The 2018 #DROUGHT in Switzerland

Manuela Brunner Angela Thür

WSL-Initiative Trockenheit Drought

Simulations

2015

univariate

P deficit



How extreme was the 2018 drought event in Switzerland compared to the 2003 and 2015 events?

The 2018 drought event was more severe than the 2003 and 2015 events

Observations

univariate

Data Sets Results Observations Simulations Precipitation P Precipitation P Discharge Q Discharge Q Soil Moisture SM P deficit Low Flow Storage LFS duration 307 study catchments in Switzerland 137 study catchments in Switzerland (BAFU and cantons) (used for generating the PREVAH duration model simulations) Working Steps Q deficit Drought severity assessment framework **Event identification** (2) Frequency analysis (3) Event comparison threshold-level approach Deficit **Duration Precipitation** Vol Deficit Deficit Duration Discharge Vol Deficit Duration Soil moisture Vol Deficit Deficit Duration Low-flow storage 1 Event identification using a threshold-level approach 2 Drought frequency analysis: univariate and multivariate 3 Comparison of the three drought events 2003, 2015, and 2018 The 2018 drought event was more severe than the 2003 and 2015 events, in terms of discharge and soil moisture deficit, which are

relevant for agriculture

flow storage

The 2018 drought event was most severe in

precipitation, discharge, soil moisture and low

north-eastern Switzerland in terms of

Univariate return periods for the drought events 2003, 2015, and SM deficit 2018 for the variables Q deficit duration, Q deficit, P deficit duration duration, and P deficit. The darker the color, the higher was the estimated return period (legend see below). bivariate 2015 Q deficit SM deficit duration & deficit LFS deficit Bivariate AND return periods estimated for the drought events duration 2003, 2015, and 2018 for the variable pair Q deficit duration and deficit. The darker the color, the higher was the return period. **Return period [years] [40,50] [50,60]** LFS deficit **[20,30] [30,40]** The 2003 drought event was most severe in northern Switzerland in terms of discharge deficit duration and deficit Univariate return periods estimated for the drought events 2003, 2015, and 2018 for the variables P deficit duration, P deficit, Q deficit duration, Q deficit, SM deficit duration, SM deficit, LFS deficit The 2015 drought event was less severe than duration, and LFS deficit. White catchments indicate catchments the 2003 and 2018 events where no joint event for all variables was identified. bivariate The 2018 drought event was more severe than the 2003 and 2015 events in terms of discharge Q & SM and soil moisture deficit, which are relevant for

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2015