

Hydrological Yearbook of Switzerland 2022

Discharge, water level and water quality of Swiss waterbodies

Summary of the publication “Hydrologisches Jahrbuch der Schweiz 2022”
www.bafu.admin.ch/uz-2312-d

Summary

Specific features of 2022

Following a year marked by major flood events, 2022 saw particularly low water levels. Sustained above-average air temperatures and long periods of dry weather led to warm waters and widespread low water levels and discharge conditions. At many stations, the 25 °C water temperature mark critical for aquatic organisms was exceeded, and around one third of the discharge measuring stations recorded low water discharges, which statistically only occurs every ten years or more. Meanwhile, in the more heavily glaciated catchment areas, the massive ice melt resulted in high summer discharges.

Weather conditions

2022 was clearly the warmest and, in some regions, the sunniest year since measurements began. The year was marked by consistently above-average temperatures, a significant lack of precipitation and high levels of sunshine. The hot summer brought three heatwaves and, in some regions, a marked drought.

Snow and glaciers

The winter of 2021/2022 produced record values. It was warm, especially in the south, with not much snow. It was therefore a short winter. 2022 was catastrophic for Swiss glaciers: with very little snowfall in winter and protracted periods of heatwave in summer, all records of ice melt were broken.

Flow conditions, lake levels and water temperatures

For several months in 2022, river and lake levels were significantly below the long-term average for the standard period 1991–2020 as a result of a lack of precipitation in almost all regions of Switzerland. Because of the low flow rates, water bodies heated up considerably during the summer heatwaves. The water temperatures of many rivers in the Central Plateau reached new highs.

Stable isotopes

The year was exceptionally warm and very dry. When there was rain, it fell with high intensity. The deuterium and oxygen-18 values measured in the precipitation were therefore exceptionally high on an annual average.

In watercourses, the seasonal trend of $\delta^2\text{H}$ and $\delta^{18}\text{O}$ values can be observed. However, it is strongly diminished due to regional mixing effects in the discharge.

Groundwater

In a long-term comparison, groundwater levels and spring discharges in 2022 were low at around one in three monitoring sites. In July and August, with persistently low precipitation, low groundwater levels and spring discharges were even recorded at around one in two monitoring sites. At the end of the year, around half of all monitoring sites also showed high groundwater temperatures.

Further information

Detailed information on the topics covered in 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/de/bulletin

FOEN Groundwater Bulletin:

www.hydrodaten.admin.ch/de/grundwasser/bulletin

Results of the National Groundwater Monitoring (NAQUA):

www.bafu.admin.ch/naqua

Results of the National River Monitoring and Survey Programme (NADUF) – Data download:

<https://opendata.eawag.ch/dataset/naduf-national-long-term-surveillance-of-swiss-rivers-2021-2>

National River Monitoring and Survey Programme (NADUF) – Monitoring network:

www.bafu.admin.ch/naduf

Results of the National Surface Water Quality Monitoring Programme (NAWA) in maps:

<https://s.geo.admin.ch/7902c509b7>

National Surface Water Quality Monitoring Programme (NAWA) – Monitoring network:

www.bafu.admin.ch/nawa

Monitoring networks for sediment transport in bodies of water:

www.bafu.admin.ch > *Topic Water* > *Data, maps and indicators* > *Monitoring networks* > *Sediment transport*

Water indicators and further information on water:

www.bafu.admin.ch/bafu/en/home/topics/water.html

Swiss Water Bodies in a Changing Climate – Hydro-CH2018 Hydrological Scenarios:

<https://www.nccs.admin.ch/nccs/en/home/climate-change-and-impacts/schweizer-hydroszenarien.html>

Hydrological Atlas of Switzerland (HADES):

<https://hydrologischeratlas.ch>

Water bodies in Switzerland. Status and measures.

FOEN publication, August 2022 (de/fr):

www.bafu.admin.ch/uz-2207-d

Heatwaves and drought in 2022

FOEN online dossier with further graphics and photos concerning summer 2022 (de/fr)

www.bafu.admin.ch/wasser > *Dossiers* > *Hydrologische Ereignisse*