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Federal Department of Home Affairs FDHA
Federal Office of Meteorology and Climatology MeteoSwiss
Climate Evolution

Overview of CH2018 data

Federal Office of Meteorology and Climatology MeteoSwiss

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1 Background

Within the framework of the Swiss Climate Change Scenarios CH2018, various datasets and products were generated and disseminated. These data form the basis for adaptation to climate change in Switzerland. They support scientifically sound decisions within the field of climate adaptation and climate mitigation. This overview here is intended to help users select the data that is suitable for them. This document will be continuously updated.

2 Overview of available data products

The available data products include daily time series (section 2.1) as well as aggregated and derived indicators (section 2.2) for different emission scenarios (section 3.1), time periods (section 3.2) and uncertainty estimates (section 3.3).

2.1 Daily time series

The daily CH2018 time series for a total of 68 climate model chains are the base data that were used to calculate the climate indicators. On request, they can be obtained free of charge from MeteoSwiss. These data are available as continuous daily time series of several climate variables for the period 1981-2099 at a large number of Swiss stations (DAILY-LOCAL) and on a high-resolution 2 x 2 km grid (DAILY-GRIDDED). Further information on the available data sets and the data access can be found on the CH2018 data page or in the CH2018 data documentation.

The validity of all of the data is subject to the limitations inherent in the methodology. These limitations are explained in detail in the Technical Report on the CH2018 Climate Change Scenarios. No guarantee can be made of the validity of the data.

2.2 Derived climate indicators

The daily time series were evaluated according to different characteristics (e.g. different time periods and emission scenarios) and/or were used to derive further climate indicators. A graphical overview of the aggregated and derived indicators as well as their original data sets are shown in Figure 1. Averaged data are available for temperature and precipitation, extreme temperatures and extreme precipitation events, as well as dryness indicators. These figures describe seasonal or annual changes for the regions of Switzerland.

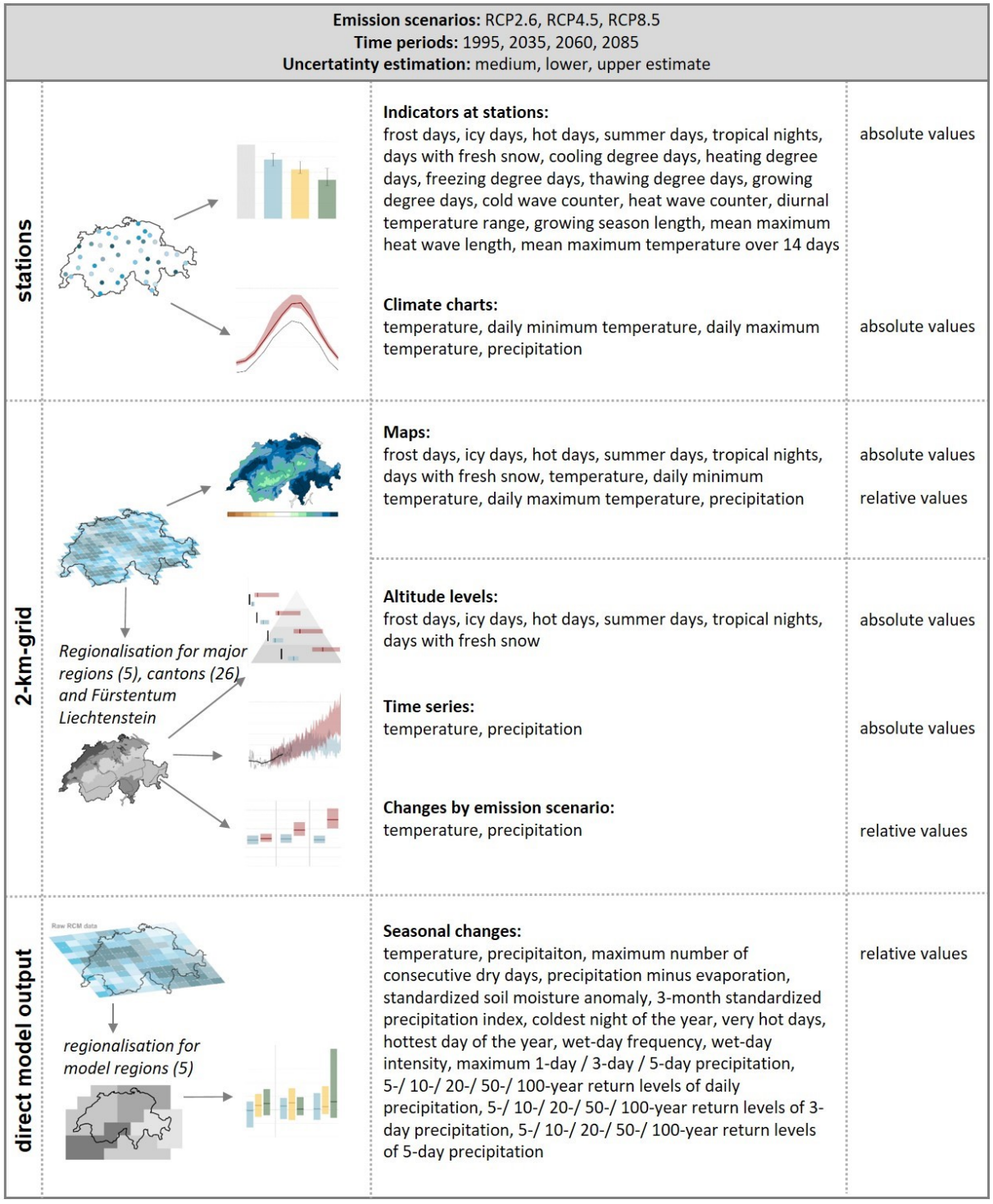

Figure 1: Overview of graphically processed climate indicators of CH2018.

Additional climate indicators such as hot days, tropical nights etc. indicate location-specific characteristics of the climate. These data are available for a range of meteorological stations throughout the country, and can also be obtained in the form of maps at a grid resolution of 2 x 2 km.

The data relate to the near future, the middle, and end of the 21st century, and are based on 30-year averages for each time period. There are three estimates (middle, lower, upper estimate) for each period and each scenario.

The CH2018 web atlas provides access to graphs for climate parameter averages for all emission scenarios (see section 3.1), regions/locations and seasons, and offers the associated data for free download.

3 Interpretation of the data and products

More information on the Swiss Climate Change Scenarios CH2018 are available at www.climate-scenarios.ch.

3.1 Emission scenarios

Emission scenarios for greenhouse gases and aerosols serve as the basis for working out the possible climate conditions of the future. In CH2018, the latest generation of emission scenarios, the so-called Representative Concentration Pathways (RCP), were used. They define potential trajectories of greenhouse gas and aerosol concentrations. Each trajectory is defined through its radiative forcing by 2100. Emission scenarios therefore represent potential courses of action. They allow the climate-related consequences of courses of action to be quantified, without making any statements about which pathway is the most likely.

No mitigation (RCP8.5): No climate mitigation measures are implemented. Greenhouse gas emissions continually increase. The radiative forcing in the year 2100 stands at 8.5 W/m2 in comparison to the year 1850.

Limited mitigation (RCP4.5): Although greenhouse gas emissions are somewhat curbed, the content in the atmosphere continues to increase for another 50 years. The 2°C target is not achieved. The radiative forcing in the year 2100 stands at 4.5 W/m2 in comparison to the year 1850.

Concerted mitigation efforts (RCP2.6): Climate mitigation measures are taken. With reductions in emissions being implemented straight away, the increase in greenhouse gases in the atmosphere is halted within around 20 years. This allows the targets of the Paris Climate Agreement of 2016 to be reached. The radiative forcing in the year 2100 stands at 2.6 W/m2 in comparison to the year 1850.

3.2 Time periods

The Climate Scenarios CH2018 each describe an average level of climatic conditions over a period of three decades, grouped around the years 2035, 2060 and 2085.

Near future (2035): When the text refers to the “near future” or 2035, this refers to the period from 2020 to 2049.

Mid-century (2060): When the text refers to the “middle of this century” or “2060”, this refers to the period from 2045 to 2074.

End of the century (2085): When the text refers to the “end of the century” or 2085, this refers to the period from 2070 to 2099.

The reference period is the period from 1981 to 2010. These thirty years serve as the starting point for the simulations and as the reference period for all data on future changes in comparison to today’s climate. Notably, the climate has already changed since then, and the increase in temperature is happening more quickly than before 1980.

More details on the Swiss Climate Change Scenarios CH2018 and the emission scenarios are availbale at www.climate-scenarios.ch.

3.3 Uncertainty estimation

The projections of the climate models are always distributed within a certain range. Half the values sit above the so-called “median”, and half below. The median is thus the most plausible value and is described as the “expected” outcome in the Climate Scenarios (dark line in the graphs).

The second highest result of the climate models is shown by the upper limit (95th percentile) of the displayed range, and the second lowest by the lower limit (5th percentile). Consequently, the result is not merely informed by the most extreme values. All values in between the upper and lower limits of the range are described in terms of the Climate Scenarios CH2018 as “possible” (coloured bars in the graphs). The probability of actual values lying within the “possible” range is estimated to be two thirds.

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