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. **2 490 stations, 36.0 million daily and 1.20 million monthly values** of flow, rainfall and pan evaporation, from **1900 to 2026**, every one with its DWS quality code, and the annual and monthly flood peaks of 1 499 gauges.

You start by choosing what to look at: a site type, the record it holds and the interval. Only the stations that hold that record are put on the map. Find them by number, name, quaternary catchment, or distance from a town or a coordinate, and compare up to ten at once – first how complete and how trustworthy each record is, then what it says. The map, search and selection are RainfallArchive's, and the DWS rainfall gathered here is also RainfallArchive's DWS source.

Site types and records

Site type	Stations	Record – daily or monthly
River gauge	1 009	Flow past a weir or rated section, derived by DWS from the recorded level through the gauge's rating table: the daily mean in m³/s, the monthly volume in hm³.
Dam or lake	251	The spill over the wall. Not the storage, the level or the releases, which are separate stations.
Canal, pipe or release	675	Water released from a dam through an outlet, canal or pipeline, or carried by a canal elsewhere.
Spring (eye)	56	Flow from a spring – most of them the dolomitic eyes of the North West, Gauteng and the Northern Cape.
Weather station	490	Rainfall (493 series), and at some A-pan (30) or S-pan (49) evaporation, in mm.
Flood peaks	1 455	A site type of its own: the highest instantaneous flow of each year (57 907 peaks) or of each month (665 411), from the DWS flood-peak files.

Data quality comes first

DWS gives every day or month it publishes a quality code, and gives one to every missing day or month too – there the code says why it is missing. The database keeps both: 2.43 million missing days are stored with their code. For each series the app counts the record by class, charts it as a quality profile and a year-by-year coverage, and lists every code in the selection with DWS's own description.

Class	What it means
Good or audited	Good continuous, edited, audited or preserved historical data.
Unaudited	Published but not yet audited – 3.9 million daily values. It can change.
Estimated or gap-filled	Made up by DWS to fill a gap (49, 50, 64, 65, 66, 130).
Above the rating	Beyond the gauge's rating, so the flow is a floor – 234 526 days (60, 91, 150, 254).

Class	What it means
Monthly reading	A storage rain gauge read once a month, its total spread over the days – 1.81 million days (27). The month is sound; the day is not daily rainfall.
Partial month	A monthly total DWS made over only the days it has, under the code of the gap – 33 290 months. Never counted as a month.
Missing	Split by reason: no data (151, 201, 255), a gap in the record (170, 171, 172), no flow could be computed (152, 160–165, 245–253), or withheld as unreliable (173).
Flood peaks	Measured; unaudited (Q); estimated (E, S, X); above the rating, a floor (>, A, ^); from a period with data missing (M); or no peak flow at all.

How the record is read

Daily and monthly are two records. Monthly means DWS's own monthly values, with their own codes – some stations have no daily record at all. From a daily record, months and years are built only from months whose every day has a value. Pipeline volumes, published in thousands of m^3, are converted to hm^3.

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" and are treated as flow.

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.

How a run works

Step	What happens
1. Choose sites	Site type, record and interval; then search and select up to ten on the map or the list.
2. Data quality	Each record counted by quality class and missing reason, its quality profile, and every code in it.
3. Statistics	Record, annual totals over complete years, and the values themselves – for flow, Q10 to Q95; for peaks, the peak record.
4. Records over time	As recorded or as annual totals, on a log scale or as cumulative departure; peaks over time.
5. Seasonality	The long-term mean of each month, October first; for peaks, the flood season.
6. Spread and coverage	A box plot of the annual totals of complete years – or of the peaks – and how much of each year can be counted.
7. Exceedance	The flow duration curve, or each value against the share of days or months it is exceeded; annual peaks against an empirical return period.
8. Report	Everything above in one printable page.
9. Export	The values as published, with their codes, missing periods included; the quality, statistics and totals as computed; the station and series catalogues.

Limitations worth knowing

- 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 dam's 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 – 2 541 peaks. That and the pipeline unit are the only changes made to the published record.
- Ten stations is the limit for one selection.

Why this one is not entirely in your browser

The database is 755 MB, so the station catalogue and the catchment boundaries are downloaded once, and each series is fetched from the server as you select it. The quality counts, 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.