In: E. Fischer, Ch. Schär et al. (2018), 6. Climate extremes and climate indices. In: CH2018 (2018), CH2018 – Climate Scenarios for Switzerland, Technical Report, National Centre for Climate Services, Zurich. P. 140.

Type of extreme	Process-based expectation	Observed changes over last decades	Projected changes	LOSU*	Key uncertainties in projections
Hot days and warm nights in summer	More frequent and warmer hot days and warm nights as a result of mean summer warming, strongest increase at low elevations and areas of low variability	More hot days, summer days, warm nights and tropical nights (Section 3.4.2)	More summer days and tropical nights, strong increase in very warm days and nights (Section 4.3.3 and 4.3.4)	Very high	Amplification due to urban heat island effects, soil moisture-temperature feedbacks, circulation changes, and lack of consideration of changes in land use and irrigation
Heat extremes, summer heat waves	Increasing intensity of heat extremes and more frequent and longer lasting heatwaves along with summer warming and enhanced variability/amplification through land-atmosphere interactions	Increasing intensity of heat extremes and increasing frequency and duration of heat waves (Section 3.4.2)	Increasing frequency, intensity and duration (Section 4.3.3 and 4.3.4)	High	Circulation changes (persistence of anticyclones, large-scale circulation changes), strength of land-surface atmosphere interactions, precipitation and cloud processes
Heat stress (combination of temperature and humidity)	More frequent and intense heat stress due to higher temperatures and specific humidity which increases despite a weak reduction in relative humidity	?	More intense and more frequent days with high heat stress (Section 4.3.5)	High	Same as for heat extremes, other factors affecting heat stress such as changes in wind, radiation and urban heat island effect
Cold days and nights in winter	Fewer and warmer cold days and nights as a result of mean winter warming, strongest reduction at high elevations and areas of snow melt or shortening snow seasons	Fewer and warmer cold days and nights in winter, fewer frost days and ice days, rising zero degree line (Section 3.4.2)	Fewer and warmer cold days and nights and fewer frost and ice days (Section 4.3.3 and 4.3.4)	Very high	Circulation changes
Winter cold waves / cold extremes	General decrease along with winter warming potentially amplified by snow albedo feedback and pronounced warming in source region of cold air advection	Weakly decreasing frequency and duration (Section 3.4.2)	Decreasing frequency, intensity and duration but cold waves will continue to sporadically occur over coming decades (Section 4.3.4)	High	Circulation changes (changes in winter blocking frequency and persistence) and potential effect of Arctic amplification and sea ice melt on midlatudinal weather
Heavy rainfall	More intense as a result of higher water carrying capacity of warmer air	Majority of stations with trends to more frequent and intense heavy rainfall events in all seasons (Section 3.4.3)	More intense and frequent heavy rainfall events in all seasons, in particularly in the cold season, the more intense the events the higher the increase (Section 4.3.6)	Medium-high	Large-scale circulation changes, vertical stability and wind, small-scale convective processes
Dry spells / drougts	Increased probability of summer droughts and dry spells due to enhanced evapotranspiration, earlier snow melt and vegetation onset leading to soil drying and potentially more dry days	No robust and significant trends in summer mean precipitation and drought indicators (Section 3.4.3)	More frequent soil moisture droughts (soil moisture droughts), tendency to more and longer dry spells (meteorological drought) (Section 4.3.7)	Medium	Circulation changes (persistence of anticyclones, large-scale circulation changes), precipitation, processes, strength of land-surface atmosphere interactions (soil moisture and vegetation feedbacks, convection, boundary layer processes)
Winter storms and extreme wind speeds	Intensification of cyclones due to latent heat release, changes in latitudinal temperature gradient affecting storm tracks	No robust trend but high decadal variability (Section 3.4.5)	No evidence for changes (Section 4.3.8), changes cannot be ruled out	Low	Circulation changes (frequency, intensity and track of cyclones)
Hail	Not clear (Box 4.3)	No observational evidence for changes	No model evidence for changes (spatial scale too small)	Very low	Small-scale convective processes
Tornadoes	Sign not clear, competing effects of decreasing wind shear, and moistening / warming of boundary layer (Box 4.3)	Events of waterspouts and few tornadoes documented, no evidence for changes	No model evidence for changes (spatial scale too small)	Very low	Vertical wind shear, change in convective available potential energy, storm initiation
Intense snow fall events (lowlands)	Sign not clear, winter, warming and precipitation increase are competing factors at low altitudes (Box 4.3)	No observational evidence for changes	No model evidence for changes	Low	Circulation changes (frequency and persistence of cross-Alpine flows)

* Level of scientific understanding: This is an index on a 5-step scale (very high, high, medium, low, and very low) designed to characterize the degree of scientific understanding. The index represents a subjective expert judgment about the reliability of the estimate, involving such factors as the significance of observed changes; uncertainties in how model capture the relevant mechanisms, agreement among different models, and theoretical process understanding.

Table 6.2 Synthesis table for different types of extremes. The projections and levels of uncertainty (LOSU) are valid for moderate- to high-emission scenarios and a mid- to end-of-century time period.