

DWSHydrology

DWS verified hydrology record – in-browser app • Hydrogeological Repository

What it does

DWSHydrology gathers the Department of Water and Sanitation's verified hydrological record – published on its website one station and one query at a time – into a single database behind a map. **2 407 stations and 33.6 million daily values** of flow, rainfall and pan evaporation, from **1900 to 2026**, and **57 907 annual flood peaks** at 1 453 gauges. Find a station by number, name, quaternary catchment, or by distance from a town or a coordinate, then compare up to ten at once – from the hydrograph and the runoff statistics to the flow duration curve and the flood record.

It is built the same way as RainfallArchive, with the same map, search and selection, so the two read as one. The DWS rainfall gathered here also feeds RainfallArchive, where it is the DWS source for every DWS rain gauge.

What the record holds

Kind of station	Stations	What its daily record is
River gauge	984	Daily mean flow past a weir or rated section, in m ³ /s, derived by DWS from the recorded level through the gauge's rating table.
Dam or lake	212	The daily mean spill over the wall. Not the storage, the level or the releases, which are separate stations.
Canal, pipe or release	662	Water released from a dam through an outlet, canal or pipeline, or carried by a canal elsewhere.
Weather station	490	Daily rainfall (493 series) and S-pan (49) or A-pan (30) evaporation, in mm.
Spring (eye)	51	Daily flow from a spring – most of them the dolomitic eyes of the North West, Gauteng and the Northern Cape.

How the record is read

The quantity comes from the DWS variable code, never the label. 10.xx is rainfall, 710.xx and 711.xx are A-pan and S-pan evaporation, 100.xx and 194.xx are flow. 57 flow series sit behind a DWS button labelled “Daily Rain”; their own data header calls them a flow in cubic metres a second, and they are treated as flow.

A missing day is absent, not zero. DWS publishes a day it has no value for with a code – 151, 170 or 255 “Data missing”, 161 “Rating missing” – and no number. Those days are left out, and every statistic says how many there were.

Flow is a rate per day and a volume per month or year. A daily value is the day's mean flow in m³/s; a month's or a year's runoff is those days summed as a volume in hm³ (millions of m³). A month or a year has a value only if every one of its days does, so a part-year cannot pass for a dry one.

The hydrological year runs October to September and is labelled by its start. DWS's flood-peak files label it by its end: the year from October 1924 is “1925” there and 1924 – written 1924/25 – here, matching RainfallArchive and WR2012.

What you get

Output	Detail
Map	Every station over the quaternary catchments, on a street, aerial or hybrid base map, its symbol saying what kind of station it is, optionally shaded by record length or by when it last reported. Click to select; Ctrl+click to add; click the map itself to filter to that catchment.
Search	By station number or name, by quaternary catchment, or within 10 to 200 km of one of 1 943 towns or of a coordinate; narrowed by kind of station and by what it records, or to stations still reporting.
Statistics	Per series: the record, missing, estimated, above-rating and unaudited days, complete years, mean annual runoff or rainfall, median, CV, extremes; for flow, mean daily flow, Q10 to Q95 and the share of days with no flow.
Charts	Daily, monthly or annual records, on a log scale or as cumulative departure; record coverage; long-term monthly means; flow duration curves; annual flood peaks over time and against return period.
Report	A standalone report of the selection, in its own tab with Print / Save as PDF and Download HTML.
Exports	Long-form CSV of the daily values and flood peaks with their quality codes, unrounded; the monthly and annual totals, statistics and monthly means as computed; the search results; and the whole station and series catalogue. PNG of the map, PNG and SVG of every chart.

How a run works

Step	What happens
1. Find stations	Search, filter, and select up to ten on the map or the list.
2. Statistics	Choose the quantity – flow, rainfall or pan evaporation – and whether estimated and above-rating days count.
3. Records over time	Daily, monthly or annual.
4. Seasonality	The long-term mean of each month, October first.
5. Flow duration	Every daily flow against the share of days it is exceeded.
6. Flood peaks	Annual maximum flows, and their empirical return periods.
7. Report	Everything above in one printable page.
8. Export	CSV of any part of the selection, or of the whole catalogue.

Limitations worth knowing

- A flow above the rating is a floor. 234 526 days of flow are coded above the rating table or extrapolated past it: the water was higher than the rating reaches, and the flow given is the most it can say. A tick box leaves these and the estimated days out.

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- Rainfall from a monthly reading is not daily rainfall. 1.6 million rainfall days carry code 27: a storage gauge read once a month, its total spread evenly over the days. The month is sound; a daily maximum from those years is not.
 - Much of the recent record is unaudited – 3.9 million values – and can change when DWS audits it. A rebuild picks the change up.
 - Flood-peak return periods are Gringorten plotting positions with no distribution fitted. They describe the years on record and say nothing about a flood larger than the largest. A peak coded > or A passed the rating and is a floor; a year coded M has data missing, so its real peak may have fallen in the gap.
 - A dam's daily record here is its spill, not its storage. Reservoir levels, groundwater levels, water quality and the twelve-minute primary data are not in this database.
 - Some DWS peak files repeat the flow in the level column. Where the two agree to the third decimal at 1 m³/s or more, the level is left blank; this is the only change made to the published record.

Why this one is not entirely in your browser

The database is 601 MB, so the station catalogue and the catchment boundaries are downloaded once, and each station's daily values are fetched from the server as you select it. The statistics and the charts are computed in your browser. Nothing about your selection is stored.

Credit

The record is the work of the Department of Water and Sanitation's hydrological services, published at dws.gov.za/Hydrology/Verified. This app gathers and presents it and claims no authorship of it.

Beta. DWSHydrology is published for evaluation and feedback. Check any figure you rely on against the DWS record before using it in an assessment.
