

RURAL DROUGHT & FLOOD (Northern Europe)

Partners: Klimatorium (DK), Technisches Hilfswerk (DE), STOWA (NL)

OVERVIEW

Use Case 5 addresses rural challenges stemming from **extreme fluctuations in groundwater levels**, which lead to land-use issues and impact infrastructure, utilities, and crisis response in rural Denmark, the Neatherlands and Germany. These fluctuations cause soil moisture variations, resulting in **subsidence and uplift**, with some areas in Denmark experiencing subsidence rates of up to 6-7mm annually. Peatrich soils are particularly vulnerable, risking organic oxidation and underground fires in rural Germany, while **high groundwater levels can overload wastewater systems** as seen in Denmark. Since the 1980s, rising shallow groundwater has caused significant infrastructural damage in Denmark, necessitating smart monitoring and investment security. Key objectives **include identifying and mapping soil moisture and groundwater levels**, supporting real-time monitoring, and assessing land use changes. Effective risk management involves proactive measures for extreme scenarios like peat fires and flooding, analyzing historical trends, and developing spatial risk indicators to ensure resilient rural ecosystems and stable agriculture amid climate change.



USE CASE 5 IN DETAIL

Pain points & user needs

Stakeholders in Denmark report a **lack of robust forecasting models to enable scenario analysis** and support decisionmaking, especially when it comes to risk assessments. **Data sharing practices are also lacking**, and risk perception among the population can lead to detrimental risk behaviour. They also report a **lack of local-scale data** and that national-scale datasets cannot always be scaled down.

Available tools and data examples

- **Vejrudsigt Portal:** Danish Meteorological Data Portal, including free weather and ocean datasets
- **Danmarks Miljøportal:** Danish Environmental Portal, containing free GIS, land use, and other public data
- **Danmarks Areal Information:** Connected to the Miljøportal, an interactive spatial data viewer
- **KlimaAtlas:** Free Danish climate data, showing climate from the past, the present and for future scenarios.



HOW PCP WISE CAN HELP

- Continuous monitoring of root zone soil moisture, vegetation health, groundwater levels (including evapotranspiration), precipitation, and surface water conditions using smart meteorological (spatio-temporal) inputs.
- Development of risk indicators for drought and flood-related crises affecting agriculture, ecosystems, and rural infrastructure.
- Long-term climate monitoring to analyze historical trends and forecast future water availability in local and regional river basin areas, helping to create sector-specific risk indicators (agriculture, nature conservation, and rural infrastructure).

