Annual Report 2007

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Report of the Head of the Department
The Department of Geography of the University of Zurich (GIUZ) is currently in a phase of expansion and renewal. The new assistant professorship (tenure track) in Human Geography has been held by Benedikt Korf since February 2007. The newly created unit is called Political Geography and is concentrating its research and teaching work on Political Ecologies (violent conflict, natural resources, natural disasters, vulnerability) and Development Theory (theory of development practice, development ethics, participation). This unit is already working very well and at various different levels in collaboration with the Human Geography unit. A new assistant professor (tenure track) in Physical Geography (climate and the water cycle) will be appointed in the year 2008. The seamless replacement of two chairs – Remote Sensing and Economic Geography – is planned for Spring 2009. We can therefore look forward to a successful end to the three faculty search procedures being organised concurrently at the moment and, together with the new professors at the GIUZ, we can turn our minds to the necessary planning work and to questions of how we position ourselves in terms of content. The faculty’s long-term strategic plan foresees the creation of additional assistant professorships (with tenure track) in remote sensing and in the research field of human geography after successors for Elsasser and Itten have been named.

The reorganisation of the management structures and of support services carried out in 2007 already anticipated the coming changes in personnel. The GIUZ is well prepared to make the best use of the boost in innovation in research and teaching these new appointments can be expected to bring with them, and is ready to concentrate its activities on these core areas.

Over the year covered by this report, much attention was paid to ensuring that the Department’s management structure was properly adapted to its size and its growing range of tasks. In an externally facilitated workshop in June 2007, the Board of Directors decided to maintain a centralised management structure. Two areas of responsibility were created within the Department’s executive: teaching & corporate communications and administration & IT. These two areas of responsibility, led by Dr Yvonne Scheidegger and Ruth Hunkeler respectively, include the GIUZ’s entire support services, and the academic staff can thus concentrate on the real core business. Various executive committees (e.g. personnel and finance, teaching, communications) were established to take care of interfaces and to deal swiftly with everyday business. The Board of Directors and the Department Assembly are therefore able to focus on strategic issues. Various tools (bi-monthly GIUZ Newsletter, GIUZ agenda, web documents) have also been implemented to strengthen our corporate communications. The reorganisation of systems administration and IT, as well as the redesign of the website, are now in their final stages. The flow of information has been greatly improved and the transparency of strategic decisions increased.

The MNF’s Fachbereich IV (Geosciences and Environmental Sciences) committee approved the inclusion of two professors from the GIUZ and the GIUZ’s importance is now adequately reflected by its number of representatives.

A new round of budget cuts in 2007 again affected the Department, even though allocations from the Dean’s funding pool were able to ease the problems. It was not always easy to continue working normally while renovation work was being carried out on the building; and, after only a short while to get our breath back, it will be a question of solving the problems of space that are once again making themselves felt.
The large number of students (in the Autumn Semester 07 there were 682 students majoring in geography) proves that the University of Zurich is an attractive place to study geography. The number of first semester students (majoring in geography) was slightly down on the previous year (2006: 128 students; 2007: 120 students). Roughly half of all MNF final year students graduated with a degree in Geography, and the first Masters students sat their exams in December.

The “Bologna” system has been fully implemented. The first Master theses of a maximum one-year duration have been started. Several groups are further developing and spreading e-learning tools (GITTA; Cartouche; ALPECOLe, NAHRIS, do it your soil, GLOPP), and in some courses new and innovative contents have been introduced. In response to the great demand for project management skills, a project management course has been on offer for the first time. The Department contributes to the new Master’s in Advanced Studies in Secondary and Higher Education (MAS SHE) and the new Master’s in Earth Science.

Geography is one of the most successful departments at attracting external funding – an indicator of the quality and external recognition of our research (2006: approx. 4.3 million CHF; 2007: approx. 4.75 million). The large number of successful post-doctorate grant applications as well as the number of completed PhDs are visible signs of the Department’s success; this achievement is all the more remarkable given the high teaching load. The Department also provides various scientific services to third parties, e.g. the NPOC for Swisstopo, the WGMS for UNEP and a dating laboratory.

The vision of the Department remains unchanged: to see geographical research and teaching as its main challenge and to offer great potential for networking and bridge-building in a world which is changing ever faster. Over the reporting period, this vision has become more concrete and more precise. There is a consensus that the diversity of areas of highly specialised research practised at the GIUZ represents one of its main strategic assets; and this is also true of the great potential that exists to discover new and pioneering topics at the points of intersection between sub-disciplines. In such a context, there are room and possibilities for the impulses and innovative ideas our new colleagues bring with them to flourish.

We are convinced that enlarging the staff of the Department will, in the medium and long term, contribute to ensuring that a large number of students will be able to benefit from a high and continuously improving level of geography studies in the future. This enlargement should also enable us to extend the PhD programme and to start to develop a PhD graduate programme. It will also be necessary to evaluate whether we can offer specialised Masters courses within the graduate programme. Last but not least, this increase in staff will also give senior researchers more time for their own research.

We are especially obliged to the members of staff, celebrating their anniversary at GIUZ.

Dr. Dagmar Brandova           15 years
Dr. Norman Backhaus           15 years
Dr. Urs Geiser                20 years
Dr. Mathias Kneubühler        10 years
Philippe Meuret               10 years
Martin Steinmann              25 years
Dr. Regula Volkart            30 years
Dr. Stefan Leyk was appointed Assistant Professor (tenure track) in Geographic Information Science at the University of Colorado, Boulder (USA). Professorships were also offered to Dr. Ingo Petzold, PD Dr. Markus Egli and Dr. Ing. Jens Nieke, although they did not accept the positions. We heartily congratulate them on these wonderful successes!

We would like to thank the students at the GIUZ, the interested public and especially the authorities of the university and the faculty for their support, and also wish to express our thanks to all staff members for their valuable commitment.

*Ulrike Müller-Böker, Head of the Department*
List of the Department staff (31 December 2007)

Heads of unit
Binder Claudia, Prof. Dr., SNSF professor
Elsasser Hans, Prof. Dr.
Fabrikant Sara, Prof. Dr.
Haebeler Wilfried, Prof. Dr.
Itten Klaus, Prof. Dr.
Korf Benedikt, Prof. Dr.
Müller-Böker Ulrike, Prof. Dr., Director
Schmidt Michael, Prof. Dr.
Weibel Robert, Prof. Dr.

Executive staff
Hunkeler-Wittleder Ruth, Admin.director
Graf Kurt, Prof. Dr., Section head teacher training
Meier Erich, Dr. Scientific section head
Scheidegger Jung Yvonne, Dr., Head of teaching administration and corporate communications
Dorigo Guido, Dr., Head of IT

Lecturers and senior researchers
Abegg Bruno, Dr.
Backhaus Norman, PD Dr.
Brandová Dagmar, Dr.
Bühler-Conrad Elisabeth, Dr.
Burga Conrado, Prof. Dr.
Burghardt Dirk, Dr.
Cöltekin Arzu, Dr.
Egli Markus, PD Dr.
Geiser Urs, Dr.
Gruber Stefan, Dr.
Hagmann Tobias, Dr.
Heim Alexander, Dr.
Hoelzle Martin, Dr.
Huggel Christian, Dr.
Kellenberger Tobias, Dr.
Klaus Philipp, Dr.
Kneubühler Mathias, Dr.
Maisch Max, Prof. Dr.
Nieke Jens, Dr.
Odermatt André, Dr.
Paul Frank, Dr.
Purves Ross, Dr.
Reichenbacher Tumasch, Dr.
Small David, Dr.
Van Wezemaal Joris Ernest, Dr.
Zaugg Stern Marc, Dr.

Teaching and research associates
Abiven Samuel, Dr.
Arnold-Küng Andrea, B.Sc.geogr.
Asser Benjamin, Intern
Böckli Lorenz
Caduff David, Dr.
Diniz Silva Peter, Intern
Dodge Somayeh, M.Sc.geogr.
Eggenberger Jürg, M.Sc.geogr.
Engeler Michelle, MA
Grossmann Thomas, dipl. geogr.
Grünenfelder Julia, dipl. geogr.
Heye Corinna, Dr.
Huber Gharib Silvia, dipl. geogr.
Junginger Mathias, dipl. geogr.
Landolt Sara, dipl. geogr.
Lautenschütz Anna-Katharina, dipl. geogr.
Loepfe, Matthias
Meier Matthias
Neun Moritz, Dr.
Odermatt Daniel, dipl. geogr.
Paternoster Georg, Intern
Schärer Lilith, dipl. geogr.
Schneider Demian, dipl. geogr.
Schneider Maximilian, dipl. geoökol.
Schopfer Jürg, dipl. geogr.
Schwiter Karin, dipl. geogr.
Snozzi Jonas
Starmanns Marc, dipl. geogr.
Straumann Ralph, dipl. geogr.
Treichler Desirée

Technical services
Bachmann Andreas, Dr., Computer scientist
Hilf Michael, Lab assistant
Kägi Bruno, Head of lab
Marchi Patrick, Computer scientist

Administration
Altorfer Malakar Sandra, Secretary
Assef Perscheng, Secretary
Büschlein Lisa, Secretary
Cottier Elisabeth, Secretary
Holliger Nicole, Student advisor
Kohler Regina, Secretary
Nietlispach Elisabeth, Secretary

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

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

Project staff
Allgöwer Brita, Dr. **
Barmettler Arnold, El. Ing. ETH **
Bircher Simone **
Bitzi Barbara **
Böhlert Ralph *
Brundiers Katja **
Bühler Yves, dipl. geogr. **
Craviolini Christoph, dipl geogr. **
Dell’Endice Francesco, M.Sc. **
Eckmeier Eileen, Dr. **
Edwardes Alistair, M.Sc. **

Tuor Rico, dipl. geogr.
Wiedemeier Daniel
Wilkening Jan Henrik, dipl. geogr.
Wirz Vanessa
Wyss Rahel, dipl. geogr.
Zanola Silvio Werner

Steinmann Martin, Graphic designer
Werschlein Thomas, dipl. geogr. Computer scientist
Woodhatch Ivan L., Lab assistant

Psarellis Paolo, Secretary
Ott Rita, Secretary
Salvini Marco, Student advisor
Sautier Sibylle, dipl. geogr., Student advisor
Sieber Amalia, Student advisor
Wüst-Jakober Margrit, Secretary

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

Ejderyan Olivier, dipl. geogr. **
Favilli Filippo, M. Sc. **
Feola Guiseppe, M. Sc. *
Fischer Luzia, dipl. Natw. *
Frey Holger Rudolf **
Frey Othmar, dipl. Ing. ETH **
Fritschi Astrid **
Frioud Max **
Garcia-Santos Glenda *
Hammes Karen, Dr. **
Hasler Andreas **
Henke Daniel **
Herren Martin**
Hofmann Anett, dipl. Ing. Agr. *
Hüni Andreas **
Imfeld Stephan, Dr. **
Jehle Michael, dipl. Ing. **
Joos Ottmar, dipl. geogr. *
Kalberer Rima Renate **
Kaspar Heidi, dipl. geogr. *
Klem Bart **
Le Bris Raymond **
Lehmann Christine **
Lüscher Patrick, dipl. geogr. **
Machguth Horst, dipl. geogr. *
Magnard Christophe **
Meier Armin **
Morsdorf Felix, Dr. **
Müller Urs, Dr. **
Nötzli Jeannette, dipl. geogr. *
Ostermann Frank *

**External lecturers**
Achermann Matthias, dipl. geogr.
Ammann Walter, Dr.
Baumann Stefan, dipl. geogr.
Bernasconi-Green Gretchen, PD Dr.
Brugger Ernst A., Prof. Dr.
Bürki Rolf, Dr.
Capaul Urs, Dr.
Cherubini Paolo, Dr.
Edelkraut Kunz Kirsten, Dr.
Edwardes Peter, Prof. Dr.
Eichenberger Susann, Dr.
Escher Hermann, Dr.
Fischer Urs, Dr.
Geiger Alain, Dr.
Ghirlanda Silvia
Güsewell Sabine, Dr.
Häberli Verena
Hagedorn Frank, Dr.
Prinz Rainer *
Roer Isabelle *
Rosset Aline **
Schläpfer Daniel, Dr. **
Schmidt Ronald **
Schoell Regina, M.Sc. **
Schubert Adrian, Dr. **
Seidel Felix, dipl. natw. ETH **
Steimann Bernd, dipl. geogr. **
Thieme Susan, Dr. **
Tomko Martin **
Weber Bruno, dipl. chem. HTL **
Weder Andrea **
Weyermann Jörg **
Wittmer Dominic **
Yang Jing, Dr. *
Zemp Michael *
Zingerli Claudia, Dr. **
Zuegbühler Lukas **

*SNSF **Other projects

Hanser Christian, Dr.
Hauck Christian, Dr.
Heinrich Christoph A., Prof. Dr.
Hunziker Marcel, Dr.
Ivy Ochs Susan Denise, Dr.
Käab Andreas, Prof. Dr.
Kaiser Klaus Felix, PD Dr.
Keller Oskar, PD Dr.
Keller Urs, Dr.
Korup Oliver, Dr.
Kos Andrew, Dr.
Kuster Jürg, Dr.
Lötscher Lienhard, Prof. Dr.
Meier Kruker Verena, Prof. Dr.
Pazeller Adalbert, dipl. Ing.
Pauli Urs, dipl. Betriebsökonom
Pronk Marco, Dr.
Rauch Theo, Prof. Dr.
Reuschenbach Monika, Dr.
Rixen Christian
Rüegg Maurice
Saurer Matthias, Dr.
Schär Christoph, Dr.
Schläpfer Daniel, Dr.
Schöttli Heinz, dipl. arch. ETH  

Seneviratne Sonia Isabelle, Dr.
Siegwolf Rolf, Dr.
Tarnutzer Andreas, Dr.
Vonder Mühl Daniel, Dr.
Walter Daniel, Prof. Dr.
Wieler Rainer, Prof. Dr.
Wüest Marc, Dr.
1 Main research activities

The vision of the Department remains unchanged: to see geographical research and the related teaching as its main challenge and to offer great potential for networking and bridge-building in a world of accelerated change. Over the reporting period, this vision has become more concrete and more precise. There is a consensus that the diversity of areas of highly specialised research practised at the GIUZ represents one of its main strategic assets; and this is also true of the great potential there is to discover new and pioneering topics at the points of intersection between sub-disciplines. In such a context, there are room and possibilities for the impulses and innovative ideas our new colleagues bring with them to flourish. The lead topic "The Earth in Accelerated Change: Habitats in the 21st century" is approached using both system- and actor-oriented concepts.

The different units of the Department are newly grouped under the umbrella of three research fields. The research field Physical Geography concentrates on the dynamics in high mountain areas and global biogeochemical cycles as the focal points where climatic and climato-political aspects meet. The newly created assistant professorship will enlarge this main focus to take in the central preoccupation of climate and the water cycle. In the research field Human Geography, the development-oriented research focuses on the livelihood strategies of poor people, access to and use of natural resources, as well as on violence and statehood. The Economic Geography unit’s programme covering tourism, regional economics, regional and urban development, and gender studies, will strike out on a new path. Earth observation and geo information science are at the heart of the research field Methods to enable the development and visualisation of space-time databases capable of capturing fast and complex processes as they unfold. In the following section the units report in detail about their research focus and projects.

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<td>Remote Sensing Laboratory</td>
<td>Social and industrial Ecology</td>
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<td>Wilfried Haebeli</td>
<td>Hans Elsasser</td>
<td>Klaus Itten</td>
<td>Claudia R. Binder</td>
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<td>Soil Science &amp; Biogeography</td>
<td>Human Geography</td>
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<td>Michael Schmidt</td>
<td>Ulrike Müller-Böker</td>
<td>Systems</td>
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<td>Sara J. Fabrikant</td>
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1.1 Glaciology, Geomorphodynamics & Geochronology
**General overview**
Research at the unit *Glaciology, Geomorphodynamics & Geochronology* focuses on the climate-related evolution of high mountain environments with special emphasis on past, present and future changes in landscape characteristics, the water cycle and natural hazard conditions related to glaciers and permafrost. Members of the unit participated in the preparation of the latest IPCC report (Working Groups 1 and 2) and the important UNEP overview “Global outlook for ice and snow”. The project GISALP completed as part of the National Research Program 48 for the first time provides an integrated GIS-based geo-information system for a high Alpine region (the Upper Engadin) and clearly illustrates the striking changes that can be expected in high mountain areas characterized by snow and ice with continued atmospheric warming. A synthesis of monitoring data from in-situ measurements, GIS-based spatial modelling and remote sensing shows that the overall glacier volume in the Alps is now decreasing by 2 to 3% per year — a total loss of about 75% compared with 1970-1990 is anticipated within the coming four to five decades on the basis of realistic climate scenarios (roughly one third of this scenario has already taken place). This trend corresponds to the accelerated glacier shrinkage at global level observed by the World Glacier Monitoring Service, which is based in the unit and now financially supported by the Swiss National Science Foundation (SNSF) and the Federal Office for the Environment (FOEN). Coordinated efforts are undertaken to better understand, quantitatively model and continuously monitor the deep warming of permafrost in complex high-mountain topography and the increasing probability of large rockfalls. Helicopter-based high-resolution laser scanning of rock and ice surfaces in the Monte Rosa east face and exposure dating of high-altitude rock walls at Aiguilles du Midi (Mont Blanc) in view of rockfall frequency/probability were among the most conspicuous research highlights. Two important new activities were initiated with the ESA-funded GlobGlacier project for worldwide satellite-based glacier inventories and the project PERMASENSE as part of the NCCR Mobile Information & Communication Systems (MICS). The national Permafrost Monitoring Switzerland (PERMOS) network is run by the unit and international consultancy work — mainly in South America — continues within the framework of SDC and SECO projects.

**Main research activities and scientific progress**

**Glaciers**
A major achievement and important new challenge was the preparation and initiation of ESA’s GlobGlacier project. The main aim is to map the world’s glaciers and ice caps from space and derive additional value-added products for different user groups (WGMS, GLIMS, etc.). The project started in November and will last for 3 years. It is lead by F. Paul and has four sub-contractors in Switzerland (Gamma), Austria (Enveo), Norway (University Oslo) and the UK (University of Edinburgh). The budget is 950,000 euros (about 45% for GIUZ) and two new PhDs have been employed (R. Le Bris from France and H. Frey). Within the SNSF-project ALGLAMBA-CLIP (F. Paul, PhD H. Machguth) the mass balance measurements on Findel Glacier were continued, a comparative study of different distributed mass balance models was performed together with R. Dadic (Environmental Engineering ETHZ) and the influence of input parameter uncertainties for such models were analysed. Ice core drilling in cooperation with the Institute of Environmental Physics at the University of Heidelberg and the Physics Institute of the University of Berne reached bedrock underneath the cold
miniature ice cap at Piz Corvatsch (M. Hoelzle), where a GPS survey with support from H. Ingensand (Geodesy and Photogrammetry ETHZ) documented strong thickness losses (on average -1 metre per year) and a possible disappearance of this interesting Holocene ice archive before the middle of the century. Quantitative approaches were developed to model the location of new lakes forming in cold mountain regions where glaciers disintegrate or vanish completely (H. Frey, F. Paul, C. Huggel, W. Haeberli).

**Permafrost**

Numerical 4D modeling of subsurface temperatures below complex mountain topography was conducted in order to investigate time and depth scales of past and future transient effects in high-altitude permafrost (SNSF-project ROCKFROST; S. Gruber, M. Hoelzle, PhD J. Noetzli). Remaining paleo-effects from the last ice age and before are very small for subsurface permafrost temperatures, whereas transient effects of current and future warming were found to be highly relevant for the subsurface thermal field. A first validation study of the 4D modelling approach on Schilthorn, which included a comparison of results from modelling and a quasi 3D electrical resistivity tomography campaign, provided promising results. In the autumn, a second wireless sensor network (WSN) was set up on the Matterhorn (3400m a.s.l.) within the framework of the transdisciplinary project PERMASENSE of NCCR MICS to measure rock temperature, cleft water circulation and joint dilatation to investigate frost weathering and destabilization of permafrost in rugged topography (S. Gruber, PhD A. Hasler). The sensor-to-desk data transmission of the two networks (Matterhorn & Jungfraujoch 2006) is still in the testing phase, while the data from the sensors is recorded with a temporary logging-only solution. Comparison of measurements at the rock glacier Murtèl and model simulations revealed that the observed ground cooling exerted by coarse debris covers is in part caused by thermal conductivity contrasts, a much simpler mechanism than air circulation, which is usually used (S. Gruber). A profound analysis of rockglacier stratigraphy and ice content was enabled by deep excavation for ski-run construction at Gornergrat near Zermatt. Samples for laboratory analyses could be extracted in a complete profile through a rock glacier, and geomorphological mapping was combined with geophysical surveys for interpretation and extrapolation of results (I. Roer, S. Gruber, in cooperation with C. Hauck - University of Karlsruhe, C. Hilbich - University of Jena, D. Wagenbach - University of Heidelberg, and O. Wild - University of Giessen). The studies on hydrothermal processes and stability of permafrost active layers on steep talus were completed (PhD A. Rist, supervision M. Phillips and W. Ammann at SLF).

**Environmental dynamics and natural hazards**

The project GISALP as part of the NRP 48 was completed and the corresponding final report published (W. Haeberli, M. Egli, S. Gruber; collaboration with B. Krüsi, WSL, F. Keller, PhD C. Rothenbühler, PhD J. Meilves, Academia Engiadina). The report as well, as a press release, were amply covered by the media. An integrated 4D-geoinformation system now exists for the world-famous tourist region of the Upper Engadin, allowing early anticipation of possible climate change impacts, including complex system interactions. This, in turn, forms the basis for long-term planning under conditions of rather dramatic environmental change. The project and its product constitute an important lesson about long-term system behaviour in high mountains and our - still very limited - possibility to deal quantitatively with such spatio-temporal complexity. In the SNSF project “Slope stability in perennially frozen and glacierized rock walls” (C. Huggel, PhD L. Fischer), insight
into stability aspects has been gained by numerical stability modelling for a case study in the Tschiera area. A highlight of this project was the successful helicopter-based LIDAR scan of the complete Monte Rosa east face – the first such measurement of a large Alpine high-mountain wall that now opens new perspectives in stability-related analysis and modelling. In a new project on the influence of ice in large and rapid mass movements (C. Huggel, PhD D. Schneider; cooperation with B. McArdell and P. Bartelt from WSL), first laboratory experiments on the WSL chute and dynamic modelling of large ice-rock avalanches have been performed.

Important steps towards the operative implementation of a landslide early warning system have been achieved in the SDC-supported hazard prevention project in the Central Cordillera of Colombia (C. Huggel) in close collaboration with the partners in Colombia. The project has furthermore provided a quick response to the crisis caused by the eruption of the ice-capped volcano Nevado del Huila.

**Geochronology**

Easily recognisable traces of dramatic climatic variations make high-mountain areas unique geotopes and “storytellers” about past - as well as possible future - climate change effects on landscape dynamics and living conditions in regions of rugged topography. The chronology of Alpine landscape processes and chronologies is often derived from a few and sometimes questionable dates. One main aim 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. Two PhD projects (R. Böhlert: “Constructing a temporal framework for landscape dynamics in the eastern Swiss Alps during the Lateglacial and early Holocene” and F. Favilli: “Soil and Alpine landscape evolution since the Lateglacial and early/mid Holocene in Val di Sole, Trentino, Italy”), which are funded by the SNSF and the Stiftung zur Förderung der wissenschaftlichen Forschung (University of Zurich) focus on the application of several numerical and relative dating techniques in the high-alpine region. Numerical techniques such as surface exposure dating using \(^{10}\)Be, optically stimulated luminescence (OSL) or radiocarbon dating are combined with relative techniques such as Schmidt-hammer rebound values, weathering rinds, soil mineral/chemical properties on the same landforms to cross-check the methods. In a separate field study at Aiguille du Midi (France), surface exposure ages of rock walls and the rock surface colour (based on spectral properties) were compared (S. Gruber, R. Böhlert). Remarkably old ages of almost 40,000 years were obtained and a pronounced relation between surface exposure ages and spectral signature could be found. Both PhD projects are under the supervision of M. Egli, M. Maisch, W. Haeberli, D. Brandová, S. Ivy-Ochs. The ISSDS (Florence), IGT (ETHZ), TU Freiberg, IPP (ETHZ), Macaulay Institute (Aberdeen) and the WSL (P. Cherubini) are also involved. M. Schaub completed his PhD work on multi-proxy analysis of lateglacial tree rings and sediments in the deep excavation for the Üetliberg freeway tunnel. This work was a collaboration with WSL (F. Kaiser) and the Heidelberg radiocarbon laboratory (B. Kromer) funded by the cantonal civil engineering office and coordinated by R. Wyss from Dr. H. Jäckli Consultants for geology, geotechnics and groundwater. It saved and documented unique paleoenvironmental information about the final parts of the transition from the last ice age to the Holocene near Zurich.

*Wilfried Haeberli and collaborators*
1.2 Soil Science and Biogeography
General overview

“Global Change and the Carbon Cycle in the Plant-Soil System” remains the main topic of work by the Soil Science and Biogeography group. The year 2007 was a year of consolidation. After several years of overcrowded offices in separate buildings and labs jammed with instruments, the new soil labs and offices were finally inaugurated in January. New analytical instruments could be used for analysis in diploma and PhD projects. We also warmly welcomed urgently needed additional positions for technical (M. Hilf) and administrative (E. Nietlispach) support. The first cohort of junior scientists - R. Zanelli, M. Zimmermann, K. Hammes and E. Eckmeier (passed with distinction) - received their PhD degrees, and two scientists (S. Abiven, E. Eckmeier) won research grants from the University of Zurich to pursue their research projects.

Over several years (2003-2007), our group coordinated the first methodological intercomparison of different methods of quantifying fire-derived residues in the environment, which involved 17 labs worldwide. Results of this unique and timely experiment finally became available to the scientific community and were published this summer. As part of a NCCR Climate project, we tested the effect of summer drought on the carbon budget of grasslands. After very difficult weather conditions during the field season in 2006, we finished the field season 2007 successfully. GISALP, a project within NRP48, was also successfully completed. Overall, 2007 was a successful year both in terms of research and teaching, and it set the stage for several exciting new research projects combining field and lab work in the coming year.

Main research activities and scientific progress

The main focus of our research in soil science continues to be the dynamics and stability of soil organic matter, which is analysed by molecular, isotopic, and spectroscopic methods. In spring 2007, two PhD theses were completed: Karen Hammes evaluated methods for black carbon quantification in the environment in a large-scale inter-laboratory ring trial. Eileen Eckmeier applied biochemical markers to detect prehistoric fire-based farming. After a research visit at the CSIRO Land and Water in Adelaide (Australia) and a teaching assignment for the Dept. of Pre- and Protohistory, she has now started her postdoc project “A geoarchaeological approach to investigate human-environment interactions in the Valle Leventina”. The project is funded by the research fund of the University of Zurich and will be realised in cooperation with the Dept. of Pre- and Protohistory of the Institute of History. A newly started PhD project by Maximilian Schneider will focus on the effect of formation conditions on the chemical characteristics of black carbon.

In lignin research, Anett Hofmann is continuing her PhD project on factors controlling lignin stability in soils. She established a new joint project with the Department of Agro-environmental Sciences and Technologies (University of Bologna, Italy), which she visited in summer. She was also invited to present her results at the Research Center Foulum (University of Aarhus, Denmark), which is our main partner for field samples in her project. Based on the results of the first phase of her PhD, we obtained funding by the SNSF for a follow-up project, which will allow a more detailed study of the mechanisms of lignin stabilisation in soil.

Parallel to this project, we started to broaden our methodological basis in lignin analysis: Samuel Abiven reviewed different methods that were used to extract lignin from plants and is currently modifying them to be applicable to soils as well. In a project funded by the research fund of the University of Zurich, he
developed an approach with selected lignin-decomposing microorganisms in order to investigate lignin stabilisation mechanisms in the soil. Alexander Heim and Samuel Abiven developed a model that enables us to estimate confidence limits for results from organic matter turnover studies.

Ottmar Joos completed the fieldwork in the NCCR Climate project Plant/Soil on drought effects on grassland ecosystems. This project is a joint project between the Plant Nutrition group (University of Berne), Grassland Sciences group (ETH Zurich) and our group. First results show a decrease of CO$_2$ efflux of Swiss grassland soils due to drought. On one of these field sites, Alexander Heim and Ottmar Joos collaborate with the Technical University of Berlin in a project on fluxes of dissolved inorganic carbon.

The research of Markus Egli focuses primarily on weathering processes, clay mineralogy, organic matter - mineral interaction, element cycles (nutrient elements, heavy metals), and soil conservation and transport processes. The research project about the influence of soil properties (micro and macro-nutrients) on the production and quality of citrus fruits is finished and the knowledge gained will now be implemented at a local to regional scale together with the Agenzia Regionale per lo Sviluppo e i Servizi in Agricoltura (Catanzaro). In a current, international project, the binding mechanisms and mobility of heavy metals in high-alpine regions (Trentino, Italy) on silicate and volcanic parent material are investigated. Special emphasis is placed on the interactions of clay minerals, heavy metals and organic matter fractions and their effects on soil biology.

The project GISALP NRP48 was successfully completed (in cooperation with Conradin Burga). Our current research in the Morteratsch glacier forefield, which was conducted in close collaboration with the Institute for Forest, Snow and Landscape Research WSL, contributed significantly to this project. During summer 2007, the results of the EU project GLORIA (vegetation monitoring on summits in Upper Engadin) were presented to a wider audience on several occasions. A diploma thesis (Alex Indermair) was completed in the project on invasive neophytes in Switzerland. Conradin Burga is project leader in the Swiss Virtual Campus project ALPECOLE, which includes 12 university partners. The maintenance phase of this project has now been completed and the course is currently in use at several Swiss universities and at the Nature Museum in Chur. The vegetation map Monte Caslano /TI was completed end of 2007. Publication is scheduled for 2008 and will be funded by Malcantone Turismo.

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

• poor people’s livelihood strategies in a globalising world
• sustaining livelihoods through migration
• negotiating sustainability in natural resource use and management

The human geography unit conducts and coordinates development-related research with the aim of contributing to sustainable development in both developing and industrialised countries.

We continued our various research activities in these fields with success. For example, the South Asia group of the NCCR North-South made a huge step forward by comparing and synthesising case study results from three countries. The lengthy process to legalise our South-Asia coordination office in Kathmandu by an agreement with the Government of Nepal is progressing well. This office is already a nodal point of livelihood-oriented research in Nepal with strong links to the Pakistan group. In Central Asia, NCCR research on migration and pastures is in full swing, and S. Thieme and B. Steimann successfully presented their results during the site visit by SNFS reviewers in Kyrgyzstan. B. Strasser and S. Kianicka successfully defended their PhD dissertations. U. Müller received a postdoc scholarship within the UPRP Asia–Europe of the University of Zurich, and N. Backhaus contributed to the enhancement of the UPRP.

Main research activities and scientific progress

Livelihood options and globalisation
Led by: U. Müller-Böker, U. Geiser
http://www.research-projects.uzh.ch/p7540.htm
http://www.north-south.unibe.ch/content.php/page/id/9

The project is part of the NCCR-North-South and focuses on poor people’s livelihood strategies in a globalising world. The core research question is: what are the opportunities for, and what hinders poor people in securing their livelihoods, specifically considering the spatial implications of present-day livelihood dynamics? Conceptually, the project applies a livelihood perspective in its research, focusing on institutional issues of (contested) access to assets, and people’s entitlement to benefit from assets. These questions are operationalised through the following activities, which are based on research partnerships with organisations in the respective countries:

Nepal research group
Prof. U. Müller-Böker, G. Gurung, Prof. K. Pyakurryal, Dr. S. Sharma, Dr. B. Upreti; PhD students: M. Junginger, P. Nepali, A. Ghimire

The core interest of the Nepal research group is to understand and analyse different rural livelihood strategies in marginalised areas of Nepal with their urban links and to identify related institutions that support or hinder efforts of the poor to secure the means for improving their lives. In 2007, one new PhD project on migration
processes in Nepal began. Moreover, collaboration with the University of Kathmandu was strengthened and two new joint PhD projects were launched in Nepal.

Pakistan research group
Dr. U. Geiser, Dr. A. Suleri, M. J. Ahmad, Dr. B. Shahbaz, Dr. K. Siegmann, Prof. T. Ali, Dr. Sultan-i-Rome; PhD student: J. Grünenfelder.
www.nccr-pakistan.org
NCCR N-S research in Pakistan focuses on livelihood constraints, and alternatives, for people living in the highlands and adjoining lowland regions of Northwest Pakistan. Researchers pay special attention to the rapidly changing role of local and national institutions under the pressures of globalisation. In 2007, research addressed the impact of migration, and an action-research component was added to test the feasibility of negotiating relationships between the state’s Forest Department and local stakeholders through independent mediation.

Research in India
Dr. U. Geiser, Prof. K.N. Nair, Prof. V. Menon, Prof. R. Ramakumar; PhD students: B. Strasser (completed), C.P. Vinod
This research group focuses on coping with change – the effects of decentralisation and economic globalisation on rural livelihoods. In Kerala, research results were published as working papers. In early 2007, a new partnership was established with the Centre for Development Studies at the Tata Institute for Social Studies (TISS), Mumbai. Research is concerned with agrarian change in Maharashtra. Finally, Balz Strasser completed his PhD thesis on livelihood strategies, diversity and the local institutional setting of rubber smallholders in Kerala, South India.

Research in Kyrgyzstan
Prof. U. Müller-Böker; PhD student: B. Steimann
The work package’s research in Kyrgyzstan is concentrating on the use and management of pastures, its institutional setting and the effects of postsocialist transformation thereupon. In his PhD study, B. Steimann looks at the interaction between pasture-dependent livelihoods and the institutional change resulting from the collapse of the former Soviet society and economy. Selection of and empirical research in two case study locations has been carried out in spring and autumn 2007. In September 2007, a joint field excursion with researchers from Kyrgyzstan, Pakistan and West Africa helped to better link ongoing research on extensive production systems.

Link between research and practice
The NCCR North-South provides for supplementary so-called Partnership Actions, which, although conducted by NGOs, are closely tied to NCCR research projects. Partnership Actions are a vehicle to test the practical application of development research results. In 2007 the following projects associated with the Human Geography unit were continued or started:
• Facilitating Access of Dalit People on Land Resources in Nepal (ongoing)
• Strengthening communication and trust between actors for sustainable forest governance in the NWFP of Pakistan (new)

Decentralisation, social movements and natural resource management
Dr. U. Geiser, PD Dr. S. Rist
http://www.research-projects.uzh.ch/p7544.htm
This project examines the dominant discourse and practice of formalising participation in natural resource management – be it through decentralising state involvement, the devolution of power to local level, or the (often autonomously conducted) empowerment of local actors with their forms of organisations (e.g. social movements) – intended as a mitigation strategy to overcome resource exploitation and to improve people’s livelihoods. In 2007, researchers from Mexico, Argentina, Bolivia, India, Pakistan and Nepal submitted their final research papers. These papers are now going through a peer review process in view of a joint publication.

Knowledge, power, politics: evaluating social and institutional practices in sustainable development and syndrome mitigation research
Dr. C. Zingerli, Dr. A. Uzeda Vásquez
http://www.research-projects.uzh.ch/p7541.htm
This NCCR North-South postdoc project deals with questions regarding knowledge production in development research and knowledge exchange processes between development research, policy and practice. The project has three case studies, conducted in Switzerland, Bolivia and Vietnam. The most important project activities during 2007 were data collection in Switzerland and Bolivia, and the organisation of an international project workshop in Zurich on “Knowledge, Power, Politics”. First results were presented in four conferences and workshops (in Heidelberg, Brighton, La Paz, Cochabamba).

Sustaining livelihoods in trans-local and trans-national settings
Dr. S. Thieme, Dr. S. Barbora
http://www.research-projects.uzh.ch/p7542.htm
The ongoing NCCR N-S postdoc research project deals with the multilocal dimension of people’s livelihoods and investigates potentials and risks of this multilocality. Case studies are carried out in Central Asia, South Asia and Central America. Highlight of year 2007 was the production of a film documenting processes of labour migration in Central Asia. A camera team joined the researchers to Kyrgyzstan and Kazakhstan.

Globalisation and livelihood options of people living in poverty (GLOPP)
Prof. U. Müller-Böker, PD. Dr. N. Backhaus, O. Ejderyan, P. Kauer-Ott
http://www.research-projects.uzh.ch/p7562.htm
Globalisation and Livelihood Options of People Living in Poverty (GLOPP) is a blended learning project (e-learning and class attendance) financed by the Swiss Virtual Campus (SVC) and the University of Zurich. There is now a comprehensive e-learning platform and several courses have been integrated into the curriculum, providing Bachelor’s and Master’s students with experience of research processes and applications as well as analytical skills. The project was presented at the SVC Days in October 2007 in Berne, and a partnership with
the Sustainable Public and Private Environmental Management (SUPPREM) course of the University of Geneva was established in order to offer courses to the European virtual campus eLERU. Last but not least, an extension of the project until July 2008 has been endorsed.

**Overcoming the nature-culture dualism?**
Dr. U. Müller  
http://www.research-projects.uzh.ch/p9460.htm  
This newly started postdoc project, granted by the University Priority Programme Asia and Europe (UPRP Asia and Europe), examines and links two innovative conservation approaches that attempt to reconcile conservation and livelihood interests in protected areas: the Kangchenjunga Conservation Area in Nepal and the UNESCO Biosphere Entlebuch, Switzerland. Actors’ notions of nature and nature protection will be analysed through methods of discourse, image analysis and observation. The aim is to make explicit if and how the so-called model regions deal with characteristic dichotomies of modernity, in particular the separation of nature and culture. The main activities in 2007 were literature reviews and the elaboration of the current state of research. The research design, theoretical approach, and methodology were presented at the seminar of the UFSP Asia and Europe.

**Landscapes and habitats of the Alps: Processes of perception**
PD Dr. N. Backhaus, Prof. Dr. C. Reichler, Dr. M. Stremlow  
http://www.research-projects.uzh.ch/p7543.htm  
The interdisciplinary research group was granted with the compilation of the NRP48 synthesis on “processes of perception”. In this synthesis, the theoretical approaches, methods and research results of individual projects were analysed and placed in the context of a newly established landscape model with the aim of providing recommendations for landscape practice. The model is based on the analysis of landscape as a concept in different disciplines and cultural spaces. It includes the preferences and estimations of different stakeholders regarding (alpine) landscapes. The landscape model was presented at different conferences and the synthesis was published in 2007 in German and French.

**Youth in public space**
S. Landolt  
http://www.research-projects.uzh.ch/p7555.htm  
The PhD project focuses on practices of appropriation of public spaces in Zurich by adolescents (e.g. by drinking in public spaces). In examining the role public space plays for young people, it considers ways in which adolescents experience norms in public spaces in Zurich, as well as adolescents’ resistance to space produced by, and orientated towards, the needs of adults. The main research activities in 2007 were data collection and interpretation. Highlights of 2007 were a presentation at IGU Commission on Gender and Geography “Symposium Sustainable Public Space” in Zurich and a presentation and participation as an expert at the Fachgremium Jugend Zurich.

*Ulrike Müller-Böker and collaborators*
1.4 Political Geography
**General overview**
Political Geography is a newly established research group within the Department of Geography. In 2007, we put a lot of energy into getting organised, recruiting staff, developing new teaching modules (and contributing to existing ones), and building networks with scientific and policy partners in Switzerland and abroad. By the end of the year, we have formed an exciting small team of researchers and collaborate with close links to colleagues from Human Geography and the sotomo group. Our main fields of interests are in political geography (in particular violent conflict), political ecology (nature-society dialectics), development theory and theoretical (philosophical, methodological) debates in human geography.

**Main research activities and scientific progress**
Our research centres around three core themes that shape contemporary geographies of global networks and uneven development:
- geographies of violence,
- moral geographies,
- geographies of power.

We conduct theory-guided empirical research in Africa and South Asia. Our aim is to contribute to, challenge and refine ongoing academic debates on nature-society dialectics, resource conflicts, ‘new’ wars, state failure, ethical trading and unequal development. At the same time, we collaborate and maintain a dialogue with policymakers and development practitioners and establish partnerships with academics from the global South.

**Aid and conflict in Sri Lanka**
B. Korf, J. Goodhand, J. Spencer
Routledge publishers have signed a book contract for this compilation of papers by eminent peace researchers and practitioners on aid and peace building in Sri Lanka after the ceasefire in 2002. An authors’ workshop is in preparation for April 2008.

**Collective action and property rights for poverty reduction in Ethiopia (CAPRI)**
B. Korf, F. Beyene, B. Hundie, A. Bogale, M. Mealin Seid, with K. Hagedorn, M. Padhmanaban, R. Meinzen-Dick, E Mwangi
The collaborative research programme with the Humboldt University of Berlin and the International Food Policy Research Institute (IFPRI) was completed in summer 2007 (funded by BMZ). The project investigated the nexus of property rights, collective action and fragile statehood in the Afar and Somali regions of Ethiopia.

Activities in 2007:
- Participation in the Policy dissemination workshop of the overall research programme organized by IFPRI-CAPRI in Uganda
- Two small field studies in Ethiopia were funded, one investigating the political geographies of resource conflict in Somali region (M. Mealin), one on forestry management (A. Bogale)
• The PhD dissertation of Fekadu Beyene on ‘Challenges and Options in Governing Common Property: Customary Institutions among (agro-) pastoralists in Ethiopia’ (Supervisors: K. Hagedorn, B. Korf) has been completed and successfully defended (7 Jan 2008).

Conflict, community and development in Sri Lanka (FAITH)
B. Korf, B. Klem, J. Goodhand, J. Spencer, K. T. Silva, S. Hasbullah
This is a collaborative project with the University of Edinburgh, the School of Oriental and African Studies (SOAS) and the University of Peradeniya in Sri Lanka funded by the ESRC. The project studies the linkages between aid, religion and conflict on the multi-ethnic and multi-religious east coast of Sri Lanka.
Activities in 2007:
• Reconnaissance mission to Sri Lanka in July to set up the team, fine-tune research topics and identify research sites (B. Korf, B. Klem and the team)
• First phase of field research in Oct-Nov with a focus on a place-based case study in Akkaraiappattu (B. Klem).

Youth, violence, belonging and survival strategies in the Guinée Forestière
M. Engeler
This PhD research project looks at the everyday practices of survival, belonging and violence of local communities in Guinée Forestière. Strongly marked by the legacy of neighbouring civil wars in Liberia, Sierra Leone and Ivory Coast, Guinea’s southeastern border region represents a typical yet unstudied case of fragile statehood. Building on the anthropological literature on violence and conflict, the research aims to study everyday practices of youth and their role in constructing state- and nationhood at the margin of the state. It combines an ethnographic inquiry with theoretical debates about geographies of violence, African statehood and political ecology.

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

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

**How ethical is ethical trade? Private governance networks in global value chains**

M. Starmanns

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

*Benedikt Korf and collaborators*
1.5 Economic Geography
General overview
The research focus of the unit Economic Geography lies in the fields of urban and regional development, housing and real estate markets, tourism, and gender studies. An important event was the international symposium of the IGU commission on Gender and Geography “Sustainable Public Places: Feminist perspectives on appropriation, representations and planning of public spaces” at Zurich (www.geo.uzh.ch/nfp54). In addition to the presentation of research findings on specific places, presentations took up methodological and theoretical concerns, emphasised challenging and resisting divisions between the “public” and “private” in space, and considered the gender effects of and implications for the planning of public spaces. This event took place between May 31-June 3 and was organised by a team coordinated by Elisabeth Bühler. Over 50 participants, together with visiting students, participated in lecture sessions, a walking tour of Zurich, and a day-long field trip led by geographer Verena Meier Kuuker and historian Elisabeth Joris to examine historical gender relations in the Gotthard region of the Alps. In the framework of the scientific co-operation programme between Eastern Europe and Switzerland SCOPES, the SNSF supported the symposium Sustainable public places through a conference grant. This grant enabled three distinguished scientists from Hungary, Romania and Serbia to attend the event.

Main research activities and scientific progress
As part of the NRP 54 Sustainable Development of the Built Environment, Elisabeth Bühler is directing the research project Sustainable design, management and appropriation of urban public parks. Focusing on three specific urban parks in the city of Zurich, this project aims at identifying elements of design and planning as well as strategies of management and operation that foster a socially sustainable appropriation of public areas. These research objectives are to be achieved by a combination of quantitative and qualitative methods and through joint work by the units of economic geography (PhD student Heidi Kaspar and Elisabeth Buehler) and GIVA (PhD student Frank Ostermann and Sabine Timpf, Augsburg). The public administration unit “Grün Stadt Zürich” of the municipality of Zurich supports the project. Its results will contribute to the performance measurement of public goods and services in the city of Zurich (information on the project: www.research-projects.unizh.ch/p6306.htm and symposium: www.geo.unizh.ch/nfp54/). In the PhD project Life Plans, Karin Schwiter analyses the narratives of young adults from the German-speaking part of Switzerland on their life plans. The focus of interest thereby lies on the collective norms and values as well as the concepts of masculinity and femininity they refer to. The PhD project is part of the interdisciplinary PhD programme “Gender in Motion” at the University of Basel (http://www.research-projects.uzh.ch/p9164.htm).

Climate change and winter tourism is still of major importance. After the publication of an OECD report by Abegg et al. 2007, our research gained unprecedented attention. As a result, Bruno Abegg and Hans Elsasser were able to present their findings on numerous occasions. The audiences were the scientific community and the tourism industry, but also the general public. We have continued our research activities. The focus, however, has shifted from impacts to perception, and adaptation and mitigation strategies. We have conducted the first nation-wide survey among ski area operators in an Alpine country. This work, called "Klimawandel als Strategietreiber - eine Befragung der Schweizer Seilbahnunternehmen" was done in cooperation with Swiss Cableways in Bern and the ETH in Zurich (Group for Sustainability and Technology). In
addition, several research groups in Switzerland and abroad requested our expertise. For example, Bruno Abegg is a member of the "climate" think-tank established by Switzerland Tourism.

The research project zone*imaginaire examines the potential for temporary uses in former industrial areas in the cities of Aarau, Winterthur and Zurich. The project is executed in collaboration with the Hochschulen Rapperswil and Winterthur. The Department of Economic Geography, represented by André Odermatt and Philipp Klaus, analyses the development of the creative industries in the areas and their significance for the local and regional economy.

The research project “Langstrasse – Gentrification or incumbent upgrading?” examines the development of Zurich’s Langstrasse district in the period from 1990 to 2007. By means of statistical analysis of census and register data as well as by interviews, recent changes in social structure, housing market and industry structure are studied in this run-down area. The main objective of this project is to provide a basis of information that makes it possible to make statements about the potential or actual expulsion of specific population groups or industry sectors. The project, commissioned by the Department of Urban Development of Zurich (Stadtentwicklung Stadt Zürich), is undertaken by the Department of Economic Geography of the University of Zurich, represented by André Odermatt, Corinna Heye and Christoph Craviolini.

Hans Elsasser and collaborators
1.6 Remote Sensing Laboratories (RSL)
General overview
In 2007, our new research strategy was fully implemented working toward a strengthening of research efforts, improving quality and international visibility. A special focus was put on reinforcing interdepartmental cooperation through joint projects such as PARADOX etc.

One major thrust was that the APEX project entered the manufacturing phase after more than 10 years of planning, design improvements, securing of funding and thorough computer simulations. A functionality test in November 2007 yielded its first results. Without the massive investment and positive influence of Jens Nieke in this project, APEX would certainly not have made it through the last 4 years. He left RSL in October to take up a new post at ESA in the Sentinel-IV programme, but he remains an important advisor on our project. The SARLab carried out major flight campaigns in 2007 with the ultra-wideband radar CARABAS, in addition to making major breakthroughs in moving target detection with millimetre-wave SARs and the processing of flight data acquired using highly non-linear trajectories. A paper by Maurice Rüegg was featured on the cover of the major journal IEEE transactions on geoscience and remote sensing.

LACOMMLab succeeded in securing the NPOC contract for the coming years and contributed important inputs to the Earth Observation role of Switzerland in GMES.

Three symposia highlights in 2007 are worth mentioning due to the massive participation and contributions of RSL researchers. First, the ISPMSRS Symposium at Davos, organised by M. Schaeppman (WUR) and Mathias Kneubühler (RSL), second the ESA Envisat Symposium in Montreux, and third the 5th EARSel Workshop Imaging Spectroscopy in Bruges (Belgium).

The search for candidates for the replacement of Klaus Itten began and has resulted in a list of the top three. Since the prime candidate was accepted by the University, negotiations will begin in early 2008. This search has certainly influenced our work mentally - it became obvious that transition thinking has started. With an early decision, we will have ample time to prepare a smooth transfer of RSL to its new leadership in February 2009.

Main research activities and scientific progress
RSL research projects are summarised below for the three research groups SARLab, SpectroLab and LACOMMLab as well as the NPOC. For more detail please consult our website http://www.geo.uzh.ch/rsl or the University Research Databank http://www.research-projects.uzh.ch/math/unit70600/.

Research projects SARLAB
led by E. Meier & D. Small
SARLAB’s research activities were a combination of extending existing projects, introducing new subjects and setting new goals. The implementation of airborne SAR raw data processing through blockwise focusing, geocoding and mosaicking was concluded. The results obtained using a variety of sensors and focusing algorithms show considerably improved quality in comparison to traditional methods (C. Magnard, M. Rüegg). In the processing of airborne interferometric SAR data, a multi-baseline phase unwrapping algorithm was integrated with phase to height conversion and geocoding, allowing generation of digital elevation models (C. Magnard).
SAR processing (focussing) was extended to enable highly non-linear flight tracks. Algorithms for processing, two new innovative SAR acquisition modes, namely tomographic multi-baseline SAR and SAR data acquired from highly non-linear sensor trajectories were implemented. The algorithms and the software were successfully tested using dedicated experimental data acquired in late 2006 by the airborne E-SAR system of the German Aerospace Center (DLR) (O. Frey).

The Swedish ultra-wideband radar CARABAS works in the VHF band and has potential for applications in the forestry industry. Although the resolution is ~3 m, single tree positions can be extracted from radar maps. The newly developed method can be applied in coniferous, deciduous and mixed forest. In September, a two-week flight and data acquisition campaign was carried out in Switzerland. Together with the airborne CARABAS system, a ground-based receiving unit was synchronously operated in a bi-static radar configuration. The acquired data will be used to develop and test advanced radar imaging concepts and technologies (A. Barmettler).

In the field of polarimetric SAR, the focus is on the polarimetric calibration of data and on the implementation and validation of a simulator for polarimetric SAR-data. Dependencies between forest and polarimetric SAR parameters were investigated; the fundamentals of polarimetric interferometric SAR (PolInSAR) were acquired (L. Zuberbühler).

An ESA project was successfully concluded. Radio wave propagation through the atmosphere was modelled by deriving total electron content and Faraday rotation from SAR data (M. Jehle). Radar image products from the Japanese space agency’s ALOS/PALSAR sensor were tested for geometric accuracy and robustness in the context of an ESA contract for sarmap s.a.. A geocoding software package including map projection transformations, multi-looking and detection, FM rate estimation, geometry refinement, atmospheric path delay & Faraday rotation estimation, terrain-geocoding, and synthetic fringe generation was developed, documented and successfully delivered to ESA (D. Small, M. Jehle, A. Schubert).

In the context of an ongoing ESA project evaluating ENVISAT ASAR geometry, the geometric and radiometric accuracies of Envisat/ASAR wide-swath products were estimated; recommendations for improvements were submitted. The incoming data from different beams (ScanSAR mode) were stitched together to form mosaics, enabling radiometric comparisons of the data subsets (beam subswaths) (A. Schubert, D. Small).

Geolocation accuracy tests were performed evaluating the absolute location error over the full suite of ESA ASAR focussed products. Different geolocation methodologies (mainly variable state vector qualities) were contrasted: all but the lowest level of state vector quality allowed sample-level geolocation without any tiepoints, a much higher accuracy than available from any previous spaceborne SAR sensor, enabling more robust radiometric terrain correction for multi-temporal multi-track overlays (D. Small, A. Schubert).

In the domain of laser scanning, a model simulating laser backscatter signals was implemented and validated with real laser scanning data of geometric objects - the work was financed by the research fund of the University of Zurich. The presented results won a best paper award at the ISPRS laser-scanning conference in Helsinki. The cooperation with the PARADOX forest fire research consortium and the French institutes INRA and Cemagref was continued: biophysical vegetation products were derived from laser scanning data by RSL and delivered. First analysis and comparisons of the derived products with field
measurements of the French test sites showed very good agreement and were input to EU deliverables (F. Morsdorf).

**Research projects SpectroLab**

led by M. Kneubühler

The 10th International Symposium on Physical Measurements and Signatures in Remote Sensing (ISPMRS’07) that took place in Davos, Switzerland on March 12-14, 2007 represents one of the highlights of the lab’s activities in 2007. The conference was organized through the ISPRS Working Group VII/1 (M. Schaepman (WUR, NL), S. Liang (Univ. Maryland), M. Kneubühler (RSL)), and attracted 150 researchers worldwide dealing with state-of-the art quantitative remote sensing issues.

In January 2007, the manufacturing phase of the APEX instrument began, after the successful close-out of the Critical Design Review (CDR) by the APEX Industry Team (RUAG, OIP, Netcetera) under the new prime contractor RUAG Aerospace (Emmen). The APEX instrument manufacturing included the production and testing of the thermal control box and the optical baseplate (RUAG), the finalization of the procurement of all opto-electronical parts (e.g., prisms, lenses, detectors), leading to the assembly and alignment of the optical subunit (OIP). The final acceptance of the APEX calibration homebase (CHB) was successfully closed out in January at DLR and the corresponding software development for testing, characterization and calibration - the CHB test master - for the APEX instrument was started (RSL, RUAG, Netcetera). This led to the first test of the assembled APEX at the Calibration Home Base in October. At that time the first images and performance tests were successfully carried out. Until early 2008, the instrument is being fine-tuned in order to prepare for the upcoming acceptance procedures. In the meantime, the aircraft certification process started with a first integration in the DO-228 aircraft. First test-flights with the APEX instrument are scheduled for the beginning of 2008. The APEX institutes (RSL, VITO) were able to add Andreas Hüni (RSL) and Reno Choi (Vito) to their team: they have significantly supported the effort since 2007, making it possible to release a new Processing and Archiving Facility (PAF) software package (version 0.6) in May and a PAF documentation update in September. Also in September, the first APEX Science Product Day was carried out at RSL in order to stimulate discussion of possible new and advanced scientific products using the APEX instrument. The project is financed via PRODEX (Programme de développement d’ experiences scientifiques) and the Earth Observation Programme of the European Space Agency (ESA) (K. Itten, J. Nieke, F. Dell’Endice, A. Hüni, D. Schläpfer, B. Suhr).

The EU project Hyressa (FP6, Infrastructures, Accompanying Measures) that was initiated in 2006, organized a dedicated session at the ISPMRS’07 in Davos, as well as an Exploratory Workshop to identify strategies to build and coordinate a Europe-wide network of hyperspectral remote sensing facilities. Also within the project, user driven requirements of the European hyperspectral remote sensing community were elaborated. The Hyressa consortium consists of universities and research institutions from nine European countries (K. Itten, J. Nieke, M. Kneubühler).

In February 2007, the kick-off of the European project HYPER-I-NET (Hyperspectral Imaging Network, FP6 Marie Curie Research Training Network) was held. In the frame of this project, Petra D’Odorico started her PhD on the topic of sensor calibration and validation, jointly supervised by RSL, Kayser-Threde (DE) and Specim (FI). The first Hyper-I-Net summer school in Caceres, Spain took place in October 2007 and brought
together more than 100 young and senior researchers in all fields of hyperspectral technologies (K. Itten, J. Nieke, M. Kneubühler, P. D’Odorico, F. Dell’Endice, A. Hüni).

RSL’s field and laboratory goniometer system has proven to be a well characterized and stable device for measurements of spectro-directional reflectance behaviour of remote sensing targets. The recently updated field setup which now allows for simultaneous measurements of the target reflected radiance and the incoming diffuse directional component (by mounting two identical ASD Field spectrometers on the goniometer) has largely improved the retrieval of object-inherent spectro-directional target properties (J. Schopfer, M. Kneubühler, S. Dangel, K. Itten).

In the frame of the SNSF project on “Investigation of Imaging Spectrometry as an Earth Observation Method for Environmental Analysis” research has advanced in the development of methods for the retrieval of ecologically relevant variables of vegetation canopies from imaging spectrometer data in support of climate issues (e.g., Kyoto Protocol) (S. Huber, M. Kneubühler, B. Kötz, K. Itten). The second research topic within the SNSF project deals with the development of operational methods for the retrieval of water constituents in Swiss and European inland waters. An automated retrieval scheme has been implemented for MERIS full resolution data sets in collaboration with EOMap (DE) (D. Odermatt, M. Kneubühler, J. Nieke, K. Itten). The activities prepare for environmental research algorithm development within the APEX Science Center.

RSL identified the need for a spectral data base (SPECCHIO system) allowing storage of hyperspectral signatures and their meta data. A complete redesign of the data base scheme and data management software aimed at a) minimizing manual data input, b) enabling searches of spectral data via combinations of constraints applied to the metadata space and c) simple export functionality. The multi-user concept of SPECCHIO will foster data exchange among research institutions (http://www.specchio.ch), as the system is currently one of the most advanced products in the area of spectral data bases (A. Hüni, M. Kneubühler, J. Schopfer, J. Nieke).

In close collaboration with WSL (N. Zimmermann), the integration of spectro-directional remote sensing data as an improved input into ecosystem models (S. Huber) and the assessment of seasonal variability of dry meadows using hyperspectral data and analysis techniques were investigated (A. Psomas).

As a final contribution to the European Integrated Project “Fire Paradox”, a prototype for monitoring the spatial distribution of land cover classes within the heterogeneous wildland/urban interface has been produced. The prototype is based on an innovative multi-source (Imaging Spectrometer & LiDAR) approach using a non-parametric Support-Vector-Machine classifier. The work is a collaboration with Cemagref (Aixen-Provence, France) and the Humboldt University (Berlin, Germany) (B. Koetz, F. Morsdorf).

Within the NASA project “Model Inversion of Multiple-Sensor Data For Forest Biophysical Parameters Retrieval”, several modelling studies have been conducted to explore the synergy of RADAR, LIDAR and multidirectional optical data to describe the 3-D structure of forests. The project is a research opportunity funded by NASA in collaboration with the University of Maryland and NASA-GSFC (Principal investigator) (B. Koetz).

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

**Research projects of LACOMM Lab**

led by T. Kellenberger

The LACOMM Lab carried out many interdisciplinary projects in the field of applied remote sensing. Following up last year’s cooperation with the Swiss Government, a multi-sensor data set was analyzed focusing on land cover mapping of the Swiss Midlands. The special applicability of high spatial resolution SAR-, LIDAR- and optical scanner data along with the advantage of a combined data approach was evaluated (Y. Bühler, T. Kellenberger).

In collaboration with the Federal Office of Topography (swisstopo) the applicability of ADS40 airborne scanner data for agricultural mapping in the test area "Vordenwald" was investigated. The data of this digital airborne scanner has a very high spatial and radiometric resolution that enables its application in different fields of research. This research demonstrates the potential of ADS40 data for precise classification of different crop types and deduction of significant vegetation parameters. Results from this study were presented at the “Dreiländertagung” of the German, Austrian and Swiss remote sensing associations in Muttenz, BL (Y. Bühler, T. Kellenberger).

The potential of various remote sensing methods for archaeological prospection is the focus of cooperation with the Cantonal office for Archaeology Zurich. Several new time horizons and hidden objects were identified on new airphoto mosaics in the Rheinau (ZH) testsite. From scientific cooperations with swisstopo and with Leica Geosystems two ADS40 flight campaigns over Rheinau were carried out with different sensor setups, accompanied by intensive fieldwork. Preliminary analysis of the data has already given an idea of the large potential for archaeological prospection (M. Lässer, T. Kellenberger, Y. Bühler, A. Hüni).

Mapping different crop types in a peri-urban environment is in the focus of a collaboration work with the Swiss Federal Institute of Aquatic Science and Technology (EAWAG). Students participating in Module Geo444 “Classification and Analysis” supported the project by analysing small subsets of a Quickbird scene acquired over Hanoi, Vietnam during their project exercises. Very high spatial resolution satellite data proved to be well-suited for agricultural mapping in developing countries (D. Forster, T. Kellenberger, Y. Bühler).

The research concerning rapid mapping of alpine natural disasters has focused on snow-avalanche mapping and monitoring. In collaboration with the Swiss Federal Institute for Snow and Avalanche Research (SLF), preliminary studies have been conducted and promising experiments are planned for the coming Winter 2007/2008 (Y. Bühler).

**NPOC**

led by T. Kellenberger

The scientific NPOC (National Point of Contact for satellite images) was once more engaged during the reporting year in the advisory service, research and development. The main research topic addressed the development of rapid mapping processing chains, foremost with respect to an automated avalanche
detection methodology. Another field in which the scientific NPOC has expanded its expertise is remote sensing of the atmosphere. Synergy between RSL and NPOC was used for several projects, such as the support of campaigns in optical and microwave remote sensing (LACOMM and SARLab) (T. Kellenberger, F. Seidel, Y. Bühler).

A highlight was the contract award for a study by the Swiss government to assess the needs of potential Swiss governmental users of the upcoming EU/ESA initiative GMES (Global Monitoring for Environment and Security). Within a short time, the scientific NPOC was able to compile and provide the required information to the requesting body. The results of this study will influence the new Swiss space policy to be published in the coming year (T. Kellenberger, F. Seidel).

Another focus was the development and processing of the "Spot-5 Radcor Mosaic" of Switzerland and its surrounding areas. This is a unique dataset of four radiometrically fully corrected SPOT-5 bands at 10m spatial resolution, dedicated to the special needs of various interested parties. It enables environmental studies of large areas of vegetation due to its spatially seamless, spectrally rich and homogeneous information content (T. Kellenberger, L. Mathys, Y. Bühler, F. Seidel).

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

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

**Main research activities and scientific progress**

Research activities are centred around four threads involving spatio-temporal analytics (i.e. relevance modelling, moving object representations, vague concepts formalization, spatialization, human navigation, etc.), interface design of large and small interactive displays (i.e., mobile cartography and location-based services, 3D stereoscopic wall displays, dynamic and interactive exploratory visualization tools, etc.), in addition to 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). Specifically, externally funded research activities in the past year included:

**Visual analytics of spatio-temporal gaze point patterns in eye movements**

http://www.research-projects.uzh.ch/p7787.htm

This new 3-year SNSF funded research program lead by S. Fabrikant (GIVA) and R. Weibel (GIS) aims at developing visual analytics and data exploration tools for the effective depiction and analysis of time-referenced spatial data sets at high resolution. One line of research emphasises spatio-temporal analytics methods (Somayeh Dodge, PhD GIS), while the second focuses on the design of cognitively adequate visual analytics displays through empirical evaluation (Anna-Katharina Lautenschütz, GIVA PhD student). In this past year a typology of space-time movement behaviors was developed. Additionally, a first experimental design to evaluate depictions of eye-movement behavior was presented to peers at the GI Days 2007.

**How does animation work? Eye-movement analyses of dynamic geovisualization**

http://www.research-projects.uzh.ch/p6389.htm

Graduate student researcher Stacy Rebich completed eye movement data collection at the University of California Santa Barbara (USA) in December 2007 on map animations developed at the UZH, under the guidance of PI Sara Fabrikant. Thomas Grossmann successfully completed his MSc thesis on the spatio-temporal visualisation of eye movement data with the UNIGIS program in Salzburg. This line of research will continue on at the UZH with incoming PhD student, Jan Wilkening, who starts in January 2008, and a new MSc project by Simone Garlandini on saliency in animated displays.

**Visualization of appropration in public parks (VISPA)**

http://www.research-projects.uzh.ch/p7756.htm

VISPA is one research arm of the Sustainable Design Management and Appropriation of Urban Public Parks project led by Elisabeth Bühler and Sabine Timpf, under the auspices of the NRPS4 Sustainable Development of the Built Environment program. Frank Ostermann’s dissertation deals with visualising the spatio-temporal behaviour of park visitors and developing visual geoanalytics methods for the quantitative analysis of vague
spatial concepts, such as space appropriation. The conceptual model of the dissertation was presented at the 10th AGILE Conference on Geographic Information Science in Aalborg, Denmark, and was selected as best conference paper by international peers (see Ostermann and Timpf, 2007). Frank (on the right in the photo) is presented with the ESRI-sponsored best AGILE paper award during the conference.

Additional research activities supported through UZH funding in 2007 included the continuation of the formerly SNSF-funded SimWay Project (http://www.research-projects.uzh.ch/p7755.htm) led by Dr. Sabine Timpf, now Associate Professor at the University of Würzburg, Germany. SimWay concluded with two successful dissertation defences by Urs-Jakob Rüetschi and David Caduff during the reporting year. David Caduff developed a novel computational model for the assessment of landmark salience, which is based on the relationship between observer, observed object and environment. An empirical study was conducted to verify the conceptual framework underlying the computational model. The main findings show that, with additional fine-tuning, the model is a promising approach for the replication of human judgments of landmark salience for human navigation. David Caduff received UZH/SNSF funding for post-doc research on a one-year project entitled “Assessing Landmark Salience for Human Navigation: Evaluation of Cognitive Assessment Strategies using Agent-based Models” to continue this line of research at the Centre for Advanced Spatial Analysis at University College London. Urs-Jakob Rüetschi designed a cognitively motivated but formal model of scene and network space to formalise human navigation in public transport environments. He developed a software agent to simulate human wayfinding and to empirically validate the conceptual framework in two models representing two railway stations in Zürich. Results shows that humans integrate information from various sources and of different types to achieve good wayfinding performance. However, well-designed architecture can further support wayfinding by providing structural clues and previews.

**Overview of achievements and challenges in the unit**

In the past year, one of GIVA’s main activities and challenges consisted in submitting new research proposals to funding agencies to jump-start new lines of research for incoming academic staff. Along with the general relocation and remodelling of the GIUZ, GIVA members were active rebuilding from scratch a new operational research infrastructure including the set-up of two new research labs featuring state-of-the-art eye-tracking equipment, including software specifically targeted for human subjects experiments, and a large-screen 3D stereo display system (Geowall). The new eye-tracker has been already put to the test in collaboration with Prof. Amy Griffin, on a sabbatical visit from the University of New South Wales in Canberra, who collected eye movement data in an animation experiment during autumn 2007. The compact eye-tracking system depicted in the image is located below the computer screen in front of the test subject, Tumashch Reichenbacher. His eyes are being tracked during a map experiment monitored by the experimenter Anna-Katharina Lauteschütz (on the right in the image). The newly built stereoscopic display system Geowall was featured for the first time in a demo during a GEO115 lecture on 3D mapping (see below in the teaching section). This system will be employed in an empirical MSc project starting in 2008, exploring the effects of realism in immersive 3D views with human subjects.

*Sara Fabrikant and collaborators*
1.8 Geographic Information Systems (GIS)
General overview
2007 was a successful year for the GIS unit. The unit’s work was presented in almost 40 conference, book and journal publications. Bisheng Yang, previously a postdoc in the group, accepted a position as an Associate Professor at Wuhan University (China) and Dr. Ingo Petzold was offered a position as an Assistant Professor at the International Institute for Geo-Information Science and Earth Observation (Netherlands). A recent PhD graduate from the group, Stephan Leyk accepted a position as Assistant Professor at the University of Colorado at Boulder (USA). Stefan Steiniger, Moritz Neun and Alistair Edwardes all successfully defended their PhD dissertations, and Stefan Steiniger recently received an SNSF fellowship to continue his research as a postdoc at the University of Calgary (Canada). Felix Hebeler successfully submitted a proposal to the University’s research fund for a project continuing one theme of his doctoral research on methods to downscale large-scale melt models.

A large new European Project (TRIPOD), concerned with the automatic description and indexing of geo-referenced images, started in January and continues the successful research themes started through the SPIRIT and WebPark projects investigating semantics, geographic information retrieval and notions of the representation of place in Geographic Information Science. Such research is becoming increasingly important in GI Science, as the importance of developing techniques to deal with unstructured data increases. A long-running theme within the unit is automated generalisation. Our expertise in this area was recognised this year, as Dirk Burghardt and Moritz Neun were invited to organise a tutorial on web services for generalisation as part of a workshop on generalisation hosted by the International Cartographic Association in Moscow. Robert Weibel was on sabbatical in the autumn semester and visited Prof. Dr. Tapani Sarjakoski and Dr. Tiina Sarjakoski of the Finnish Geodetic Institute in Masala, Finland and Dr. William Mackaness of the School of Geosciences at the University of Edinburgh, where, together with Patrick Lüscher, he continued developing a new strand of research on the use of ontologies in the recognition of urban structures from spatial databases.

Demonstrating the quality of the work carried out by Master’s students, a number of reviewed conference papers resulted from their MSc theses. Christoph Suter and Curdin Derungs presented their work at the GISRUK conference in Maynooth, Ireland and Thomas Woodtli’s work formed the core of a conference paper presented by Dirk Burghardt in Moscow. We look forward to a similarly productive year in 2008.

Main research activities and scientific progress
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, Cartographic Visualization, focuses on methods for the automated generalisation of spatial data and the development of innovative techniques within mobile information services. The second group, Digital Terrain Modelling specialises in research on the impacts of topographic uncertainty, methods to extract and represent semantics from terrain data and the emerging field of Geographic Information Retrieval. The third and final research group, Environmental Data Management, focuses on the domains of GIS for wild animals and protected areas. Within this group, research on the spatio-temporal analysis of moving point data will
form an increasingly important focus in the coming years. Through these three research groups a total of twelve research projects were active in the reporting year, with three of these receiving European Commission funding, three funded through the SNSF, one through Swiss federal participation in the European’s Commission COST program, one through CTI and two projects funded by charitable foundations, together with an internally funded PhD project and two external PhD students.

**Cartographic visualisation group**

**Project SerAx**  
http://www.research-projects.uzh.ch/p8045.htm  
The applied CTI project SerAx was successfully completed within the reporting period. A main result is the development of a service-based generalisation platform, which provides generalisation functionality independent from programming language and operating system. The software will be further developed into a product by the cooperation partner and used, among others, by the Federal Office of Topography (Swisstopo) in the production of topographic maps.

**Data enrichment for automated generalization**  
http://www.research-projects.uzh.ch/p4390.htm  
Within the SNSF project “Data enrichment for automated generalization” (DEGEN), two dissertations were submitted and successfully defended. The main focus of the first sub-project (Stefan Steiniger) was set on the formalisation and recognition of settlement structures from digital data as well as the formalisation of cluster and alignment pattern within polygon groups. In the second sub-project (Moritz Neun), a service-based architecture was developed with generalisation covering the complete generalisation process chain.

**ORUS**  
http://www.research-projects.uzh.ch/p8037.htm  
The COST project ORUS aims to enrich spatial databases of the urban domain with complex semantic concepts and funds the PhD research of Patrick Lüscher. A collection of important concepts was compiled during a research stay at the University of Edinburgh. We are currently working on formally defining these concepts using ontologies. We are also developing a research platform that allows automatic instantiation of the ontologically defined concepts from real data.

**Digital terrain modelling group**

**Tripod**  
http://www.research-projects.uzh.ch/p8052.htm  
During 2007, the new EU-project TRIPOD kicked off. Tripod’s aim is to annotate and search images on the basis of their locations. Our main work in 2007 concerned the collection of images as a test dataset for Tripod and the development of a conceptual ontology which will form a cornerstone of the ongoing project

**Topice 2**  
http://www.research-projects.uzh.ch/p6375.htm  
The SNSF project Topice 2 came to an end in 2007. The project was concerned with the development of methods to assess and mitigate uncertainty in ice sheet modelling as a function of uncertainty in topography.
Felix Hebeler is currently completing his associated PhD thesis and, in 2008, will commence a spin-off project funded by the University of Zurich’s Research Fund.

**Extraction of semantics from elevation models**
http://www.research-projects.uzh.ch/p8051.htm
Ralph Straumann’s PhD project, exploring the extraction of semantics from elevation models, continued with the focus on the development of an ontology of geomorphological landforms.

**Environmental data management group (EDMG)**

**FIRE PARADOX**
http://www.research-projects.uzh.ch/p8033.htm
During 2007, the GIUZ team, consisting of the GIS and RSL units, explored within this EU project the various possibilities to detect the shrub layer and its properties in the typical Mediterranean fuel layers (the main fire carrier) by both the LiDAR and AISA data. Further, a function for converting field measurements into a voxel space has been implemented. Additionally, the GIUZ team was involved in creating and supplementing a fuel database for the project.

**IPODLAS:**
http://www.research-projects.uzh.ch/p2552.htm
In 2007, Yi Wu finished her PHD thesis on “Knowledge-based 4D Visualization of Amorphous Phenomena in Complex Terrain”. Embedded in the NRP48 programme “Landscapes and Habitats of the Alps”, special emphasis was given to the visualisation of smoke, flames and fire, but also of migrating insects.

**NRP48 Synthesis V**
http://www.research-projects.uzh.ch/p8034.htm
The synthesis project of NRP48 “Virtual worlds – real decisions. The Alps in a modeller’s nutshell” is finished. It reviewed all projects of the NRP48 program that applied modelling techniques and demonstrated the advantages of working with the use case approach in environmental planning and modelling.

**GIS Swiss National Park (GIS-SNP)**
http://www.research-projects.uzh.ch/p281.htm
This project is part of a long-term collaboration between the Swiss National Park, the research commission of the National Park and GIUZ. Its focus is on the implementation and support of spatial analysis in nature conservation institutions and research. In 2007 the GIS-SNP concentrated on general data administration (e.g. data documentation), maintenance and support of the GIS-SNP infrastructure in Zurich and Zernez, the production of thematic data (e.g. ortho-rectification of historic maps, the elaboration of a disturbance inventory of the SNP), the support of individual projects and strategic tasks.

**GIS Sihlwald**
http://www.research-projects.uzh.ch/p2947.htm
GIS Sihlwald continued its successful development in 2007 with the collection of more basic data for use in research. Many existing datasets were also enlarged and updated. GIS Sihlwald supports both research and teaching with its data and by georeferencing of sampling locations. In particular, a number of diploma theses
have used Sihlwald data and expertise. GIS Sihlwald has continued to play a key role in Grün Stadt Zurich’s planning for the management of the protected area and provision of visitor information.

**External PhD students**

http://www.research-projects.uzh.ch/p2574.htm

In cooperation with the research unit Mountain Hydrology of the WSL, Luzi Bernhard is working on his PhD project on the estimation of the influence of climate change on the water cycle in forest ecosystems. Ruedi Haller continues working in the Swiss National Park on the theme of accuracy and the analysis of spatial data in connection with wild animals.

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

The unit is structured in three methodological areas: (i) decision-making models (mental models, agent
based models and statistical models); (ii) environmental process models (material flow analysis, spatially explicit
risk assessment models) and (iii) integrative approaches (interdisciplinary simulation models, sustainability
assessment, and transdisciplinary system and scenario elaboration).

The thematic priorities are: sustainable rural development and sustainable regional resource
management. We undertake research in Switzerland and in different developing countries, mostly Latin
America.

Main research activities and scientific progress
Reducing human health and environmental risks from pesticide use
http://www.research-projects.uzh.ch/p7610.htm
The main goal of the project financed by the SNSF (project leader: Claudia Binder) is to contribute to
interdisciplinary research in the area of sustainable rural development. The project develops a simulation
model consisting of a behavioural and a spatially explicit risk assessment component for deriving and
assessing strategies for reducing the human health and environmental risks from pesticide use. The study
area is Vereda la Hoya in Boyaca, a rural area in the Andes chain in Colombia. In a first step, the mental
models of farmers and experts regarding the perception of risks to farmers’ livelihood were developed and
compared (method development: Structural Mental Model Approach (SMMA): forthcoming publications in
2008). The SMMA was further developed last year for analysing the mental models of the future
development of the region (Future SMMA). Finally, a Future Scenario Workshop was performed in which the
perspectives of farmers and experts were brought together and a consistent and agreed-upon future state of
the region was developed (Dissertation: Regina Schöll). Based on the results from the mental model
approach, an integrated sociological-psychological model, based on Giddens’ structuration theory, was
developed (behavioural part of the simulation model). The model includes sociological and psychological
(e.g. attitude, social norms) as well as environmental (e.g. climate, soil quality, health) explanatory variables.
The latter provide the link to the environmental system model. To quantify the model parameters, a socio-
economic survey was carried out in 2007. In the year 2008, the model will be implemented as an agent-
based model (PhD: Giuseppe Feola).

Secondly, we are adapting and further developing current risk assessment models to include
occupational exposure and spatial distribution. One major challenge is to make the model applicable within
commonly encountered risk boundary conditions of less developed countries such as few resources and low data availability. A candidate for the environmental system model is Pest LCI. Local geographical and meteorological parameters, as well as agricultural practices are studied and will be incorporated into the model. Uncertainties are known to be a major issue in designing fate models. Therefore, calibrating the main outputs (pesticide effect in soil and surface water) will be one of the main challenges to deal with in the next year. The earthworm avoidance test will be implemented under laboratory and field conditions to calibrate the predicted soil contamination rates. In the case of surface water contamination, evaluation of life cycle ecotoxicity tests in Daphnia will be carried out (Post-docs: Dr. Glenda García Santos and Dr. Jing Yang).

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

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

http://www.research-projects.uzh.ch/p7611.htm

The aim of the project financed by the Federal Roads Office (FEDRO), the Federal Office for the Environment (FOEN), the Buildings Office of the City of Zurich and the industry is to develop a decision support tool and recommendations for sustainable construction material management (Project leaders: Claudia Binder and Hans-Jörg Althaus). Demand and supply of recycled mineral construction material should be matched in such a way that minimal environmental impacts and the highest contribution for sustainable development result. Based on the premise that the demand for recycled mineral construction material controls its supply, in a first step the demand will be simulated with agent-based modelling as a function of material quality, time, and place. In a second step, the supply of recycled mineral construction material will be modelled with dynamic material flow analysis over the period from now until 2100. With the information from these two steps, different scenarios will be developed and assessed regarding their contribution to sustainable development. In April 2007, Christof Knöri started his PhD thesis in the project.

The project is realized in collaboration with the technology and society laboratory at the EMPA materials science and technology (H.-J. Althaus, co-leader), the FEDRO and FOEN (Dr. K. Schenck).

**Sustainability assessment of the milk value-added chain in Switzerland**

http://www.research-projects.uzh.ch/p7801.htm

The goal of this project funded by the Swiss Office of Agriculture (Project leader: Claudia Binder, PI: Julia Steinberger) is to develop a Sustainability Assessment instrument, a computer-based tool, which combines the powerful insight gained from industrial ecology with transdisciplinary methodologies to guide research, policy and action towards sustainability.

This project formalises a robust and flexible methodology for combining industrial ecology (natural science) and multi-stakeholder transdisciplinary methods (social science). We developed the methodology for the milk value-added chain in Switzerland. It includes four steps:

1. Material, energy and monetary flow analysis of the value chain, definition of an agent network;
2 Indicator development for assessing the value-added chain from a sustainability perspective;
3 Sustainability assessment, including the analysis of the relationship among indicators and development of a sustainability solution space;
4 Assessment of current trends and scenarios of the value added chain.

In 2007, we developed the transdisciplinary methodological approach and the computer-based tool to set the sustainability solution space and assess the deficits and strengths of the value-added chain. As the methodology was designed as a generic one, we expect it to be applicable to a variety of problem areas, including both geographical regions and economic sectors, as a research and policy-guiding tool. The project will finish in March 2008. It is performed in collaboration with the Federal Office of Agriculture; the Institute of Environmental Decisions, ETHZ (Prof. Dr. Bernhard Lehman); the Swiss College of Agriculture (Prof. Dr. Christoph Studer); Emmi Switzerland (Dr. Markus Willmann); Coop (Dr. Sybille Anschwander) and Seed Sustainability.

**Phosphorus flows in Switzerland: Status, risks and options for action**

http://www.research-projects.uzh.ch/p9206.htm

The goal of this research project funded by the Swiss Federal Office for the Environment (FOEN) (Project leader: Claudia Binder, PI: Dominic Wittmer, post-doc Dr. Patrick Mouron) is to analyse the phosphorous system of Switzerland for the year 2006, to propose strategies to improve the management of flows, and to develop a monitoring system for quantifying the potential risks and effectiveness of the proposed strategies. The project includes three modules (i) analysis of the status quo; (ii) development of a phosphorous management system; (ii) risk assessment and development of a monitoring tool. The 1\textsuperscript{st} module (December 2007-March 2008) deals with the set-up of the Swiss phosphorus system and the quantification of flows and stocks and their uncertainties. The core method used for the project is Material Flow Analysis. The phosphorus model is processed with the Software STAN. Based on this, options for a monitoring concept are prepared.

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

This research project started in December 2007 and aims at analysing the transition of pasture management system in the Swiss Alps. We will investigate the changes of high mountain pasture areas managed in communal tenure. In doing so, the study will analyze (i) the parameters inducing management change with special focus on institutions; (ii) the effect of these changes on local biodiversity. Laura de Baan will undertake her PhD thesis in the project starting April, 2008. This project will be carried out in collaboration with the Workshop in Political Theory and Policy Analysis, Indiana University and the Center for the Study of Institutional Diversity, Arizona State University (Prof. Dr. Elinor Ostrom).

*Claudia Binder and collaborators*
1.10 sotomo

General overview
In summer 2007, the sotomo research unit (M. Hermann and H. Leuthold) was constituted as an independent corporation, which is associated with the Department of Geography and its unit of Political Geography. sotomo combines research with application and knowledge transfer including consultancy work and contract research. The two main thematic foci are quantitative social geography (social area analysis, segregation analysis, urban studies) and Swiss political geography (regional political mentalities, values and political behaviour).

Main research activities and scientific progress

Political processes in Switzerland
The main goal of this project funded by the Swiss Virtual Campus (SVC) is to develop an e-learning-course on democratic decision-making and political behaviour in the Swiss political system for bachelor level at Swiss universities. The project is managed and mainly executed by sotomo in collaboration with the major university departments in political sciences at Swiss universities. In 2007, the entirely bilingual (German and French) course was implemented and tested successfully at the universities of Geneva, Berne and Zurich and will now be integrated into their curricula.

Segments of demand at the housing market
This project is a collaboration with Corinna Heye from Economic Geography and Fahrländer Partner AG, a firm that conducts real estate market and location analysis. The main goal is to estimate the proportions of socio-cultural milieus that are relevant to demand on the housing market. The project started in 2007. At this stage an operational model and prototype is in use.

Environment policy
A smaller research project investigated the change of perception and evaluation of environment policy projects in popular referenda over the past 25 years in Switzerland. The results of the analysis were published in an anthology on the Green Party in Switzerland.

Performance analysis of Swiss parties
2007 was the year of the national elections in Switzerland. sotomo conducted numerous pieces of analysis of the performance of political parties, incumbent and new candidates for seats in the national parliament. Most of these analyses were published in the major Swiss newspapers.

Michael Hermann and Heiri Leuthold
1.11 Joint Research Projects

This section refers to collaborative projects reaching across the boundaries of a single unit and therefore highlights intra-departmental networks. The following projects are in progress:

- In the context of the PARADOX fire-modelling project, the ongoing cooperation between the RSL and the GIS unit (B. Allgöwer) was continued – the dissertations of Y. Wu & F. Morsdorf were successfully concluded.
- In the context of the EU fire-modelling research project PARADOX, the ongoing cooperation between the RSL and the GIS unit (B. Allgöwer) was continued – the dissertations of Y. Wu & F. Morsdorf were successfully concluded.
- The SNSF research project PopEye is carried out with collaboration between Robert Weibel (GIS) and Sara Fabrikant (GIVA).
- The research project Sustainable design, management and appropriation of urban parks (lead: Elisabeth Bühler) in the framework of the NFP54 programme is carried out in collaboration between members of the units Economic Geography and GIVA. In the framework of this NFP-54 project, members of the Economic Geography and GIVA units supervise two dissertations: Heidi Kasper, “The production of space in urban public parks” and Frank Ostermann, “Modeling and visualizing space appropriation in public parks”, supervised by E. Bühler and H. Elsasser (Economic Geography) and S. Timpf and S. Fabrikant (GIVA).
- The EU research project Tripod is realised jointly by Ross Purves (GIS) and Sara Fabrikant (GIVA).
- The NRP48 Project IPODLAS (Yi Wu’s PhD) was run with collaboration between GIS and RSL.
- A project on the estimation of uncertainties involved in distributed glacier mass balance modelling was realised with collaboration between Horst Machguth (3G) and Ross Purves (GIS).
- Supervision of doctoral candidate Luzia Fisher on “Slope instabilities in perennially frozen and glacierized rock walls”: collaboration between GIS (Ross Purves) and 3G (Christian Huggel).
- In 2006, J. van Wezemael (Economic Geography) and M. Zaugg Stern (Human Geography) established a new study group called Geography and Processes of Decision-making approved by the German Association for Geography (DGFG). On the occasion of the “Deutscher Geographentag 2007” in Bayreuth, they organised a constitutive meeting including five presentations addressing various topics to do with opinion-building and decision-making.

Examples of the co-supervision of Diploma and Master theses – occasionally an incentive for joint research projects and an opportunity for mutual scientific exchange – are a common practice at GIUZ. Some examples are given below:

- The RSL LACOMMLab collaborated in 2007 by co-chairing diploma and master theses with the following units of the Department: SIE (landcover mapping in Colombia), GIS (forest mapping Sihlwald), Biogeography (landcover mapping in Sarawank), Economic Geography (urban development in northern Zürich), Human Geography (mapping in Kanchenjunga conservation area, Nepal).
- GIS and 3G are jointly supervising an MSc thesis on “Topographic resolution, ablation and ice sheet modelling”.
- GIS and GIVA are jointly supervising an MSc thesis on “Agenten-basierte Modellierung der Raumnutzung in öffentlichen Parks” and an MSc thesis on “Was ist ein Berg? Wo ist ein Berg?”. 
1.12 Promotion of young researchers

Promoting the next academic generation to become national and international players in research or on the free labour market is regarded as one of the Department’s main tasks. Currently, approximately 60 PhD students (38% female) are enrolled at the Department, 17 post-docs are externally funded and one SNSF Professor is hosted. In the reporting year, 22 dissertations were completed at the Department (see list of publications).

There is outstanding infrastructure and embedding in highly specialised, national and international, inter- and trans-disciplinary projects and programmes. Internal and external supervisors and mentors provide for capacity-building. Special care is taken over the advancement of women. For example, Sara Fabrikant is in the advisory committee of the mentoring project FrauschaftWissen, supported by the UniFrauenstelle of the UZH under the auspices of the Bundesprogrammes Chancengleichheit zur Förderung von Nachwuchswissenschaftlerinnen. Sara Landolt is member of the Gender Graduierten Kolleg, Scripts and Prescripts, Berne/Fribourg; Karin Schwiter is member of the Gender Graduierten Kolleg Gender in Motion, Basel.

Five post-docs were offered faculty positions, of which two accepted. Young researchers are very committed to and involved in teaching activities at different levels.
2 The Department’s teaching activities

The Department offers a Bachelor’s and Master of Science in Geography, and trains students minoring in geography and majoring in a range of subjects from both natural sciences and humanities. It contributes to the Master of Advanced Studies in Secondary and Higher Education, to Secondary Level 1 Education and to the Master in Geoscience.

2.1 Overview on admissions
In total, 682 students majoring in Geography (including PhD students) were enrolled in 2007; 40.8 % were women. 120 persons were enrolled for the first semester. In 2007, 73 diplomas were completed at the Department.

<table>
<thead>
<tr>
<th>Degrees 2007</th>
<th>3Phys</th>
<th>Hum</th>
<th>WG</th>
<th>GIva</th>
<th>GIS</th>
<th>RSL</th>
<th>GIUZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s Degrees</td>
<td>3G</td>
<td>2B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>51</td>
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<td>Diploma Degrees</td>
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<td>10</td>
<td>20</td>
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<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Students and Degrees
Course of Studies according to old (Diplom) and new (Bologna) system
(Source: Prorectorat Lehre, Informationsmanagement und Lehre,
www.imc.uzh.ch)
2.2 Innovative teaching concepts

Several groups are further developing and spreading e-learning tools. The GITTA project, led by the GIS unit, formed an association for its promotion and to ensure long-term maintenance. This association aims to promote and make GITTA materials widely available and to ensure the long-term maintenance of GITTA materials as SVC funding ceases. The Cartouche e-learning project continued to develop innovative multimedia cartography learning materials. New blocks of the e-learning platform GLOPP were further developed. The course thematically focuses on poor people’s livelihoods and contributions to the improvement of their situation. Several blocks are already in use (i.e. ‘Globalisation, ‘Sustainable Development’, ‘Migration’, ‘Inequality and Change’, ‘Livelihood Research Perspective’).

In some courses new and innovative contents had been introduced. Some examples are: Geowall, a 3D stereo display system, was featured during a lecture on 3D mapping with over 100 students in attendance. The 3D stereo demo included an immersive fly-through the Swiss Alps, exploring multivariate statistical overlays of U.S. census data in Google Earth, and terrain data visualisations in ArcScene (ESRI). The GIS unit signed an education contract with Intergraph for the provision of GeoMedia Professional. In the summer term, the Integrative Project supported by K. Itten, G. Dorigo and externally by Dipl. Arch. H. Schoettli of the City Development Department of Aarau came to a successful end, after having been initiated and carried out for the first time in 1990. Since 2007/2008, the Social and Industrial Ecology unit teaches this module in collaboration with ‘Entsorgung und Recycling Zürich’ (Urs Pauli, deputy director). The goal is to analyse the viability of establishing a second-hand market in Zurich re-using goods that are brought to the ERZ recycling area for incineration. In response to the great demand for project management skills, the Department of Geography is for the first time offering a Project Management course as well as the course on Information Literacy in Geography.
The ‘Auslandekursion’ led a group of highly motivated students to southern and central regions of Alaska under the guidance of F. Kaiser, G. Weber and W. Haeberli. RSL conducted an excursion to Belgium with 19 students. Visits to VITO, OIP, the Universities of Leuven and Liège (CSL), and MUMM in Brussels gave good insights into remote sensing in Belgium.

Different units started to realise further modules jointly. New collaborations are:

- Module GEO216 (Methoden der empirischen Forschung): S. Fabrikant (GIVA), C. Heye (Economic Geography) and the sotomo group.
- Module GEO 312 (Humangeographie III): N. Backhaus, U. Müller-Böker (Human Geography) and B. Korf (Political Geography)
- Module GEO 410 (Disziplingeschichte): J. van Wezemael (Economic Geography), A. Odermatt (Teacher Training) and B. Korf (Political Geography)
- IDL-course: Daniel Schläpfer (RSL) and Stephan Gruber (3G)
- “Kleines Kolloquium” for Master and Diploma students: Economic Geography, Human Geography and Political Geography
- Forschungsforum Humangeographie: Human and Political Geography
- The PhD Seminars 1 and 2 are jointly conducted by Sara Fabrikant (GIVA), Ross Purves (GIS) and Benedikt Korf (Political Geography).

2.3 Quality management in teaching

The quality of teaching is assessed each year with an evaluation of most of the courses through questionnaires or Olat-online questionnaires. However, we hope to get support from MNF for these time-consuming exercises. Furthermore, students are offered opportunities to discuss their concerns and make suggestions for improvements in teaching at our Department. The main goal of such evaluations is to optimise both the content and the form of the courses on offer. Based on these course evaluations, the development of new teaching programmes has been continuously refined and consolidated during the reporting year. Additionally, new teaching assistants were encouraged to take part in didactic courses offered by the University, and this offer was also capitalised on for the benefit of both teaching staff and students.
2.4 Teacher training
Secondary school-level

The training of candidates wishing to teach in secondary schools is organised by the Department’s teacher training team (K. Graf, M. Maisch, A. Odermatt) together with the teacher training college (Pädagogische Hochschule Zürich, PHZH).

At the University, the future secondary school teachers receive a scientific specialisation in four subjects, with German and Mathematics compulsory. In 2007, about 100 students from the Pedagogical High School Zurich (PHZH) completed these studies in Geography. Soon it will also be possible to acquire a master title at the PHZH. For this, the training courses, the credits and the performance requirements need to be continuously adapted. If and how this Master’s degree can be taken into account if it becomes necessary for further study at University level in the future is currently under negotiation.

In our education programme in Geography, we organise practical courses lasting two hours per week. These are run during the spring semester and again in autumn. Since there are so many students, we have to offer these courses for five cohorts, requiring very extensive administrative tasks, controls and exams. Apart from this, we also organised about 15 field trips to several Swiss regions. Normally around 25 students take part, and each student has to complete three field trips. Our former colleague Verena Haebeler offered such excursions. She has now retired and we would like to express our grateful thanks to her for her long-lasting involvement and input as an external lecturer.

Our students may choose from a range of lectures on the Bachelor’s curriculum as well as special lectures in Regional Geography, focusing on Japan (by Hermann Escher), on Asia (by Norman Backhaus) and on the Andes (by Kurt Graf). These presentations have been accompanied by a complementary course with a didactic focus (by Monika Reuschenbach and Stefan Baumann). We ran three Compact Courses in 2007, each lasting a week, in Zurich, Tessin and Graubünden (Katja Brundiers, Silvia Ghirlanda, Kurt Graf, Verena Haeberli, André Odermatt). Additionally, in July 2007, André Odermatt and Katja Brundiers developed and presented a corresponding didactic concept on “Places of Sustainability in Cities: An Outdoor-Teaching Approach” at the Lucerne Symposium of the International Geographical Union Commission on Geographical Education.

The two semester exams for PHZH students were organized by Max Maisch. Although these examinations require students to learn the instructed subjects intensively within a short time, i.e. within the 14-week semester, the students are then free during the semester holidays to take on temporary employment, e.g. teaching posts at a secondary school.

Generally, our administrative tasks, the number of meetings and consultations have grown enormously. The co-ordination of staff within the Geography Unit at the PHZH is managed by Monika Reuschenbach, Stefan Baumann and Arthur Jetzer. Additionally, the PHZH secretaries assist in organising the teaching program by defining time-tables for participants, and by providing information within the “evento” registration programme. Apart from our main task as instructors of secondary school teachers, as geography experts, we take part examining practice lessons by future high-school teachers. In this, we supported the three specialists in didactics: Barbara Vettiger, Stefan Hesske and Hans-Rudolf Volkart. We also participate in final exams in high schools, inspecting oral presentations and/or correcting written tests.
Our team comprises Kurt Graf, Max Maisch and André Odermatt, as well as Andrea Arnold. We were also glad to have our former assistant Ulysses Witzig rejoin us for a period of three months. Other semester jobs were filled by the University students Judith Albers, Claude Benz, Gérard Buner, Madeleine Fitze, David Huber, Manuela Lässer and Annina Morger in order to assist the PHZH students during their practical exercises in geography.

Kurt Graf, Max Maisch and André Odermatt

Higher Education
In the new Master of Advanced Studies in Secondary and Higher Education (MAS SHE), 12 out of 60 credit points are acquired in an area of expertise (e.g. geography). Together with the Earth Sciences (ETHZ) (M. Van Daalen), the Department of Geography (A. Odermatt, Y. Scheidegger Jung) developed the specialised contribution in cooperation with the “Fachdidaktik Geographie” (B. Vettiger, S. Hesske). The 12 credit points are acquired over three modules. A first module was offered in the autumn term 2007 with a cycle of lectures on current research questions and debates, accompanied by a seminar. The lecture contents were critically discussed in the concomitant seminar and the exemplary meaning for the training at the high schools (Maturitätsschulen) was extracted. Based on these obtained results, concrete examples for application in education were developed. Two further modules (sequences of excursions and regional geography) have already been developed and will be offered for the first time in the spring semester 2008.

André Odermatt and Yvonne Scheidegger
3 Academic services and functions

3.1 Academic services

The Department provides various academic services to third parties, e.g. the NPOC for Swisstopo, the WGMS for UNEP and a dating laboratory. Furthermore, academics from the Department are members of editorial boards, research associates, and members of expert groups and commissions. In detail:

Glaciology, Geomorphodynamics

W. Haeberli is director of the World Glacier Monitoring Service of UNEP, UNESCO, IACS/IUGG and FAGS/ICSU, and president of the Beratendes Organ für Umweltforschung (BAFU). M. Hoelzle is president of the Schweizerische Gesellschaft für Schnee, Eis und Permafrost and vice-president of the Schweizerische Kryosphären-Expertenkommission of ScNat. M. Maisch is president of the “Geographisch-Ethnographische Gesellschaft Zürich” (GEGZ). Furthermore, academics of the unit are members of editorial boards, research associates, members of expert groups and commissions.


Furthermore, academics of the unit are members of editorial boards, research associates, members of expert groups and commissions such as SNSF; DFG, University of Innsbruck; Pôle Grenoblois Risques Naturels; Oesterreichisches Nationalkomitee Global Change; NRC USA; Research Council of Norway, University of Oslo; New Zealand Earth Quake Commission; National Science Foundation USA; Agence Nationale de la Recherche, France; Earthquake Commission, New Zealand.

Soil Science and Biogeography

Human Geography
Members of the unit participated in research and policy-oriented boards or commissions like Wissenschaftsplattform Biosphäre Entlebuch, Forschungsplattform Werbelbe Jungfrau-Aletsch-Bietschhorn or Swiss Academic Society for Environmental Research and Ecology, Fachgremium Jugend Zürich or SDC. In the context of NCCR North-South, a South Asia coordination office is run from Kathmandu. The unit contributed to the workshop on Grounded Theory at the University of Berne and the constitutive session of the new study group Geography and processes of decision-making, which was adopted by the German Association for Geography. U. Müller-Böker was a member of the Swiss UNESCO commission. She evaluated several PhD and habilitation theses (AIT Bangkok, Faisalabad, Berne, Heidelberg), was involved as a reviewer in several appointment procedures in Germany and examined SNSF research proposals. Members of the unit refereed articles for Ecological Economics; Environmental Science and Policy; GAIA; Geographica Helvetica; International Journal of Agricultural Resources; Governance and Ecology; Landscape and Urban Planning; Mountain Research and Development; Social Indicators Research.

Political Geography
Members of the unit trained research staff of the Academy for Peace and Development, Somailand, for research into “land-based conflict project” and convened a panel at the AEGIS European Conference on African Studies, Leiden. Module sessions have been taught at the University of Manchester, Institute for Development and Policy Management, on “Post-Conflict Reconstruction and Development” and at the Marie Curie University Summer School on “Modern Agriculture in Central and Eastern Europe”, Corvinus University, Budapest. T. Hagmann reviewed the draft project document ‘The Design of Productive Safety Net Pilot Activities for Pastoral Areas of Ethiopia’, Pastoralist Task Force, World Bank, Ethiopia. Members of the unit refereed articles for Political Geography; Singapore Journal of Tropical Geography; Conflict, Security and Development; Africa Spektrum; Quarterly Journal of International Agriculture; Nordic Africa Institute; and International Migration Journal, as well as research proposals for the SNSF and the Economic and Social Research Council (ESRC) of the UK.

Economic Geography
H. Elsasser was co-president of the senior citizens’ university and member of the steering committee of the NRP 48 “Landscapes and habitats in the Alps”. He is member of the research commission of the Swiss National Park (Scnat). E. Bühler, H. Kaspar and K. Schwiter are members of the Academic Forum of the Centre in Gender Studies. E. Bühler organised the international symposium on Sustainable public places on behalf of the IGU commission on gender and geography in Zurich; she is member of its steering committee, lecturer at the Department of Geography of the University of Basel and was mandated of the SNSF to design a research proposal for the NRP Geschlechterverhältnisse im Umbruch – Perspektiven einer nachhaltigen Gleichstellungspolitik in der Schweiz. Members of the unit take part in school commissions and as experts of maturity (equivalent of A-level) examinations. K. Schwiter was expert at the 41. Contest of Science and Youth in Switzerland; she is MP in the County of Schwyz. A. Odermatt is MP in the town of Zurich. The unit guided excursions for students of the universities of Berne, Bochum, Jena and Nijmegen. H. Elsasser evaluated several PhD and Master’s theses (ETHZ, Universities of Berne, Erlangen). Members of the unit refereed articles
for Climate Research, Planning Theory, Tourism Review International and Geographica Helvetica. Further evaluations were performed for Switzerland Tourism, Swiss Cableways and CIPRA.

RSL
M. Kneubühler acts as a Swiss representative on ESA DOSTAG, as secretary of the ScNat Comm. Remote Sensing and as Secretary of ISPRS-Comm. VII WG Spectral Signatures. T. Kellenberger is president of the ScNat Comm. Remote Sensing and board member of its Platform Geosciences. E. Meier is member of the ESA Category One Advisory Group, member of the TerraSAR-X Science Committee and board member of the Swiss Society of Photogrammetry, Image Analysis and Remote Sensing. D. Small is member of the ESA Quality Working Group for Envisat/ASAR-Data. The RSL unit has taught at the ETHZ with MILAK and the Geomatics programme, as well as on the subject Imaging spectroscopy and hyperspectral imaging in the lecture course Satellitenfernerkundung. In 2007, one review for the International Journal of Remote Sensing was accomplished by LACOMMLab, while members of SARLAB provided peer reviews of 10 journal papers in IEEE Transactions on Geoscience and Remote Sensing, Remote Sensing of the Environment, and ASPRS Photogrammetric Engineering and Remote Sensing. The team undertook reviews as a member of the ESA ENVISAT-ERS Symposium (Montreux, Switzerland) scientific committee and as a member of the ESA Fringe’07 (Frascati, Italy) scientific committee. In 2007, five journal peer reviews, 38 research proposal reviews, as well as abstract reviews for three international symposia sessions were performed by SpectroLab staff members.

GIS
Researchers from the unit organised and chaired workshops such as the EuroSDR workshop in Zurich and the Workshop on Geographic Information Retrieval. The unit also includes members of different expert groups, editorial boards (Int. Journal of GIS, GeoInformatica), scientific advisory boards, publication committees, and program committees (e.g. ISSNIP/ISPRS, AGILE Conference, etc.). Researchers of this unit carried out reviews for the following journals: International Journal of Geographic Information Science; Computers & Geosciences; GeoInformatica; IEEE Computer Graphics and Applications; ACM Transactions on the Web; Cold Regions Science and Technology; Natural Hazards; Water Resources Research; Computers, Environment and Urban Systems; Information Visualization; ISPRS Journal of Photogrammetry and Remote Sensing; Journal of Location-based Services; Landuse and Urban Planning; Pattern Recognition. Full-paper reviews were carried for conferences: AGILE 2007 Conference; ACM GIR’07 Workshop; ICA Workshop on Generalisation and Multiple Representation; ISSNIP/ISPRS Workshop on Distributed Geoinformatics and Sensing, Ubiquity, and Mobility; Photogrammetric Image Analysis 2007; GeoCLEF’07; European Colloquium on Theoretical and Quantitative Geography; COSIT 2007; and Int. Workshop on Web and Wireless GIS (W2GIS 2007). The unit has members in the GIS working group of the Swiss Association of Geography Teachers and holds the chair of the Snow and Avalanche Foundation of Scotland.

GIVA
Researchers from the unit are members of the International Cartographic Association, as well as a number of other commissions in the field (i.e., ISPRS, SPIE, SKS, SGK, TEK, HKMO). The unit further holds an elected member of the Council of the Association of Geographic Information Laboratories Europe (AGILE) and an elected academic director of the Association of American Geographers Cartography Specialty Group. D.

SIE
The unit includes members of several programme committees and chairs of international conferences and workshops, as well as an editorial board member of the Journal of Industrial Ecology (section editor, material flow analysis), a secretary and board member of International Society of Industrial Ecology (ISIE) and assessor for the grant application Jeune Chercheur and Echange Universitaire of SDC. C. Binder is member of BoD of the newly founded USITAWI Network for Sustainability. She reviewed papers for Risk Analysis, Industrial Ecology, a published book Sustainability Impact Assessment of Land-use Policies (Springer Verlag) and abstracts for conferences. R. Schöll reviewed papers for Risk Analysis.

3.2 Academic offices and functions held at UZH
Professors and other members of the Department are represented in various bodies of the university and faculty.

University: Senate, Environmental Commission, Commission of International Relations, E-Learning Council, Supervisory Committee Main Library, Senior Citizens’ University, Gender Equality Commission, University Priority Research Programme Asia and Europe: Executive Committee

Faculty (MNF): Extended Faculty Board, Faculty Board, Research Commission, Commission for Career Development, Commission for Public Relations, Information Technology Committee (which was disbanded in fall 2007), Commission for Teacher Education, Working Group for Teacher Education, ombudsperson for teaching, search committees, 175th anniversary of the University of Zurich.

3.3 Public events and advanced training
The “Zürcher Geographisches Kolloquium” with the umbrella theme: “The opening-up of new spaces and landscapes” offered a range of innovative and enlightening presentations. S. Fabrikan coordinated this event.

In the reporting year, three faculty search procedures were transacted. Within this context three symposia took place. In the search process for an Associate or Full Professor of Remote Sensing (succession of Prof. Klaus Itten) five internationally renowned candidates were shortlisted and invited to present their work and vision in a symposium on "Remote Sensing for Earth Observation" on 31 May and 1 June. Following interviews and further evaluation, the search committee made a recommendation of three remaining candidates to the Executive Board of UZH in November 2007. At the time of this writing (March 2008), the top ranked candidate has accepted the offer made by UZH, and will most likely commence his position in March 2009. In the search process for the new Assistant Professorship in Hydrology, the symposium „Climate impacts and the water cycle” took place in December 8 - 9. In the search process for an Associate or Full Professor of Economic Geography (succession of Prof. Hans Elsasser) six internationally renowned candidates were invited to present at the symposium "Knowledge-Work-Space: Current
Research Perspectives of Economic Geography” in December 13 -14, and, in addition, one person was invited to present in March 2008. By the end of the reporting year, the top ranked candidate has been invited by the responsible Vice-President for negotiations. We are confident that we can report good news about the positive completion of the negotiations in the 2008 annual report.

The following advanced training events (courses, excursions and practical) were organized by members of the Department in 2007. Examples are:

- Gebirgskurs am Steingletscher, CH, ’Gebirgskurs Fels & Eis’. 03.-07.09.2007. Organisation: M. Zemp
- Tutorial on Web Services for Generalisation, which was offered as part of a one-day introduction to generalisation hosted by the International Cartographic Conference in Moscow. Development and Organisation: D. Burghardt and M. Neun
4 The Department’s support unit

General support services in the Geographical Department like IT, library and graphic design have been reorganised. Since 1st of July 2007, they form the general support unit and are organised into two sections (cp. organisational chart):

- The first section “Administration & IT” (head: Ruth Hunkeler-Wittleder) is responsible for finance, accounting, human resources, facilities and IT affairs.
- The second section “Study affairs and corporate communication” (head: Dr. Yvonne Scheidegger Jung) takes care of the organisation of teaching issues - including supervising the students advisory board, library, graphic design, internal and external communications.

4.1 Finance and administration

Finance

In 2007, the operating expenses mounted up to 13.965 million CHF, whereof 4.714 million CHF (34%) were third-party funded. Compared to 2006, this is an increase of 980k CHF in operating expenses and 416k CHF in third-party funding respectively.

In addition to the operating expenses, 103k CHF were spent on larger investments (e.g. IT, laboratory and research equipment). In comparison to 2006, investment decreased by almost 50% (-95k CHF).

<table>
<thead>
<tr>
<th>Expenses GIUZ CHF (in 1’000)</th>
<th>Year 2006</th>
<th>Year 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>(without university overhead)</td>
<td>Total</td>
<td>of which third-party funds</td>
</tr>
<tr>
<td>Tangibles (material + small investments)</td>
<td>1’458</td>
<td>407</td>
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<tr>
<td>Personnel costs (without professors &amp; social overhead)</td>
<td>8’573</td>
<td>3’346</td>
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<tr>
<td>Operating result 2 (Betriebsergebnis 2)</td>
<td>10’031</td>
<td>3’753</td>
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<tr>
<td>Personnel costs (professors &amp; social overhead)</td>
<td>2’954</td>
<td>545</td>
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<td>Operating result 3 (Betriebsergebnis 3)</td>
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<td>4’298</td>
</tr>
<tr>
<td>Investments (over 10 CHF)</td>
<td>198</td>
<td>103</td>
</tr>
</tbody>
</table>

Renovation of the building

The refurbishment of the building services engineering, that had been started in 2006, was completed at the end of 2007. At the same time the air conditioning has been successfully installed in our computer labs. Unfortunately, during renovation works rubble and dust covered the backup RAID-Systems in the room Y25J47b. They had to be replaced because of a high risk of breakdown and malfunction. Mercifully the
financial loss was compensated for, except for the work necessary to reinstall the systems including all data transfers (about 12 Tera-Bytes).

**Organisation**

During the reorganisation of the Department, several committees have been established to reduce the workload of the Board of Directors (see also corporate communications and lecturing).

The committee for human resource and finance (PFAU = Personal- und Finanzausschuss) is responsible for management and operating decisions related to personnel and financial affairs. In addition, it designs planning and strategic processes for the Board of Directors. The Head of the Department, two professors and the chief financial officer, namely Ulrike Müller-Böker, Hans Elsasser, Wilfried Haeberli and Ruth Hunkeler-Wittleder, are members of the committee PFAU. Independently of management, an ombudsteam was implemented in order to provide advice and support to employees. The team discusses questions, employment matters or mitigates conflict affairs. The members of the ombudsteam are Yvonne Scheidegger Jung, Gary Seitz and Klaus Itten. They conduct their service discreetly, anonymously and confidentially.

*Ruth Hunkeler-Wittleder*

### 4.2 IT

The team of Andreas Bachmann, Patrick Marchi and Thomas Werschlein is in charge of the IT infrastructure for the Department of Geography. At the end of February 2007, Othmar Wigger left the Department, and Patrick Marchi and Thomas Werschlein have been assigned as IT Service Managers. Since end of June, Lourdes Heim was on maternity leave and decided afterward to resign from her job. Since October, Andreas Bachmann has strengthened the IT-team with a part time job of 60%. At the Department’s full assembly (MAV) on April 25, the new IT concept concerning the main servers was presented. In the last ten months, we have been able to establish a solid basic technical platform as a prerequisite for the further development of the infrastructure in line with the new strategy. Below, you will find a summary of the most important new features and changes.

**Reactive changes:**

- Domain name change from geo.unizh.ch to geo.uzh.ch
- Change of e-mail address format from username@geo.unizh.ch to firstname.lastname@geo.uzh.ch;
- Adaptation of the newly defined account creation process to adapt to the new, SAP-based module booking system of the University;
- Preemptive measures to cope with the scheduled power cut in August;
- Measures to rectify the dust contamination of the backup RAID system in Y25J47b caused by the building conversion;
- Failing air conditioning in the server room Y25L97 required the installation of mobile AC devices and shutdown of all redundant servers;
- Decoupling of the primary and secondary RAID controllers within the SAN to circumvent resilvering problems with failing RAID disks;
• Increasing Spam required the installation of a front-end mail server to cope with spam and virus filtering.

Proactive changes:
• IT Blog - http://it.geo.uzh.ch/
• IT Wiki - http://it.wiki.geo.uzh.ch/
• Room booking tool - http://rooms.geo.uzh.ch/
• Commissioning of the new Windows infrastructure
• Organisation of all Windows Terminal Servers in a cluster, in order to achieve a better load-balancing during the teaching courses;
• Automatic account creation for students who booked at least one of the Departments computer-based teaching courses;
• Monitoring of the infrastructure (Nagios monitoring service);
• Change of architecture from SPARC (Solaris only) to x86 (Solaris x86, Ubuntu Linux, Windows) to adapt the usage of the server hardware;
• Virtualisation of services by means of VMWare and Solaris zones in order to improve utilisation and adaptation of the server infrastructure;
• New, redundant directory service (LDAP) for the soon to be decommissioned, old and unstable NIS+;
• Introduction of a more flexible server file system (ZFS) for dynamic allocation of storage;
• Provisioning of the technical resources for the new website (TYPO3);
• Decommissioning of the “Unix Server for Mac” by means of a more stable service for Mac and Windows (Samba).

Many of these changes are not, or only marginally, visible to the end-user. At the same time; these changes are basic prerequisites to be able to offer services that fit the needs and requirements of GIUZ users. The way towards the optimal IT infrastructure often turned out to be more difficult than expected. The unscheduled interruptions of the mail- and fileserver during autumn were caused by several factors:
• All services depend on the fileserver. An interruption of the fileserver leads to a breakdown of the mail system, the thin clients in the course rooms, of the Windows Terminal Servers and many other services;
• Increased workload on the existing systems;
• Lack of redundancy in the infrastructure at hand;
• Misconfiguration of the “Storage Area Network” (SAN), that provides 90% of all GIUZ data.

Due to the above-mentioned reasons, we will focus on the building of a reliable and fail-safe storage solution. Other changes are planned, namely:
• Extension of the existing Windows Terminal Server cluster in order to increase its performance;
• Installation of a redundant mail server to increase the reliability of our mail system;
• Modernisation of our SunRay servers to improve the capacity and performance of the thin clients in the course rooms;
• Development of a state-of-the-art user accounting to increase the degree of automation and to enhance the end user support for configuration changes of important settings (password, email, backup, etc.);
• Introduction of a print server in order to regain control over the printing volume at the Department.

Patrick Marchi and Thomas Werschlein
4.3 Corporate communications

A small committee (Norman Backhaus and Yvonne Scheidegger Jung) for corporate communications (Ausschuss Öffentlichkeitsarbeit) has been established. They meet monthly and discuss about external as well as internal communications issues, like newsletter, information flows for lecturers, and a central solution for the monitoring of the Department’s publications.

The website www.geo.uzh.ch is an important platform to present the projects, publications and teaching activities of the units, as well as a gateway to the search portals of the library.

The redesign of the website in the sense of layout and technology was started in spring and is still under development. The project was designed with the members of the redesign team and carried out with the webmasters of the units. A content management tool (typo3) has been selected and programming work was outsourced to Rüegg Tuck Partner GmbH (RTP) due to the lack of human resources within the IT team.

A further platform to transfer internal information is the GIUZ newsletter. It was published in September for the first time and appears on a two-monthly basis. In the meantime, a Department calendar has also been implemented. Events, presentations, planning dates and deadlines for teaching and management, periods of absences of professors, etc. are communicated.

In 2008, the University of Zurich celebrates its 175th anniversary. Many preparations already started in 2007. Along with many objects and posters representing the Department, a showcase for the “Campus Promenade” has been designed.

Yvonne Scheidegger Jung

4.4 Library

One aspect of knowledge management is that the Department library is continuously changing from paper to electronic publications, information search and retrieval. One of our main topics this year was the first course held on information literacy. Students were taught two hours daily for a week how to find relevant information. The lecture has been integrated into the university website dealing with “Überfachliche Kompetenzen”.

The time used for advisory services and training is expanding with the increasing digitalisation and mechanisation. Users are instructed in the many different possibilities of information-seeking. This is done in the physical library as well as online. There has been an exponential increase in the documents and databases accessible online. The website of the library (http://www.geo.uzh.ch/department/library/) serves as gateway for complex information research in geography.

Almost 2,000 users borrowed 5,300 items. This is a slight reduction compared to last year, which can be explained by the growing access to electronic publications.

This year, the collection catalogued in the IDS University of Zurich has increased by 4,000 new entries. The list with the new acquisitions can be found on the website. 131,854 items are now registered in the catalogue. Additionally, the library holds about 200 current journals. A growing number of them can be accessed online. The amount of worktime needed to make these journals accessible has increased.
Library meta-search makes it possible to search for information in various catalogues simultaneously. In Switzerland, it is the IDS-Search, worldwide it is the “Karlsruher virtuelle Katalog”. The integration of about 10,000 items from the Remote Sensing Library is still in progress. Again, the library would like to thank everybody for the books and maps they have provided. Staff of the Department should give one copy of every publication to the library. We will include documents in any form into the IDS catalogue and archive them. This would expand the visibility worldwide of the publications of the Department of Geography, lead to higher citation rates and due to this to a higher rating.

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.
Lending maps: during the opening times (only for use in the Department).
The public area is open daily from 8.15 to 17.00.

Gareth Seitz and staff

4.5 Study affairs

Both structure and content of the “Bologna” system have been fully implemented and this year’s autumn semester saw the completion of the adaptation to the international semester periods.

A teaching committee (Ausschuss Lehre) has been formed with the task of preparing teaching issues like curriculum adaptation, new rules of handling bachelor’s and master’s theses, changes of study guidelines etc., and to advise the board of directors. The members of the committee are three professors (S. Fabrikan, B.Korf, W. Haeberli) representing the three research fields, one delegate of the students (Florian Zellweger), the student advisory team (M. Salvini, Amalia Sieber) and Yvonne Scheidegger Jung.

The Department is in dialogue with teacher training institutions such as PHZH and the Institut für Gymnasial- und Berufspädagogik (iib). K. Itten and S. Fabrikan are in charge of networking with these interfaces. A. Odermatt moderates and represents the Department in the interface project “Qualification to study and baccalaureate” (HSGYM).

Student advisory team

A new team structure with two people advising students and one taking care of updating the website, the vademecum and notice boards has been established. Sibylle Sautier completed her studies in July and left the student advisory team. Amalia Sieber joined the team. Fortunately, Sibylle Sautier could be hired as the deputy of Yvonne Scheidegger Jung during her maternity leave from October to December.
The student advisory team accomplished the following information events:

• Information / orientation for coming Master students, 23.04.2007
• Information for “Maturanden”, 4./5.09.2007
• Information for freshers, 17.09.2007
• Information for Bachelor’s thesis, 10.12.2007
• Information for 4th semester students about the third Bachelor year, 22.05.2007

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An electronic system for booking classrooms and meeting rooms, as well as tools like beamers, has been in place since the autumn semester. The team – supported by M. Steinmann - designed a GIUZ T-shirt that helps to identify the geographers in public.

**Changes in study rules**

March saw the start of the first Master’s theses limited to one year. Therefore, the first two Master students (RSL, Human) did their exams in December. The exam consists of a public presentation and a defence in front of a small exam committee.

All examinations of the first semester modules were carried out before Christmas (end of lecturing period) this time. Retaking exams during the Bachelor’s studies will be permitted only once a year in September, in exceptional cases for the 5th semester modules to enhance exchange studies.

Within the MNF, a great deal of resources were absorbed in discussions about the possibility of a second retake of a compulsory module during the Bachelor’s studies. In the end, the faculty decided to offer this option, as the Bologna reform has made conditions for the students much tougher.

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

5.1 Studies coordination centre
The year 2007 was dominated by the restructuring of how the semesters were organised. Due to the Bologna reform, the semesters’ dates had to be rearranged. In 2007, the reduction of the semester break led to an extra half-semester to be taught. This in turn meant that less time was available for the planning and administrative tasks. Priority was given to ensure the smooth running of the studies. In spite of these hindered conditions, the further development of the administrative system (SAP) of the University of Zurich continued. The module booking system that was introduced under time pressure for the autumn semester 2007 unfortunately generated a lot of extra work and did not prove satisfactory either for the students, the lecturers or the administrative staff. The problems were discussed in detail together with those responsible and urgent improvements implemented for the spring semester 2008. Unfortunately the full range of functions of the module-booking tool cannot yet be carried out, especially as far as the lecturers are concerned. Various functions that are urgently needed by lecturers have now been integrated into the IT services’ project planning for the year 2008.

The curriculum of Fachbereich IV offers now a complete range of master courses in geography and in earth sciences (ETH/UZH). Due to some new lecturers, the BSc and MSc courses in geography have been slightly modified and the modular structure was adapted.

Thanks to good collective work between the relevant administrative centres and the teaching staff, existing tasks could be managed.

Philippe Meuret

5.2 E-Learning coordination
In 2007, eLearning@GeoWiss organised various OLAT training courses for specific user groups as well as for individuals from GIUZ and UWINST. These were intended to develop as broadly as possible the technical skills lecturers need to manage their own eLearning content. Other advice in great demand was for survey tools and the production of questionnaires. Courses could be more coherently structured for OLAT so that they were easier to find (name, catalogue). The number of courses and their complexity has further increased which is, among other things, due to the rise in the number of students.

Once again, the programme for the year included participating in several bodies (e.g. the OLAT Usability Group or the eLearning Skills Network) and attending various further training events, fora and SVC Days.

The main foci of our work was on support, course development, content production with XML, the development of content in the form of graphics, drawing up draft documents in various formats, testing components and software, course evaluation and content updates. Preparations for the university’s anniversary celebrations started in mid-2007. Together with other coordinators, we developed the “MNF Knowledge Game”, and we organised the “Parcours des Wissens” (Knowledge Course) along with members of the eLearning Skills Network.
All the main eLearning projects of Fachbereich IV are up and running successfully and have made no small contribution to the fact that the MNF has exceeded the strategic objective of achieving a 15% proportion of eLearning with 18.1%. The SVC projects have applied different maintenance strategies. While GITTA chose a development association, ALPECOLe launched a further training programme and is partly translated into Spanish (Alpandino). GLOPP initiated a collaboration of the UZH within the e-LERU association (making it easier to exchange credit points) and the database-based business of pp/s can, thanks to their structure, be relatively easily expanded to integrate the current business.

The other SVC projects CartouChe, DIYS, NAHRIS and PRESS are built in to the curriculum. It is nevertheless clear that not all these projects will have the means to employ their own staff in the future. ELearning@GeoWiss and the other eLearning services provide the necessary support. P. Kauer-Ott has therefore taken over the administration of the Virtual Experiment Platform (VEP, PRESS project), and also administers Geowiki (PmWiki for the GIUZ).

Petra Kauer-Ott
www.geo.uzh.ch/elearning
6 Geoteam

A new and promising year began with the Annual General Meeting of the faculty association at the beginning of January. Along with the decision to amend the statutes, there were also personnel changes. Christian Höchli, Vanessa Wirz and Simon Egger made it known that they were stepping down and Bettina Weibel, Susanne Menet, Lea Felber and Lukas Beck were accepted into the faculty association by a formal vote. The DoBars (Thursday Bars) are now well-known and they continued this year. Even though the DoBar season was shorter this year because of the changes to the semester dates and the occasionally indlement weather, there were nevertheless seven occasions on which the weather-hardened and the sociable came together for a drink and a bite to eat at the student halls of residence. This year, the summer party held before the holidays was part of an extended DoBar with special highlights such as a sack race.

After the summer holidays, new students were shown around the Irchel site on freshers’ day by members of the faculty association and helpers and then welcomed with an aperitif. This provided an opportunity for new students to discuss any questions and queries they might have about their studies and subsidiary subjects with the student advice office.

There were exceptionally two further DoBars after the holidays. An extraordinary AGM was called at one of the DoBars. This became necessary because the old president, David Sorg, resigned from office and we had to elect someone to the post urgently. Bettina Weibel was unanimously elected the new president. The resignations of Susanne Menet and Philippe Aemisegger were announced on the same occasion and the amended statutes approved.

The new faculty association homepage (www.geoteam-uzh.ch) was completed just about on time for the beginning of the semester. It is totally different in appearance, not least because of the newly designed faculty association logo. It is well worth a visit because the latest news is regularly uploaded, for example the results of this year’s choice of lecturers.

An equally revolutionary event is the walking weekend that took place on 6-7 October in the national park and was organised and led by two members of the faculty association who know the area well. It is also worth mentioning here that the faculty association has recently started to fund two internships in mobile information systems within the park.

The latest „Junge Geographie Schweiz“ meeting was held on 20th October in Zurich. Masters courses were one of the main topics, meaning that queries about masters’ dissertations and exams were discussed. The student bodies plan to keep each other informed from now on about upcoming information sessions about masters courses and thus improve coordination between universities.

The legendary geographers’ party took place at the beginning of September under the name of “Géo-Fête” at the Dynamo – which certainly did justice to its name.

The geographers’ magazine, Geoscope, has had a tumultuous year. In the spring, some young, motivated geographers who were in their second semester at the time mentioned that they would love to completely renew and transform the Geoscope. And these euphoric words actually came true in the autumn. Along with its different format, the content of the magazine has also undergone a complete facelift. People were able to get their hands on the first edition, hot off the press, at the mulled wine bar as well as take out a subscription. It should be noted here that the new editorial staff took over the Geoscope in agreement with the old editorial staff.
The faculty Santa Klaus paid the first freshers a slightly belated visit on 7th December, bringing with him a welcome present and information about upcoming events.

And so a year full of novelties and changes drew to a close and we would like to thank all the many people who put in so much effort to support our activities and make them possible.

Lea Felber
7 Presentations

Abegg, B.: "Klimawandel: Herausforderung für den Schweizer Tourismus". Schweiz Tourismus, Zürich. 05.02.2007.

Abegg, B.: "Bergtourismus morgen - wie und wohin?". Fachtagung "Die Alpen ohne Eis?", Naturhistorisches Museum Bern. 23.02.2007.


Abegg, B.: "Tourismus im Klimastress". Jahresversammlung der Vereinigung der diplomierten Tourismus-Experten (TOUREX), Muotathal. 15.06.2007.


Andrienko, G.L., Jern, M., Dykes, J., Fabrikant, S.I., Weaver, C.: "Geovisualization and synergies from InfoVis and visual analytics". 11th International Conference on Information Visualisation (IV) 2007, Zürich, Switzerland. 02.-06.7. 2007.


Böhler, R., Egli, M., Maisch, M., Brandová, D., Iva-Ochs, S., Plötze, M. & Haeberli, W.: "Exploring landscape dynamics in the eastern Swiss Alps (Albula-region, Grisons) during the Lateglacial an early Holocene". Poster presentation, AGM, Zürich, Zürich, Switzerland. 01.-02.03.2007.


Buehler, E.: "Sustainable public places. Feminist perspectives on appropriation, representations and planning of public spaces". Symposium of the IGU commission on Gender and Geography, Department of Geography, University of Zurich. 01.-03.06.2007.

Buehler, Y.A.: "Development of processing chains for rapid mapping with satellite data". Geomatics for Disaster and Risk Management, Joint CIG / ISPRS Conference, Toronto, Canada. 23.05.2007.


Burghardt, D., Schmid, S. & Stoter, J.: "Investigations on cartographic constraint formalisation". Workshop of the ICA Commission on generalisation and multiple representation, Moscow. 02.-03.08.2007.

Çöltek, A.: "An empirical evaluation: visual attention management by foveal?". Meeting ICA Commission on Visualization and Virtual Environments. Workshop "From geovisualization toward geovisual analytics", Helsinki Technical University. Espoo, Finland. 02.-03.08.2007.


Eckmeier, E.: "Possible connections between prehistoric anthropogenic burning and the chance to a cultural landscape in Northwestern Germany". XVII International Union for Quaternary Research (INQUA) Congress, Cairns, Australia. 28.07.-03.08.2007.

Eckmeier, E.: "Dark soils in Northwestern Germany indicate connections between prehistoric burning and the change to a human-dominated landscape". 5th International Congress of the European Society for Soil Conservation (ESSC), Palermo, Italy. 25.-30.06.2007.


Eckmeier, E.: "Chemically isolated microcharcoal can be used for 14C dating when macrocharcoal is absent". Poster presentation, EGU 4th General Assembly, Vienna, Austria. 15.-20.04.2007.

Edwardes, A.J. & Purves, R.S.: "Authoring an ontology of place semantics using volunteered geographic information". Geospatial Knowledge Infrastructures Workshop, Cardiff. 27.11.2007.


Edwardes, A.J. & Purves, R.S.: "Eliciting concepts of place for text-based image retrieval". GIR'07 Lisbon, Portugal. 06.11.2007.

Egli, M.: "Bodenkunde am Geographischen Institut der Universität Zürich". BGS Jahrestagung, Bern, Schweiz. 15.03.2007.


Fabrikant, S.I., Montello, D.R. & Rebich, S.: "Seeing through small multiple map displays". Meeting ICA Commission on Visualization and Virtual Environments. "Workshop From geovisualization toward geovisual analytics", Helsinki, Finland. 02.-03.08.2007.


Forster, D.: "Fernerkundung stadtnaher Landwirtschaft in Hanoi". RSL Forschungskolloquium - Aktuelle Probleme der Fernerkundung (GEO 441.1), Universität Zürich. 11.10.2007.


Gruber, S.: "Permafrost in steep topography". Adlershofer Planetenseminar, German Aerospace Center, Institute of Planetary Research, Berlin-Adlershof, Germany. 16.05.2007.
Gruber, S.: "Permafrost in steep terrain". Seminar, Faculty of Engineering, University of Trento, Italy. 29.10.2007.
Haeberli, W.: "Anticipating climate-driven geosystem changes in high mountain areas: a study in the upper Engadin, Swiss Alps". CRYONOR seminar, Department of Geosciences, University of Oslo, Oslo, Norway. 27.03.2007.
Haeberli, W.: "Klimaänderung, Gletscherschwund und Naturgefahren in den Alpen". Physikalische Gesellschaft Zürich, Zürich, Schweiz. 29.03.2007.
Haeberli, W.: "The Alps without ice?". UNEP press briefing Global Outlook for Ice and Snow, Parc du Cinquantenaire, Brussels, Belgium. 06.06.2007.
Haeberli, W.: "The Alps without ice?". Lunch seminar EU Commission DG Environment Unit D2, EU Environment Directorate-general, Brussels, Belgium. 06.06.2007.
Haeberli, W.: "Alpen ohne Eis?". Jahresversammlung myclimate, Zürich, Switzerland. 12.06.2007.
Haeberli, W.: "Alpen ohne Eis?". Seminar, Institut für Umweltphysik, Universität Heidelberg, Deutschland. 21.06.2007.
Haeberli, W.: "Ghiacciaio del Belvedere et la face est du Monte Rosa". Exkursion mit der Gesellschaft "La Murithienne". 30.06./01.07.2007.


Hoelzel, M.: "Modelling of mountain permafrost distribution", Institute of Geography, University of Lausanne, Switzerland. 06.02.2007.


Hoelzel, M. "Borehole and ground surface temperature in relationship to meteorological conditions in the Swiss Alps". Poster presentation, 5th Swiss Geoscience Meeting, Geneva, Switzerland. 16.-17.11.2007.


Hofmann, A., Heim, A., Abiven, S. & Schmidt, M.W.I.: "Askov (DK) and Cadriano (I) longterm field experiments - sites for studying lignin dynamics in arable soil". University of Bologna, Department of Agro-Environmental Sciences and Technologies, Bologna, Italy. 03.04.2007.


Huber, S.: "Estimating nitrogen concentration from directional CHRIS/Proba data". Poster presentation, 10th ISPMSRS, Davos, Switzerland. 14.03.2007.


Huggel, C.: "Impactos por amenazas relacionadas al cambio climatico en areas de alta montana: perspectivas de monitoreo, evaluacion y prevencion". Universidades Nacional “Santiago Atunze de Mayolo”, Huaraz, Peru. 19.06.2007.

Huggel, C.: "Modelos de remociones en masa y su aplicación en diferentes ámbitos", Universidad Nacional de Colombia / Instituto Colombiano de Geología y Minería, Bogota, Colombia. 29.08.2007.


Hüni, A.: "2nd generation of RSL's spectrum database “SPECCHIO”". Poster presentation, 10th ISPMSRS, Davos, Switzerland. 14.03.2007.


Itten, K.I.: "Hyperspectral applications in remote sensing". SSOM Engelberg Lectures, Engelberg, Switzerland. 05.03.2007.


Joos, O., Heim, A. & Schmidt, M.W.I.: "Preliminary Results". NCCR - Young Researchers Meeting, Gwatt, Switzerland. 07. - 08.06.2007.

Junker, B.: "Ecological visions of successful river restorations – are they also aesthetically pleasing to the public?". International symposium on society and resource management 2007, Park City, Utah, USA. 17.06.-21.06.2007.

Kaspar, H.: "Potent processes on space appropriation. How an urban public park is created by planners, designers and users". IGU Symposium "Sustainable public places. Feminist perspectives on appropriation, representations and planning of public spaces", Department of Geography, Univeristy of Zurich. 01.-03.06.2007.


Kellenberger, T.W., Buehler, Y.A. & Ginzier, C.: "Erfahrungen mit der ADS40". RSL Forschungskolloquium - Aktuelle Probleme der Fernerkundung (GEO 441.1), Universität Zürich, Zürich. 18.01.2007.


Klaus, P.: "Kulturwirtschaft und Stadtentwicklung". Veranstaltungsreihe der SP Stadt Zürich zu Stadtentwicklung, Zürich. 01.02.2007.


Klaus, P.: "Zwischennutzungen und ihre kulturwirtschaftlichen Potenziale". Veranstaltungsreihe "Monat der Arbeit", Aarau. 11.05.2007.


Klaus, P.: "Temporary uses and cultural development". INRA - Transformation, survival and emancipation in a world city, Brighton, UK. 28.06.2007.

Klaus, P.: "Die Kultur der Weltstadt - Kulturproduktion zwischen Weltwirtschaft und Subkultur". Weltgesellschaft in Zürich, Zürich. 15.11.2007.


Knöri, C., Binder, C. R., Althaus, HJ.: "Agent based modeling (ABM) for analyzing the demand for recycled mineral construction material". R’07 World Congress Recovery of Materials and Energy for Resource Efficiency, Congress Center, Davos, Switzerland. 3.-5.9.2007

Koetz, B.: "Radiative transfer model inversion based on multi-temporal CHRIS/PROBA data for LAI estimation". Poster presentation, 10th ISPMSR5, Davos, Switzerland. 13.03.2007.


Koetz, B.: "Fusion of imaging spectrometer LIDAR data using support vector machines for land cover classification". Poster presentation, 10th ISPMSR5, Davos, Switzerland. 13.03.2007.

Korf, B.: "Post-conflict Reconstruction and Development". MSc module OA5402 Reconstruction and Development, IDPM, University of Manchester. 16.03.2007.
Lüscher, P.: "Ontology-driven enrichment of spatial databases (in the urban environment)". 10th ICA Workshop on Generalisation and Multiple Representation Moscow. 03.08.2007.
Lüscher, P.: "Matching road data of scales with an order of magnitude difference". XXIII International Cartographic Conference, Moscow. 07.08.2007.
Machguth, H.: "On the uncertainties of two glacier mass balance models obtained from Monte Carlo simulations". Poster presentation, EGU 4th General Assembly, Vienna, Austria. 15.-20.04.2007.


Nieke, J.: "Hyperspectral imagers - from design to application". SSOM Engelberg Lectures, Engelberg, Switzerland. 05.03.2007.


Nieke, J. & Small, D.: "Fernerkundung in Japan oder Was sehen japanische Satelliten besser?". RSL Forschungskolloquium - Aktuelle Probleme der Fernerkundung (GEO 441.1), Universität Zürich. 11.01.2007.


Noetzli, J., Gruber, S. & Kohl, T.: "Transitent 3-dimensional modelling of permafrost temperatures below steep alpine topography.". Alpine Glaciology Meeting, Zürich, Switzerland. 01./02.03.2007.


Odermatt, D.: "Evaluation of a physically based inland water Processor for MERIS data". Poster presentation, EARSeL Special Interest Group Workshop Remote Sensing of the Coastal Zone, Bolzano, Italy. 07.-09.06.2007.

Odermatt, D.: "Constitution of an automized processing chain to analyse a MERIS time series of Swiss Lakes". Poster presentation, 10th IS PfMSR5, Davos, Switzerland. 14.03.2007.

Ostermann, F.: "Evaluating sustainable appropriation of urban public parks". 12th CORP Conference, Vienna. 23.05.2007.

Ostermann, F.: "GIS methods for a critical geography". IGU Symposium on Sustainable Public Places, Zurich, Switzerland. 01.06.2007.

Ostermann, F.: "Modelling space appropriation in public parks". 10th AGILE International Conference on Geographic Information Science, University of Aalborg, Aalborg, Denmark. 11.05.2007.


Paul, F.: "A new glacier inventory for the Svartisen area (Norway) from Landsat ETM+: Methodological challenges and first results". Workshop on the dynamics and mass budget of Arctic glaciers, Pontresina, Switzerland. 15.-17.01.2007.

Paul, F.: "A new glacier inventory for the Svartisen area (Norway) from Landsat ETM+: Methodological challenges and first results". 11th Alpine Glaciology Meeting, Zürich, Switzerland. 01.-02.03.2007.


Paul, F.: "Spatial variability of glacier elevation changes in the Alps obtained from the SRTM DEM". EGU 4th General Assembly, Vienna, Switzerland. 15.-20.04.2007.


Paul, F.: "Spatial variability of glacier elevation changes in the Alps obtained from the SRTM DEM” Observations of the Cryosphere from Space (9.7)"). IUGG General Assembly, Perugia, Italy. 02.-13.07.2007.
Paul, F.: "WGMS - NSIDC - GLIMS Officer meeting (11.7)"). IUGG General Assembly, Perugia, Italy. 02.-13.07.2007.


Reichenbacher, T.: "Attention-guiding geovisualisation ". 10th AGILE International Conference on Geographic Information Science, University of Aalborg, Aalborg, Denmark. 8.-11.05.2007.

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