group WG II/6 Geographic Visualization and Virtual Reality (2010-2012). Master students S. Schnur and M. Salahi together with K. Bektas and A. Çöltekin presented their extended GIScience2010 abstract in Poster format to an international expert audience. Doctoral student K. Bektas’ extended abstract (supervisor: A. Çöltekin) was published in the proceedings GIScience2010 doctoral colloquium.

The GeoRel group contributed to the 6th Workshop on Geographic Information Retrieval held in Zurich in February, where S. De Sabbata presented a paper on the criteria of geographic relevance (co-authored with T. Reichenbacher). This research line leads to an extended oral abstract presentation at the above mentioned GIScience2010 conference. T. Reichenbacher, being program co-chair for GIScience2010 was kept busy throughout the year co-organizing various conference events and co-editing the conference proceedings published with Springer’s Lecture Notes in Computer Science, together with S. I. Fabrikant, M. van Krefeld (Utrecht) and C. Schlieder (Bamberg).

J. Wilkening and A.-K. Lautenschütz (advisor: S. I. Fabrikant) also had extended abstracts accepted at GIScience2010, and presented first results of their dissertation projects at this conference. A.-K. Lautenschütz co-organized the newly established GIScience Doctoral Colloquium together with researchers from the University of Münster (Germany), and co-edited its respective proceedings.

S. I. Fabrikant continued co-organizing various sessions at the world’s largest gathering of geographers, the Association of American Geographers’ (AAG) annual meeting, this year in Washington, D.C. with an all-time high of over 8200 people attending. Her three respective sessions on geographic information visualization featuring 15 papers were again packed with food for thought and attendees. Luckily, S. I. Fabrikant had been invited to deliver two department colloquia just after the AAG meeting, at the Ohio State and the Michigan State University, respectively, while the Icelandic volcano kept erupting and essentially eliminating transatlantic air traffic for more than a week. S. I. Fabrikant also delivered various invited talks in the context of future research policy needs and technology foci in Europe, such as at the Challenges of Visualizing Biological Data Symposium, organized jointly for the first time by the British Biotechnology and Biological Sciences Research Council (BBSRC) together with the Arts and Humanities Research Council (Bristol, UK), then on Validation of Geo-Information Products for Crisis Management (Ispra, IT), and finally at the Austrian Alpbach Forum Technology Talks (Alpach, Tyrolia).
As in previous years we hosted a cartography intern from the Fachhochschule Karlsruhe. S. Kaspar seemed to have liked his internship so much, that he embarked on a Master’s thesis project with GIVA (advisor: S. I. Fabrikant). His empirical research on cartograms was awarded an AAG Cartography Specialty Group Master’s thesis research grant. We are equally happy to report that, as in past years, our MSc graduates have found education related and fulfilling jobs after their graduation, and, as always, 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 around 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, and 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-subjects experiments). More detailed information on the various GIVA research projects can be found on respective web pages maintained by the UZH (see URLs listed below).

**PopEye 2: Visual Analytics of Spatio-Temporal Gaze Point Patterns in Eye Movements (SNSF)**
(http://www.research-projects.unizh.ch/p7787.htm)

This is a 2-year continuation by PI S. I. Fabrikant of an initially 2-year SNF funded research program lead by PIs S. I. Fabrikant (GIVA) and R. Weibel (GIS) that aims at developing visual analytics methods and data exploration tools for the effective depiction and analysis of time-referenced spatial data sets at high resolution. PhD Student A.-K. 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)**
(http://www.research-projects.unizh.ch/p6389.htm)

This project initially funded by the U.S. NSF aims at developing cognitively inspired interactive and dynamic visuo-spatial displays for improved spatial inference and decision-making. This research thread continues on entirely at the UZH, but with new collaborations established including researchers at the UCSB psychology department (Prof. Hegarty), the Temple University psychology department (Prof. Shipley), and Penn State geography (Prof. Klippel).

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

How do people make decisions with maps in time critical situations (i.e., search and rescue)? In this research project PhD Student J. Wilkening (advisor: S. I. 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 with 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 for improving the effectiveness and efficiency of human decision-making with maps in time pressure situations.

**GeoRel: Geographic relevance in mobile applications (SNSF)**
(http://www.research-projects.unizh.ch/p10675.htm)
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: S. De Sabbata) funded by the Canton of Zurich, seeks to assess the relevance of geographic objects in mobile usage contexts. The second strand (PhD Student: P. Crease) is a 3-year SNF funded project aiming at developing methods to represent and handle geographic relevance in mobile applications.

**GeoF: Development and Implementation of Geofoveation (SNSF)**
(http://www.research-projects.uzh.ch/p10737.htm)
In this SNF funded project (PI A. Çöltekin) PhD Student K. Bektas’s 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 to increase the efficiency and effectiveness of geovisualization displays. A continuation from this project, GeoF II was funded in 2010 and will be carried out in the period of 2011-2013.

**Relational urban studies – A triangulation of computational semantic analysis, social network analysis, and spatialization methods**
This 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 M. 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 of within these systems. His project is in collaboration with Prof. C. Rosenblatt at the geography department of the University of Lausanne (advisor: S. I. Fabrikant). With his novel interdisciplinary methodological framework M. Salvini proposes the integration of theoretically sound quantitative methods from social science (i.e. social network analysis and computational linguistics) with computational approaches in GIScience and computer science (i.e., spatial analysis, geovisualization, graph drawing). His framework is put to a rigorous test in a case study to uncover the latent structure of the Swiss city system and its embedment within the international urban system.

**One medicine – one oncology**
This new interdisciplinary research project, under the auspices of the UZH/ETHZ Collegium Helveticum, is in collaboration with Collegium Helveticum Fellows A. Pospischil (Director of the Institute of Veterinary Pathology at the UZH Vetsuisse Faculty) and K. Axhausen (Professor at the ETHZ Institute for Transport Planning and Systems). The aim of this endeavor is to investigate the spatial patterns of tumors incidences in cats and dogs in Switzerland (1964-2008) by means of geovisual analytics, coupled with spatial statistics, and to compare the spatio-temporal patterns with human tumor incidences. In a first phase of this project a GIS database with the animal tumor data is set up for future spatial analyses.

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

Enjoying the morning sun during the GIS excursion to the Swiss National Park, 21./22.09.2010.

Photo: P. Laube, 2010
Overview

2010 was a solid year for the GIS Unit research-wise. Yet, the fact that the members of our unit will probably best remember about 2010 is that this was the year when we organized extraordinarily many and large international conferences and workshops. The year started with a very successful two-day workshop on Geographic Information Retrieval, held at GIUZ in January and endorsed by the ACM, the world’s leading computing research association. This was the sixth in this very fruitful series of workshops, organized by R. Purves, together with C. Jones of Cardiff University.

In June, R. Weibel and A. Leonowicz organized a two-day set of working group meetings of the European COST network MOVE (see below), which attracted around 70 participants.

In September, then, came the key event of the year: The Sixth International Conference in Geographic Information Science, or short GIScience 2010 (www.giscience2010.org). The event was co-organized in equal shares with the GIVA Unit, and kept the members of the two units busy all over the year, through the various stages of preparation. This is the premier conference series in GIScience exclusively devoted to research and hence, the three-day conference was attended by more than 350 participants, featured 120 research papers and presentations, and eight pre-conference workshops and tutorials.

Among these pre-conference workshops to GIScience 2010 were two workshops organized by our staff. R. Weibel, with assistance from P. Bereuter and R. Venkateswaran, organized the 13th ICA Workshop on Generalization and Multiple Representation, and attended by 30 participants. P. Laube acted as co-organizer and local host of the First Workshop on Movement Pattern Analysis (MPA’10). The workshop attracted more than 40 participants and featured three keynote talks, discussion papers and most importantly fruitful hands-on break-out sessions.

The conference year ended in December with a week-long workshop on the Representation, Analysis and Visualization of Moving Objects, held at the Leibniz Centre for Informatics at Schloss Dagstuhl, Germany. This invitation-only specialist event was co-organized by R. Weibel.

A number of staff left us during this year. F. Ostermann went to a position as a researcher at the EC’s Joint Research Centre in Ispra, Italy. R. Straumann completed his PhD, and after making an invaluable contribution to a new series of GIS practicals for GEO 315 of the 5th semester left for a position with Ernst Basler and Partners. Finally, at the end of 2010, M. Tomko left the department to return to Melbourne, Australia and a position at the University of Melbourne.

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 Modelling, specializes in research on the impacts of topographic uncertainty, methods to extract and represent semantics from terrain data, and the emerging field of geographic information retrieval. The third research group, Environmental Geoinformatics, refocused in 2010 after the arrival of P. Laube around the two core topics of (1) spatio-temporal GIS and (2) planning and implementing GIS strategies and
facilities for protected areas. Core research activities in spatio-temporal GIS revolved around methods for spatio-temporal analysis of animal tracking and other moving object data. The long-standing collaboration with GIS application specialists for protected areas remains a stronghold of the group, grounding its GIS research with the real needs of application researchers.

**Digital Cartography and Mobile Systems Group**

**GenW2: Generalization for Portrayal in Web and Wireless Mapping (SNF)**
GenW2 pursues the development of methods for web and mobile mapping with a focus on ad hoc integration of heterogeneous information and on-the-fly generalization. In the reporting year, one of two PhD Students on the project, R. Venkateswaran, completed a study to explore the variations in geographic and linguistic coverage of web content, with the objective of developing a measure of trust for use in ad hoc integration of web content with spatial data for mobile map services. Her colleague P. Bereuter developed a framework and tested for the experimental, comparative evaluation of various algorithms for real-time map generalization for web/mobile applications.

**ORUS: Ontology-driven Recognition of Urban Structures (COST/SER)**
ORUS aims to extract complex urban concepts, such as special building types, *residential areas*, or *city centres* from spatial databases. In the final year of his PhD P. Lüscher developed a methodology for cognitively plausible recognition of vaguely defined geographical concepts from spatial vector databases, demonstrated on the example of the concept *city centre*. He is now very close to completing the write-up and defense of his thesis.

**MOVE: Knowledge Discover from Moving Objects (COST)**
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 the development of, and showcase methods for, knowledge discovery from massive amounts of moving object data. This year, the network organized a two-day meeting of the four MOVE working groups, a week-long summer school on Rhodes, as well as two workshops devoted to specific research themes. Within the framework of MOVE, our group received acceptance for a new PhD project called CASIMO that will be funded by COST/SER and that will start early in 2011.

**Digital Terrain Modelling Group**

**EU-Project Tripod**
Although the funding for Tripod ended in 2009, the final review took place in spring 2010 and as such former members of the Tripod team worked hard to make sure that a first class demonstration was in place before the review meeting. This was indeed the case, and the EU reviewers were very impressed by the resulting system. A number of Tripod related publications were produced in 2010, including a paper resulting from the Master’s thesis of L. Hollenstein on vernacular use of language in the very first issue of the new open access *Journal of Spatial Information Science*.

**Extraction of semantics from elevation models**
R. Straumann’s PhD project was completed in 2010, with a successful defense of the work. A final paper, linking models developed to delineate valleys to a wide ranging questionnaire was accepted for publication in
Spatial Cognition and Computation, signaling the end of a very successful project, which has generated a number of interesting results and potential future research strands.

Exploring the functional structure of urban environments
M. Tomko’s UZH Forschungskredit project ran throughout 2010. In his research M. Tomko explored the use of formal descriptions of city centers which relate to five elements of city form, namely paths and nodes, edges, landmarks and districts. The long term aim of this research is to better characterize cities in terms of their form, in ways which relate directly to how we experience and move through cities.

Improving Accessibility to Environmental Databases through ‘Folk-centered’ Ontologies (SNF)
C. Derungs commenced his PhD on this SNF funded project in May 2010. The core of his research is based around the notion of identifying references to locations in unstructured text, particularly at very fine granularities, which are typically very ambiguous, and disambiguating these using, for example, topographic properties of associated locations. The long term aim of this work is to make environmental data more accessible to laypeople, and as such this work is being carried out in collaboration with the Swiss Federal Institute for Forest, Snow and Landscape Research where C. Derungs is based for two days a week.

Environmental Geoinformatics Group

Analysis of Moving Objects
S. Dodge’s PhD project on the similarity analysis of movement trajectories reached its final year and will be completed by the end of December. In this final year the work focused on various distance measures that can be used to assess the similarity of movement trajectories. In parallel, S. Dodge successfully applied to the UZH Forschungskredit for her postdoctoral research project, entitled Context-Dependent Similarity Search in Traveler Movements (CONSIST), which will ensure continuity in her research all through 2011. Also in the area of analyzing movement, the SNF agreed to fund a new project called CAMA, which aims at the development of analysis techniques for context-aware movement analysis and which will start in January 2011.

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. Its focus is on the implementation and support of spatial analysis in nature conservation institutions and research. In 2010 this collaboration most prominently resulted in the completion of R. Haller’s PhD Thesis on effects of uncertainties in the analysis of spatial data in wildlife studies. The work is based on a rich set of seven case studies that were embedded in several large-scale research projects in the SNP, for which R. Haller was the project coordinator. Furthermore, the project was gearing up for the 100 years SNP celebration in 2014, initializing a set of research initiatives around monitoring and documenting long-term ecological change.
GIS Wildnispark Zürich

GIS Wildnispark Zürich is a joint project between the GIS Unit and Wildnispark Zürich (formerly Naturlandschaft Sihlwald). 2010’s main activities focused on the enhancement of the visitor monitoring program and the continued integration of geodata supporting the maintenance of tourism infrastructure in the park. A large volume of important data was made accessible for park employees via a GIS Viewer. Six research projects in the park have also been supported and a Master’s thesis on web-based visitor information system was supervised. More than 90 maps were created in 2010 for internal use and external communication.

Robert Weibel and collaborators
1.10 sotomo

Overview
The sotomo research Unit is an independent corporation, associated with the Department of Geography and Political Geography unit. sotomo combines basic research with application and transfer of this research into areas such as consulting, contract research and 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).

Main research activities

Challenges of future labor force immigration
A research project on the future of labor force immigration into the Metropolitan Region of Zürich was finished in 2010. The project was funded by the Zürcher Kantonalbank (ZKB). It dealt with the forecast of immigration and expected impacts on economy, society and institutions. Special attention was given to spatial variations in these impacts. The project resulted in a publication (‘Immigration 2030 – Szenarien für die Zürcher Wirtschaft und Gesellschaft.’) which was well received by the public and by governmental authorities.

Monitoring and analysis of political behavior in Switzerland
As in previous years, sotomo conducted numerous pieces of analysis of the performance of political parties and members in the national parliament. Most of these analyses were published in the major Swiss newspapers.

Social Area Analysis
Together with Fahrländer Partner AG sotomo further developed their analysis tool called ‘Nachfragersegmente NASE’. It was used for Social Area Analysis in neighborhoods in Kanton Zurich which are burdened with aircraft noise as well as for a comparative study of 28 Swiss cities.

Teaching
M. Hermann gave the ‘Grundlagen und Techniken der empirischen Forschung’ lecture (GEO216.3). He was also responsible for the course ‘Geographie des Politischen’ (GEO 318) and gave lectures as guest teacher at the University of Berne and at the University of applied Science of Luzern. sotomo also has a mandate to update and support the e-learning project ‘Political processes in Switzerland’ which is integrated in the curriculum of the four main institutes of political sciences at Swiss universities in Lausanne, Berne and Lucerne.

Michael Hermann
Impression from a field trip on «Sustainable mobility in the Emmental». 

Photo: F. Boller, 2010

1.11 Geography Teacher Training (GTT)
With responsibility for the sound and diversified scientific background of all Geography teacher students, mainly at the Secondary level I (Sekundarschule, PHZH-Master-Students) but also at the Secondary level II (Gymnasialstufe; students of the 'Lehrdiplom für Maturitätsschulen') the Geography Teacher Training team underwent substantial changes in personnel in 2010.

As Dr. A. Odermatt became a newly elected member of the city council of Zurich we lost one of our main group members. We thank our colleague A. Odermatt for more than 7 years of fruitful, creative and straightforward collaboration in his various functions for the benefit of the GTT group. We congratulate him on his fantastic personal achievement and we believe that important geographical concerns are now well represented also in the political agenda of our home city.

As his successor and after an open selective procedure we finally were able to engage dipl. geogr. S. Landolt. She is at the final stages of her PhD-thesis on Appropriation of urban space by youth: Processes of negotiation of public space in Zurich, with a planned completion date in the spring semester 2011. S. Landolt has taken over – besides a variety of administrative tasks – the portions of Human and Economic Geography in our teaching program (i.e. lectures, exercises and excursions) and will continue her research in the field of geographies of youth. The 50% position, formerly held by dipl. geogr. F. Boller who found a new job near his home in Bern, was taken over by MSc. B. Bitzi. Her scientific focus is on the topic of youth, migration and integration in Switzerland and is therefore closely linked to research fields of Human Geography. The search for another 50% position (associated with Physical Geography) has not yet been completed.

Amongst our secretaries, where A. Arnold still holds a 20% position, M. Fitze, who left for a Geography teaching job at the Kantonsschule Wetzikon, was replaced by I. Meister (30%). I. Meister recently completed her Master’s Degree in Physical Geography and holds another small part-time job at the BAFU (Federal Office of Environment) in Bern.

Our main teaching activities are centered around our consecutive practical geography exercises (level I and II) on a broad variety of topics, methods and working techniques in both Physical and Human Geography. In these exercises, relevant for the needs of an up to date school-geography curriculum we were ably supported by teaching assistants P. Buri, S. Gassman, M. Glaus, L. Hauser, G. Kaufmann, A. Kern, N. Landert, A. Nussbaumer, M. Rotta and S. Speck (in alphabetical order).

In the reporting year we offered numerous excursions especially designed for the PHZH students. The one day fieldtrips lead us to places ranging from Zurich-City to the region of Glarus, covering topics from urban planning to agricultural and industrial development (by A. Odermatt and F. Boller). Fieldtrips in Physical Geography took us to Lucerne (visit to the Glacier Garden Museum), to the top of Rigi, the Göscheneralp and to the Upper Engadine (by M. Maisch). The latter three-day journey was dedicated to geomorphology and glaciology as well as the effects of climate change in high-mountain areas closing with a spectacular hike on the Morteratsch glacier. In the Autumn Semester B. Bitzi organized a field trip on youth and Islam including a visit to a religious centre in Schlieren and S. Landolt offered an excursion based around the topics of migration and the labor market.

The GTT team is also responsible for coordinating various classroom- and/or field-based teacher training modules, such as 'Ausserschulische Lernorte' (by A. Schmid & S. Hesske) and the Ringvorlesung. The 2010-series on Aktuelle Themen aus der Fachwissenschaft für die geographische Allgemeinbildung included lectures on current research projects by speakers both from the GIUZ- and the ETH-side (Earth Sciences Dept.) The
module is accompanied by a seminar, where central topics and results were selectively discussed and tested for their potential High-School transferability (by B. Vettiger, V. Meier, D. Fuhrimann). The special lectures in Regional Geography were given on Asia (by N. Backhaus) and on Japan (by H. Escher). These courses are open to PHZH-students as well as to Geography students, and can be combined with a complementary didactic course (by M. Reuschenbach and S. Baumann), closely related to the main lecture.

At the end of each semester we prepare special exams for the PHZH students in close coordination with the responsible people from the basic modules of Physical Geography (by W. Haeberli and others) and Human Geography (by U. Müller-Böker).

External Collaboration

As geography experts we are continuously involved in the supervision of practical exams of future High-School teachers. Due to a significant change in requirements, M. Maisch and S. Landolt (supported sporadically by E. Bühler, J. Nötzli, K. Schwiter, N. Backhaus and T. Reichenbacher) had to attend a considerably increased number of exams this year. More than 25 exams are – as well as our regular tasks at GIUZ – a massive and time-consuming additional workload. On the other hand we could develop and deepen our fruitful cooperation with the specialists in the field of geography didactics, namely with Dr. B. Vettiger and Prof. Dr. S. Hesske (IGB).

M. Maisch is president of the GEGZ (Geographisch-Ethnographische Gesellschaft Zürich) and member of the Scientific Advisory Committee of the Swiss Tectonic Arena Sardona (Unesco Natural World Heritage) and of the Forum Gletschergarten. As successor to A. Odermatt he is now also member of the Geography Working Group of the HSGYM-project (Arbeitsgruppe Hochschule-Gymnasium) together with Y. Scheidegger, who presented at a HSYGM-Meeting in November 2010 GIUZ’s main experiences with Bologna reform since its introduction. Furthermore M. Maisch was involved in several public exhibitions on glaciers, landscapes and climate history (posters, visualizations, multimedia productions, public field trips) and collaborates in projects at the interface between Natural Science, Schooling and Tourism.

We are grateful to all those at GIUZ supporting us in our daily work and in our broad and service-orientated responsibilities. We finally thank our cooperation partners at PHZH (Pädagogische Hochschule Zürich), IGB (Institut für Gymnasial- und Berufspädagogik), ZHSF (Zürcher Hochschulinstitut für Schulpädagogik und Fachdidaktik) and the Study Program Coordination at ETH-Zürich (Dep. ERDW).

Max Maisch & Sara Landolt and collaborators
1.12 Joint research projects
As in previous years, a considerable number of joint research projects were pursued between different groups of the Department, strengthening the intra-departmental collaboration. Examples of ongoing joint research projects include:

GIVA/GIS:
- SNF research project ‘Popeye’ (S. Fabrikant/R. Weibel)
- EU research project ‘Tripod’ (R.Purves/ S. Fabrikant)
- EU coordinated action ‘VisMaster’ (S. Fabrikant, A. Çöltekin & T. Reichenbacher/R. Weibel)

PGG/HGG:
- Graduate seminar for critical reading and debating (S. Corbridge/U. Geiser)
- SNF-Project ‘Living with Violence: Rural Livelihoods in Mid-Western Nepal During and After the Maoist People’s War’ (S. Byrne, B. Korf/U. Müller-Böker/T. Rauch (FU Berlin)/B.R. Upreti (NCCR North South))

During the reporting year, a new instrument called Innovation Pool was implemented within GIUZ that provides seed money to initiate cross-unit projects that hopefully will evolve into larger, self-funded projects later on. The call for proposals was issued towards the end of this year, and a first round of projects should start in the spring or summer of 2011. Next year’s annual report should therefore contain the first success stories of projects funded by the Innovation Pool.
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.

63 PhD Students are currently enrolled at the Department, 18 Postdoctoral Researchers 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.

![PhD students and degrees](image)

**Figure 1**: Development of PhD student numbers and achieved PhD degrees over the last decade
Source: SAP-CM, assembled by Y. Scheidegger-Jung

2.1 Zurich Graduate School in Geography and other PhD programs

2010 was the second full year of the Graduate School’s existence, and offered an opportunity to introduce further offerings for both transferrable skills and disciplinary specific courses, and at the same time take stock of the needs of PhD candidates. In the spring of 2010, a survey was carried out to explore what sorts of offerings would be most valued, and at the same time an information booklet, specifically aimed at those arriving from outside Zurich, was produced. In response to the survey, a course in the use of the increasingly popular
open-source statistics package R was introduced, with a special emphasis on geographic problems, organized by A. Çöltekin.

PhD candidates from the Human Geography Units organized a successful course in scientific writing, focusing specifically on their needs and offering the chance for intensive one to one feedback, while a second course was organized for those with more natural science backgrounds. A bespoke project management course allowed PhD candidates the chance to treat their PhD as a long term project, and gave hints and tips on better managing this process.

In the Spring Semester, for the first time the course Principles and Theory, bringing together PhD candidates from all disciplines, and heavily focused on using the literature to initiate and underpin discussions was run by B. Korf, P. Laube and S. Gruber. Promotionsseminar 2 took place in Stels, for the last time with both S. I. Fabrikant and B. Korf, and M. Egli has kindly agreed to replace S. I. Fabrikant in 2011.

Promotionsseminar I, as always, ran in the Autumn Semester, and saw a large group of new PhD candidates from all backgrounds, with a majority from Human Geography Units reflecting recent influxes to the Department. Also in the autumn, the second Graduate School Retreat was held, with an interesting range of talks and discussions, and an excellent keynote speaker in Prof. M. Carey from the University of Oregon. Harvey Miller from the University of Utah gave an engrossing seminar on Time Geography to round off the year’s activities. Finally, as in previous years, the Graduate School supported many PhD candidates in trips to conferences, summer schools and for mentoring outside of Switzerland. As always, thanks are due to all of those who participated, in whatever way, in making the activities of the Graduate School so successful.

Finally, beyond education on the level of PhD students, there are also plans to explore options to further improve the continued education and career development of postdoctoral researchers, who so far did not benefit from training offerings specifically tailored to their needs.

### 2.2 Advancement of women

The Department’s ratio of male to female numbers in both student enrollment and staff employment continues to have a pyramidal structure. 46.5% of first semester enrollments were by women. Over the course of studies, the proportion of women drops to 35.8% of PhD candidates. Since the departure of SNFS professor C. Binder in October 2009, only two of the nine professors are female.

In some research fields, male researchers are 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, which has been shown to be a successful strategy by the examples of the Hydrology and Climate and Remote Sensing units.

The Department is committed to creating a family-friendly environment and to taking issues of equal partnership and family into account. In recent professorial appointments, dual career prospects were considered and attractive posts were created for the partners of new professors with support from the Faculty of Science. At the same time we support mentoring programs that actively promote gender balance at 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
Two young female researchers from the Human Geography Unit were able to participate in the Short-Term Mentorship Abroad Program in 2010. This program enables young researchers to undertake a short stay abroad, giving them an opportunity to get in touch with established researchers of a similar field, use specialized facilities or carry out field work.

Along with the other female professors at UZH, S. Fabrikant and U. Müller-Böker featured in a new information brochure and web resource, edited by the UZH Office of Gender Equality as part of the project *Women in Research.*
3 Departmental teaching activities

3.1 Overview of admissions

The large number of students (there were 635 students majoring in Geography in the fall semester 2010) 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 in the previous year (2009: 117 students; 2010: 101 students). Roughly 33% of all MNF final year students graduated with a degree in geography.

In 2010, 7 Diploma, 70 Master’s, 86 Bachelor’s and 10 PhD Students graduated from the Department. The Master’s students specialized as follows: 3 in General Geography (1 3G, 1 2B, 1 HGG), 11 in Geographic Information Science (7 GIS, 4 GIVA), 27 in Human and Economic Geography (12 HGG, 5 WGG, 6 PGG, 4 SIE), 25 in Physical Geography (13 3G, 11 2B, 1 H2K), and 4 in Remote Sensing (4 RSL).

Figure 2: Development of students and degrees per year and gender in the Department of Geography
Source: SAP-CM, assembled by Y. Scheidegger Jung
Table 1: Number of degrees awarded by Unit and degree level within the Department of Geography in 2010
Source: SAP-CM, assembled by Y. Scheidegger Jung

<table>
<thead>
<tr>
<th></th>
<th>Diploma</th>
<th>Master’s</th>
<th>PhDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G</td>
<td>3</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>2B</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>H,K</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>HGG</td>
<td>2</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>PGG</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>WGG</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>RSL</td>
<td>0</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>GIVA</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>GIS</td>
<td>1</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>SIE</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>70</td>
<td>10</td>
</tr>
</tbody>
</table>

3.2 Innovative teaching concepts

In several research units the use of e-learning tools was extended. Within the e-LERU cooperation of the League of European Research Universities (LERU) the e-learning course GLOPP was included in the curriculum of Human Ecology at the University of Geneva. In return students of GIUZ are able to follow courses in Human Ecology which are based on the e-learning course SUPPREM. Specific results of the HGG’s Initiative Interactive Learning project were implemented in a seminar using Wikis. In the course GEO 225 the GIS unit continued to offer its successful blended learning offerings using the award-winning GITTA e-learning materials. GITTA materials are also partially used in other courses of the unit.

Courses incorporating practical experiments and field trips were continued or newly introduced in 2010. M. Egli, D. Brandová, F. Kaiser, S. Ivy-Ochs, P. Cherubini and H. Gaertner-Roer organized the International Geochronology Summer School for the second time. This year’s Summer School was successfully carried out in September 2010 in Klosters where students from three continents participated. H2K incorporated hydrologic hands-on experiments in the new Master course GEO 471 in order to practically deepen the students’ theoretical knowledge. Another part of the course encouraged the students to design, carry out and evaluate a simplified hydrologic measurement campaign. In March 2010 a snow field course in Wägital, SZ was co-organized with U. Steinegger from Meteodat where students could apply different snow measurement techniques. For the GIS Bachelor course GEO 315 a new set of practicals were introduced, where students were assigned the task of providing a report to cantonal authorities on the possibilities for wind power and the availability of tranquility within the Canton of Zurich. As part of this work the students presented posters illustrating their solutions for lay people as well as preparing a final report.

New courses for Master and PhD Students were established in 2010 which were taught interdisciplinarily. The course Principles and Theory in Geography was taught by S. Gruber, P. Laube, B. Korf and R. Purves as part of the Graduate School’s compulsory courses for doctoral candidates. The course aimed to encourage a discussion between geographers on cross-cutting themes in the discipline, and focused on issues of scale in...
Within the newly conceptualized Master module *Thinking Geographically* (GEO 410) jointly taught by HGG, H,K, 3G, GIVA, GIS, PGG and WGG, topics such as *Spatial Dependence, Heterogeneity and Uncertainty, Risk, Vulnerability* and *Space* were discussed. With the autumn term the HGG, PPG and WGG units started their research colloquia for Master and PhD Students in Human Geography (replacing the joint Master Colloquium). At the same time the three human geography units introduced the *Zürcher Humangeographisches Kolloquium* a joint lecture series, where international scholars give members of staff and advanced students insight into advances into their research fields. The new setting brings Master Students closer to research and gives more time for presentations and discussions.

### 3.3 Quality management in teaching

The quality of teaching is assessed each year with an evaluation of most of the courses through questionnaires (partly online through OLAT). This year’s WGG Bachelor courses (GEO 231 and GEO 232.2) also took part in the ETH Zurich evaluation. In different groups, the students are also offered the opportunity to discuss their concerns and suggestions for improvement at the end of the respective terms. As a result of these student suggestions, the practicals in this year’s GIS course GEO 315 were completely revised.

On the other hand, teaching staff are also continuously making an effort to further improve teaching quality. Staff for example participated in the courses Novice 4 on Individual learning – supervision and coaching of students as part of the Novice module on cooperative learning methods and lecturing of the Centre for University Teaching and Learning and a workshop on e-assessment allowing simultaneous examination of large quantities of students using laptops.

### 3.4 Study matters

After the restructuring of the bachelors curriculum which commenced in the autumn semester of 2009, third semester students are continuing their studies normally. Due to this restructuring, lecturers of the Human Geography and Economic Geography Units had to deal with an increased number of students since lectures like *Geographie der Schweiz/Raumplanung* and *Humangeographie II* were attended by two year groups of students (*6th* / *4th* and *2nd* semester students respectively).

C. Berndt’s arrival in March 2010 initiated a period of reflection and change in teaching by the WGG group. The transition was managed successfully with the support of ad-interim group leader A. Odermatt who left the Unit shortly afterwards.

Masters exams were carried out in February, May, September and November with total student numbers increasing on those in 2009 (2009: 47, 2010: 67). Master presentations and defenses are scheduled by P. Psarellis. Due to a decreasing number of presentations from diploma theses, these events are now managed individually by each Unit. About 20 students are still enrolled according in the old diploma system.

Only eight students with a Major from the Faculty of Philosophy and a Minor in Geography completed their studies during 2010. A reason for this small number of students may be that they had to take both exams within the same examination period. The seminar work and the oral examination from those students were handled by B. Korf and M. Egli. In 2012 the last Geography Minor exams will be organized for the Faculty of Philosophy in the diploma mode.
The committee of study affairs, represented by one professor of each research field, one or two students and the student advisory team, was engaged with different topics:

For A. Odermatt's lecture *Geographie der Schweiz* a successor had to be found to replace him after the spring semester. Fortunately, V. Meier Kruker (PHZ Lucerne) could be engaged to take over this course.

The evaluation of the Bachelor's theses discovered discrepancies in the mentoring of the students and the allocation of the students to their main topics. Therefore M. Ziege improved the subscription within OLAT where students are now able to visibly follow their registration. In order to homogenize the mentoring for the bachelor theses in 2011, an information lunch is planned for all mentors.

Furthermore, the committee discussed whether the dates of the four master examinations should be moved, because the Executive Board of the University decided to charge the semester fees to students who have to take the Master's exam only. In case of a rescheduling, the master examinations should however take place during the semester to give a chance to all students and employees to participate in the examinations.

The subscription for the general excursions (GEO399, GEO599) has also been discussed due to booking lists being filled within a few minutes of their opening. However, an analysis of the students' booking behavior did not identify multiple bookings. Therefore a technical subscription limitation for a maximal amount of excursion bookings per day will not improve the problem. For the coming year, two separate subscription dates are planned.

The lecturers of the only compulsory module in the Master's curriculum, *Thinking Geographically* (GEO410), are not satisfied with student participation and the resulting semester papers. The participating lecturers plan to transform the lecture into a seminar.

Modules of the Master's curriculum have been analyzed according to the teaching language. Inconsistencies were found with regards to the actual teaching language, the labeling of the courses and the description of the module within the online study guide. The department aims to harmonize the lecturing language and the study guide in order to enable foreign students to better inform themselves about the teaching language.

Some Master's modules exceed their capacities due to a limited admission of participants. Therefore admission restrictions have been discussed. So far, students had to write application letters in order to be accepted for such a course. This measure was effective enough to regulate the course admission due to the small number of concerned lectures. The development will however be observed closely in the future.

The information for new Master's students was reorganized. Instead of an information event during the spring semester for Master's students only, a combined bachelor and master theses information is now given during the fall semester. During this year's information event, R. Weibel informed attendees about offerings at the Master's level at GIUZ, while Y. Scheidegger explained related administrative issues. Separate, more informal presentations concerning each research unit were given outside of the lecture hall where students were able to ask questions directly to the members of the respective units. This reorganization sped up the entire information process and made it more effective and personalized.

A subgroup of the committee is still concerned with the coordination of the centralized organization of GIUZ examinations. The guidelines, such as control of the student IDs at the entrance, numbering of the candidates and personalized exam(s) with in sealed, named envelopes, have been implemented in the majority of the compulsory module exams of the Bachelor's curriculum.
Finally, since the fall semester of 2010 the entire university is bound to book two hours slots in order to use the shared lecture halls due to the centralized management of lecture halls by UZH Center.

### 3.5 Student advisory team

In addition to the regular and multi-faceted advisory services for students (person to person, via e-mail and telephone), the team treated many applications (2010: 46, 2009: 54) and 17 requests related to Master studies (2009: 20). Of these ten applications were received from foreign universities (Germany: 7). Besides their duties, the team took part in the *committee of study affairs* (Ausschuss Lehre).

In addition to the information for high school graduates at University Center, an information day at University Irchel was organized by the *Faculty of Science* where N. Kugelmeier and A. Moll were in charge of organizing the information stand for the department and N. Backhaus, M. Schaepmann, N. Singh and M. Schneider represented the three research fields.

Beyond many other tasks, the information on the website concerning academic studies was subsequently updated.

*Yvonne Scheidegger Jung and the student advisory team*
4 Academic services and functions

4.1 Academic services

GIUZ:

WGMS: http://www.wgms.ch

In 2009, the World Glacier Monitoring Service (WGMS) became officially embedded in the Department. In 2010, it had its first operational year under long-term funding from the Swiss GCOS Office at the Federal Office of Meteorology and Climatology MeteoSwiss (W. Haeberli, M. Zemp, I. Gärtner-Roer). A General Assembly of the National Correspondents was convened at Riffelalp/Zermatt, Switzerland.

3G:

W. Haeberli is president of the ‘Beratendes Organ für Umweltforschung (BAFU)’, M. Egli is secretary and a member of the committee of the Swiss Soil Science Society and member of the editorial board of the “BGS Bulletin” and the ‘Open Geography Journal”, F. Paul is member of the cryospheric commission of the Swiss Academy of Sciences (SCNAT) and is a Lead Author in Working Group I of the forthcoming fifth Assessment Report (AR5) of the IPCC. He was project manager of the ESA project GlobGlacier and is now science leader of the ESA project Glaciers_cci (project manager: T. Bolch). J. Noetzli is a member of the cryospheric commission of the Swiss Academy of Sciences (SCNAT), the committee of the Swiss Snow, Ice and Permafrost Society, and the IPA task force for the new strategy and implementation plan of GTN-P. I. Gaertner-Roer is a member of the committee of the Swiss Geomorphological Society and the Permafrost Young Researcher’s Network (PYRN). C. Huggel is a Lead Author in Working Group X of the forthcoming fifth Assessment Report (AR5) of the IPCC. S. Gruber is co-editor-in-chief of «The Cryosphere» and a member of the editorial board of «Geografiska Annaler». He is chair of the IPA subgroup on ‘Modeling the spatial dynamics of cryosphere at diverse scales”.

PERMOS: http://www.permos.ch

The Swiss network for permafrost monitoring (PERMOS, J. Noetzli and D. Vonder Muehll) jointly funded by the FOEN, the Swiss Academy for Sciences (SCNAT) and MeteoSwiss undertook major efforts related to integration, processing and storage of the data and the standardization of site instrumentation/strategies. Regular field work, data processing, and contributions to analyses and report were performed for the sites maintained by the GIUZ as a PERMOS partner institution (S. Gruber).

Geochronology laboratory (14C, 10Be): http://www.geo.unizh.ch/c14

A new record number of analyses (especially for ^14C dating) was carried out using the AMS. Most of the samples were from internal projects and a small number from external customers such as foreign scientific institutions or cantonal and archaeological services. A new state of the art machine enables processing of very small samples (around 100 to 200 micrograms of carbon) and will open new perspectives, e.g. compound specific dating of organic substances.

The unit performed reviews for 7 national and international science foundation organizations and for about 50 scientific journals.
**2B:**
M. Schmidt is on the steering committee of the research networking program *MOLTER (ESF)*. C. Burga is vice-president of *ASG* and of *R. Tüxen Gesellschaft für Vegetationskunde*, delegate of the GIUZ in the ASG and *AG Geotope Switzerland*. He is also a supervisory authority of the University library, editor in chief of *Vierteljahresschrift der Naturforschenden Gesellschaft in Zürich*, and member of the foundation *Franz Xaver Schnyder von Wartensee*. Members of the 2B unit reviewed for the following journals: *Agriculture, Biogeoscience, Biology and Fertility of Soils, Catena, Ecosystems and Environment, Etude et Gestion des Sol, Geochimica Cosmochimica Act, Geoderma, Geophysical Research Letters, Journal of Agricultural and Food Chemistry, Nature Communications, Nature Geoscience, Organic Geochemistry, Pedosphere, Soil Science Society of America*, and *Soil & Tillage Research*.

**H₂K:**
J. Seibert is Chair of the Catchment Hydrology subdivision at EGU and a member of the commission for the *Hydrological Atlas Switzerland* (HADES). He is an external PhD examiner for M. Zambrano (University Trento), a member of C. Birkel’s habilitation committee and was an external expert for the promotion committee of Prof. D. Tetzlaff (both University of Aberdeen). In 2010 members of H₂K organized the Seminar for Hydrology (ZHydro). This annual seminar presents current hydrologic research from EAWAG, ETH Zurich, UZH and WSL and provides a meeting place for all ZHydrologists.

Jan Seibert has reviewed about 15-20 papers submitted to major hydrological journals such as *Journal of Hydrology, Hydrological Processes, Water Resources Research, and Hydrology and Earth System Science*. Jan Seibert is also an editorial board member for *Hydrology and Earth Science Systems* (HESS, since 2006), *Geography Compass* (since 2009) and associate editor for *Water Resources Research* (since 2009).

**HGG:**
U. Müller-Böker was involved in three appointment and tenure procedures of the MNF. She is on the UZH’s *North-South Steering Committee*, a member of the *Fachkommission Gender Studies* at UZH, Chair of URPP Asia and Europe and on the *NCCR North-South Board of Directors*. She was elected to the council of the *European Association for South-Asian Studies*. N. Backhaus is a member of the *Swiss National Park’s research committee* and is member of the Swiss commission to coordinate the transition from gymnasium to university.

S. Thieme is a member of the executive committee of the *Commission for Research Partnerships with Developing Countries* (KFPE); U. Geiser is a Research Fellow at the *Sustainable Development Policy Institute* (Pakistan).

S. Landolt contributed to a workshop for school psychologists of the canton Zurich organized by the teacher training (PHZH). As members of Swiss advisory group on poverty, U. Müller-Böker, S. Thieme and B. Steimann advised the Federal Councilor in her assignment as a member of the *Global Sustainability Panel of UN Secretary General*. Members of the unit refereed articles for *Int. Migation, J. of Ecotourism, Tourism Review, Mountain Research & Development, Development & Sustainability, SDPI Publication Series, NCCR North-South Perspectives and Pakistan J. of Agricultural Sciences*. Members of HGG reviewed for research funding agencies included SNSF, Swiss State Secretariat for Education and Research (SER), and the German Project Management Agency.
PGG:
T. Hagmann taught at the Horn of Africa course of the Rift Valley Institute, Lamu, Kenya. T. Raeymaekers co-organized a workshop titled Bringing the margins back in: war making and state making in the borderlands with B. Korf and J. Goodhand (SOAS) in Ghent. B. Klem and B. Korf co-organized the academic roundtable Sri Lanka in Transition in Utrecht. T. Hagmann conducted a politic-economic short analysis on Ethiopia commissioned by the GIGA and BMZ. P. Hollenbach talked at the Interkulturelle Woche Radolfzell. M. Starmanns provided advice to Swiss Olympics on a corporate social responsibility strategy for future procurements.

WGG:
C. Berndt is a member of the Editorial Advisory Board of Transactions of the Institute of British Geographers and acted as a panelist for the SNF program Research Partnerships with Developing Countries in Bern. Furthermore he reviewed papers for the journals Transactions of the Institute of British Geographers, Economic Geography, Area, and Geographische Zeitschrift.
P. Goeke both monitored and advised two projects scientifically. In Nuremberg he wrote a general scientific report for the project Azubis begleiten Schüler. In Frankfurt he participated in the project Stadtteilbotschafter about how to build up social capital. The research was funded by Bavarian and local institutions in Nuremberg and the Stiftung Polytechnische Gesellschaft.

RSL:
M. Schaepman serves on selection panels for successors of Profs. U. Reyer and W. Haeberli. He also serves on the habilitation committee of C. Huggel and the promotion committee of Prof. J. Seibert. Further, he is designated chairman for the search committee of a new assistant professor tenure track in Remote Sensing. M. Schaepman has participated in a public podium discussion on dual couple careers of the University of Zurich. Members of RSL are involved in the (co-)supervision of 12 PhD Students throughout Europe and in Colombia. RSL members are also represented in ISPRS, the Swiss Delegation to ESA, IDA-Fern, GMES-IKAR, ESA advisory and quality working groups, ESA scientific assessment, TerraSAR-X science committee, EUSAR2010 committee, chairman of CEOS SAR Cal/Val workshop, SGPF, ISPRS-ISAC, SKF, NOW (NL), and SATW. Members of RSL continue to review articles in peer reviewed literature in all relevant remote sensing journals as listed in the Web of Science. Further reviews have been performed for journals related to Ecology, Atmosphere, Optics, Physics, Computer Sciences, and the Cryosphere.

GIVA:
GIVA members reviewed for 14 international journals and 17 international conferences, 2 international grant agencies, and the US National Bizarre Map Challenge. Sara Fabrikant is president of the Inter-University Partnership (UZH/ETH Zurich) for Remote Sensing and Geoinformatics (IPEG), and member of seven editorial boards (Annals AAG, CEUS, etc.), various scientific commissions (ICA, AAG, etc.), and served on six conference committees (AGILE, IV, etc.), including as Program Co-Chair of GIScience 2010. She was a member of the search committee Geographical Information Systems at ETH Zurich.
A. Çöltekin is the scientific secretary of the International Society of Photogrammetry and Remote Sensing (ISPRS), a member of six scientific commissions (IEEE, SPIE) and co-organizer of the ‘ASPRS/AutoCarto 2010 pre-conference workshop. T. Reichenbacher, is a member of six international scientific commissions (DGFK, ICA), acted as GIScience 2010 Program Co-Chair, and served on the AGILE program committee.

GIS:
R. Weibel is a member of several editorial boards (e.g. IJGIS, GeoInformatica), research committees (Swiss National Park, Wildnispark Zurich), scientific commissions (International Cartography Association.), and served on several committees (SDH 2010, AGILE 2010). He was General Chair of the GIScience 2010 Conference. Ross Purves acted as GIScience 2010 Workshops Chair and Program Co-Chair, chaired the ACM Workshop on Geographic Information Retrieval, 2010, and served on the AGILE 2010 and LocWeb 2010 scientific commissions. He is chair of the Snow and Avalanche Foundation of Scotland. P. Laube was Co-Chair of the Workshop on Movement Pattern Analysis (MPA’10) and served on the committee of the 3rd Int. Workshop on Semantic Aspects in Data Mining (SADM’10). Reviews were carried out for 14 journals (incl. IJGIS, CEUS), several conferences (incl. GIScience 2010, ACM GiR 2010, IEEE InfoVis 2010) and for research funding agencies (DFG, NSF, Netherlands Organization for Scientific Research NWO).

4.2 Academic offices and functions held at UZH and MNF
Professors and other members of the Department are represented in various bodies:

University:
Commission of International relations (U. Müller-Böcker), Supervisory Committee Main Library (G. Seitz), Association of Private Lecturers (N. Backhaus, C. Burga), University Priority Research Program Asia and Europe: Executive Committee (U. Müller-Böcker and N. Backhaus).

Faculty (MNF):
Faculty Assembly, representative of the scientific staff of GIUZ in MNF (S. Gruber), Extended Faculty Board (R. Weibel), Faculty Board (R. Weibel), chair Fachbereich IV (R. Weibel); Study commission (W. Haeblerli and Ph. Meuret), Research Commission (S. Fabrikant), Search Commission (S. Fabrikant), Commission for Career Development (M. Schmidt), Commission for Public Relations (M. Schaepman and Y. Scheidegger Jung), Commission for Teacher Education (S. Fabrikant), Ombudsperson for students of FBIV (W. Haeblerli), Staff Commission of the University of Zurich (C. Burga), Working group HSGYM (M. Maisch).

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

Short Course: Isotope short course at the European Geosciences Union 2010 organized by J. Seibert in collaboration with B. Newmann (IAEA)

Workshop: Inputs on internet-based tools for teaching at the workshop on Globalisation and Tourism at the Institut Universitaire Kurt Böschi, Sion by N. Backhaus, 30.11.2010

Training course: U. Müller-Böker acted as senior resource person at the NCCR North-South training course on Integrated Training and Capitalizing on Experience in Bahir Dar, Ethiopia, 2.9. - 12.9.2010
Training/Coaching: The peer-mentoring project YASE (Young Academics in spatial ecology, financed by the Office for Gender Equality of the University of Zurich) was continued in 2010 with a number of activities. Three young RSL scientists at the research associate and post doctoral level profited from individual support (in terms of coaching, CV training, etc) together with joint scientific effort in the group to establish a research focus in spatial ecology. The latter was achieved by organizing an international workshop on the topic of *Linking Dendrochronology and Remote Sensing*, a review paper as a follow-up to that workshop is currently in preparation.
5 The Departmental support unit

5.1 Finance, administration and general infrastructure

In 2010, operating expenses were CHF 16.443 million, of which CHF 5.669 million (34 %) were third-party funded. This represents an increase of CHF 368’000 in operating expenses compared to 2009. Although slightly reduced, the amount of third-party funds still remained at a high level. The accumulated budget cutbacks from 2009 and 2010 amounted to 4% of the global budget and resulted in a slowing down of the Department’s growth.

Over and above operating expenses, CHF 180’000 was spent on larger investments (e.g. IT, the laboratories and research equipment) and CHF 626’000 on equipment associated with the appointment of professors. The reinvestment ratio has, therefore, more than doubled.

Table 2: Development of the GIUZ expenses in 2010

<table>
<thead>
<tr>
<th>GIUZ expenses in 1’000s of CHF</th>
<th>Year 2009</th>
<th>Year 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Of which third-party funding</td>
</tr>
<tr>
<td>(without university overheads)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangibles (material &amp; small investments)</td>
<td>2’280</td>
<td>1’335</td>
</tr>
<tr>
<td>Personnel costs (without professors &amp; social overheads)</td>
<td>10’107</td>
<td>3’909</td>
</tr>
<tr>
<td>Sum operating result 2 (Betriebsergebnis 2)</td>
<td>12’387</td>
<td>5’244</td>
</tr>
<tr>
<td>Personnel costs (professors &amp; social contributions)</td>
<td>3’689</td>
<td>700</td>
</tr>
<tr>
<td>Sum operating result 3 (Betriebsergebnis 3)</td>
<td>16’076</td>
<td>5’944</td>
</tr>
<tr>
<td>Investment funds (Investitionskredit IK, over 10 kCHF)</td>
<td>71</td>
<td>180</td>
</tr>
<tr>
<td>Equipment funds (Einrichtungskredit EK)</td>
<td>292</td>
<td>626</td>
</tr>
</tbody>
</table>

5.2 Office space

Due to the arrival of new staff, several rooms on the L-floor were renovated and refurbished.

As the Department has grown continuously over the last few years, office space has now reached a high occupancy rate. It will be a challenge to deal with this trend in the future, particularly in light of the planned growth of existing units and the addition of new units (e.g. 2nd professorship in remote sensing).

Ruth Hunkeler-Wittleder
5.3 Geodata Management
A new geodata management role, filled by Ronald Schmidt, was introduced to GIUZ in 2010. At the beginning of the year the needs of geodata users in the Department’s Units were discussed and analyzed. According to this analysis, geodata packages have been acquired from various data providers, for example Swisstopo and TeleAtlas. These new data, as well as existing data holdings, were integrated into a well structured geodatabase and are now available for use. All documents, metadata, contracts and terms of use related to these geodata have been published in a Wiki (https://geodata.wiki.geo.uzh.ch) where information on data access can also be found. First steps to providing the geodata directly to GIS users without the need for local storage have also been made. A large number of staff and students in GIUZ have been given support and guidance on the use of the Department’s geodata holdings. All news and changes were published in three issues of a Geodata Newsletter.

Ronald Schmidt

5.4 IT
In 2010 IT-resource usage peaked at every level: network usage, disk usage, CPU usage, number of concurrent server sessions, number of purchased fat clients, and number of resolved support tickets. Currently the IT group is running around 50 (40) physical and 135 (60) virtual servers (last year’s figures in parentheses).

Behind the scenes, the year was dominated by consolidation and the replacement of long outdated hard- and software. This was a tedious task, since a great deal of the migration work had to be done during semester, allowing no or only minimal downtime of crucial services such as email, DHCP or DNS. The replacement of the old infrastructure led to a significant increase of the virtualization level, providing better overall resource usage and service isolation. The figure below depicts the delicate interconnections and dependencies that had to be considered during the reconstruction of the core infrastructure. The clouds in Figure 3 show the target which was to be reached, while the arrows pointing to it designate the dependent tasks that had to be realized up front.

Patrick Marchi and Thomas Werschlein
5.5 Greenhouse gas emissions of the Department of Geography

Under supervision of A. Heim and M. Nauser (KUN-consulting) students produced a report on the greenhouse gas emissions of the Department – with interesting results! According to their calculations the annual greenhouse gas emissions amount to at least 900t CO₂-equivalents. Most of the emissions are caused by mobility, in particular, by staff travel to conferences and meetings. With approximately 430t CO₂-equivalents these journeys constitute nearly half of the total emissions. Related to teaching, excursions cause 130t CO₂-equivalents per year, with more than one-fifth resulting from a single overseas excursion. The authors of the report see the highest potential in reducing emissions in future in a change of means of transport for travelling within Europe (travelling by train), of avoiding overseas excursions and to replace (at least partially) travelling by use of modern telecommunications. The report is accessible in the Department’s library.

Ulrike Müller-Böker

5.6 Corporate communication

Prof. M. Schaepman and Y. Scheidegger Jung represent the GIUZ on the MNF communications committee. This year the committee developed a new concept, beside the regular exchange of information about events within the various institutes. A subgroup is responsible for the information event for scholars at Irchel (Ma turandeninformationstage: MIT2010) which was a big success with many visitors and will be repeated in 2011. A further sub team organized the first National Future Day (formerly Daughter Day) at Irchel, GIUZ was represented with the 3D Google Screen.

The redesign of the Corporate Design of the UZH was adapted to the institute’s requirements and implemented in templates for letters, presentations, etc. The redesign of the website is being developed by the external company Ruegg-Tuck-Partners (RTP) and will be published early in 2011. The GIUZ newsletter for employees and students is continuously published on a two-monthly basis.

N. Backhaus and Y. Scheidegger Jung are in charge of (internal and outward) communications and press releases. As well as looking after daily business, the team worked very closely with the working group for the organization of module exams and developed a comprehensive regime for the efficient and secure management of semester exams. N. Backhaus, G. Seitz and Y. Scheidegger Jung represent the GIUZ Ombuds team, a first contact point for employees in case of personal disharmonies with colleagues or superiors.

Norman Backhaus and Yvonne Scheidegger Jung

5.7 Library

The increasing digitalization and mechanization of modern libraries has continued at high speed. The majority of journals are now licensed for online usage and handbooks and encyclopedias are issued in a growing number as e-books. Purchase and licensing of these electronic documents have changed the workflow quite dramatically and the rate of increase in price of 10% and more has altered the composition of expenses.

As a consequence, users have to be instructed in the diverse possibilities of information seeking. This advisory service and training is expanding and is done in the physical library as well as online. Our courses in information literacy have been declared compulsory for all geography students. Students are now taught for three hours daily over a week how to find relevant information. As founding member of the University working
group AG Informationskompetenz UZH we collaborate and exchange ideas with other institute libraries in Zurich.

The website of the library (http://www.geo.uzh.ch/en/library/) has further increased its services. Its function as gateway for complex information research in geography has been extended and it serves as the primary point of access. The pages provide guides and tools to find scientific research information. We continued to be in charge of uploading all publications of the department into ZORA (Zurich Open Repository and Archive) which provides worldwide open access to research and scholar output of the University of Zurich.

Staff members of the department are requested to give one copy of every publication to the library. We will include documents in any form into the IDS and ZORA catalogue and file them. This will expand the worldwide visibility of the publications of the department, which then leads to higher citation rates and, due to this to higher ratings of the department’s work. The integration of the complete Remote Sensing Library has been completed. All former LB-Publications are now part of the IDS library system.

This year the collection, catalogued in the IDS University of Zurich, has increased by 4146 new entries. The list with the new acquisitions can be found on the website. 141'268 items are now registered in the catalogue. Additionally, the library holds about 200 current journals. The majority of them can be accessed online. The temporal effort to make these journals accessible is increasing. 2000 users borrowed a total of 5100 items. This is a fair increase in users and items lent compared to last year, which can be explained by the growing awareness of the importance of scientific literature and the better knowledge of our users in precise searching processes. The number of online accessed documents and databases also rose.

Swissbib is the new metacatalog of all Swiss university libraries and the Swiss national library. It provides a metasearch for all information resources in Switzerland. Again, the library would like to thank everybody for books and maps provided.

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

5.8 Graphics

The Department’s graphic designer carried out work in many different areas. On one hand, he is responsible for implementation of the new corporate design of the UZH. Therefore, he parametrized the given templates of the UZH in collaboration with the IT team. Further he adapted the representation posters of each unit in the H-floor to the new design. He also processed the order of new business cards in the new design layout.

On the other hand he worked on the layout of Elisabeth Bühler, Heidi Kaspar and Frank Ostermann’s book with the title Sozial nachhaltige Parkanlagen and Conradin Burga’s vegetation map with the title Biodiversity of the upper Engadin (Grison, Switzerland) in three languages (German, English and Rhaeto-Romance). The vegetation map was published by the cartography company Orell Füssli.

Further, he designed various thematic maps for the unit of Political Geography (e.g. project of Sri Lanka) and Human Geography.
As well as these tasks new posters were designed for each unit for the restructured information event for future master students, and created attractive folders for the distribution of the *Schriftenreihe* and the annual report. Last but not least pictures were prepared to improve GIUZ buildings.

*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

2010 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 have still not 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 2011.

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.

Philine Meuret

6.2  E-Learning coordination

At the beginning of the year a major reorganization of the e-learning services at UZH took place. The former ELC (E-Learning Center) has been moved and integrated into the ID (Informatikdienste) of UZH, and is now part of MELS division of ID (Multimedia and E-Learning Services). As a result, relations with the e-learning teams of several faculties of UZH had to be redefined. To keep the communication network between the e-learning teams amongst faculties and institutes at a productive level, a new working group called MELK (MELS and Coordinates) was founded. The group will meet at least twice a year as a roundtable session and once a year in a retreat. The main objective of MELK is to keep up personal contacts, share experiences and to coordinate subprojects where coordinators will work together towards a specific goal. The group held its first meeting on 30 July 2010. As an immediate result, the former website of ELC was moved to the more general www.elearning.uzh.ch including a lot of information and tools around the field of e-learning activities at UZH.
The most important event in the academic e-learning community in the sense of community building and know how transfer was the annual Conference of GMW (Gesellschaft für Medien in der Wissenschaft), held this year at UZH. GMW, a society for academic research and application of digital media at universities, consists of universities of the German speaking countries Germany, Austria and Switzerland. Due to this combination, the conference is held in an annual cycle system at a University of one of participating countries. The main theme of this year’s conference was Digital Media in Research and Teaching, split into three key areas: method and didactics, technology and curriculum. Over three days many interesting talks and keynotes where given and during parallel sessions the audience learned a lot about experiences, concepts and techniques behind the proposed e-learning projects (see www.gmw10.ch).

OLAT, the main learning management platform of UZH, has experienced a major upgrade to version 7.0, a sign of its stability and diffusion. The release has not yet been implemented into the running instance at UZH, but this will take place in 2011.

The facilitation of e-assessments at UZH was an important issue for the support and developer team of OLAT. In order to illustrate and to demonstrate the tools and possibilities realized so far, a workshop was held, where various people responsible for e-learning at the UZH were invited by the project leader J. Petri. There are already some lecture rooms equipped with e-assessment facilities e.g. at Häldeliweg, others will be upgraded soon. A pilot project in a real world setup took place and showed positive results with regards to usability and efficiency. The main objective and final milestone will be the settlement of a stringent e-assessment solution for the whole University at the end of 2013.

The development and teaching of eLML (E-Learning Markup Language) continued in 2010. Among other improvements, M. Ziege developed a standalone solution for Mac OS X and Windows (XP, Vista, 7) called Easy eLML. The application allows the creation of new and the import of existing e-lessons built with eLML without further knowledge of XML/XSL fundamentals, nor the installation of extra tools. Easy eLML is available as open source at sourceforge and will be available on a CD ROM for developing countries.

Michael Ziege
The spring semester 2010 began with the student council’s legendary skiing weekend, which took place in Engelberg. Many first year students joined, which enhanced the contact between fellow students. On Saturday, the weather was fabulous and therefore we enjoyed a great skiing day. In the evening there was a very tasty spaghetti meal after which we spent the evening playing cards or went out for a beer. On Sunday there was a strong foehn storm which made skiing impossible. Nonetheless, we spent a nice weekend in Engelberg, had a lot of fun and made new friends.

Our first task of the spring semester 2010 was to find successors for the Geoteam members, who had graduated in the summer and left the team. Optimally, they had to be from different semesters and both genders needed to be represented. As new members of the Geoteam we welcome F. Lehner, D. Bucher and E. Moser. O. Frei, S. Christen and B. Meile left the Geoteam. We assigned E. Moser as responsible for panel discussions within the institute. D. Bucher replaces B. Meile for the DoBar organisation and F. Lehner assists S. Blumer representing the students on the committee for teaching and the INVERS meetings. Furthermore, we decided to improve the coordination between the Geoteam and external institutions, (GeoDach, Stura UZH, SNP) and assigned M. Pauli to this position.

In spite of having had some unstable weather conditions, our summer included various DoBars. We bought new sound equipment and two new grills. Many people, not only Geographers seemed to appreciate this. During the DoBar on May 27 a pleasant co-operation with the „Kommission für Entwicklungsfragen – KfE“ (www.kfe.uzh.ch) was established. We were able to donate the gain of the evening to a student project in Ghana.

In addition, the student council continued to fund two internships for the Swiss National Park’s Infomobil. We decided to continue our commitment to this program due to positive feedback from last year’s students.

Freshers’ day was held on the last Friday before the beginning of the Fall Semester 2010, 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 GIUZ.

This year’s hiking weekend took us to Val de Travers and the Areuse Gorge. During the first day we visited an Absinth distillery, where we learned about the production of Absinth and received information about the culture and the history of the Val de Travers.

In November and December we helped organizing the student interviews with the selected candidates for the election of the successor of W. Häberli. Even though we had very interesting discussions with the candidates, only few students joined the interviews. For the selection procedure for the Remote Sensing professorship in fall / summer 2011 a strategy to motivate more students has to be found.

The legendary annual „Geofäscht“ took place in November at the Dynamo club under the pseudonym „Heisszeit“. As usual, the third semester students were responsible for organizing this event and they certainly met everyone’s expectations. The party was very much appreciated and a success. Another annual highlight – especially for freshers – was Santa Claus’ visit during a lecture.

Summing up, 2010 has been a satisfactory year from the perspective of the Geoteam. The semester and the DoBars passed quickly and we are looking forward to next year, which will throw up its fair share of new
tasks and challenges. One important upcoming event will be the panel discussion about possible job perspectives for Geographers.

*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.


Abiven, S.: *Biochar, a technological tool to increase soil C storage and soil fertility - Preliminary results*. Swiss soil science society meeting, Fribourg, Switzerland, 11.-12.02.2010.

Backhaus, N.: *Landsapes: Spatial totalities or special regions?* Regional and Environmental Governance, Geneva, Switzerland, 16.-18.06.2010.


Bolch, T.: *Geomatics for analysing glacier changes in the mountains of Asia*. Cold and Arid Regions Environment and Engineering Research Institute, Chinese Academy of Sciences (CAREERI, CAS), Lanzhou, China, 11.08.2010.

Bolch, T.: *Glacier volume changes at Mt. Everest*. European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Bolch, T.: *Identification and monitoring of potentially dangerous glacial lakes in northern Tien Shan (Kazakhstan/Kyrgyzstan) using geoinformation techniques*. European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Byrne, S.: A conceptual framework for thinking about the interplay of Naya Satta and Purano Satta with livelihood strategies in Nepal's mid-western hills during and after the Maoist conflict. PhD Workshop on Theoretical and Methodological Approaches to the Study of Local Politics in Developing Countries, Roskilde, Denmark, 05.-07.05.2010.

Bühler, E.: Planungsempfehlungen zur geschlechtssensiblen Gestaltung öffentlicher Parkanlagen. Fachinformation der TeilnehmerInnen am Wettbewerb für den Pfingstweidpark in Zürich, Info-Center Zürich-West, Zurich, Switzerland, 10.03.2010.


Çöltekin, A.: Geo-virtual environments: Levels of realism and abstraction for the map metaphor in the computational Era. Florida Atlantic University, Boca Raton, USA, 18.11.2010.

Çöltekin, A.: Human visual system and visualization design. MOVE (COST Action IC0903) working group 4 “WG4: Visual Analytics for Movement Data” meeting, Zurich, Switzerland, 03.06.2010.


Damm, A.: The APEX vegetation processor, an operational implementation of a physical approach for characterizing agricultural crops. ESA Hyperspectral Workshop, Frascati, Italy, 18.03.2010.

Damm, A.: Deriving sun induced chlorophyll fluorescence from airborne based spectrometer data. ESA Hyperspectral Workshop, Frascati, Italy, 18.03.2010.


Fabrikant, S. I.: *Effective and efficient spatio-temporal inference making with geovisual analytics displays*. Challenges of Visualizing Biological Data, Biotechnology and Biological Sciences Research Council (BBSRC), Arts and Humanities Research Council, Bristol, UK, 16.11.2010.


Fabrikant, S. I.: *Designing cognitively inspired displays for effective and efficient spatio-temporal inference making*. Department of Geography, The Ohio State University, colloquium series, Columbus, USA, 22.04.2010.


Fabrikant, S. I.: *Visual analytics for movement data: Cognitive issues*. MOVE (COST Action IC0903) working group 4 "WG4: Visual Analytics for Movement Data" meeting, Zurich, Switzerland, 03.06.2010.


Frey, H.: *Compilation of a glacier inventory for the western Himalayas from satellite data: Challenges and results (Poster)*. "Benefiting from Earth Observations", ICIMOD Symposium, Kathmandu, Nepal, 04.-06.10.2010.


Frey, H.: *Compilation of a glacier inventory for the western Himalayas from satellite data: Challenges and results (Poster)*. International Symposium on Earth’s Disappearing Ice, Columbus, Ohio, USA, 16.-20.08.2010.

Frey, O.: *SAR Imaging in the time domain for nonlinear sensor trajectories and SAR tomography*. CEOS Cal/Val Workshop, Zurich, Switzerland, 26.08.2010.

Frey, O.: *3D SAR imaging of a forest using airborne MB SAR data at L band and P band: Data processing and analysis*. EUSAR 2010 Conference, Aachen, Germany, 08.06.2010.


García Santos, G.: *Agrochemical fate models applied in agricultural areas from Colombia*. European Geosciences Union General Assembly 2010, Vienna, Austria, 02.05.2010.
García Santos, G.: *Earthworms lost from pesticides application in potato crops*. European Geosciences Union General Assembly 2010, Vienna, Austria, 02.05.2010.

García Santos, G.: *Improving prediction of pesticide drift deposition on water surfaces on the Colombian highlands*. European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.


Geiser, U.: *Subaltern resistance, the unruly margin, religious fundamentalism? Multiple readings of the Swat conflict in North-West Pakistan - and their blurring*. Margins and Marginality: Pakistani State and Societies, Pakistan Workshop, Rook Howe, The Lake District, UK, 08.05.2010.


Ghimire, A. & Thieme, S.: *Migration and knowledge: the circulation of knowledge and skills in the migration process in South and Central Asia*. NCCR North-South Planning Week, Aeschi, Switzerland, 09.03.2010.


Gruber, S.: *Alpine permafrost: How can we anticipate bad behaviour in steep terrain?* Research seminar, Laboratoire de Géophysique Interne et Tectonophysique, Université J. Fourier de Grenoble, France, 17.06.2010.

Gruber, S.: *Understanding the mountain cryosphere and its trajectories of change*. Symposium Progress in Glaciology and Geomorphology, University of Zurich, Switzerland, 22.10.2010.


Grünenfelder, J.: *Arguing eligibility: How Pakistani women working in the rural development sector legitimise their doing of the job*. Research Seminar at the Department of Geography, Brock University, St. Catharines, Canada, 15.10.2010.

Grünenfelder, J.: *From descriptions of ‘villagers’ to the constitution of ‘development subjects’:* Research Seminar at the Department of Sociology, Brock University, St. Catharines, Canada, 20.10.2010.


89


Gärtner-Roer, I.: Cold regions geomorphology - Towards an integrated approach (Poster). European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Haeberli, W.: Hazards from icy peaks and related effects of global change in the European Alps. CIEP-DGA Workshop on Glacial Hazards under Accelerated Change and Climate Uncertainty-Impacts on Population, Infrastructure and Ecosystems, Santiago, Chile, 06.09.2010.


Haeberli, W.: Veränderungen von Schnee und Eis weltweit. Engadiner Naturforschende Gesellschaft, Samedan, Switzerland, 17.03.2010.

Haeberli, W.: Glacier inventories as part of integrated worldwide glacier monitoring - analyses and applications. Final GlobGlacier User-Group meeting, Zermatt, Switzerland, 31.08.2010.


Haeberli, W.: Alpine permafrost and climate change. MNF-UZH Fakultätsversammlung, Zurich, Switzerland, 03.06.2010.


Haeberli, W.: The cryosphere within the Global Climate Observing System. WGMS Symposium Science and Monitoring of the Cryosphere, University of Zurich, Switzerland, 08.12.2010.


Haeberli, W.: Ice-Age conditions in northern Switzerland. Workshop on Glacial Erosion Modelling, Nagra and University of Zurich, Unterägeri, Switzerland, 30.04.2010.

Haeberli, W.: Rock and sediment beds of mountain glaciers - A quantitative approach. Workshop on Glacial Erosion Modelling, Nagra and University of Zurich, Unterägeri, Switzerland, 30.04.2010.
Haeberli, W.: Historical background of international glacier monitoring and the integration of in-situ measurements within the Global Terrestrial Network for Glaciers (GTN-G) as part of Global Climate Observation (GCOS/GTOS). World Glacier Monitoring Service General Assembly of the National Correspondents, Riffelberg-Zermatt, Switzerland, 02.09.2010.


Hasler, A.: High resolutions rock dilatation measurements from steep bedrock permafrost and implications for rock fall releasing mechanisms. European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Hermann, M.: *Spatial metaphors* or how to make political landscapes and social spaces visible. Séminaire IMA-MISC-FORS, Université Lausanne, Switzerland, 23.02.2010.


Hermann, M.: *The concept of ‘spatial metaphors’*. Workshop, Geomatics Department, University of Tehran, Iran, 23.02.2010.


Hilbich, C.: *Applicability of time-lapse refraction seismic tomography for the detection of ground ice degradation* (Poster). European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Hollenbach, P.: *How charity wounds - The double truth of solidarity*. Faculty Seminar, Arts Faculty Peradeniya University, Sri Lanka, 12.01.2010.

Hollenbach, P.: *Tsunami Hilfe in Sri Lanka - Wenn Hilfe verwundet!* Hilfe und Ethik, Ethnologisches Seminar Basel, Switzerland, 06.05.2010.


Huggel, C.: *Developing integrated approaches to climate change adaptation in rural communities of the Peruvian Andes* (Poster). European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Huggel, C.: *The role of recent and future warm extreme events for high-mountain slope failures* (Poster). European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Huggel, C.: *Climate change adaptation and disaster risk reduction strategies in rural communities of the Peruvian Andes*. International Disaster and Risk Conference, Davos, Switzerland, 31.05-04.06.2010.


Kaspar, H.: The visit to the park as a project of pleasure. PRAXIS Conference of the Faculty of Social Science, The Open University, Milton Keynes, UK, 20.10.2010.


Kauer, S. and Schneider, P.: Monitoring soil moisture dynamics on a hillslope prone to slide - A hydrologic process study on the Rufiberg field site, Switzerland (Poster). ZHydro 2010, Zurich, Switzerland, 08.11.2010.


Laube, P.: *Decentralized movement pattern detection amongst mobile geosensor nodes.* DFG-Rundgespräch Geosensor Networks, Hannover, Germany, 03.-04.02.2010.


Laube, P.: *Decentralized spatial computing for mobile geosensor networks (Invited talk).* Institut für Kartographie und Geoinformatik IKG, Leibniz Universität Hannover, Germany, 02.02.2010.


Le Bris, R.: *A new satellite-derived glacier inventory for Western Alaska (Poster).* European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Le Bris, R.: *A new satellite-derived glacier inventory for Western Alaska.* International Symposium on Earth’s Disappearing Ice: Drivers, Reponses and Impacts. Byrd Center, Ohio State University, USA, 16.-20.08.2010.


Leonowicz, A. & Jenny, B.: *Automated small-scale relief shading: A new method and software application (Poster).* 7th ICA Mountain Cartography Workshop, Borsa, Romania, 01.-05.09.2010.

Leonowicz, A. & Lüscher, P.: *Sustaining and managing open e-learning projects: Experiences on the GITTA case and discussion of possible strategies (Poster).* Eduhub days 2010, interactive discussion, Montreux, Switzerland, 27.01.2010.


Liechti, K.: *Timetable of an operationa flood forecasting.* European Geosciences Union General Assembly 2010, Vienna, Austria, 06.05.2010.


Machguth, H.: Assessing the Swiss Alpine Glacier’s Response to the 2°C target (Poster). European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Maestrini, B.: Which decomposition rate for pyrogenic carbon in the soil? First results from a long term field study based on 13C, 15N tracing approach under actual and increased N deposition condition. European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.


Malenovský, Z.: Spectroscopy of leaf biochemistry. JRC RSL Meeting, Ispra, Italy, 03.05.2010.


Meier, E.: LIDAR, Synthetic Aperture Radar & spaceborne reconnaissance. Vorlesungsreihe Geomatik, MILAK/ETH Zurich, Switzerland, 04.05.2010.


Morsdorf, F.: LiDAR remote sensing of vegetation structure. 1st YASE Workshop, Zurich, Switzerland, 21.05.2010.

Morsdorf, F.: LiDAR remote sensing @ RSL, campaigns, projects and research. 2nd SPECL Meeting, Edinburgh, UK, 02.11.2010.


Morsdorf, F.: LiDAR, eine kohärente Technik für Umweltwissenschaften. IKUB Workshop “LiDAR”, Wabern, Switzerland, 05.11.2010.


Morsdorf, F.: Laser scanning for deriving structural forest parameters. Visit of RSL at JRC, Ispra, Italy, 03.05.2010.

Morsdorf, F.: LiDAR @ RSL, a coherent approach for environmental sciences. Workshop on the occasion of visit of Prof. N.C. Coops, Zurich, Switzerland, 19.11.2010.


Noetzli, J.: *Exchange of permafrost data with the international data centers.* 7. GCOS-Rundtisch, Zurich, Switzerland, 27.01.2010.


Noetzli, J.: *Results from 10 years mountain permafrost monitoring in Switzerland: Changes in ground temperatures, ice content and creep velocities.* European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.


Odermatt, D.: *Towards the simulation and inversion of user defined inland water imaging spectrometer data.* ESA Hyperspectral Workshop, Frascati, Italy, 19.03.2010.


Paul, F.: *Mapping the World’s glaciers from space: Results from the ESA project GlobGlacier (Poster).* European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Paul, F.: *Mapping clean and debris covered glaciers from Palsar coherence images.* European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Paul, F.: *Results from the new glacier inventory for the Jostedalsbreen region, Norway, derived from Landsat TM scenes of 2006.* IGS Symposium on Earth’s Disappearing ice, Columbus, USA, 15.-20.08.2010.


Paul, F.: *Mapping and monitoring of glaciers and icecaps by remote sensing in the ESA project GlobGlacier.* IMAU students visit, Zurich, Switzerland, 26.08.2010.

Paul, F.: *Creating a global inventory of glaciers and ice caps from satellite data: Status, challenges and outlook (Keynote).* ISSI workshop on the Earth’s cryosphere and sea level change, Berne, Switzerland, 22.-25.03.2010.


Purves, R.: *Doing geography on the geoweb.* Google, Zurich, Switzerland, 04.03.2010.

Rastner, P.: **Remote sensing of glaciers using optical satellite images.** CONAE-ESAWorkshop on use of optical and radar images to study glaciers, Policy Dialogue between the EU and the Republic of Argentina, Barreal, Argentina, 09.-13.08.2010.

Rastner, P.: **Remote sensing of glaciers.** EURAC Summer School, Matsch, Italy, 18.06.2010.


Rastner, P.: **A new glacier inventory for South-Eastern Greenland from LANDSAT and ASTER GDEM data: Applied methods and challenges (Poster).** IGS Nordic Branch Meeting, Kopenhagen, Denmark, 29.10.2010.

Reichenbacher, T.: **Das Relevanzprinzip in der mobilen Geovisualisierung.** University of Heidelberg, Germany, 27.04.2010.

Salzmann, N.: **Homogeneous temperature and precipitation series for a Peruvian High-altitude Andes region from 1965 to 2009.** 8th European Conference on Applied Climatology (ECAC), Zurich, Switzerland, 13.-17.09.2010.


Salzmann, N.: **The Swiss Alpine glacier’s response to the 2°C target.** European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Salzmann, N.: **Climate change adaptation in high-mountain regions - An example from the Peruvian Andes.** Seminar, Department of Geosciences, University of Oslo, Oslo, Norway, 09.12.2010.


Salzmann, N.: **Mountain glaciers - Changes, impacts and adaptation.** Workshop Capacity Development of Transboundary Water Management, Lijiang, Yunnan, China, 15.-18.06.2010.


Schaepman, M.: **Airborne Prizm Experiment, APEX ESA Sentinel-2 MAG, Noordwijk, The Netherlands, 18.11.2010.**


Schaepman, M.: **Fernerkundung und Geographische Informationswissenschaften.** Naturwissenschaften an der Uni Zurich: Von der Schule zum Studium, Zurich, Switzerland, 13.03.2010.

Schaepman, M.: **Scaling from ground based to spaceborne spectroscopic measurements.** SATW Forum, Zurich, Switzerland, 28.10.2010.


Schmidt, M.: **Improved benzene polycarboxylic acid (BPCA) method to characterize charcoal pyrolyzed between 200°C and 1000°C.** American Chemical Society, Spring Meeting, San Francisco, USA, 25.03.2010.
Schmidt, M.: Soil organic matter turnover - What did we learn from long-term field experiments using $^{13}$C isotopes and molecular markers and in the last years? Oregon State University, Crop and Soil Science, Corvallis, USA, 05.04.2010.


Schmidt, M.: All you ever wanted to know about biochar (and other fire-derived soil organic matter) but were afraid to ask. University of California, Davis, USA, 27.04.2010.


Schmidt, M.: All you ever wanted to know about biochar (and other fire-derived soil organic matter) but were afraid to ask. University of California, Department of Geography Seminar, Berkeley, USA, 10.02.2010.

Schmidt, M.: Soil organic matter turnover - What did we learn from long-term field experiments using $^{13}$C isotopes and molecular markers and in the last years? University of California, Earth System Sciences Seminar, Irvine, USA, 03.03.2010.

Schneider, M.: Using BPCA and pyrolysis-GC/MS patterns as a measure of charring intensity. European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.

Schneider, M.: Can we use molecular markers to trace quality changes in chars from a soil chronosequence? European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.


Seibert, J.: Gauging the ungauged catchment: A combination of regionalization and limited streamflow observations. European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.

Seibert, J.: Vattenpaketet - A Swedish information package for increased awareness in water issues. European Geosciences Union General Assembly 2010, Vienna, Austria, 06.05.2010.


Seidel, F.: Concept of a fast and simple atmospheric radiative transfer model for aerosol retrieval. European Geosciences Union General Assembly 2010, Vienna, Austria, 04.05.2010.

Singh, N.: Charcoal degradation during its initial phase of decomposition. European Geosciences Union General Assembly 2010, Vienna, Austria, 03.05.2010.


Starmanns, M.: *Contesting corporate responsibility in global trade*. PhD workshop, University of Cologne, Germany, 29.01.2010.


Steimann, B.: *Making a living in uncertainty: Agro-pastoral livelihoods and institutional transformations in postsocialist rural Kyrgyzstan*. PhD defense, University of Zurich, Switzerland, 02.11.2010.


Teutschbein, C. & Seibert, J.: *Validation of regional climate models for hydrological impact studies at the catchmentscale (Poster)*. European Geosciences Union General Assembly 2010, Vienna, Austria, 06.05.2010.


Vis, M. & Seibert, J.: *HBV-light (Poster)*. AG Hydrologische Modellierung, Dresden, Germany, 27.05.2010.

Weibel, R.: *Overview of research in cartographic generalization and pattern recognition.* University of Lund, Sweden, 24.06.2010.

Weibel, R.: *From geometry, statics and oligarchy to semantics, mobility and democracy: Some trends in map generalization and data integration.* Workshop on Generalization and Data Integration, University of Colorado, Boulder, USA, 20.-22.06.2010.


Zemp, M.: *Comparison of glaciological and volumetric mass balance measurements at Storglaciären, Sweden (Poster).* European Geosciences Union General Assembly 2010, Vienna, Austria, 02.-07.05.2010.

Zemp, M.: *Distribution and changes of glaciers in the European Alps.* Excursion Lötchental, Switzerland, Excursion to Langgletscher with University of Mainz, Blatten, Switzerland, 05.-06.10.2010.


Zemp, M.: *WGMS GA NC: How to improve our service to the (scientific) community?* WGMS General Assembly of the National Correspondents, Riffelberg, Zermatt, Switzerland, 01.-04.09.2010.


Zingerli, C.: *Knowledge, power, politics: Studying social and institutional practices in development research and policy.* FoFo - Research Forum Humangeography, University of Zurich, Switzerland, 12.04.2010.
9 Publications

Books


Edited Books


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 2010)

PhD theses (including 3 external theses from GIUZ collaborators)


Dell’Endice, Francesco (2010): Improving quality of imaging spectroscopy data. Dissertation University of Zurich, Faculty of Science, Zurich.


Frey, Othmar (2010): Flexible SAR processing in the time domain - with a special emphasis on nonlinear flight tracks and SAR tomography. Dissertation University of Zurich, Faculty of Science, Zurich.

Haller, Ruedi (2010): Integratives Geoinformationsmanagement in der Schutzgebietsforschung unter besonderer Berücksichtigung räumlicher Genauigkeit. Dissertation University of Zurich, Faculty of Science, Zurich.

Hueni, Andreas (2010): Complete observing systems: Components and interactions - integrating in-situ and airborne remote sensing data. Dissertation University of Zurich, Faculty of Science, Zurich.


Suhr, Birgit (2010): A sensor independent concept for the characterisation of imaging spectrometers. Dissertation University of Zurich, Faculty of Science, Zurich.


Diploma theses


Meier, Nina (2010): Same same but different – Experiences of Nepalese migrants in Switzerland holding different resident status.


Master’s theses

Andreoli, Romano (2010): Analysing the pesticide fate model WetSpa-Pest for its application in Vereda La Hoya, Colombia in context of the project reducing human health and environmental risks from pesticide use integrating decisionmaking and spatial risk assessment models.

Andres, Norina (2010): Unsicherheiten von digitalen Geländemodellen und deren Auswirkungen auf die Berechnung von Gletscherseausbrüchen mit RAMMS.


De Francesco, Maria Grazia (2009): The overall political risk surrounding present and future oil supply.

Di Rocco, Stefania (2010): Extreme events in total ozone over the southern midlatitudes = Extremereignisse im Gesamtozon über den südlichen mittleren Breiten.


Forrer, Karin (2010): Avoidance behaviour tests used as a screening tool to assess soil pesticide contamination in Colombian potato crops.


Kallenberger, Pascal E. (2009): Howrah the other Kolkata: The planning and making of poverty in a contemporary Indian city - a critical analysis.


Rahn, Eric (2010): Environmental and health risk indicators to assess pesticide use: A comparison of different indicators for the case of potato production in La Hoya, Colombia.


Studer, Mirjam (2010): Multi-labelling (C, H₂O), a new tool for studying the allocation of organic molecules within the plant-soil system?


Weibel, Bettina (2010): Conifer seedling demographics across a forest to tundra gradient in the Rocky Mountains.
11  List of Department staff (31 December 2010)

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.
Human Geography (HGG)
Korf Benedikt, Prof. Dr.
Political Geography (PGG)

Berndt Christian,
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., Director of Dept.
Geographic Information Systems (GIS)

Academic Heads of Units
HGG: Backhaus Norman, PD Dr.
RSL: Meier Erich, Dr.
GTT: Maisch Max, Prof. Dr.

Lecturers and Senior Research Associates (Oberassistierende und Wiss. Mitarbeitende)
3G: Brandová Dagmar, Dr.
Egli Markus, PD Dr. (3G/2B)
Gruber Stefan, Dr.
Huggel Christian, Dr.
Nötzli Jeanette, Dr.
Paul Frank, Dr.
Salzmann Nadine, Dr.
2B: Burga Conradin, Prof. Dr.
Smittenberg Rienk, Dr.
HGG: Geiser Urs, Dr.
Thieme Susan, Dr.
PGG: Hermann Michael, Dr.
Raeymaekers Timothy, Dr.

Starman Mark, Dr.
WGG: Bühler-Conrad Elisabeth, Dr.
Goeke Pascal, Dr.
Schwiter Karin, Dr.
RSL: Kneubühler Mathias, Dr.
Malenovsky Zbynek, Dr.
Morsdorf Felix, Dr.
GIVA: Colettein Arzu, Dr.
Reichenbacher Tumasch, Dr.
GIS: Laube Patrick, Dr.
Purves Ross, Dr.
GTT: Landolt Sara, dipl. geogr.

Teaching and Research Associates (Assistierende)
3G: Hilbich Christin, Dr.
Machguth Horst, Dr.
Schneider Demian, dipl. geogr.
Wirz Vanessa, M.Sc.
2B: Maestrini Bernardo, M.Sc.
Wiedemeier Daniel, M.Sc.
H2K: Ewen Tracy, Dr.

Fischer Benjamin, M.Sc.
Kauer Seraina, M.Sc.
Rinderer Michael, dipl. geogr.
Schneider Philipp, Dr.
Vis Marc, dipl. biol.
HGG: Grünenfelder Julia, dipl. geogr.
Junginger Mathias, dipl. geogr.
Locher Martina, dipl. geogr.
Pörtner Ephraim, M.Sc.
PGG: Emmenegger Rony, M.Sc
Hollenbach Pia, dipl. geogr.
Johnson Deborah, M.Sc.
WGG: Herrigel Johanna, M.Sc.
Kaspar Peter, dipl. geogr.
Latzke Peter, dipl. geogr.
Robin Catherine, dipl. geogr.
RSL: Odermatt Daniel, dipl. geogr.
Weyermann Jörg, dipl. geogr.
GIVA: De Sabbata Stefano, M.Sc.
Salvini Marco, M.Sc.
Wilkening Jan Henrik, dipl. geogr.
GIS: Dodge Somayeh, M.Sc.
Leonowicz Anna, Dr.
Lüscher Patrick, dipl. geogr.
GTT: Bitzi Barbara, M.Sc.

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
Psarellis Paolo, Secretary
Wüst-Jakober Margrit, Secretary
Kauer Seraina, M.Sc., Reporting
3G/2B: Grüter Helene, Secretary
H2K: Nietlisbach Elisabeth, Secretary
HGG: Graf Maiken, dipl. geogr., Adjunct**
Kohler Regina, Secretary
PGG/WGG: Assef Perscheng, Secretary
RSL: Altorfer Sandra, Secretary
Ott Rita, Secretary**
GIVA: Büschlen Lisa, Secretary
GIS: Mandola Annica, Secretary
GTG: Arnold-Küng Andrea, Secretary
Meister Irina, M.Sc., Secretary

Technical Services
Bachmann Andreas, Dr., Computer scientist
Hilf Michael, Lab assistant
Kägi Bruno, Head of lab
Marchi Patrick, Head of IT group
Markulin Damien, Technician
Schieiss Kaspar, Computer scientist

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

Fachbereich IV Coordination
Meuret Philippe, dipl. geogr., Coordination studies
Ziege Michael, dipl. biochem., Coordination e-learning

Schmidt Ronald, Geodata manager
Soleymani Kohler Roya, Computer scientist
Steinmann Martin, Graphic designer
Werschlein Thomas, dipl. geogr. Head of IT group
Woodhatch Ivan L., Lab assistant

Soppelsa-Wagner Edith, Librarian mbA
Stoupa Iva, Librarian mbA
Volkart Regula, Dr., Scientific librarian
Project Staff

3G:  Bäckli Lorenz, dipl. geogr.**
     Bolch Tobias, Dr.**
     Endrizzi Stefano, Dr.**
     Favilli Filippo, Dr.**
     Fiddes Joel, M.Sc.*
     Frey Holger, dipl. geogr.**
     Gärtner-Roer Isabelle, Dr.**
     Girard Lucas, Dr.**
     Gubler Stefanie, dipl. Math.**
     Hasler Andreas, dipl. geogr.**
     Huggel Christian, Dr.**
     Ivy Ochs Susan, Dr.**
     Joerg Philip, dipl. geogr.**
     Küngler Matthias, dipl. geogr.**
     Le Briz Raymond, M.Sc.**
     Linsbauer Andreas, dipl. geogr.**
     Machguth Horst, Dr.**
     Mavris Christian*
     Nätzli Jeanette, Dr.**
     Nussbaumer Samuel, Dr.**
     Paul Frank, Dr.**
     Rastner Philipp, Mag. Rer. Nat.**
     Salzmann Nadine, Dr.**
     Schneider Demian, dipl. geogr.*
     Zemp Michael, Dr.**

2B:  Abiven Samuel, Dr.*
     Griepentrog Marco, dipl. Ing. (FH) *
     Schneider Maximilian, dipl. geogr.**
     Singh Nimisha, M.Sc. *

H2K:  Staudinger Maria, Dipl.-hydr.*

HGG:  Bishokarma Miriam, dipl. geogr.**
      Contzen Sandra, dipl. geogr.**
      Geiser Urs, Dr.*
      Hatcher Craig, M.Sc.*

Junginger Mathias, dipl. geogr.*
Lieberherr Silvia, M.Sc.**
Steimann Bernd, Dr.**
Thieme Susan, Dr.**

PGG:  Byrne Sarah, M. Phil.*
      Klem Bart, M.Sc.*

RSL:  Damm Alexander, Dr.**
      D’Odorico Petra, M.Sc.**
      Friou Max, Dr.**
      Henke Daniel, dipl. Inf.**
      Hüni Andreas, M. Phil (Sc)**
      Jehele Michael, dipl. Ing.**
      Magnard Christophe, dipl. ing. EPFL**
      Markulin Damien**
      Mendez Dominguez Elias, M.Sc.**
      García Santos Glenda, Dr.**
      Schubert Adrian, Dr.**
      Seidel Felix, dipl. natw. ETH**
      Small David, Dr.**
      Suárez Dolores, Dr.**
      Weber Bruno, dipl. chem. HTL**
      Yanez Rausell Lucia, M.Sc.**
      Zuberbühler Lukas, dipl. geogr.**

GIVA:  Crease Paul, M.Sc.*
      Kenan Bektas, M.Sc.*
      Lautenschütz Anna-Katharina, dipl. geogr.*

GIS:  Bereuter Pia, dipl. geogr.*
      Derungs Curdin, dipl. geogr.*
      Tomko Martin, Dr.**
      Venkateswaran Ramya, M.Sc.*

*SNSF  **Other projects (Research funded by third parties)
External lecturers (Spring and Autumn 2010)

Bader Stephan, Dr.
Baumann Stefan, dipl. geogr.
Berger Burger Heidi, Dipl. Arch. ETH
Brugger Ernst A., Prof. Dr.
Capaul Urs, Dr.
Cherubini Paolo, Dr.
Eichenberger Susann, Dr.
Escher Hermann, Dr.
Fischer Urs, Dr.
Geiger Alain, Dr.
Hanser Christian, Dr.
Hesske Stefan
Hunziker Marcel, Dr.
Kääb Andreas, Prof. Dr.
Kaiser Klaus Felix, PD Dr.
Klaus Philippe, Dr.
Kuster Jürg, Dr.
Lichtenegger Jürg, Dr.
Lüscher Peter, Dr.
McArdell Brian, Dr.
Meier Kruker Verena, Prof. Dr.
Meile Rolf, lic. phil.II
Nauser Markus, dipl. phil.
Pazeller Adalbert, dipl. Ing.
Rauch Theodor, Prof. Dr.
Reuschenbach Monika, Prof. Dr.
Ribaux Claude, lic. phil.
Rixen Christian, Dr.
Saurer Matthias, Dr.
Schaber Peter, Prof. Dr.
Schläpfer Daniel, Dr.
Schmid Annette, Dr.
Seneviratne Sonia Isabelle, Prof. Dr.
Siegwolf Rolf, Dr.
Somer Evren, lic. phil.
Steinegger Urs, dipl. natw. ETH
Tarnutzer Andreas, Dr.
Vettiger Barbara, Dr.
Vonder Mühl Daniel, Dr.
Wachter Daniel, Prof. Dr.
Zimmermann Stephan, Dr.