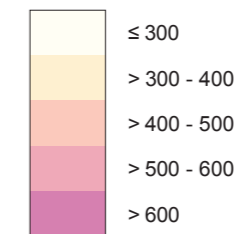








Water

# Average Annual Actual Evapotranspiration in Bavaria 1981-2010

1:1250000

Actual evapotranspiration in mm/yr



-  Main watershed
-  District capital
-  City
-  Urban area
-  National border
-  State border

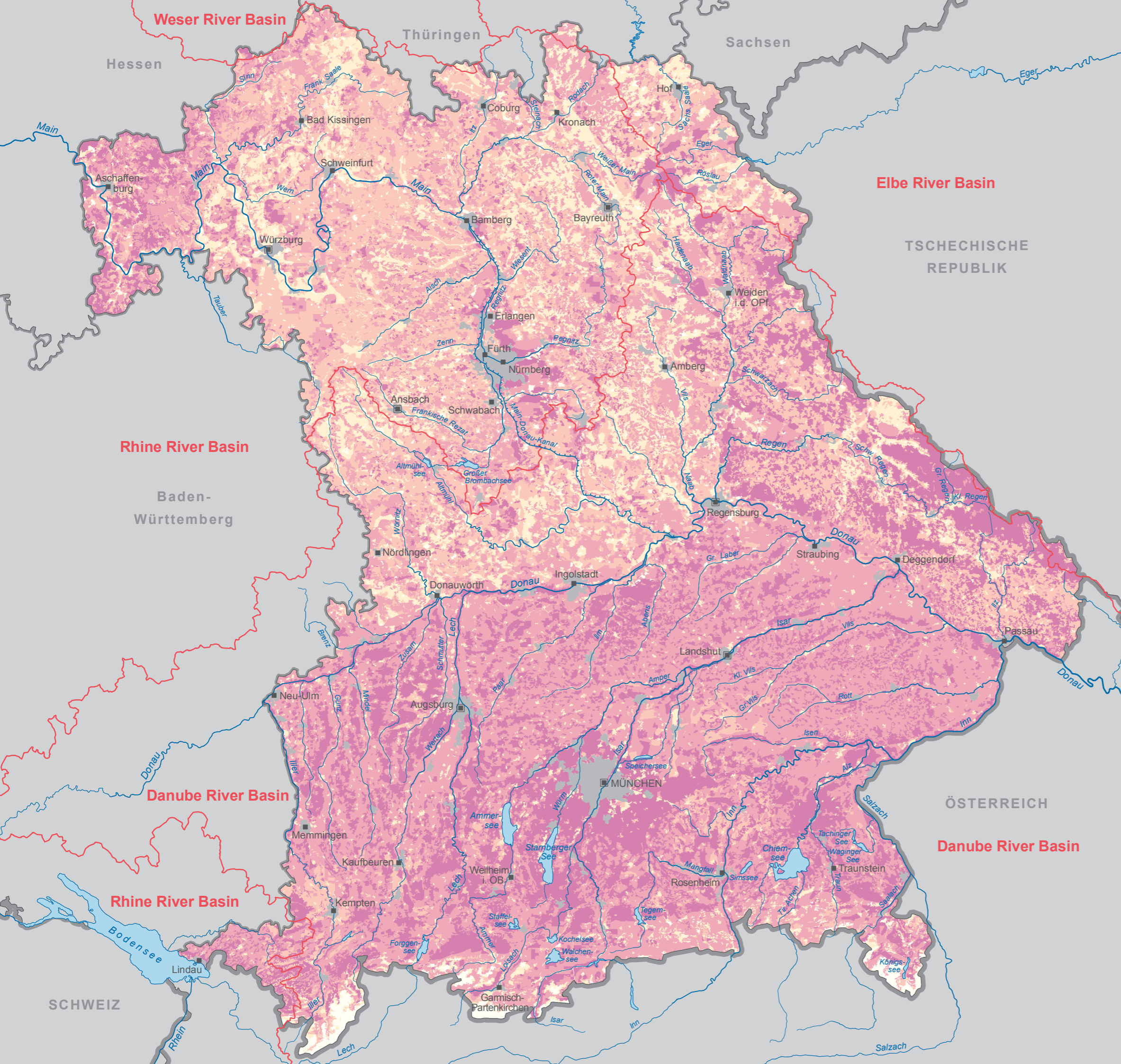


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Thematic geodata: The map is based on results of the soil water balance model GWN-BW. Due to methodological reasons, modeled data for urban areas are excluded from the map.  
 River basins: DLM1000 W (Länderarbeitsgemeinschaft Wasser, Federal Environment Agency), Version: September 2012

Topographic geodata: DLM1000, © GeoBasis-DE / BKG 2013 (Data modified)  
 Urban areas based on Vektor 500, 2011, © Bayerische Vermessungsverwaltung

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Maps for Water Management

## Average Annual Actual Evapotranspiration in Bavaria 1981-2010

### 1 General

As an essential component of the natural water cycle, evaporation describes the transformation of water - usually introduced into the water cycle as precipitation - into water vapour. The sum of evaporation (vaporisation from surfaces) and plant transpiration (evaporation from vegetation) is known as "evapotranspiration". Whilst potential evapotranspiration (= maximum amount of water that could evaporate) is a theoretical value, actual evapotranspiration (often simply referred to as actual evaporation) takes the real conditions at a given location (soil, vegetation, climate) into account.

### 2 Methodology

The actual evapotranspiration rates were calculated using the soil-water balance model GWN-BW. For the simulations, the investigation area (Bavaria) was divided into 105 000 individual areas, based on soil and land-use properties. Whilst the prevailing land-use type regulates amount and seasonal variation of actual evapotranspiration, available soil water determines the volume of the soil water storage. The simulations are driven by daily values of precipitation, air temperature, relative humidity, wind speed and sunshine duration. The resulting values for actual evapotranspiration were aggregated to average annual values and are represented here on a 200 m × 200 m grid. Due to methodological reasons, modeled data for urban areas are excluded from the map.

### 3 Interpretation

Averaged over 30 years, the actual evapotranspiration sum for Bavaria is 539 mm/yr (or l/m<sup>2</sup>). Due to regional differences in precipitation, there is also an unevenly distributed supply of water available for evapotranspiration. This explains why actual evapotranspiration calculated for the Bavarian part of the Main River Basin (481 mm/yr) amounts to less than the Bavarian average, whilst the 565 mm/yr calculated for the Bavarian part of the Danube River Basin is more. Comparing northern and southern Bavaria (north/south of the Danube), annual actual evapotranspiration sums are 490 mm and 601 mm, respectively. Typical values for annual actual evapotranspiration range between 400 and 600 mm. Lower values occur in the region around Würzburg, as a consequence of lower precipitation, and in elevated alpine regions due to lower temperatures that result in a lower saturation deficit. Low evapotranspiration rates also occur in areas with high levels of urban sealing. Values above 600 mm/yr are particularly characteristic of woodland areas, as trees are able to draw water from large root areas and because conifers in particular also contribute to evapotranspiration in winter.

### 4 Notes Concerning the Use of the Map

The values for average annual actual evapotranspiration presented here are the result of soil-water balance simulations, for the whole of Bavaria. Therefore, this map represents a large-scale overview, which allows regional conditions to be described in a manner that is appropriate for the scale 1:1 250 000. The use of values for individual grid cells is not valid for methodological reasons.