

Example of monthly discharge for station ADO_DSC_ITC1_0037 in Italy at Isola S. Antonio (Po river) with Q95 denoted with a red band. For this station the Q95 value is 116.0 m³/s.

Q95

Q95 Index



Q95 or also called Q347 is the discharge of the watercourse which is reached or exceeded at least for 95 % of the time, that is on 347 days in an average year.



Input variable	Type of drought	Temporal coverage	Unit
Streamflow	Hydrological	Variable (station dependent), available from streamflow records	m³/s

Definition

Q95 is one of the low flow duration indices. These low flow indices indicate when the river flow rate is below an accepted standard. Q95 or Q347 is based on the Flow Duration Curve (FDC) which is a cumulative frequency curve that plots a river's flow rate (Q) against the percentage of exceedance (0–100 %). It combines the flow rate characteristics throughout a range of discharges, without taking into account the sequence of occurrence.

The Q95 should be obtained from observed measurements, and the flow rate must not be influenced noticeably by anthropogenic activities. This low flow index should be used with caution due to the problems related to both the measurement of very low discharges and the increasing proportional variability between the natural flow and the net impact of artificial influences, such as

abstractions, discharges, and storage changes as the river flow diminishes (Pyrce, 2004).

Q95 is often used as low flow index in the government, management and academic literature. Its uses are listed below:

- indicator of extreme low flow conditions,
- minimum to protect the river,
- minimum monthly condition for point discharges,
- licensing of surface water extractions and effluent discharge limits assessment,
- biological index for mean monthly flow,
- used to maintain the natural monthly seasonal variation,
- used to optimize environmental flow rules.

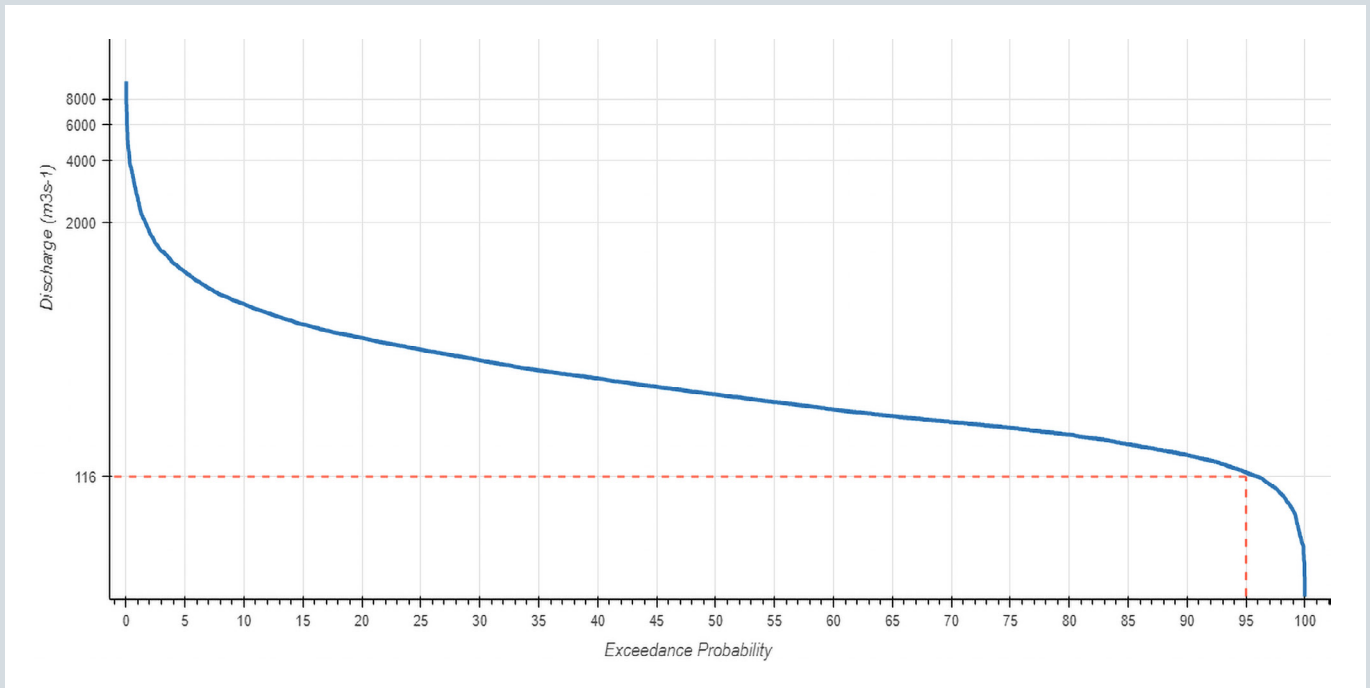
Methodology

Data source	Data provider	Index provider	Metadata
Observed daily streamflow	Multiple data providers (ADO project data - CDB Documentation)	Eurac	Hydrological stations

CALCULATION

To calculate the flow duration curve, it is necessary to sort the data from smallest to largest and assign it a range from 1 to n values, then it is possible to compute the frequency (f) by dividing the total number of data (N) by the rank (n), following which we can compute the probability of exceedance (1/f).

The flow rate Q95 is obtained by plotting the flow duration curve with discharge values in the ordinate and the percentage of exceedance in the abscissa. Therefore this indicator represents the flow rate reached or exceeded in 95 % of cases.



Example of flow duration curve for station ADO_DSC_ITC1_0037 in Italy at Isola S. Antonio (Po river). For this station the Q95 value is 116.0 m³/s which means the value is reached or exceeded for 95 % of the time.

References

Hydrologische Mitteilungen-Communications hydrologiques. (1999). Landeshydrologie und-geologie (No. 27)., Die Abflussmenge Q347.

Pyrce, R.S. (2004). Hydrological Low Flow Indices and their Uses. WSC Report No.04-2004. Watershed Science Centre, Peterborough, Ontario.



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