

CCES News 5

After having primarily focused on the initiation and support of large scale collaborative research projects in its initial phase, CCES is increasing its efforts in education and teaching projects such as the CCES Winter School 'Science Meets Practice' (see below) as well as in dialogue and networking activities – e.g. the public event 'Designing a sustainable energy future' (see below). Common denominators of all these activities are the complementarity and subsidiarity to activities that are implemented and carried out by CCES partners individually, and making use of synergies through collaboration with external partners to ensure highest quality.

Scientific Events

Designing a sustainable energy future – chances and risks for Switzerland

More than 900 persons attended the public event 'Designing a sustainable energy future – chances and risks for Switzerland' co-organized by CCES at ETH Zurich on September 2, 2011. In the first part of the event, scientists from ETH Zurich discussed the current status of energy research and presented future energy policy scenarios, in particular in the light of the withdrawal from nuclear energy in Switzerland until 2050. In the second part, opened by a keynote speech by Federal Councilor Doris Leuthard, representatives from politics, industry, and civil society discussed together with the audience possible challenges and options for actions. A main conclusion from the presentations and discussions was that phasing out nuclear energy is not only feasible from a technological perspective as well as from an energy policy and economic point of view but also provides new market options. However, to become reality, the political



Keynote presentation by Federal Councilor Doris Leuthard at ETH Zurich. Photo: T. Kawara

will and concerted actions of societal decision makers as well as a stable political framework are needed that consequently support the transformation of the energy system continuously in this direction.

Further information including the podcasts of the speeches and transparencies of the presentations are available at www.energiegesprach.ethz.ch
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International workshop 'Environmental Risk and Extreme Events'

A workshop on the use of statistical methods of extreme value theory in modeling extreme environmental events took place at the Centro Stefano Franscini, Ascona, from July 10 to 15, 2011. Its main goal was to bring together statistical scientists with expertise in extremes and environmental scientists having an interest in rare events in order to foster interaction between the two groups, to encourage cross-fertilization of ideas, and to identify pressing problems for future research. A total of 55 scientists participated. One important result of the meeting was the numerous links made between the different scientific areas, which should ultimately trigger high-level collaborative research between participants and



The Centro Stefano Franscini Award given for the best talks at the Workshop to Christine Steinkohl (Technical Univ. of Munich), Anne Sabourin (Univ. Claude Bernard Lyon 1) and Jennifer Wadsworth (Univ. of Lancaster).
Photo: Centro Stefano Franscini

other colleagues in the home institutions. More information as well as presentations and posters can be found at <http://stat.epfl.ch/ascona2011>.

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The event was organized as part of the EXTREMES project:
www.cces.ethz.ch/projects/hazri/EXTREMES

Outreach

CCES Winter School 2012 'Science Meets Practice'

How can scientists lead a true dialogue with people and institutions outside the scientific community? This is the topic of the CCES Winter School 'Science Meets Practice', which supports exchange efforts and enhances capability to create interactions beyond scientific boundaries. By joining the Winter School, participants are acquiring knowledge and skills for the dialogue between science and practice and are improving their capabilities to understand and analyze the foundations of their research as well as the societal implications of its results.

The Winter School addresses primarily PhD students from environmental and natural sciences, engineering, and social sciences working in the fields of sustainability and sustainable development. The Winter School runs at the seminar location Boldern at Männedorf during two block weeks (January 9 to 12, and February 6 to 9, 2012). Application deadline: October 31, 2011. Flyer, application form and further information are available at www.cces.ethz.ch/winterschool.

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Research

Measuring interest groups influence on the CO₂ tax on combustible fuels and the Climate Cent

Interest groups are traditionally involved in the Swiss decision-making process. It is thus of interest to assess how and to what extent interest groups manage to influence policy outcomes, especially in the climate policy field. Looking at the legislative process that led to the introduction of the Climate Cent in 2005 and the CO₂ tax on combustible fuels in 2007, we analyzed several dimensions such as interest groups' level of establishment, their participation, reputation of power, and resources.

A questionnaire was sent to the forty main interest groups of the Swiss climate policy. A good response rate was obtained (40%), which allowed us to verify that interest groups participate in the whole decision-making process, even in informal stages. Resources, however, condition the level of participation. The very least will thus be to participate in the consultation procedure. But organizations which dispose of more resources have the possibility to intervene at more stages and consequently seem to have better access to the Government and its administration. This is valuable, as we were able to verify that participation leads to higher preference attainment, i.e. greater correspondence between desired and actual legislation.

Two groups are unanimously recognized as influential by all other influence groups: *économiesuisse* and the WWF. Greenpeace, the Petrol Union, the Energy Agency for the Economy, the Climate Cent Foundation, and the Touring Club were also acknowledged as influential in Swiss climate policy making. However, the reputation of power could not be proven to be a good predictor of preference attainment.

We observed that economy-oriented influence groups are better connected in a network of alliances than non-economic ones, and that there is rather little cooperation (exchange of information) between both networks, except for one organization, WWF, which is at the junction between both networks.

In addition to the questionnaire, we analyzed several documents such as MPs interest links and a list of accredited lobbyists in Parliament. We thus verified that the left-right divide is also to be found in climate policy, since only MPs from the left and center invited lobbyists representing environmental interests.

Finally, an interview with an expert of the Swiss law making process confirmed the importance of the pre-parliamentary phase in the opinion-building of MPs, thus emphasizing the results we obtained about resources, participation, and preference attainment.

This work was performed by Claudine Morier as her master's thesis at IDHEAP, under the supervision of Prof. Alexandre Mack (UNIL), Prof. Philippe Thalmann and Alexandra Quandt (EPFL). It contributed to the latter two's research in the context of CCES/CLIMPOL:

www.cces.ethz.ch/projects/clench/CLIMPOL.

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Temperature affects the interaction between the plant pathogen *Cryphonectria parasitica* and its hyperparasitic virus

The appearance of fungal diseases is the result of an interaction between the fungal pathogen, its host and potential hyperparasites. However, the outcome of host-parasite interactions may not only depend on the genotypes of the species involved but also on environmental factors. We used the fungus *Cryphonectria parasitica*, the causal agent of chestnut blight (Fig. 1), and its hyperparasitic virus, *Cryphonectria hypovirus 1* (CHV1), to test for a genotype-by-genotype-by-environment interaction.

In *C. parasitica*, infection with CHV1 induces a hypovirulent phenotype with reduced virulence towards the chestnut tree (*Castanea* spp.) and thus controls chestnut blight in many European regions. In contrast, uninfected virulent *C. parasitica* have nearly eradicated the American chestnut in North America. We applied a full factorial design and assessed the fungal growth and sporulation of four *C. parasitica* strains, uninfected and infected with each of the four known CHV1 subtypes, at 12°C, 18°C, 24°C and 30°C. We found a significant ($p < 0.0001$) genotype-by-genotype-by-environment interaction (Fig. 2) which demonstrates the potential for a selection mosaic. As a consequence, different host and parasite genotypes would be selected under different climatic conditions, thus affecting the coevolutionary dynamics in the host-parasite interaction, the course of chestnut blight epidemics, and the design of biological control strategies. Therefore, different management strategies have to be designed for different geographical regions, and the most suitable biological control agent must be evaluated for



Figure 1 (left) European chestnut forest. Some trees were killed by virulent *Cryphonectria parasitica*, but most trees were healthy. They were infected with virus-infected (hypovirulent) *C. parasitica* strains. (right) Chestnut blight bark canker, the symptom of infection with virulent *C. parasitica*. Photos: S.F. Bryner

each case individually. Furthermore, the significant genotype-by-genotype-by-environment interaction indicates that the outcome of any given fungus-virus interaction could change when temperatures increase. Extreme summer heat events, as expected under the scenario of climate change, might be able to turn a formerly hypovirulent fungus more virulent and lead to a re-activation of the disease.

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The full article on this project was published as S.F. Bryner and D. Rigling. 2011. Temperature-Dependent Genotype-by-Genotype Interaction between a Pathogenic Fungus and Its Hyperparasitic Virus. *American Naturalist* 177:65-74

This study is part of the GEDIHAP project:

www.cces.ethz.ch/projects/feh/gedihap

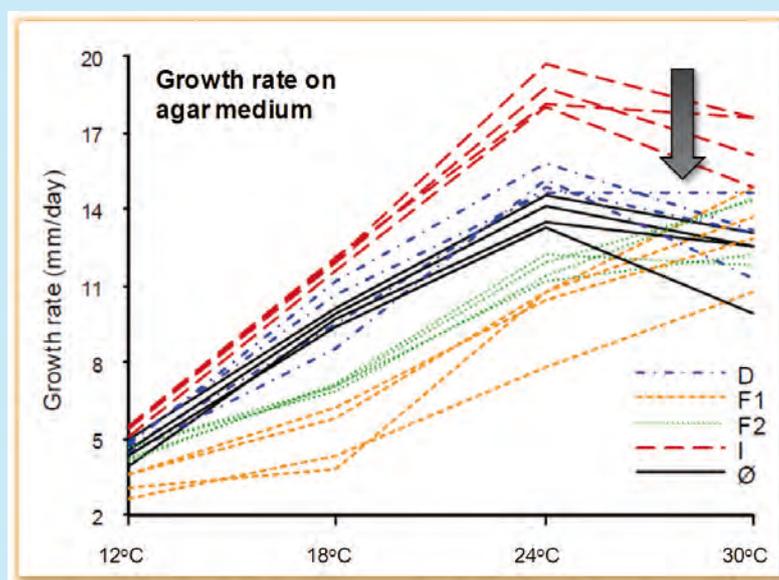


Figure 2 Interaction norms for the growth rate (colony diameter) on agar medium at four different temperatures. Lines represent the mean performance ($n = 6$) of each combination between four *Cryphonectria parasitica* strains and the four *Cryphonectria hypovirus-1* subtypes. Different line styles refer to different subtypes (D, F1, F2, and I) and uninfected control strains (Ø). The arrow points at the crossing of interaction norms.