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In 2010, CCES partners again have been very productive on a scientific as well as outreach level. For instance, 266 articles were published in peer-reviewed scientific journals, and 46 PhD and 79 master and diploma theses have been accomplished. 570 abstracts, proceedings, presentations, and posters at scientific events have been contributed. In addition, CCES projects are also fostering dialogue with stakeholders outside the scientific community: a total of approximately 300 outreach activities have been accomplished. It is this commitment on both the scientific as well as the dialogue level that makes CCES unique and creates an added value for both scientists and societal groups.

Scientific Events

River Corridor Restoration Conference 2011 – RCRC11

More than 75 persons participated in the international conference RCRC11, held at Centro Stefano Franscini, Monte Verità, Ascona from March 13 to 18, 2011. RCRC11 was organized by a team of the CCES-funded RECORD project. The focus of the conference was on hydrological and ecological processes within the system river – river corridor – groundwater. Different sessions addressed experimental methods and models to investigate and predict effects of river restoration on biodiversity or groundwater protection. The conference brought together scientists from universities and consulting offices as well as regulators. The program showed the difficulties, challenges, and opportunities of river restoration for science and practice, especially under the conditions of climate change. The full program and the abstracts of the presentations are available at www.eawag.ch/medien/veranstaltungen/events/rcrc2011/index_EN.



Participants of RCRC11 at Monte Verità.
Photo: Massimo Pedrazzini, Losone.

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The event was organized as part of the RECORD project:
www.cces.ethz.ch/projects/nature/Record

Outreach

Designing a sustainable energy future – chances and risks for Switzerland

As a leading country in the areas of innovation and technology, Switzerland is playing a seminal role in developing concepts for sustainable energy policies and technology. In a world which is increasingly characterized by political and economic upheaval, there is a growing demand for safe, environmental-friendly, and reliable energy services. Thanks to its broad and interdisciplinary orientation, ETH Zurich as the leading house of CCES can provide a well-founded and integral perspective towards an environmental-friendly, efficient, and affordable energy future.

'Designing a sustainable energy future – chances and risks for Switzerland' is a public event at ETH Zurich on September 2, 2011, providing first-hand information and a discussion platform on the above-mentioned issues. In the first part, most recent developments in energy research will be presented and discussed. In the second part, opened by a key note speech by Federal Councilor Doris Leuthard, representatives from politics, industry, and civil society and the audience will discuss challenges and options for actions. Independent participation in either part is possible.

The event is co-organized by ETH Sustainability, the Energy Science Center of ETH Zurich, The Sustainability Forum Zürich (TSF), and CCES. It will be held in German. Registration is compulsory.

Further information and registration:

www.cces.ethz.ch/energiegesprach

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Education

Collaborative development of research agenda for the Zambezi River Basin: ADAPT stakeholder workshop in Lusaka

The African Dams Project (ADAPT), focused in the Zambezi River Basin (ZRB), aims to enhance the scientific basis of integrated water resource management by developing new data resources and models that can be used to improve the operation and design of large hydraulic structures.

In January 2011, ADAPT held a meeting in Lusaka, Zambia with 40 stakeholders from various ZRB



Participants of the ADAPT stakeholder workshop in Lusaka in January 2011. © D. Senn, ETH Zurich.

water sectors (hydropower, agriculture, environment). The meeting's main goals included updating ZRB stakeholders on ADAPT's research results and identifying priority topics for future collaborative research in the basin. Among the priority research topics identified was how to best incorporate climate variability scenarios into basin-wide planning for water resources management across water sectors and the ZRB's eight riparian countries. Workshop results will be available at the ADAPT website.

Dave Senn, Institute of Biogeochemistry and Pollutant Dynamics, ETH Zurich

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This workshop was organized by the ADAPT project:

www.cces.ethz.ch/projects/nature/adapt

Successful first edition of the CCES Winter School 'Sustainability Science Meets Practice'

In January and February 2011, CCES ran its first Winter School 'Sustainability Science Meets Practice'. This activity aims at developing methodological and transferrable skills for strengthening interactions between science, practice, and society at large.

An international group of sixteen doctoral candidates and post-docs attended the course in 2011.



The course concept supported an extraordinary group dynamics which allowed the awareness raising for and experiencing of transdisciplinary research practice.



The organizational setup of the course enhanced interest and confidence for actively managing dialogues between science and practice as becomes evident from the following statements of participants:

«For the first time, I experienced a very dynamic learning process interacting with other participants, coaching lecturers, and real stakeholders in diverse fields.»

«Besides meeting so many great people, I have learned and taken away an appreciation for the usefulness and applicability of the transdisciplinary process.»

Drawing on such a feedback, CCES looks forward to offering this course again in 2012 (see www.cces.ethz.ch/winterschool).

Claudia Zingerli, Coordinator CCES Winter School 'Sustainability Science Meets Practice', ETH Zurich

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Photos: C. Zingerli, CCES.

Research

Comparison of precipitation gradients along hill slopes on small temporal scales

Spatially distributed precipitation data are required in numerous applications, for instance in hydrological modeling. Since changing climatic conditions affect the spatial distribution of rainfall, comprehensive knowledge of the present precipitation patterns is necessary in order to assess future changes. The effect of topography on precipitation amount and intensity is still subject of ongoing research. At the annual time-scale, rainfall increases with elevation; however, at hourly or daily scales the effect of elevation is not well understood. Field experiments were started in Zermatt (Canton of Valais) during summer 2010, and will be continued in summer 2011, to gain insight about how topography affects precipitation at the event scale from a couple of hours to days. Along two hill slopes, 15 automatic weather stations were installed (1600 m to 2900 m above sea level). Each station was equipped with rainfall, wind, and temperature sensors.

During the observation period, nine events with cumulative precipitation of more than 8 mm occurred. For these events, the precipitation measured on the ground was compared to the cumulative rainfall measured by radar (MeteoSwiss), particularly focusing on the gradient patterns. Figures 1 and 2 show the results for one selected event for rain gauge and radar measurements, respectively. Qualitatively, there is a good agreement between the observed precipitation amounts. Both show decreasing precipitation with elevation from the blue to the yellow station (figures 1 and 2) and considerably less precipitation at the lowest station (shown in black). In this case there is a negative gradient along the upper part of the hill slope (-2.7 mm per 100 m). However, the lowest station in the valley is an outlier, which indicates that this precipitation gradient is a fairly localized phenomenon.

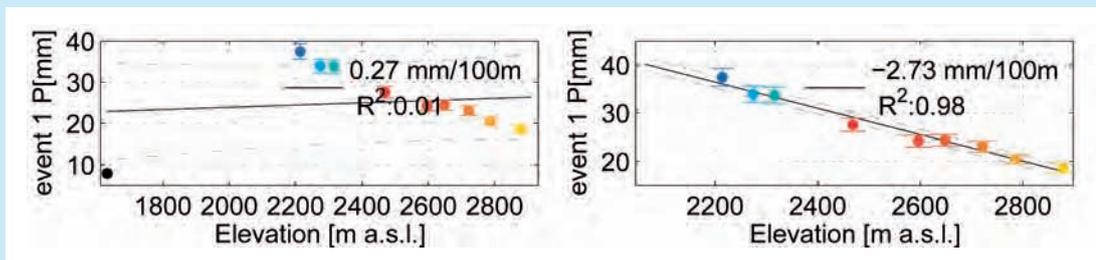


Figure 1: Precipitation gradient measured on the ground. A negative precipitation gradient with elevation was observed only in the upper part of the hill slope.

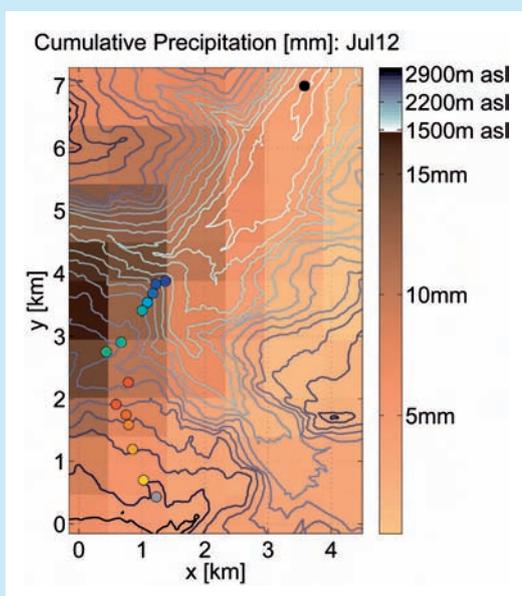


Figure 2: Cumulative event precipitation measured by radar (brown color scale) and 100 m contour lines of the terrain (gray color scale).

Across the observed events, cumulative precipitation does not always follow a constant elevation gradient. A comparison of all recorded events showed that the pattern of cumulative precipitation depends on the event duration. For events lasting more than about ten hours, often positive elevation gradients were observed. For events with a duration of less than three hours, the effect of elevation is less clear. The pattern is event-specific and depends strongly on additional factors such as weather type, direction, and velocity of the rain cell.

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This study is part of the APUNCH project:

www.cces.ethz.ch/projects/hazri/apunch