

# The Drought of 2018: Linking Multi-Sectorial Impacts to Hydrometeorological Extremes



Unusual impacts

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#### **Motivation and Aims**

The drought of 2018 caused a wide range of impacts on environment and economy. These impacts contributed to the event's high visibility. Focusing on Southwest Germany, this study investigates

- the temporal co-evolution of the physical drought severity in different variables and the range of direct and indirect drought impacts in different sectors, and
- how the drought characteristics and impacts of 2018 compare to those of previous events.

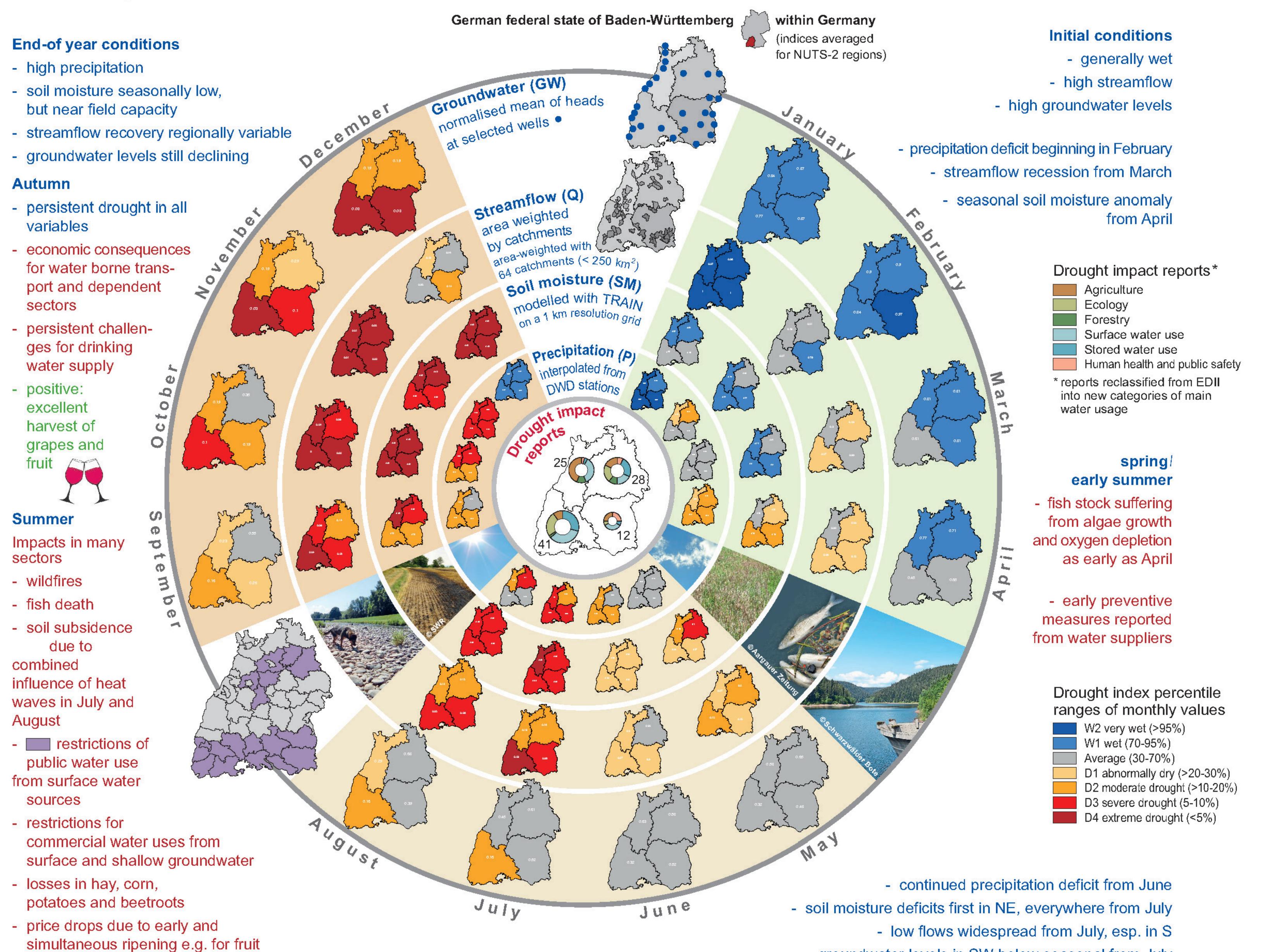
## Data Analysis

- Monthly anomalies of four variables based on the period 1989-2018: precipitation, soil moisture modelled with TRAIN, streamflow from meso-scale catchments with near-natural flow and groundwater heads from observation wells (source: official monitoring networks in Germany)
- Drought impact reports collected from media and other text sources and initially coded for the European Drought Impact report Inventory (EDII) system.

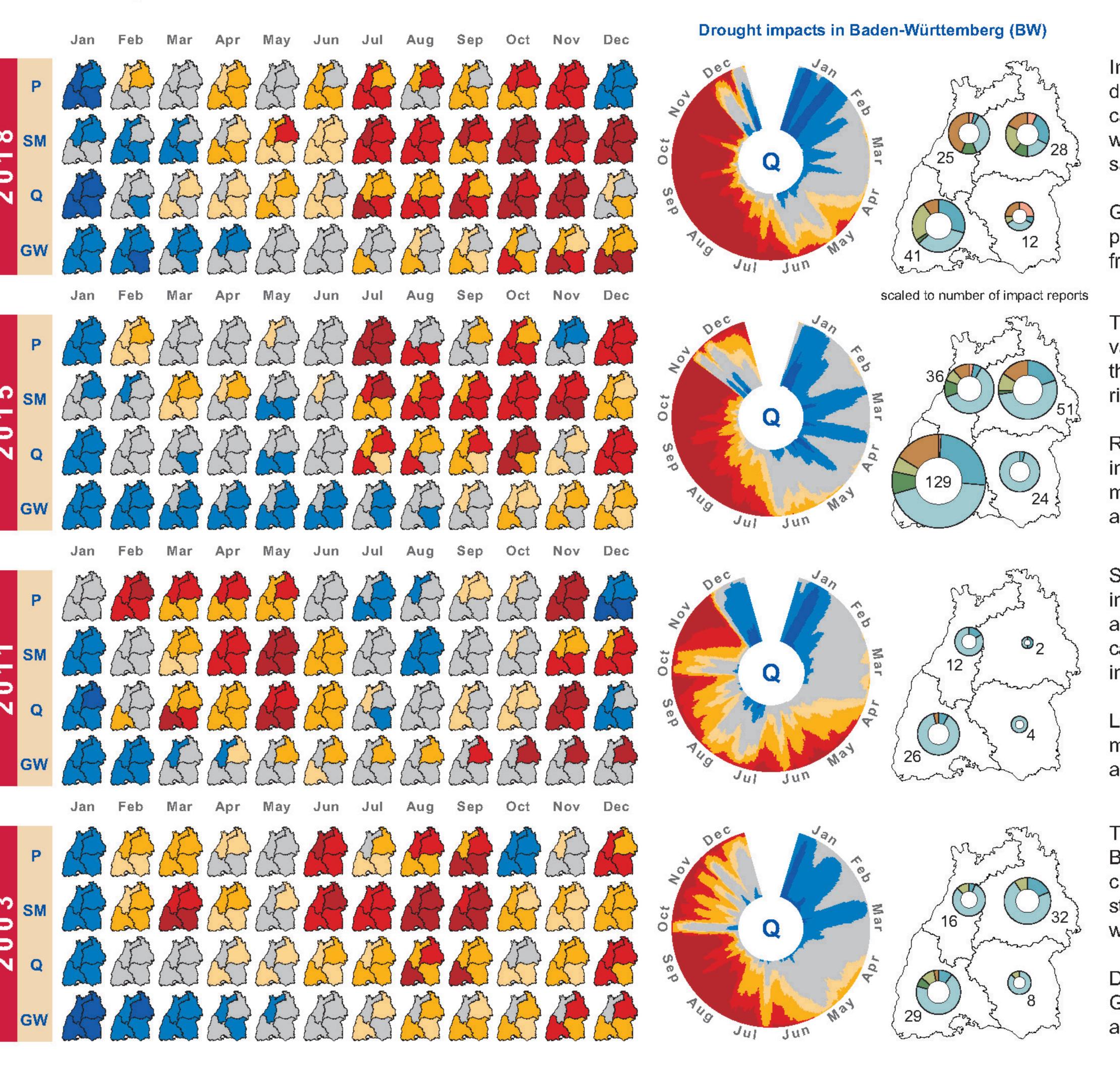
#### **Index and Data Limitations**

- Monthly anomalies may indicate stronger anomalies than necessary to cause impacts (e.g. Q during wet seasons or SM after the vegetation season) and may cover shorter term variations.
- Impact report numbers may be biased to search strategies and reporting cultures; currently available data provide too little temporal accuracy to establish a monthly sequencing of impacts; lagged effect reports may still become available.

# The Drought Calendar 2018



## The Drought of 2018 Compared to Previous Events



In BW, the long-lasting severe drought caused impacts in all categories; unusually numerous were impacts on health and public

Germany's Federal States experienced different unusually frequent impacts.

The drought of 2015 was more variable and ended earlier in BW than 2018, it particularly impacted rivers and water supplies.

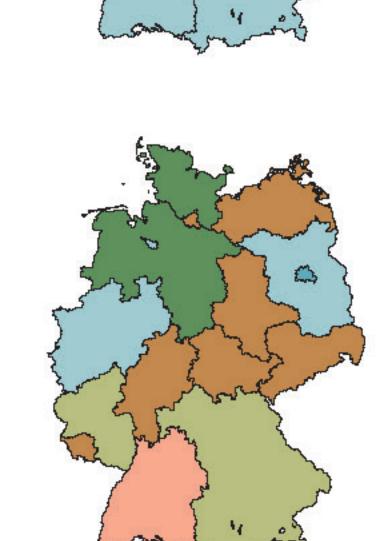
Reports on health and safety impacts emerged across Germany; effects on water supplies and forests were unusual.

Spring anomalies in BW had little impact but late autumn drought after a wet summer intermezzo caused low flow and water supply

Low flow related impacts were more prominent than usually also across Germany.

The intense summer drought in BW was exacerbated by heat, causing temperature related stress on aquatic ecosystems and

Drought impacts differed across Germany – impacts on ecology and health emerged in the South.



DRIER

#### Conclusion

Compared to previous drought events, in 2018 a larger range of impacts was reported, possibly related to the extraordinary severity and long duration of the drought into the autumn. For the region studied, these physical characteristics exceeded the severities of 2003 and 2015.

Increased awareness following the event of 2015 likely affected impact reporting and media attention. A quantitative and regular monitoring of drought impacts is imperative for an objective characterization of the multi-sectorial drought risk.

- groundwater levels in SW below seasonal from July

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