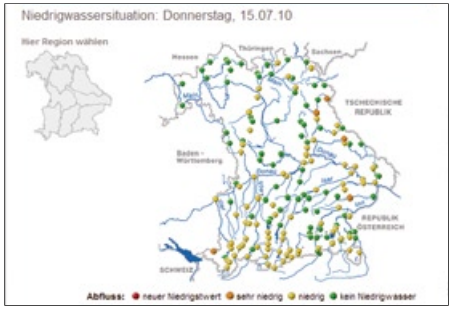
Low Water Information Service on the Net

www.nid.bayern.de

Bavarian Environment Agency

Early and up-to-date information online:
www.nid.bayern.de

The latest readings from monitoring networks are published on the internet. For groundwater a distinction is made between monitoring stations close to the surface and deep monitoring stations. The stations close to the surface also show short-term fluctuations and provide information on the water supply that feeds streams and rivers during dry periods. The deep monitoring stations show more long-term fluctuations.



Status overview: The homepage of the Low Water Information Service displays a runoff analysis.

To evaluate the latest reading in low water conditions it is compared with all previous measurements taken at the same station. The status is

- "low", if the reading is lower than 75% of all measurements taken,
- "very low", if the reading is less than 90% of all measurements taken.

It is also indicated when a new maximum low is reached.

Status report and low water information

In low water conditions a status report is issued for the whole of Bavaria giving the current situation and the predicted development. The state offices for water management publish information on the regional low water conditions, whenever appropriate, and this information is also made available on the Low Water Information website.

This internet service was launched in 2008; it presents readings from existing monitoring networks and is being further expanded.

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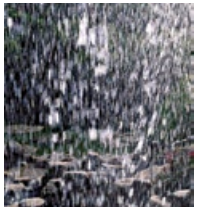
Low Water Information Service

Reasons, goals, plans

Bavaria – a land of water – are drought and low water a threat?



Bavaria's landscape is known for its plentiful rivers and lakes. The average rainfall is 940 mm (940 litres per square metre), roughly 55 % of this evaporates through plants, soil and water surfaces, and 45 % is discharged into rivers and recharges the groundwater.

Plenty of water in Southern Bavaria – less in the northern part

Rainfall distribution is not uniform. In some areas of Northern Bavaria the annual precipitation is only around 600 mm, whereas the figures for Southern Bavaria often reach 900 mm along the Danube and even exceed 2000 mm in Alpine regions.

92 % of Bavaria's drinking water comes from groundwater and springs.

Southern Bavaria also benefits from larger groundwater resources. The extensive gravel deposits in the subsoil can store large quantities of groundwater – as opposed to solid bedrock in Northern Bavaria where there are just a few cavities in which water can accumulate. Nevertheless, even in the south, water shortages can occur in extremely dry periods.

To counteract the scarcity of water that already prevails in Northern Bavaria, water is stored in reservoirs and also transferred from the Danube river basin to the basin of the Main.

Why we need a Low Water Information Service?

Climate change can cause more frequent dry periods.

The emerging climate change is going to have an increasing impact on the distribution and amounts of rainfall. There will be more floods and also more dry periods with low water levels.

Better response to low water conditions.

Bavaria has had a Flood Warning Service for over 100 years (**www.hnd.bayern.de**). This service has proved its worth by warning of floods and initiating protection measures on time. The Low Water Information Service (NID) was set up along the lines of this flood warning system. Its measurement data and status reports permit early action to be taken in low water conditions by the respective decision makers, first and foremost the water management bodies. The public also has access to up-to-date information on the current situation and the further development.

Which data are used?

Gauging networks for runoff, water levels, water temperatures and quality, groundwater and springs

The framework for the observation of low water conditions predominantly comprises existing automatic monitoring networks with 550 gauging stations for measuring water levels and runoff into rivers as well as 320 rainfall gauging stations. These readings produce important basic data in both flood and low water conditions. Additional data are acquired from monitoring networks that measure the water quality in rivers and lakes. Groundwater levels and spring discharges are evaluated for the analysis of groundwater conditions.

Forecast models

To predict water levels and discharge in low water conditions the forecast models of the Flood Warning Service are refined to include changes in the soil and groundwater as well as losses through evaporation.

Possible impact of low water

Low water has an impact on water quality, water supply, shipping, irrigation and hydro-power.

Bavaria has been able to cope even with prolonged dry periods relatively well. The last drought in the summer of 2003, however, left a first impression of the possible impact and hazards that may lie ahead. During this drought period in 2003

- shipping was impaired due to low water levels,
- hydropower stations could only produce reduced quantities of electricity,
- one power station had to reduce its output to prevent cooling water discharged from excessively heating the river,
- there were some bottlenecks in the drinking water supply in the medium mountain ranges,
- withdrawal of water for irrigation purposes was restricted in some areas.