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# Monitoring of drought in the Netherlands in an online portal





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### Background

In 2018-2020 water managers in the Netherlands were confronted with extreme drought, impacting nature, agriculture, shipping and drinking water supply. To better anticipate dry conditions and improve water management during a drought, up-to-date and accurate information about the meteorological and hydrological situation is crucial.

We developed an **online information portal** with up-to-date measurements for precipitation and **groundwater** levels. Drought severity is quantified by the Standardized Precipitation Index (SPI), Standardized Precipitation-Evapotranspiration Index (SPEI) and Standardized Groundwater Index (SGI).

#### Key messages

- By combining the information on meteorological and hydrological drought in one decision-support system, water managers and stakeholders can get an up-to-date overview of the current situation.
- Due to the uniform determination of drought severity, regions within the Netherlands can be compared. This can help to implement targeted water management decisions for adaptation measures to mitigate drought impacts.
- Visualizing the status of the groundwater system a valuable, but hidden resource – to experts and policy makers through





an online portal helped putting sustainable use of groundwater resources higher on the political agenda.

 Part of the information of the portal is also included in the national drought monitor of *Rijkswaterstaat* (Dutch Ministry of Infrastructure and Water Management).



Figure: Groundwater drought across drought sensitive areas in the Netherlands, at August 3th, 2022. Each dot represents a groundwater observation well. A uniform methodology to harmonize data using time series analysis (Brakkee et al., 2022) allows to compare the groundwater drought status for different regions. Top figure: Example of measured groundwater levels relative to mean sea level and soil surface (dotted line) at a selected observation well.

Lower figure: Calculated Standardized Groundwater Index (SGI) over time at the selected observation well.

**Black**: values for the current year. **Red**: values of extreme dry year of 2018. Grey: range of historic values.

#### References

Brakkee, E., van Huijgevoort, M.H.J., Bartholomeus, R.P. (2022). Improved understanding of regional groundwater drought development through time series modelling: the 2018–2019 drought in the Netherlands. Hydrol. Earth Syst. Sci., **26**, **3**, **551-569**. **DOI:10.5194/hess-26-551-2022** 



