Hydrological Yearbook of Switzerland 2024

Discharge, water level and water quality of Swiss waterbodies

Summary of the publication “Hydrologisches Jahrbuch der Schweiz 2024”
www.bafu.admin.ch/uz-2514-d

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Summary

Special features of 2024
Several storms with heavy rainfall led to flooding in many places in the summer of 2024. The water level of Lake Constance was above the high-water mark from the beginning of June until the second half of July. Heavy rainfall and thunderstorms caused rivers and streams to rise to extreme levels several times in June, particularly in Valais and Ticino. Floods and debris flows caused extensive damage to settlements and infrastructure, and several people lost their lives.

Weather conditions
Switzerland can look back on another extremely warm year. It began with the mildest winter since records began. Spring brought a lot of precipitation in many areas, especially on the southern side of the Alps. Summer saw the second-warmest August since records began and some extreme weather events. In late autumn, record snowfall was recorded at low altitudes on both sides of the Alps.

Snow and glaciers
The very warm 2023/24 winter saw a lot of precipitation. However, above-average temperatures meant that there was below-average snowfall below 1400 metres. The high temperatures in July and August, combined with dust from the Sahara, caused a 2.5 per cent loss in glacier volume.

Discharge, lake levels and water temperatures
Annual average discharge and water levels were above average in many rivers and lakes in Switzerland. Heavy rainfall led to local and regional flooding on several occasions and also caused lake levels to remain high for longer periods, particularly in the cantons of Valais, Ticino and Graubünden, but also in eastern Switzerland and the Bernese Oberland. Water temperatures in some rivers were above average in winter and late summer, while the values over the course of the year were mostly within the normal range.

Stable isotopes
2024 was a very warm year, especially the month of August. This meant that deuterium and oxygen-18 values measured in precipitation were above the long-term annual average. The values in the Rhine, Aare and Rhone were in line with the long-term annual average.

Groundwater
In a long-term comparison, groundwater levels and spring discharges were low at around half of the monitoring sites in 2024. High groundwater temperatures were also observed at around half of the monitoring sites.

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.

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

FOEN Groundwater Bulletin:
https://www.hydrodaten.admin.ch/en/grundwasser/bulletin

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

Results of the National Monitoring Programme for Substance Load in Swiss Watercourses (NAWA FRACHT, formerly NADUF) – Data download:
https://opendata.eawag.ch/dataset/naduf-national-long-term-surveillance-of-swiss-rivers-2024-2

National Monitoring Programme for Substance Load in Swiss Watercourses (NAWA FRACHT) (formerly NADUF) – Monitoring network:
www.bafu.admin.ch/nawa-fracht

Results of the National Surface Water Quality Monitoring Programme (NAWA TREND) in maps:
https://s.geo.admin.ch/9qdnjhkw2fbv

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/sediment

Watercourse temperature monitoring network:
www.bafu.admin.ch > Topic Water > Rivers and streams > Watercourse temperatures

Lake temperature monitoring network:
www.bafu.admin.ch > Topic Water > Lakes > Lake water temperature

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

Swiss Water Bodies in a Changing Climate – Hydro-CH2018 Hydrological Scenarios:
www.nccs.admin.ch > Climate change and impacts > Hydro-CH2018 hydrological scenarios

Hydrological Atlas of Switzerland HADES
https://hydrologicalatlas.ch

Gewässer in der Schweiz. Zustand und Massnahmen. FOEN publication, August 2022 (de/fr):
www.bafu.admin.ch/uz-2207-d

FOEN web dossiers on hydrological events in 2024
www.bafu.admin.ch > Topic Water > Extreme events

Analysis of extreme weather events in summer 2024
The information in this yearbook focuses on the hydrological situation in rivers and lakes. The extreme weather events in the summer of 2024 caused extensive damage and several deaths in many regions of Switzerland. The specialist agencies of the federal government and the affected cantons are conducting a joint analysis to investigate the causes and effects of these events. The analysis focuses on reviewing the existing hazard situations (especially for the steep watercourses concerned and their erosion and sediment transport processes and debris flows); on the behaviour and effect of protective measures and reservoirs; and on the quality of forecasts and the efficiency of warnings. It is due to be published in 2027.