



## CO<sub>2</sub>-rich groundwater in Bad Teinach

In the town of Bad Teinach, SW Germany, CO<sub>2</sub>-rich groundwater is exploited for spa purposes.

### Anomalies

Multiple drillings have been established in Bad Teinach. The water produced is in most cases enriched in CO<sub>2</sub> compared to the reference value of 250 mg/l of Weertz and Weertz (2007), although a large variation in CO<sub>2</sub>-concentrations (286 – 2671 mg/l) is observed (Griesshaber et al., 1992; Käβ and Käβ, 2008). When assuming a maximum temperature of 12 °C for shallow groundwater (< 500 m depth) or a 10 + 30 °C/km geothermal gradient for deep groundwater (>500 m), the water in Bad Teinach exceptionally shows a positive thermal anomaly of max. +8 °C (Griesshaber et al., 1992; Käβ and Käβ, 2008). The occurrence of these geomaniifestations has been explained by the NW-SE-oriented, 10 km long and 1.5 km wide Nebulacher Graben that crosscuts two smaller, perpendicular faults and in this way facilitates upward fluid flow. Additionally, Bad Teinach is located in the periphery of volcanic sources (Käβ & Käβ, 2008).

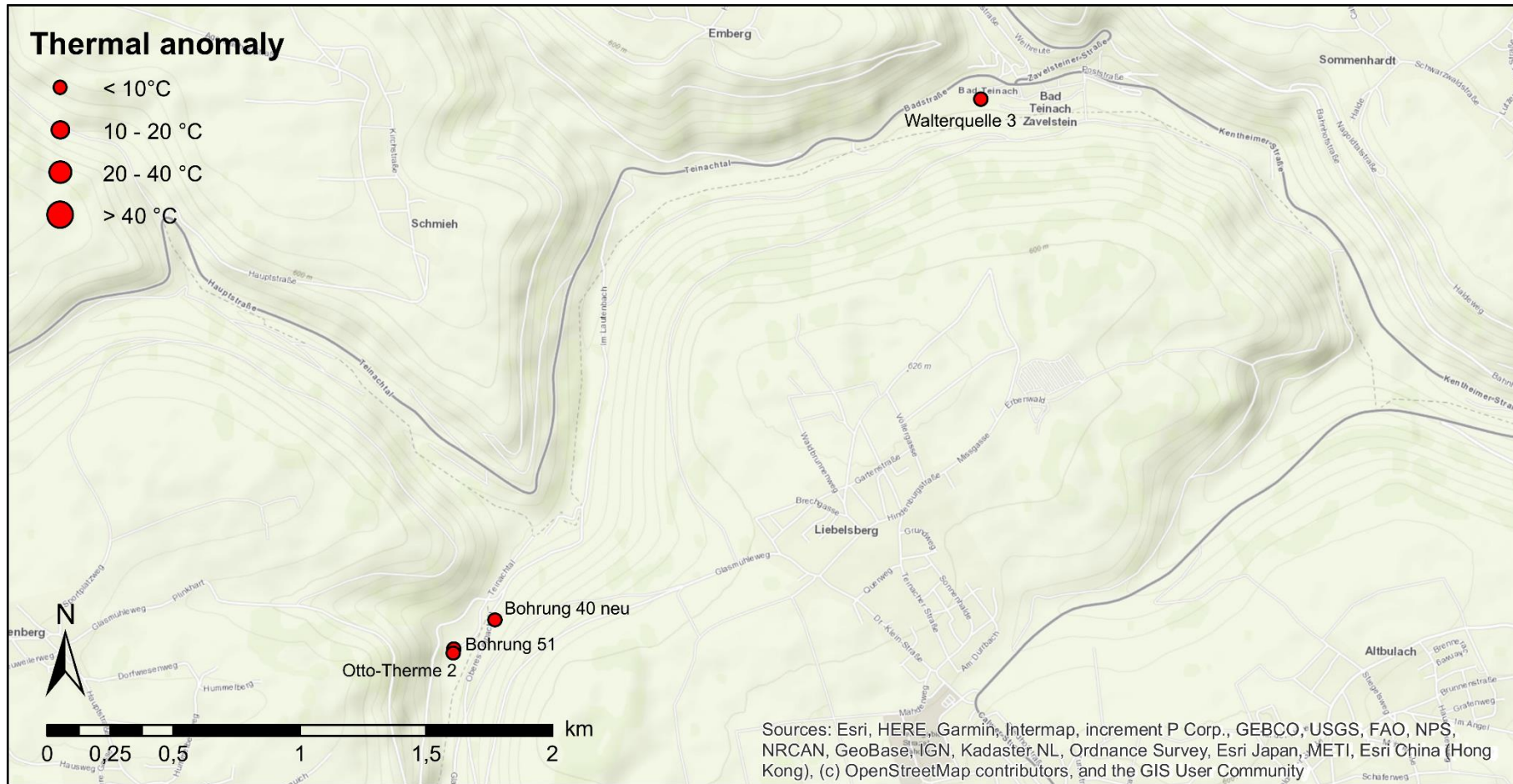


Figure 1: Thermal anomalies in Bad Teinach

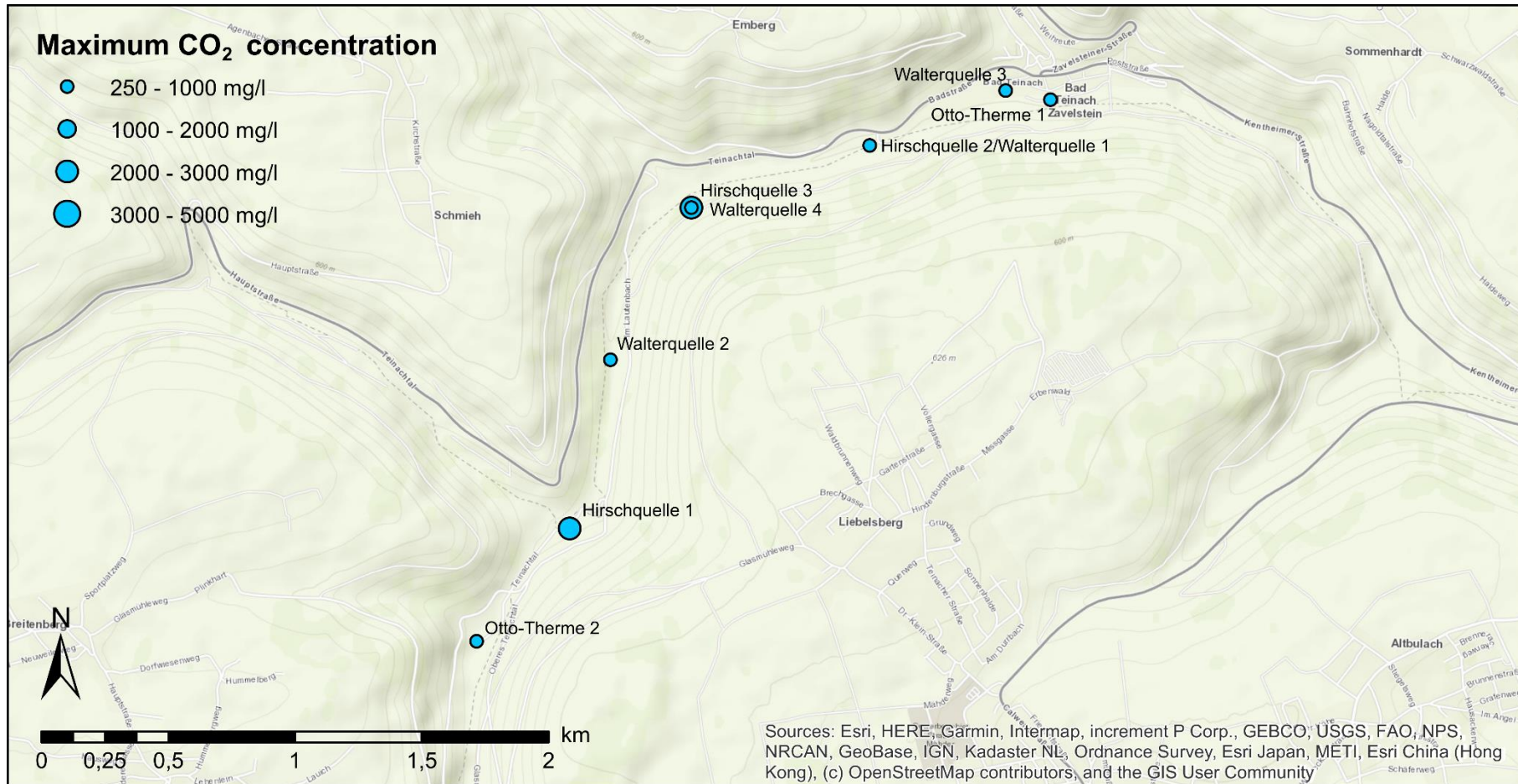


Figure 2: CO<sub>2</sub>-rich water in Bad Teinach



## Data

ID	Coordinates	T	Depth	TDS°	Cl	Na	SO <sub>4</sub>	Free CO <sub>2</sub>	He	<sup>3</sup> He/ <sup>4</sup> He	Analysis year	References
		°C	m	g/l	mg/l	mg/l	mg/l	mg/l	ppmv			
Hirschquelle 1	48°40'19" North 08°39'46" East	21			47	293	109	1844			<1992	Griesshaber et al. (1992)
										0.1	1992	
		13.7	500.4	2.09	37.3	251	92.6	2220				<2008
Hirschquelle 2 = Walterquelle 1	48°41'11" North 08°40'45" East	10	73	0.93				420			<2008	Käβ and Käβ (2008)
Hirschquelle 3	48°41'02" North 08°40'09" East	11	100.4	0.98				400			<2008	Käβ and Käβ (2008)
Walterquelle 4		16	513.7	3.73				2671			<2008	Käβ and Käβ (2008)
Otto-Therme 1	48°41'17" North 08°41'21" East	21.7	1001	1.82				286			<2008	Käβ and Käβ (2008)
Otto-Therme 2	48°40'04" North 08°39'28" East	20	460	1.93	44.9	344	118	608			<2008	Käβ and Käβ (2008)
Walterquelle 2	48°40'42" North 08°39'54" East	11	103	0.88				420			<2008	Käβ and Käβ (2008)
Walterquelle 3	48°41'18" North 08°41'12" East	13	134	0.86				380			<2008	Käβ and Käβ (2008)
Bohrung 40 neu	48°40'08" North 08°39'36" East	15	200	0.43				90			<2008	Käβ and Käβ (2008)
Bohrung 51	48°40'03" North 08°39'28" East	13	59	0.43				80			<2008	Käβ and Käβ (2008)

° TDS = Total Dissolved Solids

## References

- Griesshaber, E., O'Nions, R.K., Oxburg, E.R., 1992. Helium and carbon isotope systematics in crustal fluids from the Eifel, the Rhine Graben and Black Forest, F.R.G. *Chemical Geology* 99, 213-235.
- Käβ, W., Käβ, H., 2008. *Deutsches Baderbuch*, 2 ed. Vereinigung für Bäder- und Klimakunde e.V., Stuttgart.
- Weertz, J., Weertz, E., 2007. Eifelbronnetjes met een vulkanisch trekje. *Grondboor en Hamer* 2, 37-41.



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### Cite this source

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