water

MDPI

Supplement to

Delineation of hydraulic flow regime areas based on the statistical analysis of semicentennial shallow groundwater table time series

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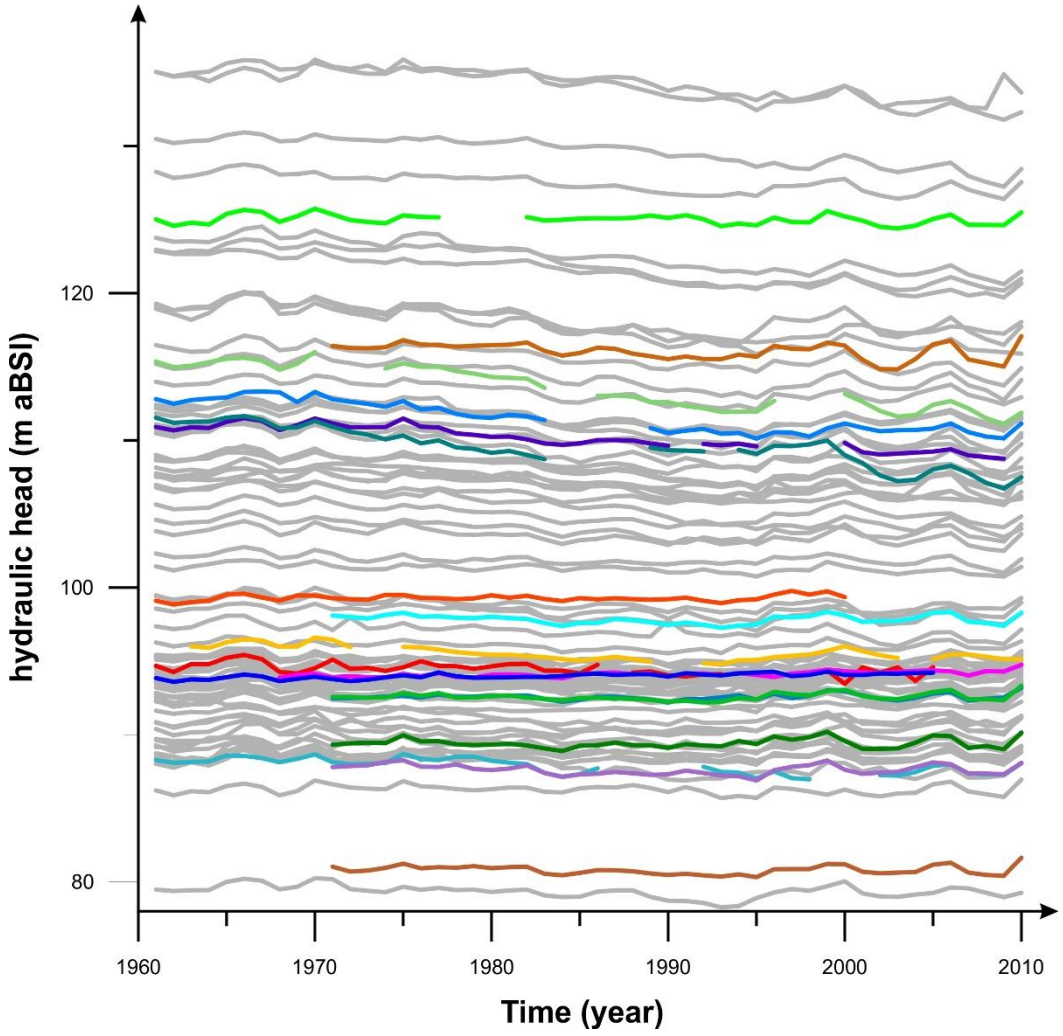

Figure S1. 91 SGW level time series. Grey lines indicate the SGW wells that provided continuous temporal coverage for the 1961-2010 (n=73), while the colored ones are the wells that had gaps (max 20% of the total time; n=18) in their time series (Section 2.3.1)

The interpolated map of standard deviation (st. dev.) of the water levels show a similar picture as the range of the water levels. The two statistics correlate to r=0.98. The st. dev. increases toward the central parts of the area (Figure S2).

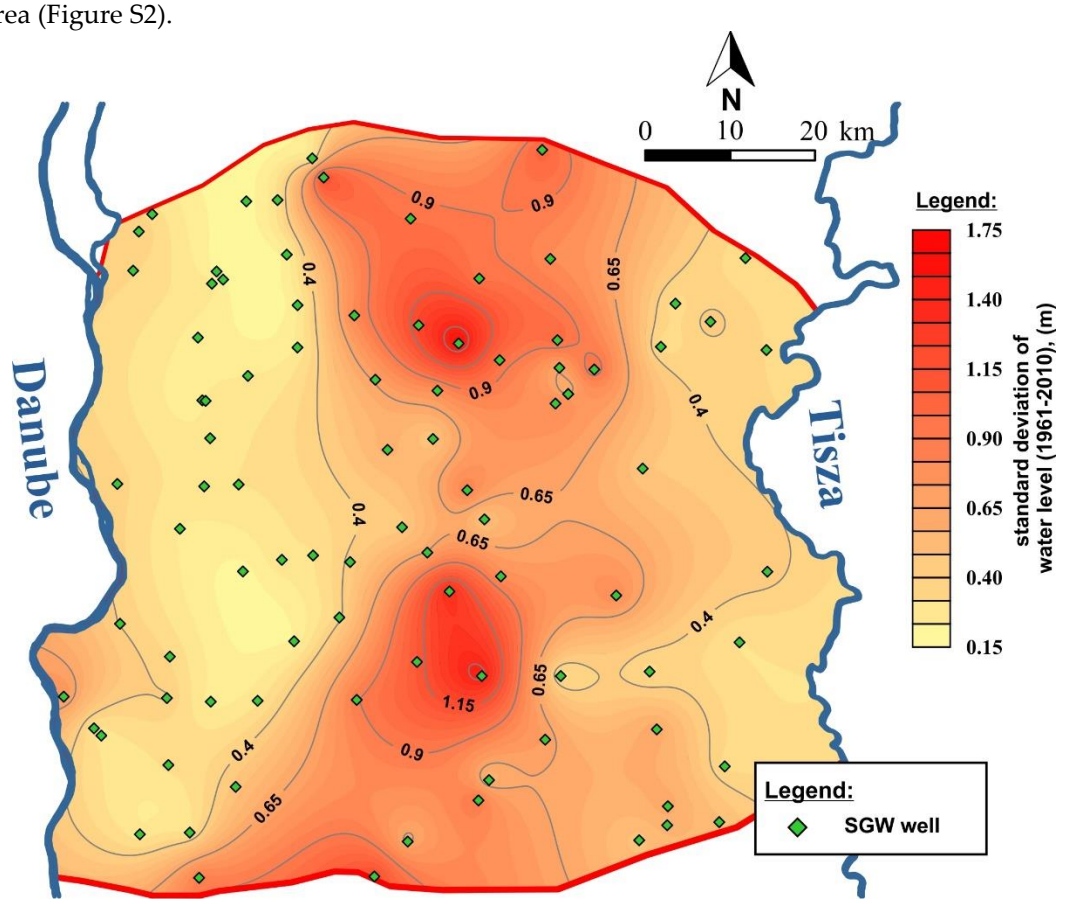

Figure S2. Kriged map of SGW level standard deviation derived from the 91 SGW wells over the time interval 1961-2010. The properties of the semivariogram can be found in (Figure S6b)

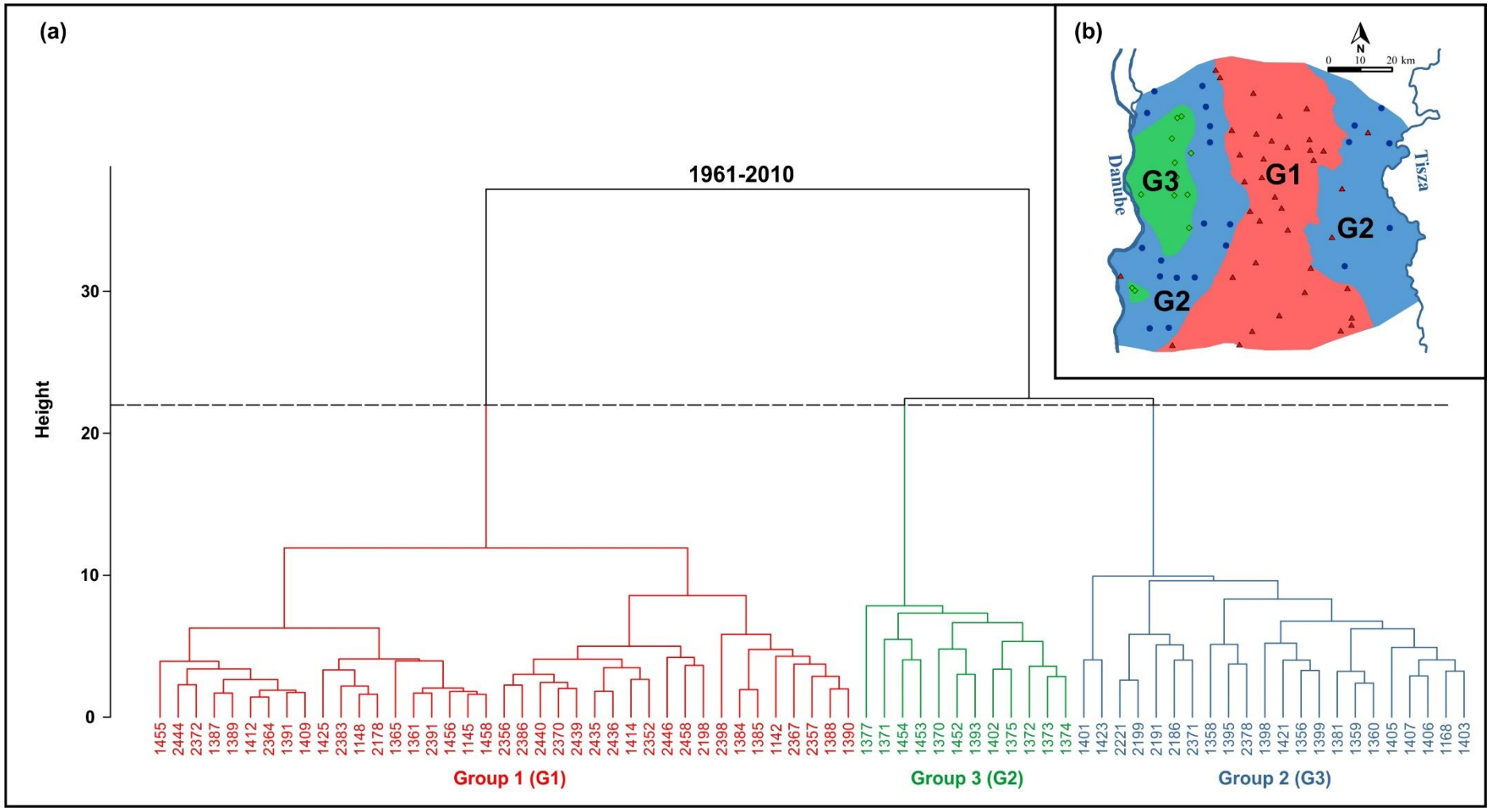

Figure S3. The grouping of the SGW wells. The dendrogram of the hierarchical cluster analysis **(a)** and the spatial distribution of the SGW well groups **(b)**

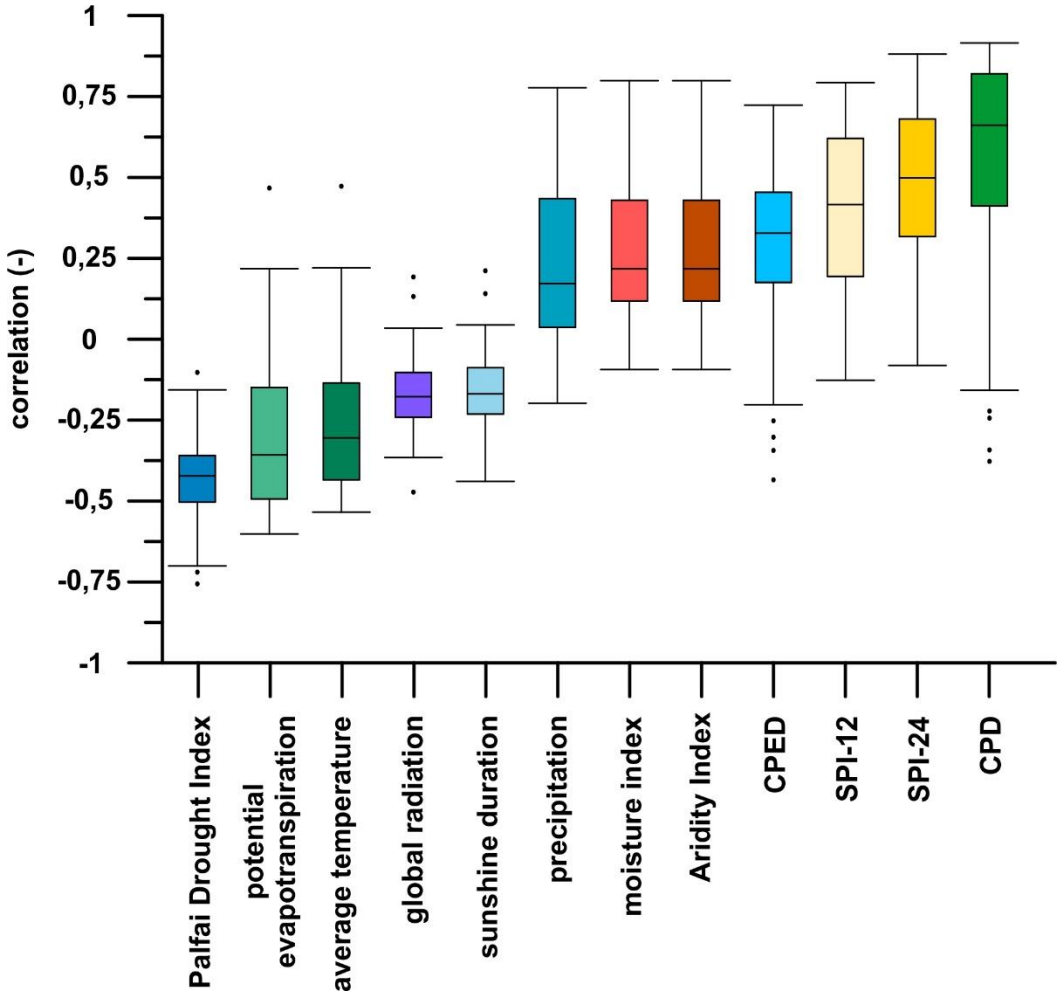

Figure S4. Correlation coefficients of the individual SGW wells and indices of meteorological variability on Box-and-whiskers plots, where CPED stands for Cumulative Potential Evapotranspiration Departure, SPI for the Standardized Precipitation Index (SPI-12, SPI-24), and CPD for Cumulative Precipitation Departure**.** The boxes indicate the interquartile interval, the black line in the middle the median, while the values outside 1.5-times the interquartile interval are indicated by a circle

As an additional information, the SGW tables were mapped for all the investigated years (1961-2010), taking them one-by-one, to reveal the spatiotemporal variability of the SGW table's overall decline. It was found that the SGW table peaked in 1966 (Figure S5a), while the lowest value was seen in 1995 (Figure S5b). While in the central parts of the region, the areas with an SGW table above 105 m aBSl shrunk over the approximately three decades, near and parallel to the two rivers no significant change was observed (Sections 3.1-3.2). This also implies that changes occurring in the course of the three decades investigated had an influence primarily on the central parts.

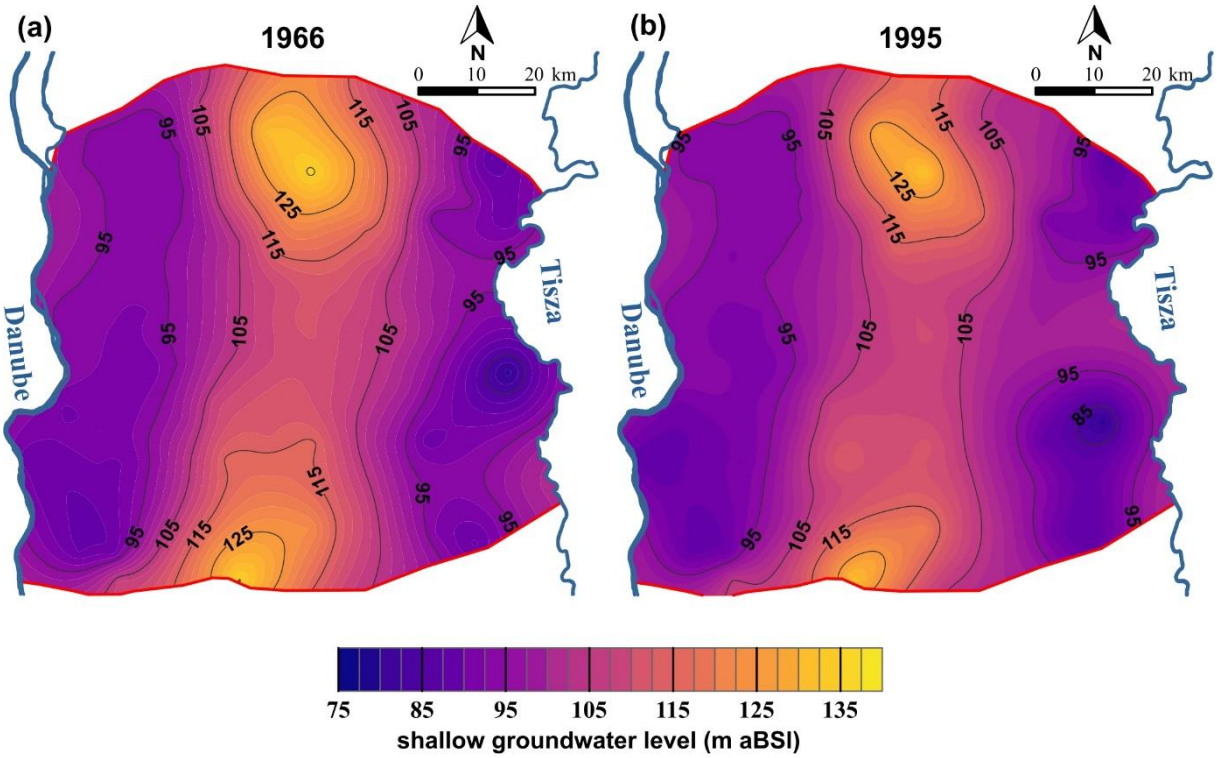

Figure S5. Kriged maps of the SGW table in 1996 **(a)** and 1995 **(b)**. The properties of the semivariograms can be found in Figure S6f and Figure S6g respectively.

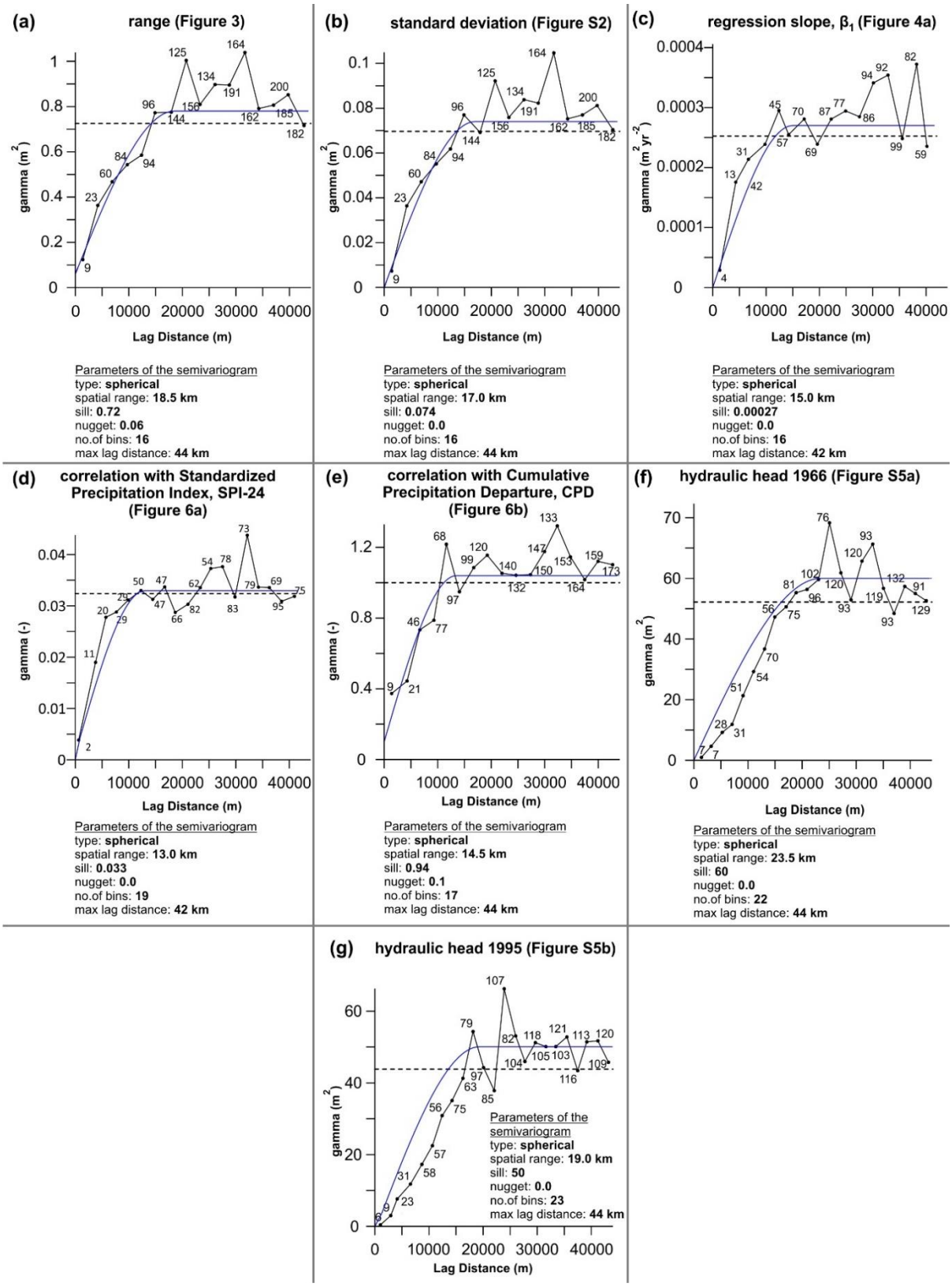

Figure S6. Empirical, and theoretical semivariograms used for weighting in the interpolation (kriging) of the presented maps. The titles of the panels show the which map was derived with the variogram, the black dotted line represents, the empirical semivariogram, the blue line represents, the fitted theoretical semivariogram, the numbers next to the points show the number of data pairs the value was calculated from. The dashed horizontal line is the variance. The parameters of the theoretical semivariograms can be found in the panels.