Hydrological Yearbook of Switzerland 2017

Discharge, water level and water quality of Swiss water bodies

Summary of the publication «Hydrologisches Jahrbuch der Schweiz 2017»
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Summary

Weather conditions
The annual mean temperature was 0.8 degrees above normal, making 2017 the sixth warmest year since records began in 1864. North of the Alps, annual precipitation reached 70 to 90 % of normal. The Alps generally recorded 90 to 115 %, but in the southern valleys of Valais only 60 to 80 %. On the south side of the Alps, 80 to 95 % of normal annual precipitation fell in many places.

Snow and glaciers
Over the winter as a whole, snow depths were well below average throughout Switzerland. The south of the country was more significantly affected than the north. After a short winter with very little snowfall – in terms of snowfall it was one of the shortest and lowest on record – Swiss glaciers were heavily affected by the heatwaves in June and August. Between October 2016 and September 2017 they lost some 3 % of their ice volume.

Discharge conditions
The annual mean discharges in all the major river basins were below normal levels in 2017. The discharge regime was characterised by prolonged low water phases early in the year and in summer and autumn which led in some cases to very low levels in rivers and lakes. Many stations on the north side of the Alps recorded new January lows. There were no very high discharge events in 2017.

Lake levels
In terms of large Swiss lakes, it was once again the annual mean levels in Lakes Maggiore and Constance (upper lake) which differed most markedly from the long-term average. The variances were –29 cm at the Lake Maggiore – Locarno station but +15 cm at the Lake Constance – Romanshorn station in 2017. The other main lakes recorded averages close to or only a few centimetres below the levels for the reference period 1981–2010. Flood alert thresholds were not exceeded on any of the large lakes.

Water temperatures
After a very cold start to 2017 with very low water temperatures, the spring and summer were marked by very high air temperatures. The impact on water temperatures in Swiss rivers was a sharp increase in the number of times annual maxima were exceeded compared with the previous year.

Stable isotopes
The winter of 2016/17 was relatively mild, which was reflected in precipitation with above-average δ values for that time of year. High δ values were also recorded in summer 2017, in parallel with high air temperatures. The seasonal changes in δ^2H and $\delta^{18}O$ values were also evident in the watercourses.

Suspended sediment loads
Due to the dry summer and low water levels, suspended sediment loads were below those of the reference period at nearly all the monitoring stations in the summer in 2017, especially in July. Following intensive rainfall in Central and Eastern Switzerland in September, higher loads could clearly to be seen. The below-average annual discharge volumes in Ticino also had an impact on annual suspended sediment loads. Only about a third of the normal load was transported towards Lake Maggiore.

Groundwater
Most groundwater levels and spring discharges were within the normal range over the year, though were low in summer and autumn at half the monitoring stations. As with the surface watercourses, the situation only recovered towards the end of the year, so that groundwater levels and spring discharges had returned to normal throughout the country by December.

Further information

Further information on the topics of the Hydrological Yearbook and the FOEN hydrometric monitoring networks, and current and historical data can be found online at: www.bafu.admin.ch/hydrologicalyearbook

Current and historical data:
www.hydrodaten.admin.ch/en

FOEN Hydrological Bulletin:
www.hydrodaten.admin.ch/en/hydro_bulletin.html

FOEN Groundwater Bulletin:
www.hydrodaten.admin.ch/en/groundwater-bulletin.html

National River Monitoring and Survey Programme (NADUF) – monitoring network:
www.bafu.admin.ch/naduf

National Surface Water Quality Monitoring Programme (NAWA):
www.bafu.admin.ch/nawa

Results of the NAQUA National Groundwater Monitoring Programme:
www.bafu.admin.ch/naqua

Results of the National Surface Water Quality Monitoring Programme (NAWA) on maps:
https://s.geo.admin.ch/7a9e387d66

Water indicators and further information about water
www.bafu.admin.ch/water