# The Complexity of Droughts





Remember the summers of 2018, 2019 and 2020? A combination of low precipitation and high evapotranspiration caused largescale droughts in Europe. Various sectors – including agriculture, nature and public water supply – were impacted by these droughts. Drought is a creeping and complex phenomenon with several negative effects, yet it is difficult to model droughts and its impacts. In particular, the impacts of multi-year droughts are uncertain. This PhD project studies droughts in the context of climate change.

### Many Uncertainties, Different Potential Futures

The frequency and severity of droughts is expected to increase in the future. However, numerous uncertainties exist, regarding future emissions, the response of the climate system to these emissions, and spatial and socio-economic developments. It is therefore important to study potential future droughts under various climate and socio-economic scenarios.



# What Lies Ahead: Exploring Droughts in a Changing Climate

#### Research Outline

*August 2024 – August 2028* 

This PhD project aims to understand the impact of climate change on the frequency and severity of meteorological droughts in the Dutch-German border region, and to assess the hydrological and socio-economic impacts of these droughts in past and future conditions.

## Study Area: The Dutch-German Border Region

This PhD project focuses on three transboundary river basins in the Dutch-German border region: Vecht, Berkel and Oude IJssel.

Emmen Meppen Coevorden Lingen Nordhorn Almelo Rheine Hengelo Enschede Steinfurt 2% Zutphen Ahaus



**1.** Determine relevant meteorological indicators based on historic impacts

2. Determine impacts of climate change on meteorological drought 3. Assess hydrological impacts of droughts

4. Assess socio-economic impacts of droughts



25 50 km



Drought Strategies in Water Management (DIWA)



This PhD research is part of and funded by the Interreg Deutschland-Nederland DIWA project, which aims to develop transboundary approaches to tackle drought and its impacts.

Background Picture: Atienzar, M. (2009). The early bird catches the worm [Photograph]. Flickr.

As the project just started, many aspects still need to be clarified

Questions or Suggestions?

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