



CO₂-seeps around the Laacher See

The Laacher See is a very popular tourism area in the Eifel. Abundant volcanic phenomena can be observed in the neighbourhood, but also multiple (different) expressions of CO₂-seepage, such as a cold-water geyser in Andernach and rising CO₂-bubbles in the Laacher See (mofettes). CO₂-enriched water is observed at many locations.

See also

[Volcanism in the Eifel](#), [He-anomalies in the Eifel](#)

Anomalies

Groundwater in the region of the Laacher See is very rich in CO₂. This is demonstrated by groundwater analyses showing CO₂-concentrations between 450 and 2631 mg/l, with an average of 1817 mg/l (Evrard et al., 2018; Griesshaber et al., 1992; Hänel, 2020; Michel, 1997), as well as by the occurrence of dry CO₂-springs, such as the Laacher See mofettes and the Wehrer Kessel mofette, and the cold CO₂-geyser in Andernach (van Overmeeren, 2014). In some cases, the shallow groundwater can be classified as thermal (> 12 °C) or displays a He-anomaly (He-content > 5.22 ppmv or ⁴He/³He > 1). The latter is discussed in more detail in the respective spreadsheet.

Seismicity has indicated that the Laacher See volcano is not fully extinct (Hensch et al., 2019). This is in correspondence with the isotopic composition of volcanic gasses, as well as the presence of hot, partially molten magma below the surface. This on-going volcanic activity explains the continuous delivery of CO₂, originating either from degassing magma or the upper mantle, which rises along faults at, amongst others, the rim of the Laacher See caldera (De Reijke, 2019; van Overmeeren, 2014).

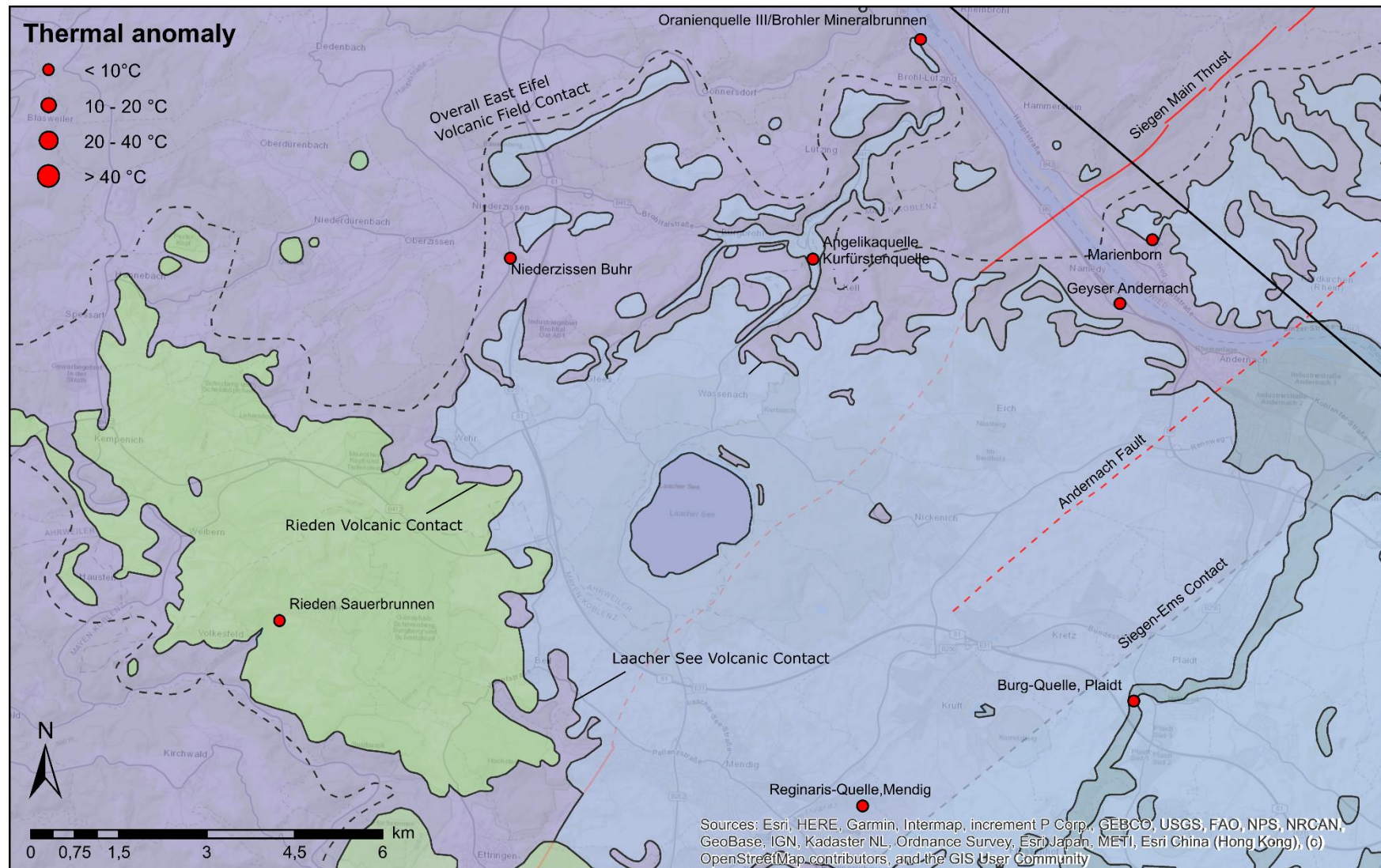


Figure 1: Thermal water around the Laacher See

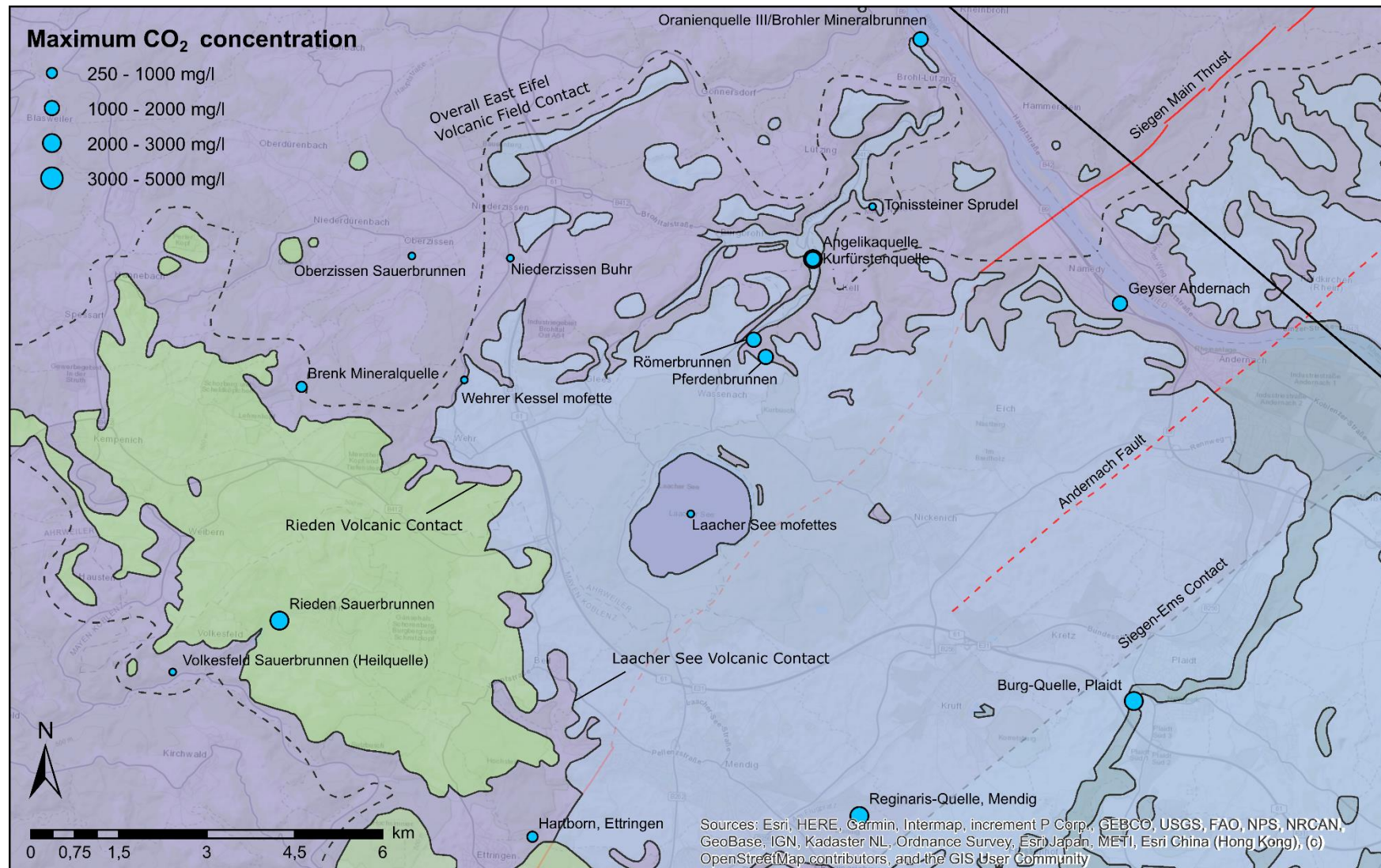


Figure 2: CO₂-seeps around the Laacher See



Data

ID	Coordinates	T	Depth	TDS°	Cl	Na	SO ₄	Free CO ₂	He	³ He/ ⁴ He	Analysis year	References	
		°C	m	g/l	mg/l	mg/l	mg/l	mg/l	ppmv				
Laacher See mofettes	50°24'46" North 07°16'14" East									5.4	1992	De Reijke (2019); van Overmeeren (2014); ... Griesshaber et al. (1992)	
		2.2 – 20.5						15.6 – 28.7	5.08 – 5.61	2001 – 2010	Bräuer et al. (2013)		
Volkesfeld Sauerbrunnen (Heilquelle)	50°23'04" North 07°08'37" East											Hänel (2020)	
Wehrer Kessel Mofette	50°25'58" North 07°12'47" East											van Overmeeren (2014), ...	
Sauerbrunnen Oberzissen	50°27'07" North 07°11'56" East									3.81	1992	Griesshaber et al. (1992)	
												Hänel (2020)	
Römerbrunnen	50°26'27" North 07°17'05" East	9.9							0.2	1.3	2000	Bräuer et al. (2013)	
		9.3		2.81				1452			2000	Hänel (2020)	
Pferdenbrunnen	50°26'17" North 07°17'16" East											Weertz and Weertz (2007)	
		9.6		1.16				1540			2000	Hänel (2020)	
Angelikaquelle	50°27'14" North	13,4	102	2,22	126	272	52	2260			2001	Hänel (2020)	
Kurfürstenquelle	07°17'55" East	13,8	80	3,88	250	554	69	1680			2001	Hänel (2020)	
Tönisteiner Sprudel	50°27'45" North 07°18'47" East											van Overmeeren (2014), ...	
Brohler Mineralbrunnen (Oranien Quelle III)	50°29'22" North 07°19'24" East	18	308	3.71	373	687	94	1874			1963	Michel (1997)	
Geyser Andernach (Namedy)	50°26'55" North 07°22'31" East	20			668	1218	188	1878			<1992	Griesshaber et al. (1992)	
										3.61	1992		
		18.4								1.6	3.8	2004	Bräuer et al. (2013)
													van Overmeeren (2014), ...



Brenk Mineralquelle	50°25'50" North 07°10'22" East	6.9		0.39				450			2002	Hänel (2020)
		11.1									2011	
Niederzissen Buhr	50°27'08" North 07°13'24" East	13									<2020	Hänel (2020)
Hartborn, Ettringen	50°21'38" North 07°14'03" East	9,3		0,41				990			<2020	Hänel (2020)
Rieden Sauerbrunnen	50°23'36" North 07°10'10" East	13			7	62	2	2310			<1992	Griesshaber et al. (1992)
										5.17	1992	
		8.1								0.2		1999
					16	240	28	2631			2005	Hänel (2020)
Marienborn Leutesdorf	50°27'32" North 07°23'08" East	12,9									<2020	Hänel (2020)
Reginaris-Quelle	50°21'57" North 07°18'55" East	11	17	2.91	38	371	47	2416			1952	Michel (1997)
										0.68	1992	Griesshaber et al. (1992)
		16.6							10.5	3.8	2000	Bräuer et al. (2013)
Burg-Quelle, Plaidt	50°23'08" North 07°22'56" East	13			41	418	91	2340			<1992	Griesshaber et al. (1992)
										3.18	1992	
		13.4							70	3.3	2000	Bräuer et al. (2013)

° TDS = Total Dissolved Solids

References

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Cite this source

Van Daele, J. & Ferket, H., 2021. CO₂-seeps around the Laacher See [Fact sheet]. Flemish Planning Bureau for the Environment and Spatial Development (VPO).