

Table S1: Input parameters for the empirical Bayesian Kriging algorithm in ArcGIS Pro 2.9.0.

Parameter	Value
Output cell size	1375.868 m
Data transformation type	None
Semivariogram model type	Power
Max number of points in each local model	100
Local model area overlap factor	1
Number of simulated semivariograms	100
Search Neighborhood	Standard circular
Max Neighbors	15
Min Neighbors	10
Sectortype	1
Angle	0
Radius	124879.519 m

Figure S1: Deuterium isoscape in groundwater

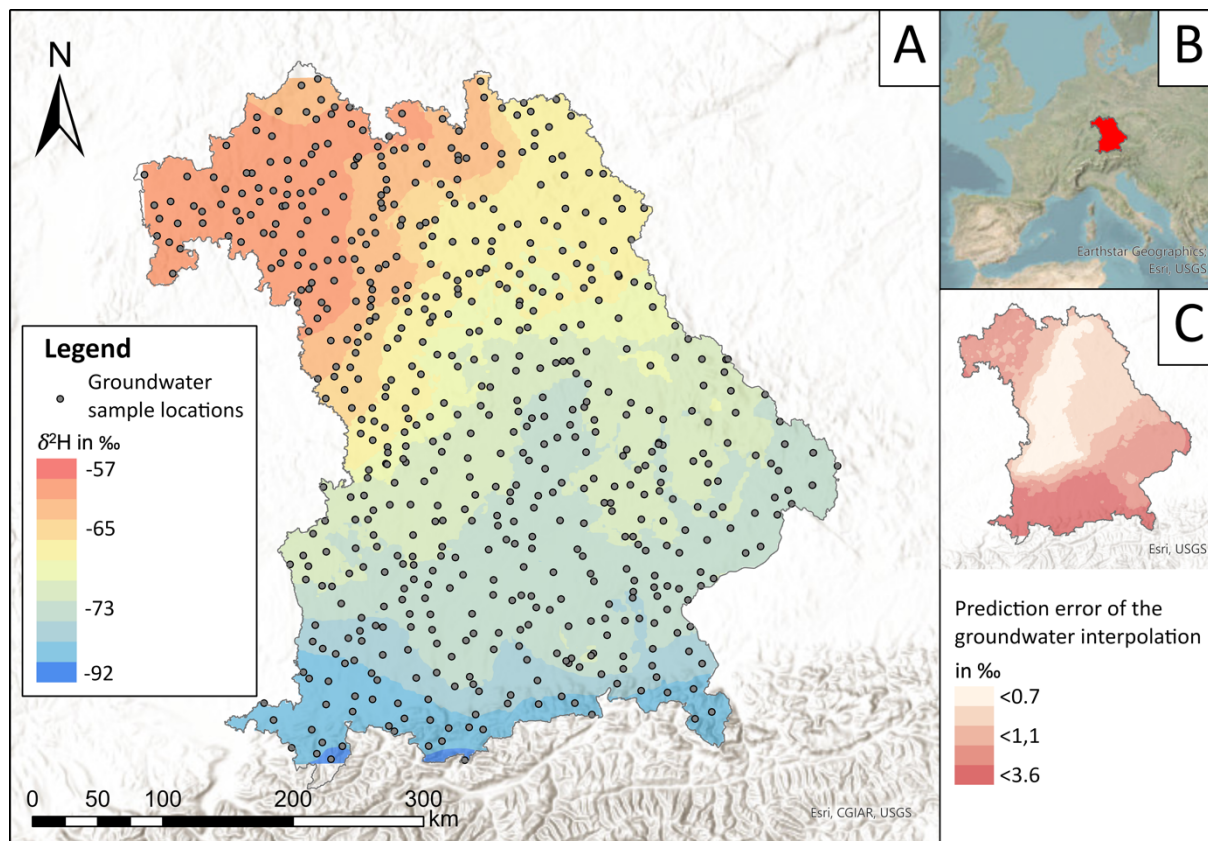


Figure 1: (a) groundwater $\delta^2\text{H}$ isoscape with sample locations. (b) Location of the study area in Europe. (c) Standard error of the interpolation in %.

Figure S2: Oxygen-18 isoscape in Groundwater

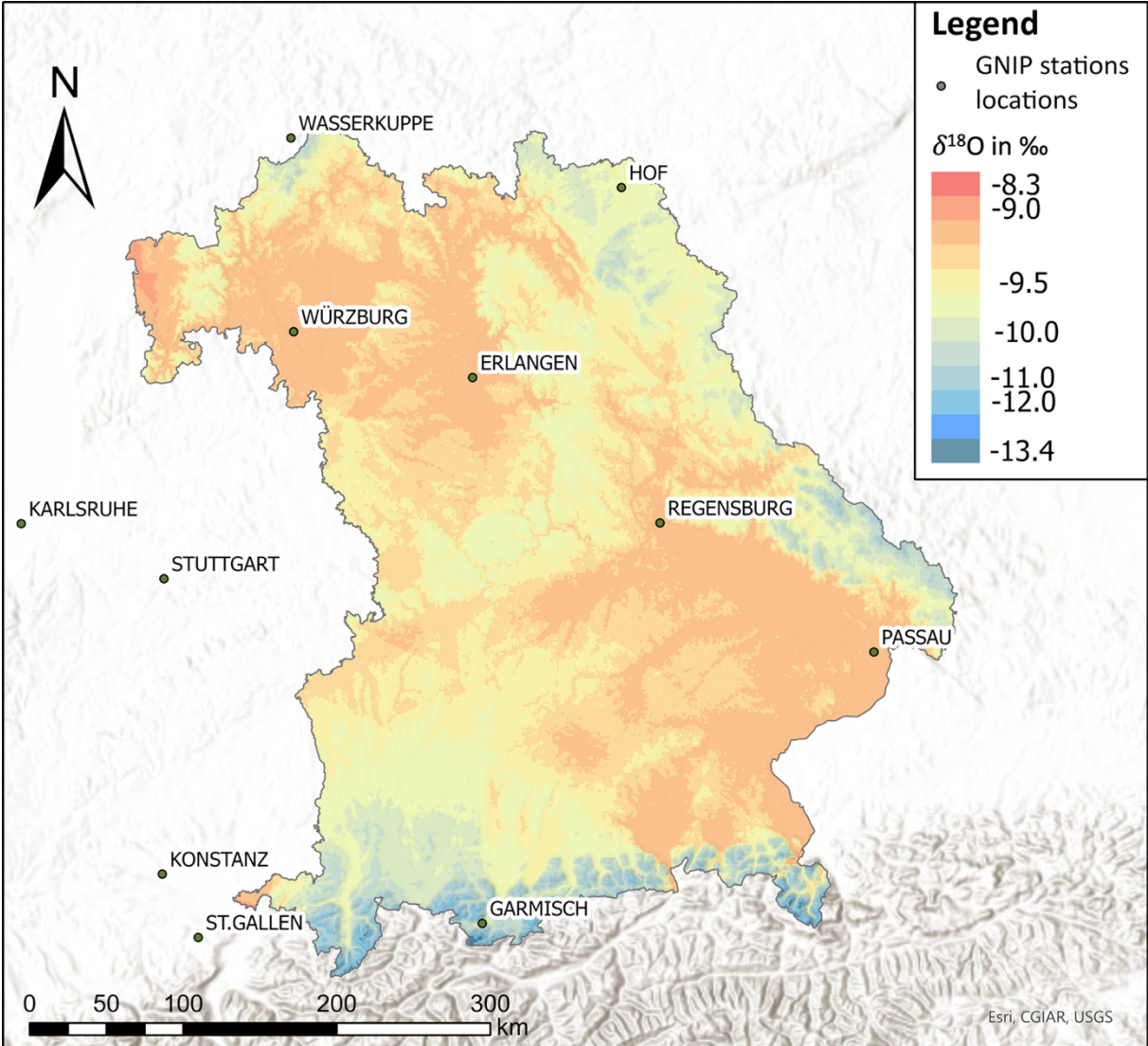


Figure 2: Isoscape (RCWIP model) of $\delta^{18}\text{O}$ -values in precipitation and location of the 13 GNIP stations used for this study (isoscape adapted from Terzer et al. (2021)).