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Fact sheet 4

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Climate Change and natural Hazards

What will the climate be like in Switzerland 50 years from now?

Swiss[1] and European research projects give a picture of the climate in Switzerland 50 years from now, based on global and regional climate models. According to a medium emission scenario, by 2050 temperatures will continue to rise throughout Switzerland, more quickly than they have so far: by about 2 degrees in the winter and about 3 degrees in the summer as compared with values towards the end of the twentieth century.

For this range of warming, the snowfall boundary will shift upwards by an average of 300 metres: so rain will also be frequent at medium altitude in the winter. There will be considerable further melting of glaciers: in 50 years it is likely that only a quarter of the present-day glacial area will remain. The shorter duration of snow cover and the rise in the boundary of snowfall are likely to be critical for numerous skiing areas, whereas there will be a tendency for agriculture to benefit from the higher temperatures. The need for heating in the winter will decrease, and refrigeration will become more important in the summer.

Rainfall will increase by about 10 percent in the winter, but will decrease by about 18 percent in the summer. Thus, annual precipitation will decrease slightly overall, with fluctuations from year to year remaining high.

Effects on natural hazards

Under the climate scenario described above, the following effects of climate change probably have to be considered in Switzerland.

Flooding
Most rivers will carry more water in the winter. Therefore, the danger of high water will increase, especially in the spring, and mainly for the Jura and Central Plateau. There will be particular problems for our neighbours downstream along the Rhine. Since in the Alps and

[1] See the OcCC project "Switzerland in 2050" (http://www.occc.ch/projects_d.html, in German only)

Pre-Alps the high water season for lakes and rivers is in the summer, there should be little change in the high water situation in those regions.

Rock-falls, landslides and mudslides
Melting glaciers leave large new masses of loose rubble. In addition, the ground is warming up, the permafrost is thawing out, and this can slide down as landslides, and minor or major rock falls. The new loose rubble collects in ditches and in the beds of streams, and can be swept away when the water level is high, bringing mudslides down to the valley, reaching inhabited areas. Erosion, and the transport and settlement of debris very often cause considerable damage during flooding. The potential for such events will increase considerably, in particular in mountainous areas.
When there is intense precipitation, wet ground on steep hillsides can move down as landslides. Since in the future, in winter more rain will fall more strongly and further up the slopes, steeper hillsides could be affected, causing more landslides from steep hillsides. This mainly involves the Pre-Alps. The overall risk of damage is increasing for installations such as transport and tourist facilities in the mountains.

Heat, drought and forest fires
In future we must expect considerably hotter, often dry summers. Heatwaves as in 2003 and 2006 will become more frequent. Heat and drought have consequesnces for health, agricultural production, the growth of forests and for ecosystems (fish) in rivers and lakes. Although most forest fires are caused by people, drought always means there is an increased likelihood of forest fires. The increased melting of glaciers in the high mountain region and dry periods on the Central Plateau will also have an effect on the production of hydro-electric power.

Prevention of natural hazards

In order to be able to take targeted protection measures, it is essential to record the possible hazard areas using hazard maps. Thus, the FOEN recently had a map made of permafrost areas. The cantons are currently producing hazard maps for flooding, landslides, mudslides and avalanches. The PLANAT platform of natural hazards is working out a strategy for natural hazard prevention. And research provides the basic scientific information through specialized programmes such as the National Centre of Competence in Research (NCCR) Climate.

Further information

- General information about the consequences of climate change for Switzerland: http://www.umwelt-schweiz.ch/imperia/md/content/oekonomie/climatereporting/nc4/nc4_impacts_2005_e.pdf (excerpt from Switzerland's Fourth National Communication under the UNFCCC)
- Reports on climate change and on extreme events: http://www.occc.ch/reports_e.html
- Natural hazards and risk management: http://www.planat.ch/index.php?userhash=19782682&l=e&nav=1,1,1,1