

# Future key climate indices in Switzerland

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Future development of some key climate indices over Switzerland have been evaluated for the end of the century (2070-2099) with respect to the reference period 1980-2009, based on previously published data on projected temperature and precipitation change (under the emission scenarios A1B, A2, and RCP3PD). For the end of the century model results indicate:

- a doubling of the number of summer days (under the scenarios A1B and A2); summer days are days with maximum temperatures  $\geq 25^{\circ}\text{C}$ .
- an appearance of tropical nights even above 1500 m asl; tropical nights are nights with minimum temperatures  $\geq 20^{\circ}\text{C}$ .
- a possible reduction of the number of frost days by more than 3 months at altitudes higher than 2500 m asl; frost days are days with minimum temperatures  $< 0^{\circ}\text{C}$ .
- a decline of the number of ice days by about 90 days above 3000 m asl; ice days are days with maximum temperatures  $< 0^{\circ}\text{C}$ .
- a prolongation by roughly 50 days of the thermal growing season length in the lowest parts of Switzerland (under the scenarios A1B and A2); the thermal growing season length is the average number of days in a year between the first occurrence of a 6-day period with daily mean

temperatures  $> 5^{\circ}\text{C}$  and the first occurrence after July 1 of a 6-day period with daily mean temperatures  $< 5^{\circ}\text{C}$ .

- a decline of heating degree days by about 30% until the end of the century; heating degree days are the annual average sum of differences between outside daily mean air temperature and the base temperature inside the building ( $20^{\circ}\text{C}$ ).
- a likely increase of cooling degree days by about a factor 3 compared to present levels in the Swiss lowlands (under the scenarios A1B and A2); cooling degree days are the annual average sum of differences between outside daily mean air temperature and the base temperature of  $18.3^{\circ}\text{C}$ , above which cooling is assumed to be needed in buildings.
- the near disappearance of days with fresh snow at low altitudes; defined as days with a minimum of 1 cm snowfall.

Source: Zubler et al., 2014. Climatic Change 123: 255–271

Photo: Francisco Antunes ([www.flickr.com](http://www.flickr.com))