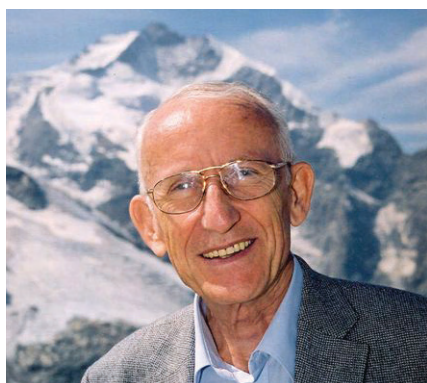




## Die Berge und ihre Bedeutung: von Rio zu Rio+20

Editorial, französische Übersetzung anschliessend



**Prof. em. Bruno Messerli**, Geographisches Institut,  
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### Rio begann 20 Jahre früher

Die erste globalpolitische UNO-Umweltkonferenz fand 1972 in Stockholm unter dem Titel «On the Human Environment» statt. Den Begriff der Nachhaltigkeit gab es noch nicht, der Klimawandel war noch kein politisches Thema und die Berge der Welt standen noch nicht auf der Agenda. Aber in den Empfehlungen wurde auf die Bedeutung des UNESCO Forschungsprogramms «Mensch und Biosphäre» (MAB) verwiesen, das ein halbes Jahr zuvor gegründet worden war. Eines der 14 Projekte trug den Titel «Man's Impact on Mountain Ecosystems» und war damit das erste globale Forschungsprogramm für die Berge der Welt. Entscheidend aber war

der Appell der UNESCO, die Zusammenarbeit von Natur- und Sozialwissenschaften unter Einbezug der Politik zu fördern. Diese Herausforderung findet sich heute, im Blick auf Rio+20, in den Global Change Programmen wieder.

Die folgenden Jahre waren entscheidend für die Berge der Welt in Rio 1992. Nicht nur in den Alpenländern, sondern auch im Himalaya, in den Anden und in den Gebirgen Afrikas entstanden regionale Organisationen zur Forschung und Entwicklung, kontinuierlich unterstützt von der DEZA, der UNESCO und UNU, aber auch gefördert

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von der Universität Bern. Diese regionalen Strukturen bildeten in den Vorbereitungskonferenzen für Rio die Basis für enthusiastische Interventionen zu Gunsten eines Gebirgskapitels in der Agenda 21.

### Rio 1992 und seine Auswirkungen

Der «Earth Summit» von Rio 1992 war politisch und wissenschaftlich hoch interessant. Die 40 Kapitel der Agenda 21 bezogen sich auf konkrete Probleme unserer Umwelt und unserer Zukunft. Für das Gebirgskapitel «Managing Fragile Ecosystems–Sustainable Mountain Development» wurde die FAO von der UNO als «Lead Agency» bezeichnet. In Rio entstand ein Gefühl einer immer notwendiger werdenden «Weltinnenpolitik», das heisst ein Verständnis für die globale Politik und dementsprechend eine Herausforderung für die Wissenschaft. Überblicken wir die Zeit seit Rio 1992, dann ist die Politik zur Nachhaltigkeit in

«Global Mountain Biodiversity Assessment» (G MBA: Universität Basel) und «Mountain Research Initiative» (MRI: Universität Bern).

### Rio+10: Von Johannesburg nach Bishkek

2002 fand in Johannesburg der «World Summit on Sustainable Development» statt, der kaum eine weltweite Nachhaltigkeitsstrategie auslöste. 2002 als Jahr der Berge erzielte in den Entwicklungsländern viel grössere Wirkungen als in den Alpenländern. In der Bishkek Abschlusskonferenz waren die anwesenden UNO-Organisationen, Weltbank, IUCN, etc. bereit, die Gebirge mit ihren Ressourcen in ihre Agenda aufzunehmen.

### Rio+20: Wieder Rio de Janeiro, aber 2012

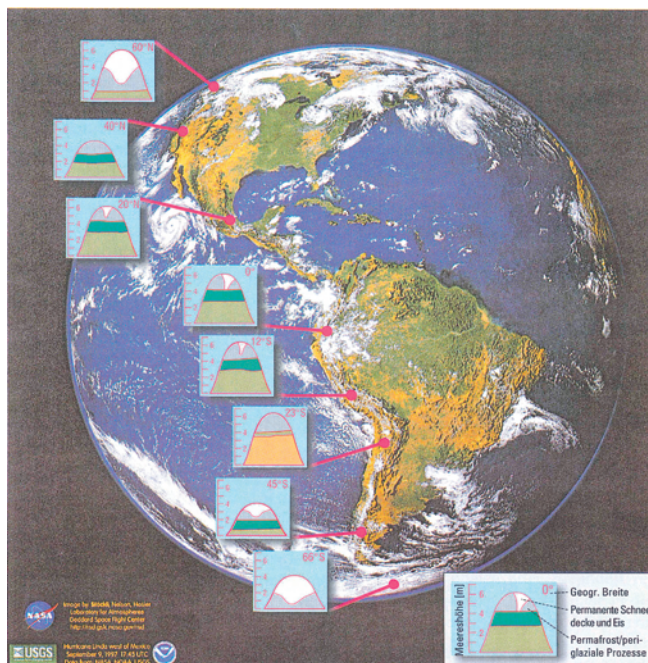
Drei Monate vor der Rio+20 Konferenz wird in London die Wissenschaftskonferenz «Planet under Pressure» stattfinden. Sie wird von den vier Global Change Programmen organisiert. Wird es in drei Monaten gelingen, wichtige Ergebnisse in die Rio+20 Konferenz einzubringen? Der neue «Earth Summit» 2012 hat zwei Themen:

1. «Green economy in the context of sustainable development and poverty eradication»
2. «Institutional framework for sustainable development».

Wo bleibt die Agenda 21? Wo bleiben konkrete Problembereiche? Wo bleiben die Gebirge?

Wieder stellt sich die Frage, welche Rolle die Politik und die Wissenschaft von Rio bis kurz vor Rio+20 gespielt haben? Die globale Nachhaltigkeitspolitik wurde immer wieder von nationalen und regionalen Eigeninteressen dominiert. Es braucht wohl weitere Katastrophen, bis sich ein globales Verantwortungsdenken durchsetzen kann. Im Unterschied dazu haben die Wissenschaften aus diesen politischen Diskussionen weitreichende Anregungen erhalten. Auch die Gebirgsforschung ist geprägt von einer rasch ansteigenden Zahl von Forschungsprojekten. Wenn es

stimmt, dass in den kommenden Jahrzehnten die Verknappung von Nahrung, Wasser und Energie zu Konflikten und Katastrophen führen wird, dann müssten die Gebirge mit ihren Wasserressourcen für Mensch, Nahrungsproduktion und erneuerbare Energie, mit ihren «Hot Spots» der Biodiversität, mit ihren Erholungsräumen für eine wachsende urbane Weltbevölkerung und mit ihren sensiblen geophysikalischen und biologischen Indikatoren für Klimaveränderungen eine ganz besondere wissenschaftliche und politische Bedeutung erhalten.



Dieses Satellitenbild zeigt dank 50-facher Überhöhung der Topographie einen Gebirgszug von Alaska bis Feuerland. Das oberste Ökosystem kommt über alle Klimazonen hinweg vor und ermöglicht so vergleichbare Messungen. Gebirge bieten sich somit als wertvolle Indikatoren – von Pol zu Pol – für den Klimawandel an. (NASA, Goddard Space Flight Centre: Stockli et al. 2000)

der Wachstumseuphorie dieser zwei Jahrzehnte verloren gegangen. Ganz anders die Wissenschaft: Sie hat den Impuls von Rio aufgenommen und ihre vier Global Change Programme gefördert (WCRP, IGBP, IHDP, DIVERSITAS). Dazu kam das IPCC, das mit seinen Berichten die globale Politik geprägt hat. Aber auch die Gebirgsforschung hat mit 5 globalen Programmen bedeutende Fortschritte gemacht, wobei die Schweiz in 3 Programmen die Führungsrolle übernommen hat: «World Glacier Monitoring Service» (WGMS: Universität Zürich),

# Les montagnes et leur importance: de Rio à Rio+20

**Prof. em. Bruno Messerli, Institut de géographie, Université de Berne**

## Rio a commencé vingt ans plus tôt

La première conférence de politique globale de l'ONU a eu lieu en 1972 à Stockholm sous le titre «On the Human Environment». La notion de développement durable n'existait pas encore, les changements climatiques n'étaient pas encore un thème politique et les montagnes du monde ne figuraient pas encore à l'agenda. Mais les recommandations signalaient l'importance du programme de recherche de l'UNESCO «L'homme et la biosphère» (MAB), qui avait été lancé une demi-année plus tôt. L'un de ses quatorze projets portait le titre de «Man's Impact on Mountain Ecosystems» et était ainsi le premier programme global de recherche consacré aux montagnes. Un fait déterminant y était en outre l'appel de l'UNESCO en faveur d'une collaboration des sciences naturelles et sociales, associant aussi les milieux politiques. Ce défi se retrouve aujourd'hui, en relation avec Rio+20, dans les programmes dédiés aux changements globaux.

Les années suivantes furent déterminantes pour l'intérêt porté, en 1992 à Rio, aux montagnes. Des organisations régionales de recherche et développement, soutenues en permanence par la DDC, l'UNESCO et l'ONU, mais aussi encouragées par l'Université de Berne, ont vu le jour non seulement dans les pays alpins, mais aussi dans l'Himalaya, les Andes et les montagnes d'Afrique. Dans les conférences de préparation à Rio, ces structures régionales ont été à la base d'interventions enthousiastes en faveur d'un chapitre sur les montagnes dans l'Agenda 21.

## Rio 1992 et ses conséquences

Le «Sommet de la Terre» de Rio, en 1992, fut d'un très grand intérêt politique et scientifique. Les quarante chapitres de l'Agenda 21 se réfèrent à des problèmes concrets ayant trait à notre environnement et à notre avenir. Pour le chapitre sur les montagnes, intitulé «Managing Fragile Ecosystems-Sustainable Mountain Development», la FAO a été désignée par l'ONU comme agence leader.

A Rio est né le sentiment de la nécessité croissante d'une «politique intramondiale», c'est-à-dire une compréhension pour la politique globale, et en conséquence un défi pour les scientifiques. Si nous considérons la période depuis Rio il apparaît que la politique axée sur le développement durable s'est perdue dans la croissance euphorique de ces deux décennies. Il en est allé tout autrement en science : elle a capté l'impulsion de Rio et encouragé ses quatre programmes dédiés aux changements globaux (PMRC, PIGB, IHDP, DIVERSITAS). A quoi s'est ajouté le GIEC, dont les rapports ont eu un

impact sur la politique globale. Mais la recherche en montagne aussi a fait d'importants progrès avec ses cinq programmes globaux, dans trois desquels la Suisse assume un rôle de leader : «World Glacier Monitoring Service» (WGMS : Université de Zurich), «Global Mountain Biodiversity Assessment» (GMBA : Université de Bâle) et «Mountain Research Initiative» (MRI : Université de Berne).

## Rio+10 : De Johannesburg à Bichkek

En 2002 s'est tenu à Johannesburg le Sommet mondial sur le développement durable, qui n'a guère déclenché une stratégie mondiale à ce sujet. A la conférence finale de Bichkek, les organisations de l'ONU présentes, la Banque mondiale, l'UICN, etc. étaient prêtes à faire figurer les montagnes et leurs ressources à leur agenda.

## Rio+20: De nouveau Rio de Janeiro, mais en 2012

Trois mois avant la conférence Rio+20 aura lieu le congrès scientifique «Planet under Pressure» organisé par les quatre programmes dédiés aux changements globaux. Réussira-t-on en trois mois à faire en sorte que la conférence Rio+20 assimile d'importants résultats de cette réunion préalable? Le nouveau Sommet de la Terre de 2012 a deux thèmes: 1. «Green economy in the context of sustainable development and poverty eradication» 2. «Institutional framework for sustainable development». Où a passé l'Agenda 21? Où sont les problématiques concrètes? Qu'en est-il des montagnes? La question se pose de nouveau de savoir quel rôle les milieux politiques et les scientifiques ont joué de Rio jusqu'à peu avant Rio+20? La politique globale de développement durable a toujours été dominée par des intérêts nationaux et régionaux. Il faudra sans doute d'autres catastrophes pour qu'une attitude globale de responsabilité puisse s'imposer. Les sciences par contre ont reçu des impulsions de grande portée de ces discussions politiques. La recherche en montagne aussi est marquée par une augmentation rapide du nombre de projets de recherche. S'il est vrai que la pénurie de denrées alimentaires, d'eau et d'énergie conduira à des conflits et des catastrophes au cours des prochaines décennies, les montagnes devraient acquérir une importance très particulière du fait de leurs ressources en eau à disposition de l'homme, de la production alimentaire et de l'énergie renouvelable, du fait aussi de leurs «hot spots» de biodiversité, de leurs espaces de détente pour une population urbaine en augmentation dans le monde et de leurs indicateurs sensibles des changements climatiques.

## News

### Roadmap to a Single European Transport Area *White Paper 2011*

The European Commission adopted a roadmap of 40 concrete initiatives for the next decade to build a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. At the same time, the proposals will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050.

By 2050, key goals will include:

- No more conventionally-fuelled cars in cities.
- 40% use of sustainable low carbon fuels in aviation; at least 40% cut in shipping emissions.
- A 50% shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport.
- All of which will contribute to a 60% cut in transport emissions by the middle of the century.

You can find additional information about the strategy like «50 Facts and Figures on Transport» at the website of the European Commission Mobility & Transport: [http://ec.europa.eu/transport/strategies/2011\\_white\\_paper\\_en.htm](http://ec.europa.eu/transport/strategies/2011_white_paper_en.htm)

### Launch of the mountain.TRIP website

*New community platform for sustainable mountain development*

The goal of mountain.TRIP is to provide stakeholders and practitioners with understandable forms of research-based information about mountain sustainability. mountain.TRIP has started where other EU projects have finished, translating research findings into useful information and developing relationships between users and researchers. The mountain.TRIP website will serve as a central place where all information on sustainable development in European mountain regions is collected and knowledge about project communication is transferred.

You can join the online mountain.TRIP community at: [www.mountaintrip.eu](http://www.mountaintrip.eu). Interesting information and discussion groups are offered for scientists and practitioners about:

- climate change
- biodiversity, conservation and tourism
- quality mountain foods
- environmental management
- and others.

### Direct Air Capture of CO<sub>2</sub> with chemicals is inefficient

The American Physical Society published the results of a two-year long study called «Direct Air Capture of CO<sub>2</sub> with Chemicals». 13 internationally known scientists from the USA, Europe and Switzerland analysed the potential role of Direct Air Capture (DAC) as CO<sub>2</sub> removal strategy. The Technology Assessment shows that DAC is not currently an economically viable approach to mitigating climate change. It costs about ten times less to capture the greenhouse gas directly from CO<sub>2</sub> rich sources like coal-fired power plant.



CO<sub>2</sub> capture directly from coal-fired power plant is much more effective than the capture with chemicals.

Picture: Dr. G. Schmitz

DAC involves a system in which ambient air flows over a chemical sorbent that selectively removes the CO<sub>2</sub>. The CO<sub>2</sub> is then released as a concentrated stream for disposal or reuse, while the sorbent is regenerated and the CO<sub>2</sub>-depleted air is returned to the atmosphere.

Download of further information:

[www.proclim.ch/News?1959](http://www.proclim.ch/News?1959)

### ESPERE: Information on the climate system

*...for schools and the world's citizens*

ESPERE stands for Environmental Science Published for Everybody Round the Earth. It is a project funded by the European Commission with the aim to put up-to-date and accurate scientific information on climate in a Climate Encyclopaedia on the web. The information is in a form which is understandable to all and very useful in school lessons. All information on the climate system exists in nine different languages (English, français, español, português, Deutsch, polski, magyar, italiano and norsk).

The Climate Encyclopaedia covers a broad range of topics:

- Atmosphere
- Weather
- Clouds & Particles
- Climate in Cities
- Oceans
- Food & Climate
- People Changing Climate

It gives either a fast overview called basics or detailed information with related worksheets.

You can find the web site at: [www.espere.net](http://www.espere.net)

### The Networker – new IHDP newsletter

The newly-updated newsletter of the International Human Dimensions Programme on Global Environmental Change (IHDP), called «The Networker» is replacing the E-zine. It will offer readers a new format and fresh design with topical articles on the most important IHDP developments.

The Networker has a format that is approachable and relevant not only to those directly involved in IHDP, but also to a broader community of interested readers. Insights on key areas for multi-disciplinary collaboration is presented to individuals representing all branches of science and policy that work on global environmental change issues.

To subscribe to IHDP's mailing lists:

[www.ihdp.unu.edu/article/read/subscribe](http://www.ihdp.unu.edu/article/read/subscribe)

### Electricity consumption up 4% in 2010

Electricity consumption in Switzerland increased by 4% in 2010 to 59.8 billion kilowatt hours (kWh). In every month of 2010, Switzerland's electricity consumption was between 1.9% and 6.8% higher than in the previous year, with the exception of January.

The main overall drivers of electricity consumption are economic growth and population development. In 2010, the gross domestic product (GDP) grew by 2.6%. As yet, no statistics are available from the Federal Statistical Office (BFS) about the development of the population in 2010. The severe weather (increase in the number of heating degree days of 12.7% compared to 2009) contributed to increased electricity consumption.

Overall electricity production at Switzerland's



Swiss electricity consumption increased by 4% in 2010. Main drivers are economic growth and population development.

power plants in 2010 was 66.3 billion kWh, 0.4% less than in 2009. Domestic production exceeded domestic demand (national consumption) over a six month period. The balance for the full year was an excess in imports of 0.5 billion kWh. Switzerland recorded an excess in imports for the third time since 2005 and 2006.

*Source: Swiss Federal Office of Energy*

### Greenhouse gas emission reductions are too slow

*Switzerland is not on track to reach the Kyoto target*

In Switzerland, greenhouse gas emissions have been reduced by 1.5 million tons of CO<sub>2</sub> equivalents in 2009. However, the emissions were still too high with regard to the Kyoto target.

Greenhouse gas emissions amounted to 51.85 million tons of CO<sub>2</sub> equivalents in 2009. The decrease of 1.5 million tons in comparison to 2008 means a reduction of 2.6 per cent. Among other things, the reduction is due to milder temperatures and the economic crises.

According to the Kyoto protocol Switzerland has committed itself to reduce its emissions by an average of 8 per cent for the period 2008 to 2012. Taking into consideration the sink effect of the forest as well as the purchase of emission reduction certificates, in 2009 the emissions were still 0.6 million tons beyond the Kyoto target.

Between 1990 (the reference year with regard to the Kyoto targets) and 2009, greenhouse gas emissions from traffic have increased by 1.8 million tons of CO<sub>2</sub> equivalents or 12 per cent. Traffic accounts for a third of total greenhouse gas emissions. Since 1990, the emissions have been reduced in the industry and the service sector, in households and in agriculture.

For the entire Kyoto commitment period (2008 to 2012), the Federal Office for the Environment anticipates that the target will be missed by 0.8 million tons CO<sub>2</sub> equivalents per year. The Federal Council will decide on how to cover the target deficit.

You can download the report in German or French at: [www.proclim.ch/News?1781](http://www.proclim.ch/News?1781)

Source: Federal Office for the Environment (FOEN)

### **New Platform of the Swiss NGOs active in Disaster Risk Reduction (DRR)**

SDC (Federal Department of Foreign Affairs) and Swiss NGOs initiated a dialogue on the importance of DRR and Adaptation to Climate Change (ACC) practices and experiences. Subsequently, interested Swiss NGOs promoted the creation of a DRR Platform. By April 2011, the preparatory work for the formal institution is completed and the following NGOs are interested to join the Platform: CARITAS, HEKS/EPER, Helvetas, Intercooperation, MEDAIR, SWISSAID, SOLIDAR Switzerland, Swiss Red Cross (SRC) and Terre des hommes. The Swiss NGO envision their DRR Platform as a network of NGO professionals seeking to be more effective in their humanitarian, development and advisory oriented work by capturing the diversity of knowledge and experience related to DRR.

### **Geologie-Portal ist online**

*Zentrale Geologieplattform der Schweiz*

### **Le portail géologique suisse est on-line**

*La version en français sera disponible en été*

(Deutsch) Neuerdings steht unter [www.geologieportal.ch](http://www.geologieportal.ch) die Informationsplattform für die Schweizer Geologie-Szene zur Verfügung. Neben aktuellen Geschehnissen, Veranstaltungen und Stellenangeboten informiert das Geologie-Portal über geologierelevante Themen und bietet den zentralen Zugang zu Daten und Informationen aus dem Bereich der Geologie.

Sowohl Berufsgeologen als auch geologie-interessierte Laien können dort eine Fülle von Informationen für Ihren Interessenbereich finden. Für die Experteninformationen wird das ProClim- Infosystem verwendet.

Das Portal wird durch eine Gruppe von gleichberechtigten Partnern aufgebaut: Schweizer Geologenverband, Landesgeologie, Plattform



Das Geologie-Portal bietet den zentralen Zugang zu Daten und Informationen aus dem Bereich der Geologie. Wichtig zum Beispiel für das Beurteilen von einem Bergsturz wie hier im Bild in Randa (VS).

Geosciences der Schweizer Akademie der Wissenschaften, Schweizerische Geotechnische Kommission und Schweizerische Geophysikalische Kommission. Zudem werden kantonale und eidgenössische Fachstellen mit in die Erstellung der Inhalte einbezogen.

Das Geologie-Portal ist seit Ende März 2011 in deutscher Sprache aufgeschaltet. Im Laufe von 2011 werden sämtliche Inhalte auf Französisch übersetzt. Weitere Sprachversionen sollen zu einem späteren Zeitpunkt folgen.

--> [www.geologieportal.ch](http://www.geologieportal.ch)

(Français) La plate-forme d'information de la scène géologique suisse est disponible sous [www.portail-geologique.ch](http://www.portail-geologique.ch) en allemand pour le moment. En plus des actualités, des manifestations et des offres d'emploi, le portail géologique informe sur les thèmes relevant en géologie. Il offre également un accès centralisé aux données ainsi qu'aux informations dans le domaine de la géologie.

Les géologues professionnels tout comme les amateurs intéressés par la géologie y trouveront une quantité d'information dans leurs domaines d'intérêts. Toutes les informations sur des experts viennent de l'InfoSystem de ProClim.

Afin de prendre en considération les besoins du plus grand nombre possible d'intéressés, le portail a été structuré par un groupe de partenaires égaux : l'Association suisse des géologues, le Service géologique national, la plate-forme Geosciences de l'Académie suisse des sciences naturelles, la Commission géotechnique suisse et la Commission suisse de géophysique. A ceux-ci s'ajoutent les offices cantonaux et fédéraux qui ont travaillé sur l'élaboration du contenu.

--> [www.geologieportal.ch](http://www.geologieportal.ch)

## Publications

### IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation

*Summary for Policy Makers published*



A new Special Report has been published by IPCC on 9 Mai 2011 which assesses existing literature on the future potential of renewable energy for the mitigation of climate change. It

covers the six most important renewable energy technologies, as well as their integration into present and future energy systems. It also takes into consideration the environmental and social consequences associated with these technologies, the cost and strategies to overcome technical as well as non-technical obstacles to their application and diffusion.

At its 11th Session of Working Group III on 5-8 May 2011 in Abu Dhabi, the IPCC has approved the Summary for Policymakers of the new Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN). The summary is a short version of a roughly 900 page comprehensive assessment compiled by over 120 leading experts from all over the world for IPCC's Working Group III. Over 160 scenarios on the potentials of six renewable energy technologies (bioenergy, solar energy, geothermal energy, hydropower, ocean energy, and wind energy) have been reviewed by a global team of technological experts and scientists. In their conclusions, the experts underline the significant future role of renewable energy in cutting greenhouse gas emissions and powering sustainable development.

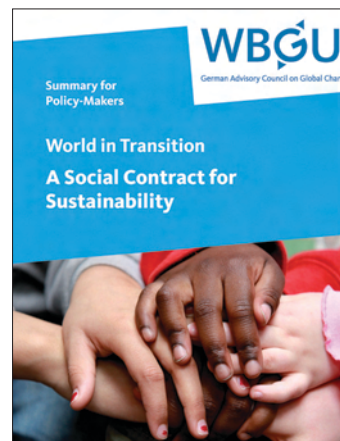
Close to 80 percent of the world's energy supply could be met by renewables by mid-century if backed by the right enabling public policies a new report shows. The findings also indicate that the rising penetration of renewable energies could lead to cumulative greenhouse gas savings equivalent to 220 to 560 Gigatonnes of carbon dioxide (GtCO<sub>2</sub>eq) between 2010 and 2050. The upper end of the scenarios assessed, representing a cut of around a third in greenhouse gas emissions from business-as-usual projections, could assist in keeping concentrations of greenhouse gases at 450 parts per million. This could contribute towards a goal of holding the increase in global temperature below 2 degrees Celsius – an aim recognized in the United Nations climate convention's Cancun Agreements.

Prof. Rolf Wüstenhagen from the Institute for Economy and the Environment at the University of St. Gallen has been one of the authors of the report.

You can find all corresponding IPCC links and contact details of Rolf Wüstenhagen for questions or an interview at: [www.proclim.ch/News?1954](http://www.proclim.ch/News?1954)

### World in Transition – A Social Contract for Sustainability

*WBGU Report 2011*



In this report, the WBGU (German Advisory Council on Global Change) explains the reasons for the desperate need for a post-fossil economic strategy, yet it also concludes that the transition to sustainability is achievable, and presents ten concrete packages of measures to accelerate the imperative restructuring. If the transformation really is to succeed, we have to enter into a social contract for innovation, in the form of a new kind of discourse between governments and citizens, both within and beyond the boundaries of the nation state.

You can download the Summary of the report at: [www.proclim.ch/News?1924](http://www.proclim.ch/News?1924)

### Road to Rio+20

*First report of series in run-up to 2012 global conference*

The United Nations Conference on Trade and Development has published the first in a series of volumes focusing on green economy. The aim of the publication is to contribute to the debate through a collection of essays that provide differ-

ent perspectives on how to increase the benefits and reduce the risks in the transition to a development-led green economy.

One of the main theme at the 2012 United Nations Conference on Sustainable Development in Rio is the green economy in the context of sustainable development and poverty eradication. «The Road to Rio+20» features 14 articles and is intended to highlight critical topics in advance of the conference. You can download the pdf of the report at: [www.proclim.ch/News?1772](http://www.proclim.ch/News?1772)

### **Decoupling Natural Resource Use and Environmental Impacts from Economic Growth**

By 2050, humanity could devour an estimated 140 billion tons of minerals, ores, fossil fuels and biomass per year – three times its current appetite – unless the economic growth rate is «decoupled» from the rate of natural resource consumption, warns a new report from the United Nations Environment Programme. While the report doesn't offer detailed policy and technology options – that's for later reports – it says technologies that have helped humanity extract ever-greater quantities of natural resources need to be re-directed to more efficient ways of using them. The report details progress in Germany, Japan, South Africa and China where government policy supports decoupling. Download of the report at: [www.proclim.ch/News?1978](http://www.proclim.ch/News?1978)

### **UNEP Green Economy Report 2011**

*Synthesis Report for Policy Makers*

Towards a Green Economy is among UNEP's key contributions to the Rio+20 process and the overall goal of addressing poverty and delivering a sustainable 21st century. The report makes a compelling economic and social case for investing two per cent of global GDP in greening ten central sectors of the economy in order to shift development and unleash public and private capital flows onto a low-carbon, resource-efficient path.

A transition to a green economy is already underway, a point underscored in the report and a growing wealth of companion studies by international organizations, countries, corporations and civil society. But the challenge is clearly to build on this momentum. Rio+20 offers a real opportunity to scale-up and embed these «green shoots».

In doing so, this report offers not only a roadmap to Rio but beyond 2012, where a far more intelligent management of the natural and human capital of this planet finally shapes the wealth creation and direction of this world.

You can download the full report and the Policy Maker Summary at: [www.proclim.ch/News?1775](http://www.proclim.ch/News?1775)

### **Klimastrategie für die Landwirtschaft**

#### **Stratégie Climat pour l'agriculture**

(Deutsch) Die Klimastrategie Landwirtschaft zeigt eine Gesamtsicht über die Beziehungen zwischen Klima und Landwirtschaft, benennt kommende Herausforderungen und Chancen und leitet ziel-führende Schritte ab. Sie umfasst beide Aspekte: Anpassung an den Klimawandel und Vermeidung von Emissionen.



Das Oberziel der Schweizer Klimastrategie für die Landwirtschaft ist ambitioniert: Die Produktion soll gesteigert und die Treibhausgasemissionen gleichzeitig gesenkt werden.

Die Strategie wurde mit breiter Mitwirkung von Verbänden, Forschung und Verwaltung erarbeitet. Der Fokus der Strategie liegt auf der landwirtschaftlichen Produktion. Im Sinne einer Gesamtsicht sind jedoch auch die vor- und nachgelagerten Sektoren sowie der Nahrungsmittelkonsum angesprochen. Das Oberziel der Klimastrategie Landwirtschaft ist mehrteilig: Die Produktion soll gesteigert und die Treibhausgasemissionen gleichzeitig gesenkt werden. Bis 2050 sollen die Emissionen der Landwirtschaft um mindestens ein Drittel reduziert werden.

Download der Strategie unter:

[www.proclim.ch/News?1966](http://www.proclim.ch/News?1966)

Quelle: Medienmitteilung Bundesamt für Landwirtschaft

(Français) La Stratégie Climat l'agriculture présente une vue d'ensemble des relations entre climat et agriculture, indique les défis et les chances à venir et en déduit les mesures permettant d'atteindre les objectifs en la matière. Elle comprend les deux aspects: adaptation au changement climatique et prévention des émissions.

La stratégie a été élaborée avec un large soutien des associations, de la recherche, de la vulgarisation, des associations et de l'administration. Elle met l'accent sur la production agricole. Cependant, les secteurs situés en amont et en aval ainsi que la consommation des denrées alimentaires sont prises en considération, comme il se doit dans une approche globale. L'objectif majeur de la Stratégie Climat pour l'agriculture a plusieurs dimensions: il faut simultanément augmenter la production et réduire les émissions. Ainsi, les émissions de l'agriculture doivent baisser d'au moins un tiers d'ici à 2050 lieu en automne pour mobiliser les forces de tous les partenaires de l'agriculture afin de mettre en œuvre la stratégie.

Télécharger le pdf: [www.proclim.ch/News?1967](http://www.proclim.ch/News?1967)

Source: Communiqué de presse de l'Office fédéral de l'agriculture

### Anpassung an die Klimaänderung im Berggebiet

Fallstudie Saastal

Der Klimawandel wird die Zukunft der Alpen entscheidend prägen – auch im Walliser Saastal. Doch wie soll sich eine Tourismusregion auf diese Veränderungen vorbereiten? Wo liegen die Chancen und Risiken?

Diese Ausgangsfragen wurden im Rahmen einer umfassenden Fallstudie in enger Zusammenarbeit mit den lokalen Behörden und einer breiten Projektträgerschaft untersucht. Im Fokus standen die Bereiche Wasser, Siedlungs- und Infrastrukturanlagen, Biodiversität und Tourismus. Fazit: Der Klimawandel wird bis ins Jahr 2050 die Gefahren und Risiken für Siedlungen, Infrastrukturanlagen und Schutzwald erhöhen. Insbesondere die Trockenheit im Sommer wird neue Gefahren mit sich bringen. Es eröffnen sich jedoch auch Chancen, besonders für den Tourismus.

Alle Dokumente zum Forschungsprojekt «Anpassung an den Klimawandel – Fallstudie Saastal» unter der Projektleitung von econcept AG finden Sie unter

[www.berggebiete.ch/forschung](http://www.berggebiete.ch/forschung)



Für den Wintertourismus im Saastal mit seinen zum Teil hochgelegenen Skigebieten kann die Klimaänderung auch als Chance gesehen werden. Bild: Fallstudie Saastal

## Meeting Reports

### 12th Swiss Global Change Day

Meeting Report

On 19<sup>th</sup> April 2011 the Swiss global change research community met for the 12<sup>th</sup> time on the Swiss Global Change Day in Bern. About 310 participants attended the event and about 90 posters were presented, giving an overview of global change research activities in Switzerland.

Following the introduction by Heinz Gutscher, chair of the ProClim- steering committee, six key note speakers presented highlights and challenges in the broad field of global environmental research:

**Ilan Chabay** from Chalmers University of Technology, Gothenburg, talked about the changes required in the learning processes in order to be able to stimulate behavioral changes in society. Chabay emphasized the importance of considering all kinds of models, because models were fundamental to our thinking. He therefore suggests using appropriate models at all levels of education, from elementary school through university and beyond.

**Lucas Bretschger** from the Center of Economic Research at ETH Zurich examined the cost of emission reductions. One of the central questions regarding this issue is how to decouple energy use and income. Based on his simulations, Bretschger suggests that adjustments to much lower energy

use do not cause significant income losses, provided that prices guide the process continuously.

**Dave Thompson** from Colorado State University examined the anthropogenic influence on atmospheric circulation. Thompson showed that ozone depletion and increasing CO<sub>2</sub>-concentration were the main factors of the current trends in atmospheric circulation in the Southern hemisphere. He also confirmed that regional climate change was strongly influenced by changes in atmospheric circulation and circulation changes were more important for regional climate than the average global processes. However, he conceded that the mechanisms of anthropogenic forcing on atmospheric circulation were still rather unclear.

**Rolf Weingartner** from the University of Berne dealt with the consequences of global change on water availability in Switzerland. How can we achieve to take the step from understanding to action? Weingartner looked at the effects of climate change on the water cycle on the global, the national and the regional scale. At all levels, he sees a gap between science and understanding. However, Weingartner suggests that the more local the level, the larger the gap between science and understanding.

**Anne Magurran** from the University of St Andrews examined the question of whether we look at the right measures to examine biodiversity. She suggested looking at the turnover instead of counting the number of species in a certain area. The turnover refers to the change of abundance through time and can be judged by considering the immigration and local extinction of species. Magurran concludes from her studies that species turnover appears to have increased in recent years.

**Jürg Beer** from the Department of Surface Waters Research and Management of EAWAG, Dübendorf, talked about fading solar activity similar to that of the 'Little Ice Age'. Beer gave an overview of the variation and the patterns in solar activity. From the comparison of current with past data he expects a minimum in solar activity over the next decades. The climate trend will still be dominated by the anthropogenic greenhouse effect but the reduced solar activity may lead to a slight damping of the warming until 2100. However, after this period global warming will speed up all the more.



Gilbert & Oleg were the big «surprise» at the Swiss Global Change Day in Bern.

In the poster session the best posters in each of the fields of WCRP, IGBP and IHDP were selected by a jury and honoured with a travel award of 1000 Swiss francs each. The following posters were awarded:

**WCRP** (awards were sponsored by the ACP, the Commission for Atmospheric Chemistry and Physics, SCNAT):

- Nathalie Schaller: The response of surface energy balance components and precipitation to climate forcings
- Elias Zubler: Impact of transient aerosol emissions on the European climate of the most recent decades

**IGBP** (awards were sponsored by the Swiss IGBP Committee, SCNAT):

- Ivy Frenger: Eddies and Chlorophyll in the Southern Ocean
- Livia Rasche: Dynamizing tree height growth improves the simulation of forest productivity under climate change

**IHDP** (awards were sponsored by the SAGW):

- Anne-Kathrin Faust: The economic impact of climate change and adaptation strategies in the Swiss water sector
- Kateryna Holzer: Compliance of Carbon-related border Adjustments with WTO Law

You can download all presentations of invited speakers as well as the awarded posters at:

[www.proclim.ch/News?1782](http://www.proclim.ch/News?1782)

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### IMILAST Workshop in Interlaken

IMILAST (Intercomparison of Mid-latitude Storm Diagnostics) is an international project coordinated by ProClim-. It aims at comparing the different identification and tracking algorithms for extratropical storms. At a 3-day workshop (completely sponsored by Swiss Re) from 30 March–1 April 2011 in Interlaken, Switzerland, 20 experts from all over the world discussed the results from the first method intercomparison calculations.



Participants of the IMILAST Workshop in Interlaken.  
Photo: John Hanley.

Storm-associated damages are amongst the highest losses due to natural disasters in the mid-latitudes. Therefore the knowledge of the future variability and change in extratropical cyclone frequency, intensity and track locations is crucial for the strategic planning and minimization of the disaster impacts. The quantification of such trends strongly depends on the methodologies for storm track detection. Thus, scientific studies may find seemingly contradictory results based on the same datasets. This makes the interpretation of storm track analyses and projection results very difficult for any user. In an intercomparison experiment numerous groups using a dozen different tracking methodologies have calculated storm tracks for a pre-defined 20-year period. As input data all calculations used the same ERA-interim reanalysis data set.

At the Interlaken workshop methodological issues with considerable influence on the results were detected and discussed, as e.g. the exclusion of cyclones over high terrain or the inclusion/

exclusion of «open» systems (i.e. cyclones without closed pressure contours). First results showed that major differences occur e.g. in cyclone counts and track density, the geographical distribution of tracks, life-time, and track length. However remarkable consistency was found in e.g. trend sign, geographical patterns of trends or the representation of extreme cyclones.

Main future steps are, among others, the intercomparison of a set of extreme individual storms and additional analysis to investigate the influence of specific differences between methods. Beside the consolidation of a scientific community of extratropical storm climate, the exchange of knowledge, argumentation, and experience at the workshop will lead – according to feedback of several workshop participants – to an improvement of their algorithms.

Further information: IMILAST Project Home Page  
[www.proclim.ch/IMILAST/index.html](http://www.proclim.ch/IMILAST/index.html) un

### Agriculture, Forestry and other Land Uses (AFOLU)

*IPCC AR5 WG III: Mitigation of Climate Change*

A small Workshop called «AFOLU topics and the Swiss Research since 2007» was held on 31 May 2011 in Bern.

Carmenza Robledo from Intercooperation Switzerland was selected as one of the lead authors for the IPCC AR5 WG III «Mitigation», chapter Agriculture, Forestry and other Land Uses (AFOLU). This chapter is part of the section Pathways for Mitigating Climate Change. She organized together with ProClim- a Workshop with interested experts in the field. The objective of the meeting was to get an overview of the research in AFOLU undertaken in Switzerland since the publication of the IPCC AR4 in 2007.

During the meeting the Swiss researchers had the opportunity to present their recent scientific work on AFOLU and the expected results before the end of 2012. Discussions and clarifications regarding ongoing research as well as a discussion on AFOLU issues were very helpful for all participants.

Please contact Carmenza Robledo [carmenza.robledo@intercooperation.ch](mailto:carmenza.robledo@intercooperation.ch) for further information. gm

## Kernspaltung und Kernfusion zur CO<sub>2</sub>-armen Stromerzeugung?

### 53. Parlamentariertreffen der Gruppe «Klimaänderung»

Die Katastrophe in Fukushima als Folge von Erdbeben und Tsunami setzte ein grosses Fragezeichen hinter die Kernenergie. Sie weist aus Sicht der CO<sub>2</sub>-Vermeidung gegenüber der Elektrizitätserzeugung aus fossilen Quellen unbestrittene Vorteile auf. Welche Risiken bestehen mit dem Betrieb der alten KKWs? Wo steht die Entwicklung der Fusion? Diese Fragen standen im Zentrum des 53. Parlamentariertreffens der Gruppe «Klimaänderung». Ziel des Treffens war es, den ParlamentarierInnen die Gelegenheit zu bieten, brennende Fragen direkt mit ausgewiesenen Experten diskutieren zu können.

Präsidiert wird die Gruppe neu von Ständerat Filippo Lombardi aus dem Tessin. 15 Parlamentarier sowie 10 Vertreter aus Verwaltung und Wissenschaft nahmen am Treffen teil.

### Kernfusion – Wo stehen wir heute? Schritte bis zur kommerziellen Nutzung

Prof. Minh Quang Tran, Direktor des Centre de Recherches en Physique des Plasmas (CRPP) der EPF Lausanne, erläuterte den Stand der Fusionsforschung. Der sich im Bau befindliche Fusionsreaktor Iter in Cadarache (F) ist ein Meilenstein auf dem Weg zur Nutzung dieser Energiequelle. Zum ersten Mal soll damit ein Testreaktor mehr Energie erzeugen als dessen Betrieb benötigt. Frühestens gegen Mitte dieses Jahrhunderts steht fest, wann diese Technologie zur kommerziellen Energieerzeugung genutzt werden kann. Damit ist klar, dass die Fusion in der aktuellen Energiedebatte keine Rolle spielt. Die Vorteile liegen aber auf der Hand: Ohne nennenswerte nukleare Risiken liessen sich praktisch unbegrenzte Energiemengen erzeugen. Dies rechtfertigt weitere Investitionen in Forschungs- und Testanlagen.

### Kernspaltung – ohne Katastrophen dank neuer Reaktortechnik?

Prof. Horst-Michael Prasser vom Labor für Kernenergiesysteme, Institut für Energietechnik



Die parlamentarische Gruppe «Klimaänderung» wird in den nächsten Treffen weitere Stromproduktionsarten thematisieren.

Die ParlamentarierInnen sollen die Gelegenheit haben, direkt mit ausgewiesenen Experten brennende Fragen zu diskutieren.



(IET) der ETH Zürich, erklärte anschaulich das Versagen der Sicherheitssysteme beim Reaktorunfall von Fukushima. Obwohl keine Anlagen mit 100% Sicherheit betrieben werden können, lässt sich von Seiten der Nuklearforschung belegen, dass die gegenwärtig in der Schweiz in Betrieb stehenden Anlagen bedeutend höhere Sicherheitsstandards erfüllen als die Unfallreaktoren. Die aktuell in Europa im Bau befindlichen Anlagen der Reaktorgeneration III, sowie die in Planungsphase stehenden effizienteren und abfallärmeren Anlagen der Generation IV weisen noch einmal deutlich erhöhte Sicherheitskonzepte auf.

Mit dem Bundesratsentscheid zum Ausstieg aus der Kernenergie erhielt das Treffen aber ungewollt eine politische Dimension: Wie könnte die Zukunft der Stromversorgung in der Schweiz ohne Kernkraftwerke aussehen? Eine solche Diskussion sprengt jedoch den Rahmen der Parlamentariertreffen am Mittag. Eine viel breitere Einbindung aller relevanten Expertisen aus der Wissenschaft wäre nötig – von der Technik über die Ökonomie bis hin zu Umwelt- und Sozialwissenschaften. Zudem müssten die zentralen Akteure miteinbezogen werden, denn schlussendlich muss die Gesellschaft entscheiden, welche Arten von Risiken und welche Technologien sie akzeptieren will. Die parlamentarische Gruppe «Klimaänderung» wird in den nächsten Treffen weitere Stromproduktionsarten thematisieren und damit den direkten Dialog zwischen Parlament und Forschung fördern.

## Human Dimensions Research in Switzerland

### From learning to action: What is needed to enable societal change?

*Workshop in Grindelwald to shape a new international research program «Knowledge, Learning and Societal Change» (KLSC)*

Between April 13–15 2011, a total of 35 experts from around the world and different disciplines and backgrounds met in Grindelwald to discuss and develop a new science programme and associated projects. The Knowledge Learning and Societal Change (KLSC) program aims to better understand how knowledge and learning contributes to action for more sustainable societies. The workshop was supported by ProClim- and the Swiss Academy of Humanities and Social Sciences with the main organizers Ilan Chabay, Heinz Gutscher, Ellen Pfeiffer, Christoph Ritz and Gabriele Müller. It is envisaged the program will be part of the International Human Dimensions of Global Environmental Change Program (IHDP).



Participants of the KLSC Workshop in Grindelwald in April 2011.

The world is facing unprecedented challenges in sustaining society and managing the global ecosystems on which it depends more sustainably. There is a growing body of «hard» knowledge about sustainability challenges and some experience of technical and economic responses. But a wide gap exists in understanding how individuals, communities, organizations, institutions, and governments are making sense of and responding to these issues. Understanding the dynamics of knowledge, learning and societal change is essential to enable systemic adaptation towards a sustainable future. This is the overall task the KLSC program will address.



Conversation mapping in different groups created a spectrum of ideas about the issues and approaches within KLSC.

Designed as a collaborative learning process, the workshop enabled a rich discussion to develop on the issues relating to KLSC and how the program could add to existing research and practice. Some key points to emerge from the workshop included:

- emphasising the importance of transformative knowledge
- challenging existing understanding and accepted practices
- bringing new ways of doing science, with policy and practitioners and communities
- developing new tools for enabling societal change in context
- engaging with other existing programs and projects
- tracking dynamics of change over time
- re-thinking role of science in learning processes for sustainability.

Participants were very supportive of the program and keen to contribute their expertise and experience from many different contexts as the program takes shape.

*Kevin Collins, Director Open Systems Research Group, Dept. of Communication and Systems, Open University, Milton Keynes, UK*

A detailed workshop report is in preparation and will be published on the KLSC website:

[www.klscproject.org](http://www.klscproject.org)

## NCCR Climate Update 30

Knowledge transfer and outreach activities are a permanent feature of the NCCR Climate. Over the years we have established a tradition of inviting media representatives to background workshops about on-going research.

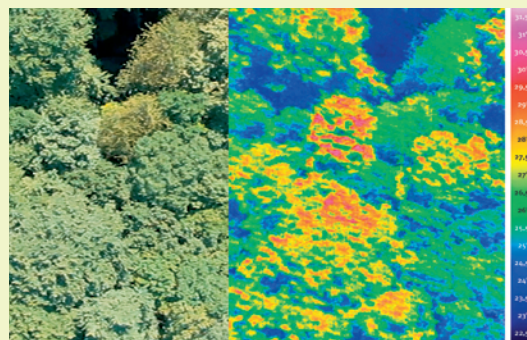
### Highlights of NCCR activities

#### **Swiss agriculture and climate change**

Natural scientists and economists work closely together in the NCCR Climate project *Climate Change and Agricultural Production Risks* to examine the implications of risks for agricultural production and farm profitability resulting from climate impacts on soil quality and water availability. The project team evaluates agronomic and economic options to cope with increasing risks. At a media workshop in Bern on 16 May 2011 the researchers shared methodological approaches and tentative results with 20 journalists and representatives of the public administration and farmers organizations. The participants of the workshop were updated on latest progress in research including topics such as the need for irrigation in a future climate and index based weather insurances as a novel tool to cope with climate risks.

#### **The future belongs to the oaks and ashes**

How well do indigenous deciduous trees cope with an increase of dry spells in a warmer climate? A large-scale experiment in the periphery of Basel headed by NCCR Climate researcher Christian Körner shed light on this question. This spectacular



A snapshot from a helicopter: different species of leaf trees in Swiss forests (at left an ordinary and at right an infrared image) heat up in unequal measure on summer days and show differing degrees of vulnerability to heat..

open-air experiment has been selected by the Swiss National Science Foundation as the subject of a monthly report entitled "Picture from Research" in March 2011. Among other measurements, including sensors, suspended beneath a tethered balloon, the team took infrared pictures of the plots and established the temperatures in individual tree crowns from a helicopter. The conclusion of the study is that sycamore maple and large-leaf linden are worst affected by water deficiency, while ash and durmast oak can cope best.

### Research Highlights (a selection)

#### **Irrigation as an adaptation strategy to climate change**

Robert Finger et al. (NCCR project *Climate Change and Agricultural Production Risks*) assess the impact of climate change on Swiss maize production using an approach that integrates a biophysical and an economic model. Simple adaptation options such as shifts in sowing dates and adjustments of production intensity are considered. In addition, irrigation is evaluated as an adaptation strategy. It shows that the impact of climate change on yield levels is small but yield variability increases in rainfed production. Even though the adoption of irrigation leads to higher and less variable maize yields in the future, economic

benefits of this adoption decision are expected to be rather small. Thus, no shift from the currently used rainfed system to irrigated production is expected in the future. Moreover, the authors find that changes in institutional and market conditions rather than changes in climatic conditions will influence the development of the Swiss maize production and the adoption of irrigation in the future. (*Climatic Change*, 2011)

#### **How to deal with uncertainties in climate policy assessment**

Marc Vielle et al. (NCCR project *Modelling Sectoral Climate Change Policies: Mitigation, Adaptation, and Acceptance*) explore the impact of several sources of uncertainties on the assessment of energy and climate policies when using stochastic program-

ming in an harmonized way in a large scale model. One of the conclusion that emerge from their work is that Carbon Capture and Storage (CCS) alone cannot provide the solution to the problem of Greenhouse Gas Emissions increase. Therefore the development of a basket of carbon free technologies must be promoted. From this perspective the development of substitution among energy forms has to be encouraged and the transition to a carbon free economy will modify our production process but our way of life as well. The simulations have shown, however, that other factors are liable to affect the success and the cost of climate policy. The price of oil and the behaviour of OPEC affects the possibility of reaching a climate target. The climate negotiations must therefore incorporate the specificities of these countries. The economic development of Asia is also a decisive factor in the cost and the success of a climate policy. Therefore China and India have to be integrated as soon as possible in a climate agreement.

(*Environmental Modelling and Assessment*, 2011)

#### **Aerosol and cloud microphysics in a regional climate model**

Elias Zubler, Doris Follini, Ulrike Lohmann, Daniel Lüthi, Christoph Schär, Martin Wild, et al. (NCCR projects *Intensification of the Water Cycle: Scenarios, Processes and Extremes* and *Global Climate Processes: Role of Cirrus Clouds for Present and Future Climate*) present a new aerosol modelling framework within the regional climate model COSMO-CLM. The model accounts for the microphysical interactions of internally and externally mixed aerosol particles. Sulfate, black carbon, particulate organic matter, sea salt, and mineral dust are considered. The model is applied over Europe at a horizontal resolution of 50 km. Present-day emissions are used for the evaluation period from 1997 to 2003. The model largely reproduces the annual mean pattern of the aerosol optical depth derived from satellite data over Europe. In comparison with the standard model version, which does not account for aerosol transport and indirect aerosol effects and uses an outdated aerosol climatology, with the new framework the mid-European summer cold bias disappears. It allows studies of mesoscale interactions between aerosols, clouds, precipitation, and radiation on climatological time scales due to the advanced physical representation of the underlying processes.

(*Journal of Geophysical Research*, 2011)

#### **Validation of a chrysophyte stomatocyst-based cold-season climate reconstruction**

Rixt De Jong and Christian Kamenik (NCCR project *Paleoclimate Variability and Extreme Events*) test the potential of chrysophyte stomatocysts (or simply 'cysts', siliceous resting stages of the golden-brown algae) as a proxy for cold-season temperature. Climate reconstructions based on biological proxies are commonly constructed using transfer functions derived from calibration in space. However, the performance of these reconstructions is rarely tested by direct comparison with meteorological data due to limitations of sample resolution or chronological control. The study compares a cyst-based near-annual reconstruction of 'date of spring mixing' from the varved sediments of Lake Silvaplana (Swiss Alps) spanning AD 1870–2004 with climate variables from the same period measured at the lake shore. The high correlation between cyst-based 'date of spring mixing' and cold-season temperature demonstrates the ability of chrysophyte cysts to archive cold-season temperature variability. Lake eutrophication, which was extensive during the last 50 years, had no obvious effect on the cyst-based reconstruction. This study underlines the high potential of chrysophyte cysts as a quantitative proxy for cold-season climate reconstructions.

(*Journal of Quaternary Science*, 2011)

#### **Sensitivity of atmospheric CO<sub>2</sub> to early human land use**

Benjamin Stocker, Fortunat Joos et al. (NCCR project *Climate Lessons from Radiocarbon Data*) use a dynamic global vegetation model as part of a simplified earth system model to simulate the impact of human land use on Holocene atmospheric CO<sub>2</sub> and the contemporary carbon cycle. The study shows that suggested upward revisions of Holocene land use reconstructions imply a smaller contemporary terrestrial carbon sink and that early agricultural activities did only marginally contribute to the late Holocene CO<sub>2</sub> rise of 20 ppm measured on ice cores. Scenarios are used to test the robustness of the results. Simulated CO<sub>2</sub> change remains small even in scenarios where average land use per person is unrealistically increased by a factor of 4 to 8 above published estimates. The results falsify the hypothesis that humans are responsible for the late Holocene CO<sub>2</sub> increase and that anthropogenic land use prevented a new ice age.

(*Biogeosciences*, 2011)

## Towards a paleoreanalysis?

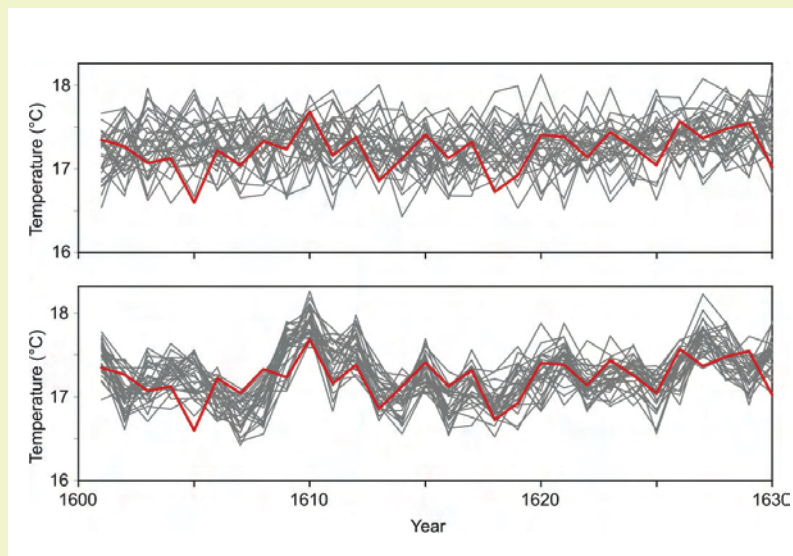
### Background information on NCCR publications

In paleoclimatology, numerical models have long been used side-by-side with empirical data. In recent years, new approaches have been emerging that combine the evidence from proxies and historical data with the power of statistics and the physical consistency of models to obtain better estimations of past climate. The broad expertise required for this task puts NCCR Climate in a good position – a model analog approach to climate reconstruction has already been developed within NCCR Climate. In the framework of PALVAREX III, in collaboration with DETREE and HyClim, we now go a step further and combine an ensemble of model simulations with historical data and proxies using Ensemble Kalman filtering.

Thirty climate model simulations are run continuously for the period 1600-2011. Their only difference lies in the initial conditions. Each simulation sees the same, time-varying forcings (including sea-surface temperatures), but each

controls how the correction is propagated in space and across model variables. The result is a new set of 30 estimations of past climate, which together give a measure of uncertainty.

The approach was tested in the climate model world by retaining one of the 30 simulations as «observations», extracting from it seasonal temperature at 45 selected locations and adding a large amount of noise to these series to mimic the quality of climate proxies. Using only this information, each of the 29 other simulations was corrected. How well do they reproduce the 30th simulation? The example of summer temperature averages over Europe (a case where proxy information is available) shows that the correction (bottom) brings the simulations relatively close to the target. For regions without proxies or for other variables results are worse, but skilful reconstructions are also found for important large-scale circulation features, even for the polar vortex in the northern stratosphere.



European summer temperature average for the years 1601-1631 for the uncorrected (top) and the corrected model simulations (bottom). The red line represents the 30<sup>th</sup> simulation that was retained as «observations», the grey lines represent the 29 other simulations.

The way towards a paleoreanalysis is still long. The approach needs to stand the test in the real world. If that is the case, however, it will allow more comprehensive studies of past climate that address, e.g., changes in the jet streams or in the Hadley circulation since the Little Ice Age. Despite the promising new techniques, it should be kept in mind that accurate reconstructions depend upon high-quality underlying proxy data – another key focus within the multi-disciplinary NCCR framework.

member also has its individual variability, which allows estimating a hypothetical «variability structure for a particular time». Climate proxies and historical observations are then used to correct each simulation at each time step (monthly or seasonal). The estimated variability structure

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[www.nccr-climate.unibe.ch/projects/project\\_en.html?acronym=PALVAREX](http://www.nccr-climate.unibe.ch/projects/project_en.html?acronym=PALVAREX)

Contact: Kaspar Meuli [meuli@oeschger.unibe.ch](mailto:meuli@oeschger.unibe.ch)

## CCES News 4

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](http://www.eawag.ch/medien/veranstaltungen/events/rcrc2011/index_EN).



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

Mario Schirmer, Department Water Resources and Drinking Resources, Eawag, Duebendorf  
Contact: [mario.schirmer@eawag.ch](mailto:mario.schirmer@eawag.ch)  
The event was organized as part of the RECORD project:  
[www.cces.ethz.ch/projects/nature/Record](http://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](http://www.cces.ethz.ch/energiegesprach)

Contact: Silvia Häfliger, CCES, [energiegesprach@ethz.ch](mailto:energiegesprach@ethz.ch),  
phone: 044 632 62 89

## 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.

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This workshop was organized by the ADAPT project:

[www.cces.ethz.ch/projects/nature/adapt](http://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](http://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.

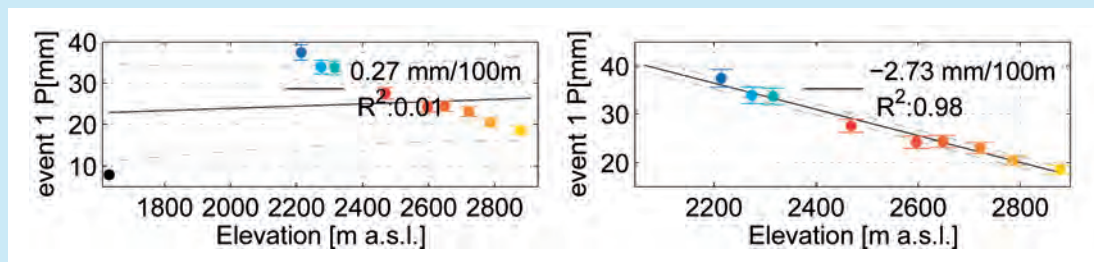


Figure 1: Precipitation gradient measured on the ground. A negative precipitation gradient with elevation was observed only in the upper part of the hill slope.

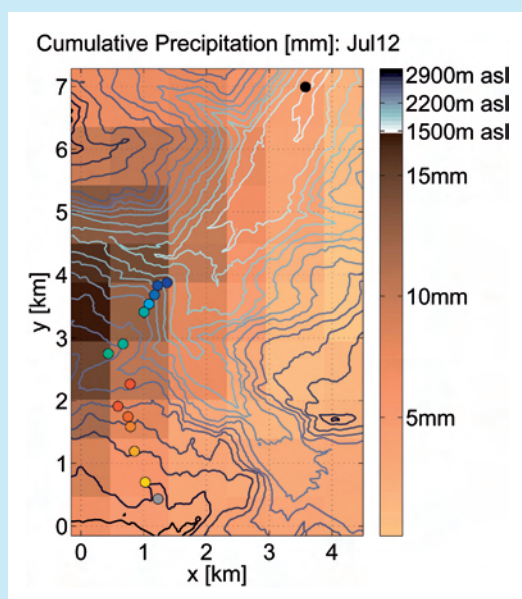


Figure 2: Cumulative event precipitation measured by radar (brown color scale) and 100 m contour lines of the terrain (gray color scale).

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](http://www.cces.ethz.ch/projects/hazri/apunch)

## Conferences in Switzerland

30 June 2011, 12.00–19.00

### **Technology and Economics of Photovoltaics in Switzerland**

Location: Berner Fachhochschule Technik und Informatik, Burgdorf BE

Info: [www.swisslaser.net/workshops.html?423](http://www.swisslaser.net/workshops.html?423)

10–15 July 2011

### **Environmental Risk and Extreme Events**

International Workshop

Location: Centro Stefano Franscini, Monte Verità, Ascona

Info: [stat.epfl.ch/ascona2011](http://stat.epfl.ch/ascona2011)

21–27 July 2011

### **XVIII INQUA Congress 2011**

The Quaternary Ice Age, the Alps and Human Dimensions

Location: BEA Bern Expo

Info: [www.inqua2011.ch](http://www.inqua2011.ch)

17–19 August 2011

### **Eighth Conference of the International Society for Alpine History ISAH**

Highlands, Lowlands: History of the Disparities

Location: Centro Stefano Franscini, Monte Verità, Ascona

Info: [www.arc.usi.ch/en/index/aisa/ris\\_ist\\_labi\\_aisa\\_convegna.htm](http://www.arc.usi.ch/en/index/aisa/ris_ist_labi_aisa_convegna.htm)

30 August–2 September 2011

### **Change and Uncertainty: Challenges for Agriculture, Food and Natural Resources**

EAAE Congress at ETH Zurich

Location: ETH Zurich

Info: [www.eaae2011.ch](http://www.eaae2011.ch)

Registration: 30 June 2011

30 August 2011–2 September 2011

### **Frontiers in Historical Ecology**

Location: Birmensdorf

Info: [www.wsl.ch](http://www.wsl.ch)

2 September 2011, 15.00 und 18.00

### **Die Energiezukunft nachhaltig gestalten – Chancen und Herausforderungen für die Schweiz**

Veranstaltung mit Bundesrätin Doris Leuthard zur Energiezukunft

Location: Hauptgebäude der ETH Zürich

Info: [www.energiegesprach.ethz.ch](http://www.energiegesprach.ethz.ch)

4–9 September 2011

### **Monte Verità Conference on 'Ecological Novelty'**

Understanding and managing ecological novelty – towards an integrative framework of the socio-ecological impacts of novel organisms

Location: Centro Stefano Franscini, Monte Verità, Ascona

Info: [www.en2011.ethz.ch/index.html](http://www.en2011.ethz.ch/index.html)

4–9 September 2011

### **World Engineers Convention 2011**

Engineers Power the World – Facing the Global Energy Challenge

Location: International Conference Center Geneva

Info: [www.wec2011.ch/welcome](http://www.wec2011.ch/welcome)

Registration: 16 July 2011

7–8 September 2011

### **Go4Cleantech**

International B2B Event with Export Opportunities and B2B Meetings

Location: Zürich

Info: [www.go4cleantech.ch](http://www.go4cleantech.ch)

Registration: 20 July 2011

8 September 2011, 10.00–16.30

### **Einfluss der Klimaänderung auf die Wasserkraftnutzung**

Projekt-Abschlusstagung

Location: Visp (VS)

Info: [chy.scnatweb.ch/downloads/FlyerDE.pdf](http://chy.scnatweb.ch/downloads/FlyerDE.pdf)

Registration: 20 August 2011

14–16 September 2011

### **CISBAT 11 International Scientific Conference**

CleanTech for Sustainable Buildings

From Nano to Urban Scale

Location: Auditorium SG1 EPFL, Lausanne

Info: [cisbat.epfl.ch](http://cisbat.epfl.ch)

19–23 September 2011

### **Eurodendro 2011**

Conference of the European Working Group for Dendrochronology

Location: Engelberg

Info: [www.wsl.ch](http://www.wsl.ch)

15 September 2011

**5. Nationales Klima-Forum**

**Global Benchmarks**



**Cleantech, Energy and Mobility**

Kongresshotel Seepark, Thun  
Info: [www.climateforum.ch](http://www.climateforum.ch)

19–21 September 2011

**World Resources Forum (WRF)**

Shaping the Future of Natural Resources –  
Towards a Green Economy  
Location: Davos Congress Centre  
Info: [www.worldresourcesforum.org](http://www.worldresourcesforum.org)  
Registration: 30 June 2011

19 September 2011

**12th International Sustainability Leadership Symposium 2011**

Emerging Economies: The New Global  
Powerhouse. Sustainable Strategies to  
Capitalize Growth Opportunities and Promote  
Development.  
Location: SwissRe Centre for Global Dialogue,  
Rüschlikon (Zürich)  
Info: [www.sustainability-zurich.org/en/  
p67000430.html](http://www.sustainability-zurich.org/en/p67000430.html)

21–23 September 2011

**Smart Energy Strategies Conference 2011**

Location: Auditorium Maximum, main building  
ETH-Zurich, Rämistrasse 101, Zürich  
Info: [www.esc.ethz.ch/ses11](http://www.esc.ethz.ch/ses11)  
Registration: 15 July 2011

2–7 October 2011

**3rd International Symposium on  
Environmental Weeds and Invasive Plants**

Location: Centro Stefano Franscini, Monte Verità,  
Ascona  
Info: [www.wsl.ch](http://www.wsl.ch)

6–7 October 2011

**7th European Conference on Green Power  
Marketing 2011**

Location: Zürich  
Info: [www.greenpowermarketing.org](http://www.greenpowermarketing.org)  
Registration: 5 August 2011

10–14 October 2011

**AGU Chapman Conference on Advances in  
Lagrangian Modeling of the Atmosphere**

Location: Sunstar Hotel, Grindelwald  
Info: [www.agu.org/meetings/chapman/2011/gcall/  
index.php](http://www.agu.org/meetings/chapman/2011/gcall/index.php)

26 October 2011

**FORUM für Wissen 2011: Der multifunktionale  
Wald – Konflikte und Lösungen**

Location : WSL Birmensdorf, Englersaal  
Info: [www.wsl.ch](http://www.wsl.ch)

11–13 November 2011

**9th Swiss Gesocience Meeting 2011**

Location: Zurich  
Info: [www.geoscience-meeting.scnatweb.ch](http://www.geoscience-meeting.scnatweb.ch)  
Registration: 7 October 2011

18 November 2011

**Dimensionality**

Annual Congress 2011 of the Swiss Academy of  
Sciences  
Location: Bern  
Info: [www.scnat.ch](http://www.scnat.ch)

19–23 February 2012

**GRF One Health Summit 2012**

One Health – One Planet – One Future, Risks and  
Opportunities  
Location: Congress Centre in Davos  
Info: [www.grforum.org](http://www.grforum.org)

4 April 2012

**13th Swiss Global Change Day**

Preannouncement  
Location: Freies Gymnasium, Beaulieustr. 55,  
Bern  
Info: [www.proclim.ch/4dcgi/proclim/en/  
eventlist?proclim-events](http://www.proclim.ch/4dcgi/proclim/en/eventlist?proclim-events)

## Continuing Education

### **Formation continue en développement durable CAS**

Certificat d'études avancées et modules de formation continue

Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud

Info: [www.management-durable.ch](http://www.management-durable.ch)

### **DAS – Diploma of Advanced Studies Management durable**

Gestion de l'environnement et entreprise

Location: HEG Genève

Info: [sustainablemanagement.ch](http://sustainablemanagement.ch)

### **Nachhaltige Entwicklung**

Besuch von Einzelmodulen oder als ganzer

Studiengang (Certificate of Advanced Studies CAS)

Info: [www.ikaoe.unibe.ch/weiterbildung](http://www.ikaoe.unibe.ch/weiterbildung)

### **Weiterbildung Wasser und Gewässer**

Praxiskurse PEAK Programm 2011

Info: [www.eawag.ch/lehre/peak/index](http://www.eawag.ch/lehre/peak/index)

### **CAS Integrated Water Resource Management**

Location: Biel

Info: [www.ahb.bfh.ch/ahb/en/Weiterbildung/cas/CAS\\_IWRM\\_Detail.htm](http://www.ahb.bfh.ch/ahb/en/Weiterbildung/cas/CAS_IWRM_Detail.htm)

### **sanu – Bildung für Nachhaltige Entwicklung formation pour développement durable**

Location: Biel, Bienne

Info: [www.sanu.ch](http://www.sanu.ch)

12–18 September 2011

### **International Dendroecological Fieldweek**

Location: Engelberg

Info: [www.wsl.ch](http://www.wsl.ch)

Deadline: 30 June 2011

## Exhibitions

15–17 November 2012

### **Geoprotecta**

3. Schweizer Fachmesse für integrale

Risikomanagement von Naturgefahren und

Klimafolgen

Location: St. Gallen

Info: [www.geoprotecta.ch](http://www.geoprotecta.ch)

## IGBP, IHDP, WCRP, DIVERSITAS related Conferences

25–27 August 2011

### **6th ECPR General Conference:**

**The new geopolitics of climate change after the Copenhagen summit**

Location: Reykjavik, Island

Info: [www.ecprnet.eu/conferences/general\\_conference/Reykjavik/panel\\_details.asp?panelid=591](http://www.ecprnet.eu/conferences/general_conference/Reykjavik/panel_details.asp?panelid=591)

29–30 August 2011

### **International Workshop on the Fragmentation of Global Environmental Governance: Causes, Cosequences and Responses**

Location: Bonn, Germany

Info: [earthsystemgovernance.org/events/2011-01-31-fragmentation-global-environmental-governance](http://earthsystemgovernance.org/events/2011-01-31-fragmentation-global-environmental-governance)

29 August–10 September 2011

### **5th International SOLAS Summer School**

Location: Cargèse, Corsica

Info: [www.solas-int.org/summerschool/welcome.html](http://www.solas-int.org/summerschool/welcome.html)

8–15 September 2011

### **Young Loicz Forum**

Enhancing Capacities for Global Change

Mitigation in Asia-Pacific Coastal Zones

Location: Yantai, China

Info: [www.loicz-osc2011.org/page.asp?id=85](http://www.loicz-osc2011.org/page.asp?id=85)

12–15 September 2011

**2011 LOICZ Open Science Conference**

Costal Systems, Global Change and Sustainability

Location: Yantai, China

Info: [www.loicz-osc2011.org/page.asp?id=67](http://www.loicz-osc2011.org/page.asp?id=67)

Registration: 1 July 2011

18–23 September 2011

**3rd iLEAPS Science Conference**

Location: Garmisch-Partenkirchen, Germany

Info: [www.ileaps.org/science\\_conf\\_2011](http://www.ileaps.org/science_conf_2011)

Registration: 30 June 2011

17–21 October 2011

**Asian Development Pathways in the context of transitions toward a «Green Economy»**

IHDP Training Workshop

Location: Nanjing, China

Deadline for applications: 31 July 2011

Info: [www.ihdp.unu.edu/article/read/call-asian-development-pathways-towards-a-green-economy](http://www.ihdp.unu.edu/article/read/call-asian-development-pathways-towards-a-green-economy)

24–28 October 2011

**WCRP Open Science Conference:**

**Climate Research in Service to Society**

Location: Denver, Colorado, USA

Info: [www.wcrp-climate.org/conference2011](http://www.wcrp-climate.org/conference2011)

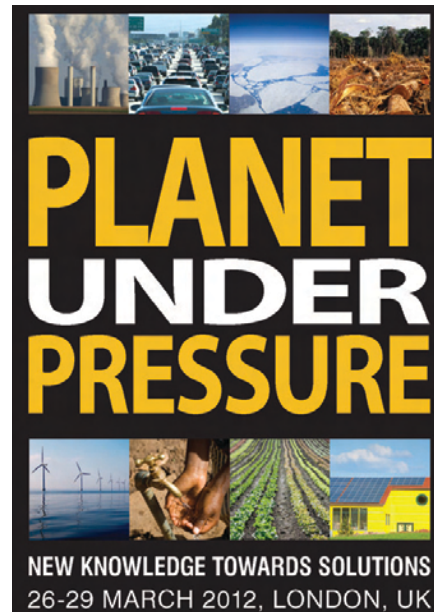
Registration: 30 June 2011

26–29 March 2012

**Planet under Pressure Conference:**

**New Knowledge towards Solutions**

Major global change conference 2012



***More than 350 session proposals received***

Following a highly successful Call for Sessions, the Scientific Organising Committee are currently reviewing more than 350 proposals for parallel sessions within the conference programme. The call for abstracts will open once the review is complete.

***Three broad themes will guide the conference:***

- Meeting global needs: food, energy, water and other ecosystem services
- Transforming our way of living: development pathways under global environmental change
- Governing across scales: innovative stewardship of the Earth system

Location: London

Info: [www.planetunderpressure2012.net](http://www.planetunderpressure2012.net)

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