

# Drought mapping and monitoring

## DOMAIN: SOIL

### Content

This EO service provides time-series information on droughts, vegetation stress and degradation. It determines surface dryness and soil moisture anomalies.

### Relevance

Climate change is expected to increasingly impact precipitation patterns and evapotranspiration processes. Thus, there will be a significant influence on the availability of soil and groundwater leading to higher frequent, longer and more severe droughts in many regions. These will affect the existence of especially rural, agriculturally-based populations through crop failures and reduction of pastureland.

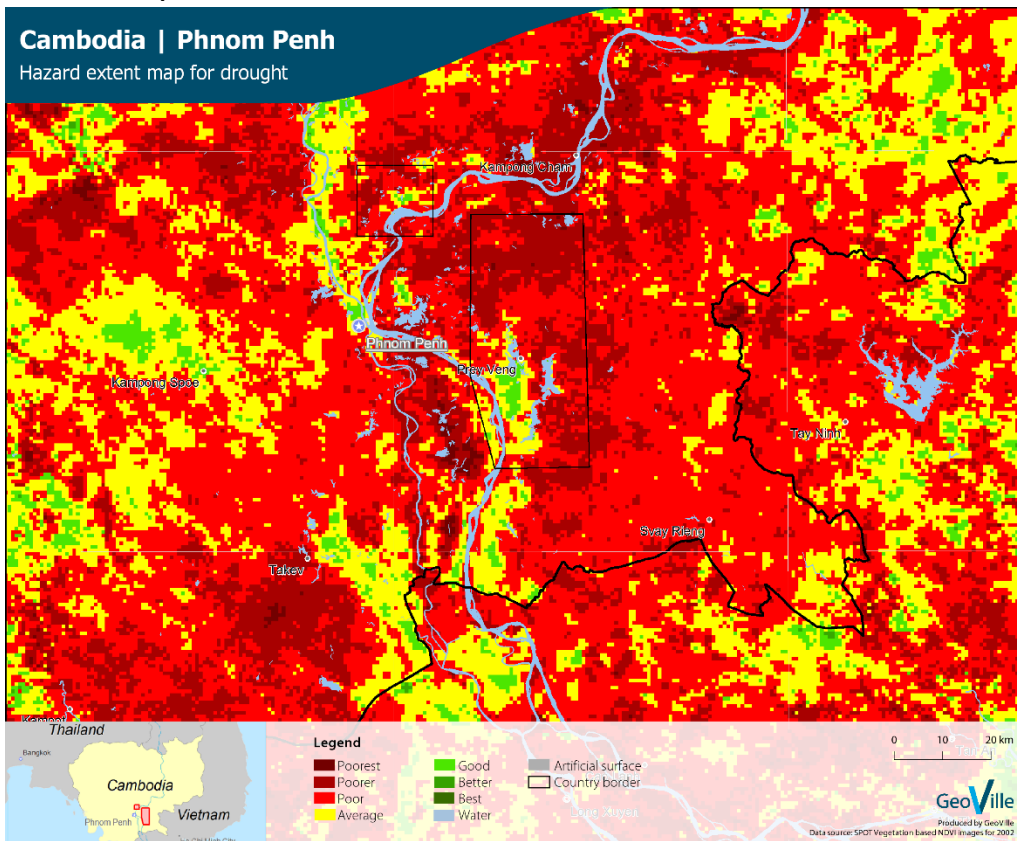
This service is relevant for e.g.

- Identifying droughts
- Relief aid management and effectiveness assessment
- Sustainable crop farming and livestock watering
- Trend analyses
- Mitigation of drought impacts (wildfires, lost agricultural production, degraded wildlife habitat)

### Input data and methods

The identification of soil moisture is derived from optical missions (e.g. Sentinel 2, Landsat) and radar (SAR) sensors (e.g. Sentinel 1). Specifically, the SAR sensors with their high revisit time being only minor affected by weather phenomena as e.g. clouds allow efficient mapping of dryness and seasonal anomalies. In addition, supplementary contributions from Satellite missions such as TRMM, MODIS and ENVISAT will be considered to improve the quality of the product. Vegetation stress is derived from time series of vegetation indices (e.g. fAPAR – Fraction of Absorbed Photosynthetically Active Radiation, NDVI – Normalized Differenced Vegetation Index or LAI – Leaf Area Index).

### Product examples



### Technical specifications

#### SPATIAL COVERAGE

100's of km<sup>2</sup>

#### DATUM / PROJECTION

User defined

#### FORMAT

Data: GeoTiff

Analysis: XLSX or PDF

#### SPATIAL RESOLUTION

10m – 1km

#### TEMPORAL COVERAGE

1980's - now

#### TEMPORAL RESOLUTION

Monthly - Seasonal

#### THEMATIC ACCURACY

>85% overall accuracy

#### POSSIBLE OUTPUTS

- Drought extent and severity maps at different scales (local to global)
- Soil moisture anomaly maps

Figure 1: Hazard extent map of drought in Cambodia.

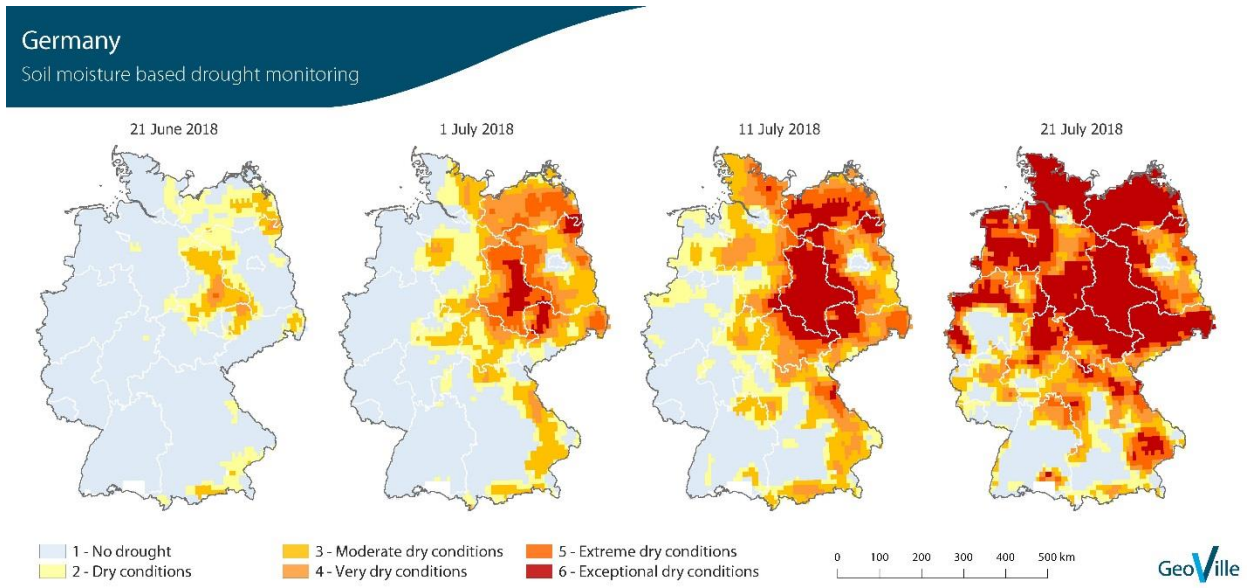


Figure 2: Soil Moisture based drought monitoring, Germany

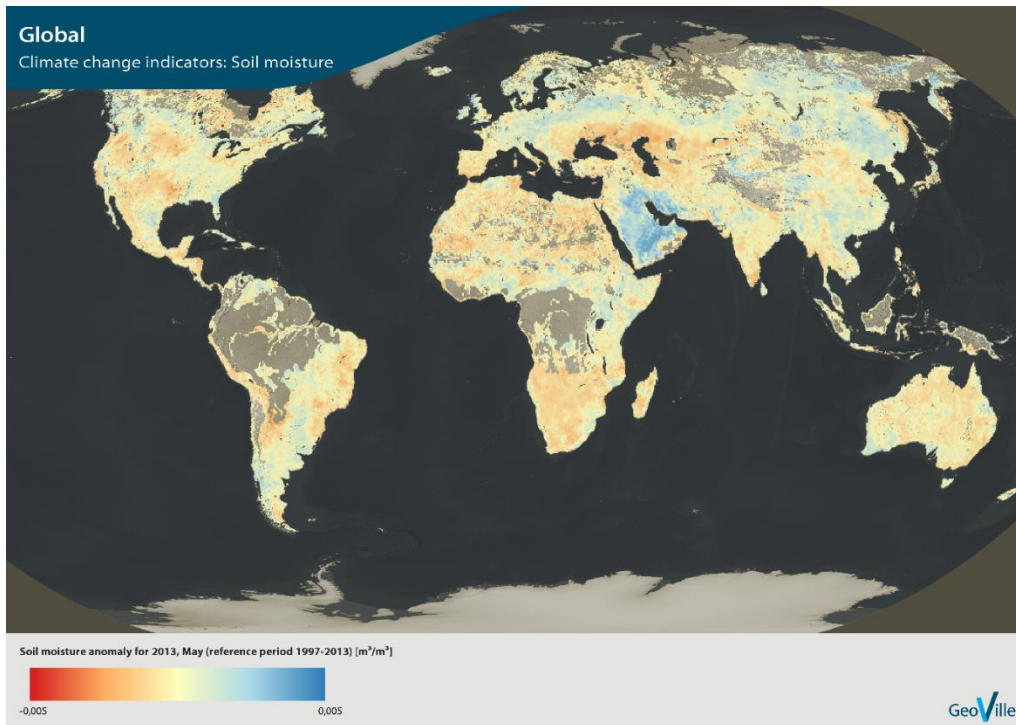


Figure 3: Map of global soil moisture anomalies.