Supplementary material for

Recent trends of groundwater temperatures in Austria

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7 Figures

8 Pages

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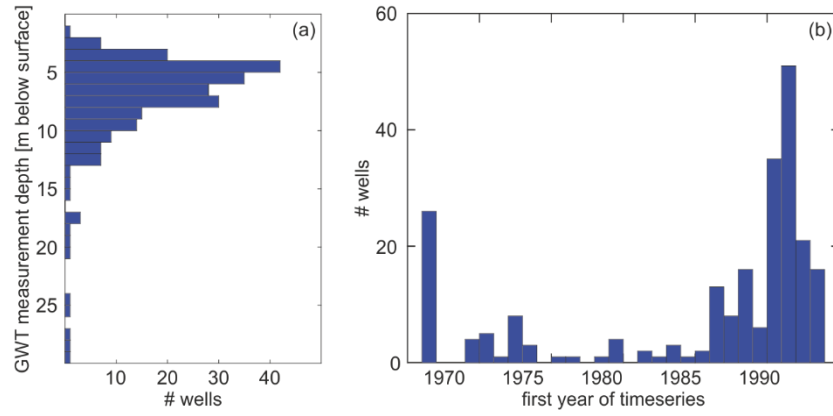
Figure S1. a) Histogram showing the GWT measurement depth of each well. The mean depth is 7 ± 4 m below ground. b) Histogram showing the starting year of each GWT time series. All analyzed time series end in December 2013 and are at least 20 years long.
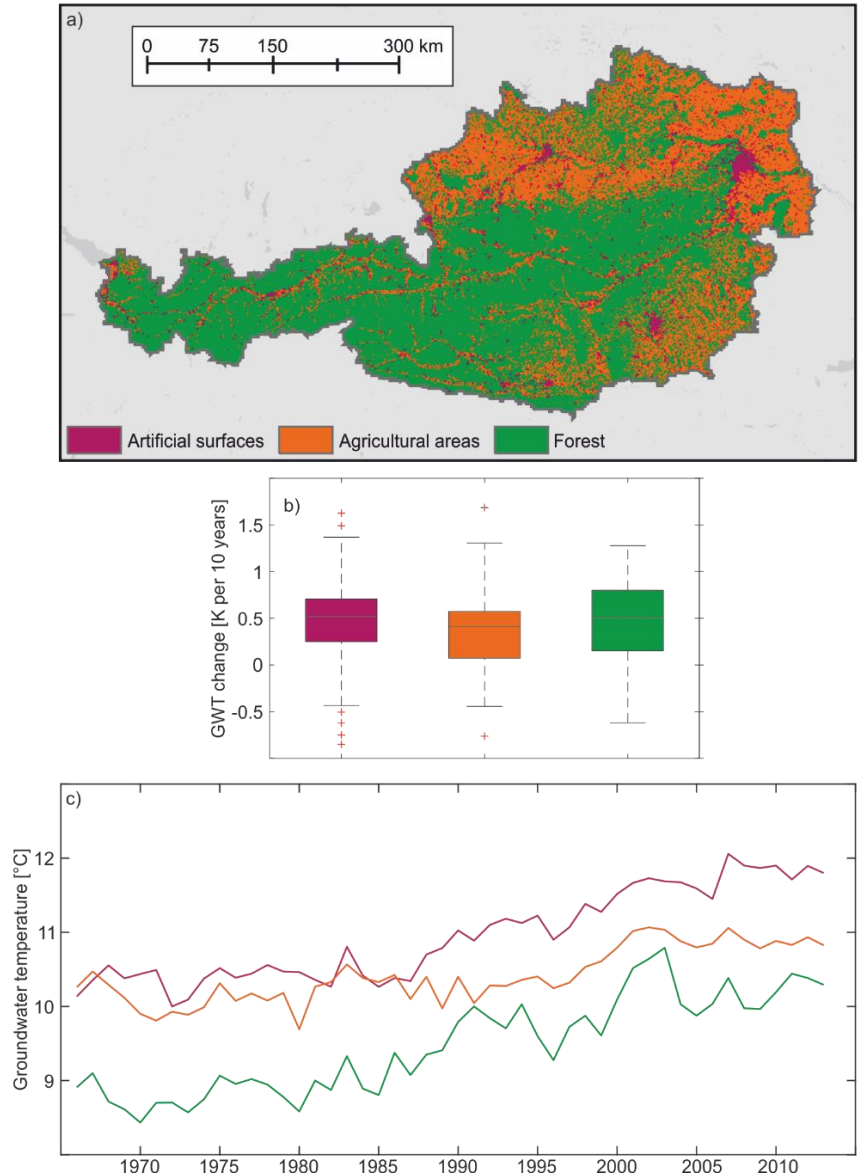
Figure S2. a) Corine Land Cover 2012 of Austria. None of the analyzed wells and weather stations experienced a land cover change since 1990. b) Relationship between land cover and groundwater temperature (GWT) change between 01/1994 and 12/2013. There appears to be no significant influence. c) Spatial median GWTs for each of the individual land cover classes.
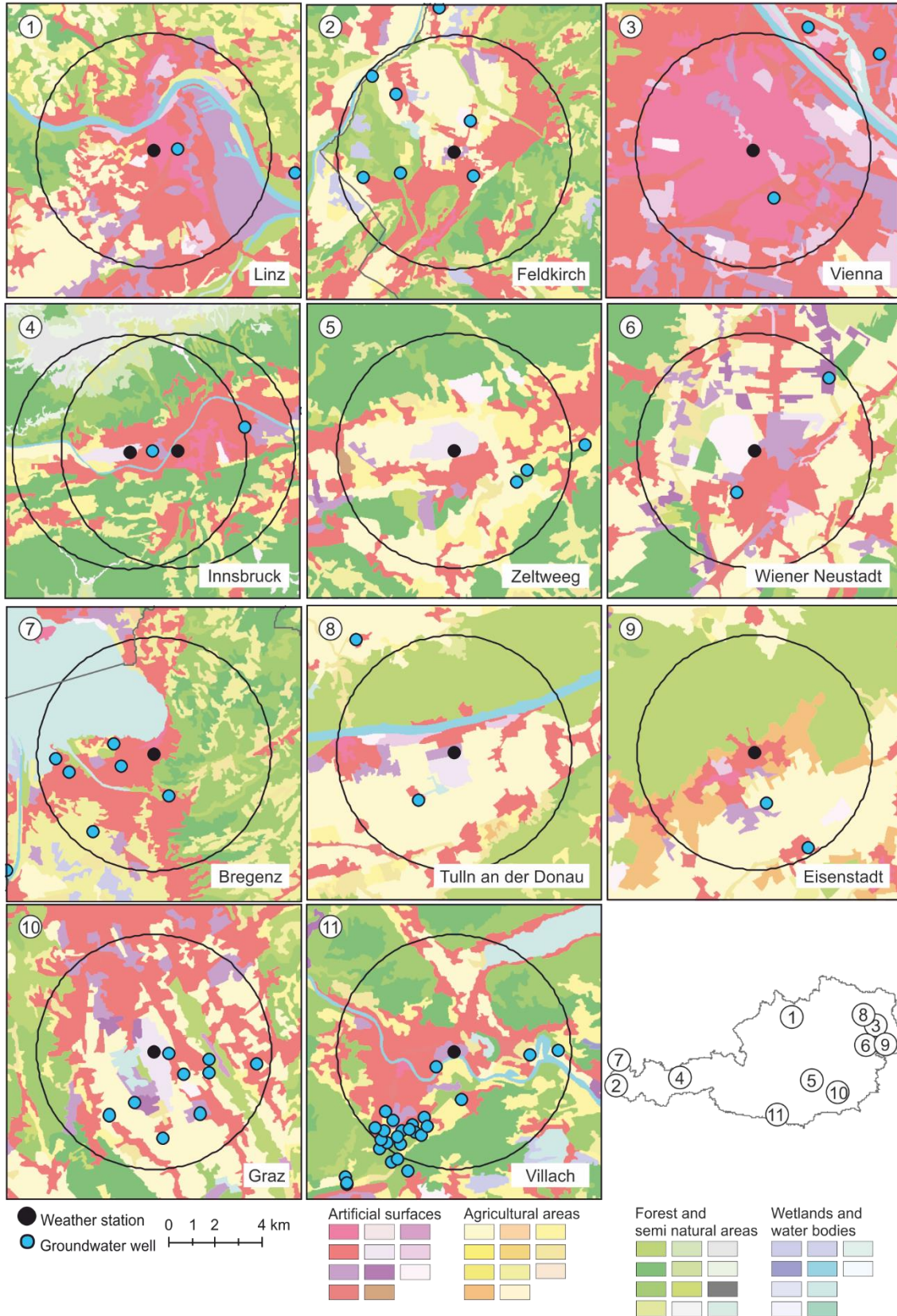
Figure S3: Location of all analysed weather stations and the surrounding wells. In the last part of this study all wells within 5 km (black circle) of any weather station are analysed.
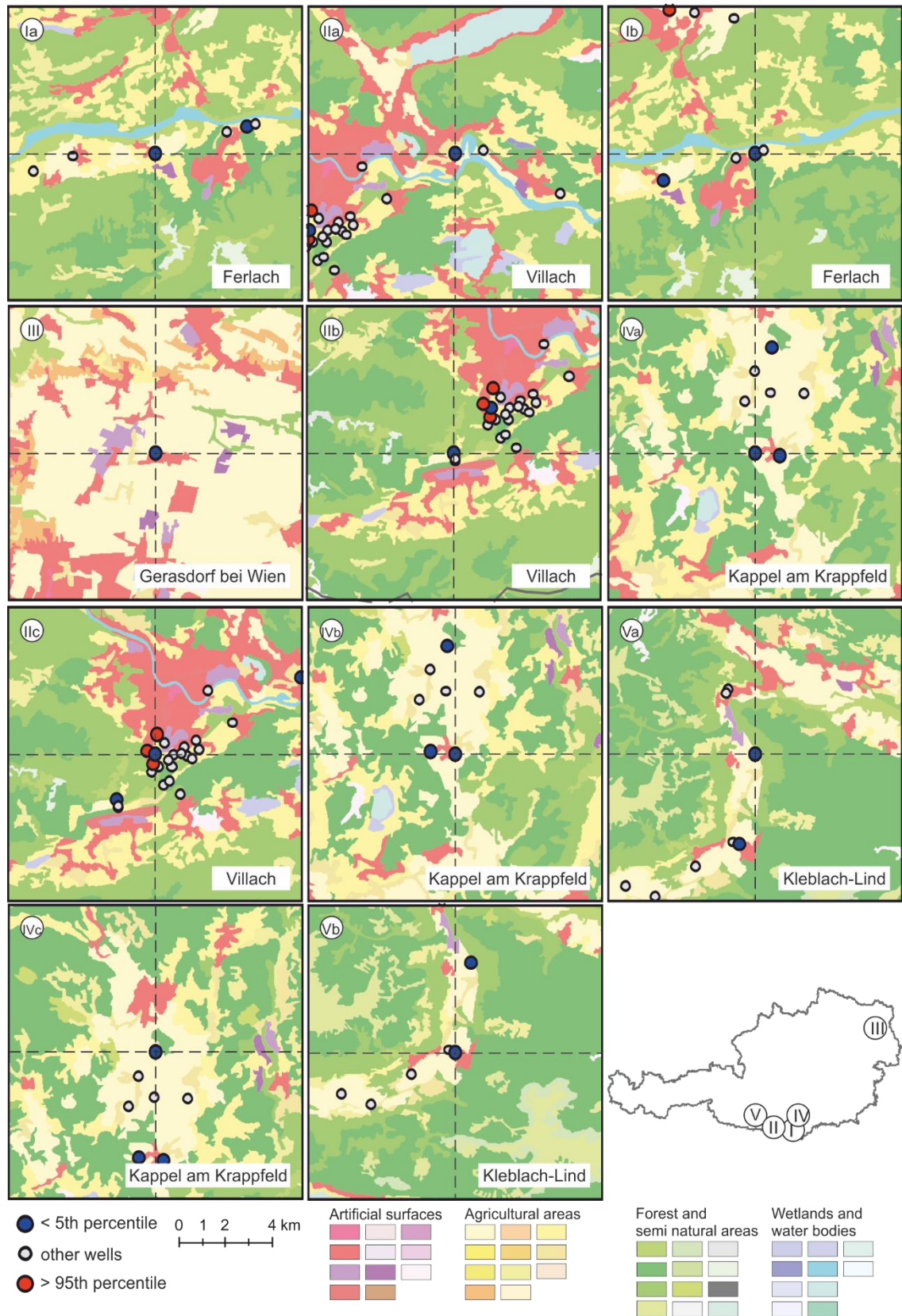
Figure S4. Location of all wells with a temperature change < 5th percentile.
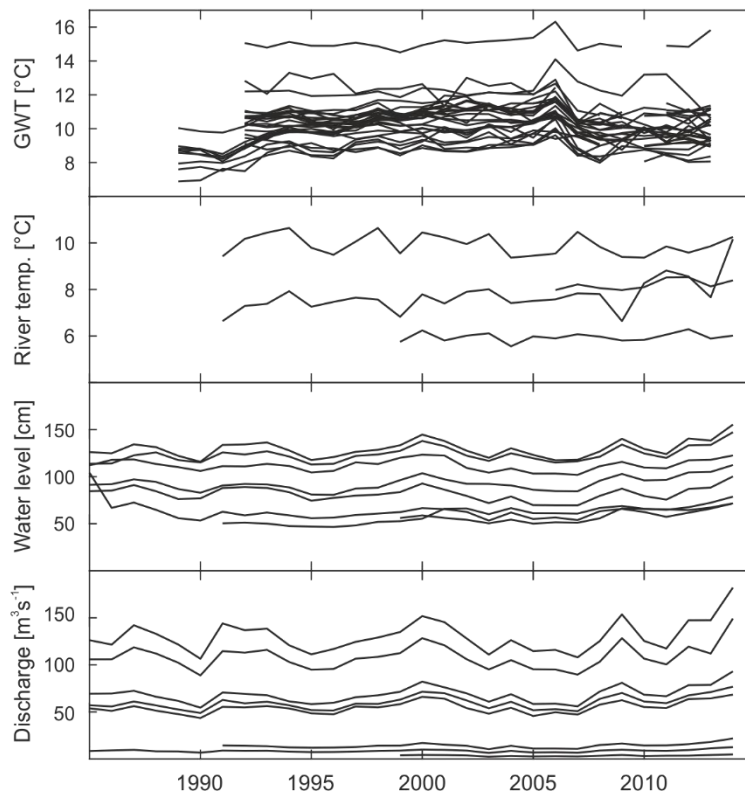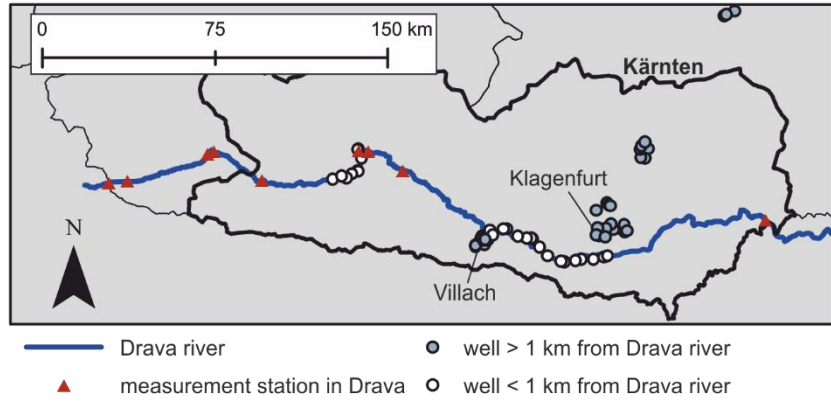
Figure S5. Location of the Drava river, the groundwater monitoring wells around it and measurement stations within the river (EHYD, 2017). Also shown is the groundwater time series of all wells within 1 km of the river and all measured river parameters. While GWTs show sudden temperature change in 2006, observed river parameters give no indication of an abnormal event around that time.
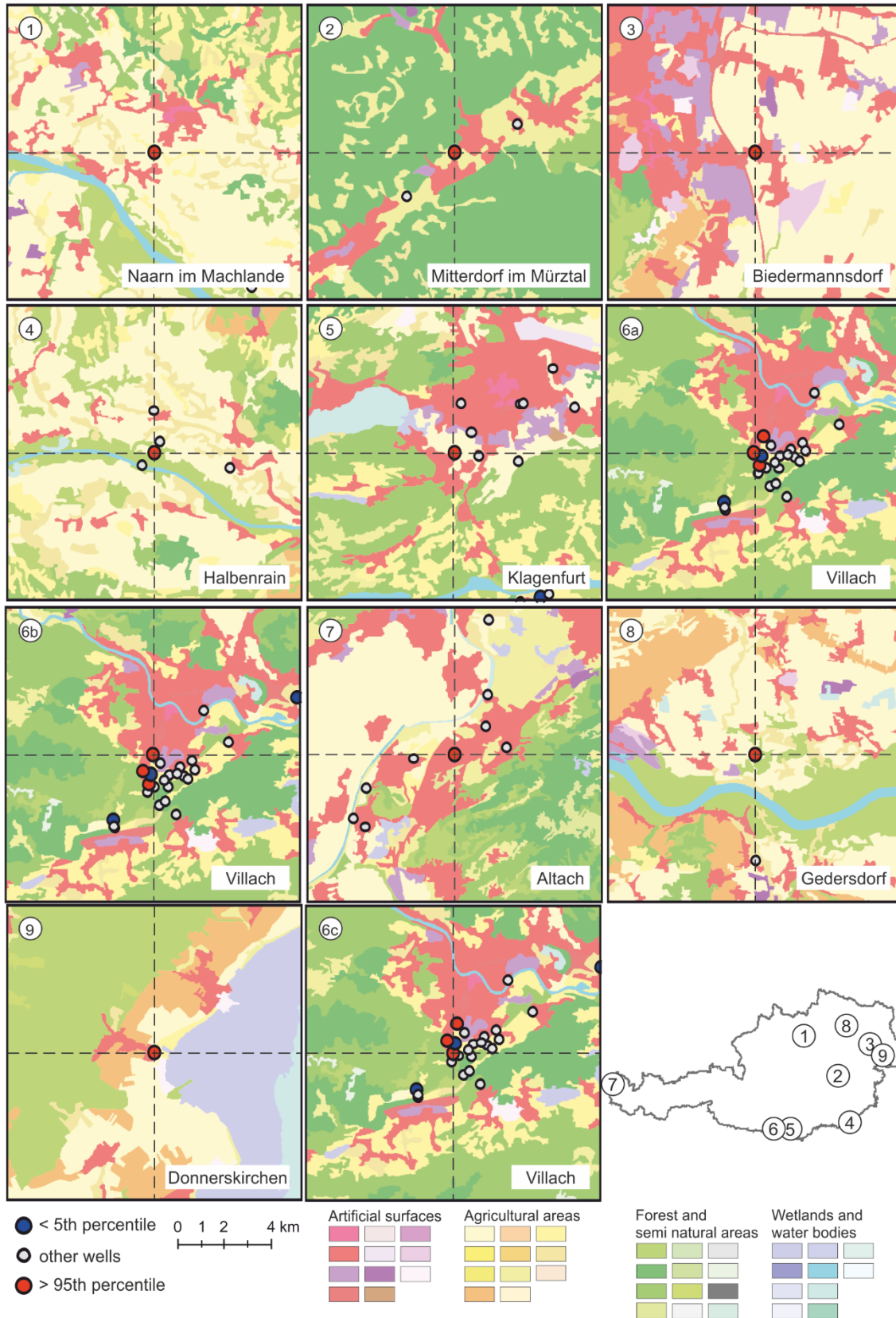
Figure S6. Location of all wells with a temperature change > 95th percentile.
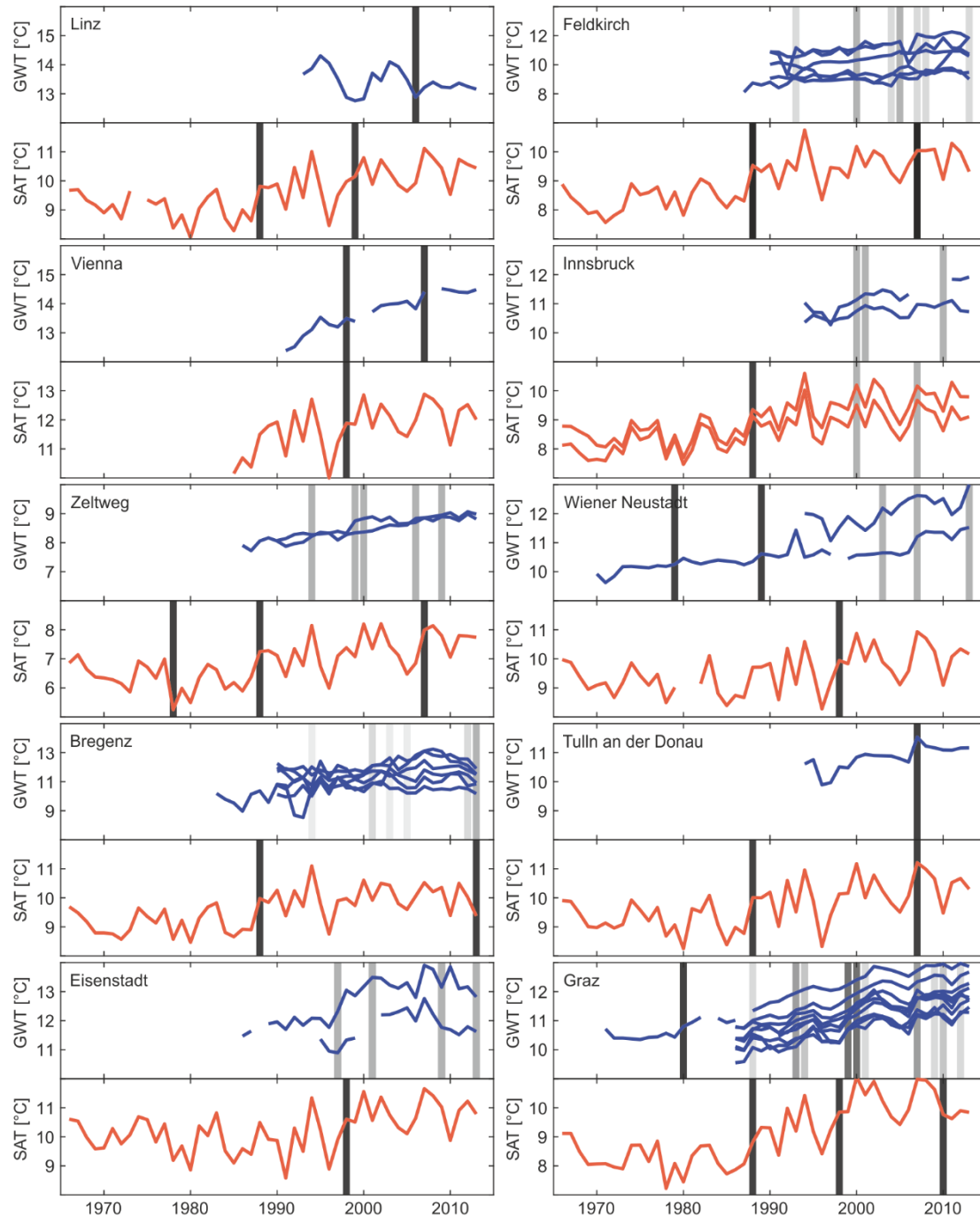
Figure S7. Climate regime shifts (CRS) of wells and weather stations within 5 km of each other. CRS are marked in grey, the darker the color the higher the percentage of wells, or rather weather stations, that observe a CRS at this point in time.

References

EHYD: http://ehyd.gv.at/#, access: 12.10.2017.