



Supplement of

Will groundwater-borne nutrients affect river eutrophication in the future? A multi-tracer study along the Elbe River

Julia Zill et al.

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Supplement S1

Table S1: Table list of all sampling location and analytical results from 2020. Sampling wells close to the Elbe River and situated in the floodplain are marked with an asterisk in column 'nu short'. Sampling wells marked with an x as 'nu short' were once sampled in 2020 (but not repeatedly in 2022).

nu short	nu	name	sampling date	elevation [mNN]	Lat	Lon	FOK [m.u. GOK]	FUK [m.u.GOK]	GW body	GW body label	EC [µS/cm]	pH	T [C°]	3H [TU]	2s-total err [TU]
0	20/401	Schmilka, Ilmenquelle	23.03.2020	210	50.893036	14.234812	spring	spring	spring	Kirnitzsch	118	6.37	8.9	5.11	0.51
0x	20/402	Ulbersdorf Quelle	23.03.2020	272	50.959444	14.210070	spring	spring	DEGB_DESN_EL-1-5	Sebnitz	165	7.56	6.4	6.03	0.57
1x	20/403	Silberquelle, Königsbrunnen	23.03.2020	158	50.907746	14.053095	spring	spring	DEGB_DESN_EL-1-6-1	Sandstein saechs Kreide	168	6.02	8	5.88	0.55
1	20/404	Mockenthal Muttergottsquelle	23.03.2020	126	50.968498	13.953651	Quelle	Quelle	DEGB_DESN_EL-1-1-2	Elbe	487	7.2	10.3	102	7.00
2	20/405	Graupa B7/91	06.04.2020	125	50.985198	13.919065	9.0	10.0	DEGB_DESN_EL-1-1-2	Elbe	544	6.72	10.9	7.67	0.65
3*	20/408	Dresden Wachwitz	07.04.2020	114	51.049700	13.820106	5.5	11.0	DEGB_DESN_EL-1-1-2	Elbe	1808	6.28	12.9	10.42	0.82
4*	20/409	Dresden (Saloppe) Elberadweg	07.04.2020	120	51.065219	13.771030	5.1	9.2	DEGB_DESN_EL-1-1-2	Elbe	306	6.8	11	5.96	0.55
6	20/410	Meißen Bohnitzsch Neubau 2017	01.04.2020	159	51.180307	13.496056	19.4	21.4	DEGB_DESN_EL-1-1-2	Elbe	900	6.46	11	6.42	0.57
5x	20/411	Coswig, GWM Pegel 2/97	01.04.2020	110	51.110078	13.583653	9.8	23.4	DEGB_DESN_EL-1-1-2	Elbe	1210	7.49	13.8	6.49	0.58
5	20/412	Coswig, Hy Cg Mn 106/90/1	06.04.2020	109	51.124938	13.583199	8.4	10.4	DEGB_DESN_EL-1-1-2	Elbe	1304	6.56	12.5	6.60	0.58
8*	20/414	Grödel, HyGdl 1/2007	06.04.2020	101	51.305970	13.367621	9.2	11.2	DEGB_DESN_EL-2-3	Nuenchritz	1163	7.07	11.8	6.88	0.60
9	20/415	Lorenzkirch Alternative #1	01.04.2020	96	51.360740	13.300935	9.0	11.0	DEGB_DEBB_SE-4-2	Elbe Urstromtal	631	6.57	11.1	5.42	0.52
14	20/416	Klöden	06.04.2020	75	51.757777	12.853710	7.1	12.0	DE_GB_DEBB_SE 4-2	Elbe Urstromtal	1206	6.83	12.3	4.67	0.48
16	20/417	Wittenberg	06.04.2020	77	51.874752	12.651775	12.0	14.0	DE_GB_DEST_EL 3-3	Suedflaeming und Elbtal Zahna	920	6.95	13.9	3.87	0.43
17	20/418	Thiesen	26.03.2020	129	51.917329	12.673387	12.0	14.0	DE_GB_DEST_EL 3-3	Suedflaeming und Elbtal Zahna	455	5.43	10.3	3.25	0.40
18*	20/419	Piesteritz, vor Kläranlage	06.04.2020	79	51.870978	12.594170	5.0	7.0	DE_GB_DEST_EL 3-2	Elbtal Wittenberg	514	6.64	11.8	5.55	0.52
19	20/420	Coswig	26.03.2020	116	51.911650	12.455420	20.0	24.0	DE_GB_DEST_EL 3-4	Suedflaeming und Elbtal Rossel	583	5.3	10	6.72	0.59
20*	20/421	Ziebigk	26.03.2020	62	51.850334	12.227230	4.0	6.0	DE_GB_DEST_EL 3-4	Suedflaeming und Elbtal Rossel	1212	6.39	11	5.31	0.51
23*	20/422	Walternienburg	26.03.2020	59	51.973541	11.947903	2.1	3.1	DE_GB_DEST_EN 2	Leitzkauer Moränenplatte und Elbtal Nuthe	305	6.01	9.2	6.78	0.59
25*	20/423	MD OT Cracau Fr. Ebert Str. 5	25.03.2020	49	52.120657	11.660480	6.2	8.2	DE_GB_DEST_EN 1	Westflaeming und Elbtal Ehle	2230	6.3	14	4.65	0.47

24	20/424	MD an B1-Brücke #Alt	25.03.2020	47	52.124760	11.692929	7.6	9.6	DE_GB_DEST_EN 1	Westflaeming und Elbtal Ehle	952	6.56	12.2	5.44	0.52
26*	20/426	Hohenwarte Ost	25.03.2020	51	52.228987	11.725113	5.0	7.0	DE_GB_DEST_OT 2	Colbitz-Letzlinger- Heide, Moränenlandschaft	428	6.07	10.9	6.42	0.58
27	20/427	Schartau	25.03.2020	42	52.288733	11.815321	21.0	23.0	DE_GB_DEST_HAV_UH_8	Rogaetzer Elbaue	721	6.98	8.5	4.81	0.48
28	20/428	Parey Siedlung	25.03.2020	38	52.376969	11.968339	13.5	15.5	DE_GB_DEST_HAV_UH_7	Burg-Ziesar Fläming, Moränenlandschaft	1074	7.18	10.9	0.54	0.29
30*	20/430	Schönhausen NW	24.03.2020	31	52.587270	12.025109	9.6	11.6	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	967	6.54	11.5	6.86	0.60
30x	20/431	Schönhausen ICE Ost	24.03.2020	30	52.590022	12.084893	8.3	9.3	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	1077	7.18	8.4	x	x
31	20/432	Schönhausen Damm (33382566) # Alt	24.03.2020	34	52.590782	12.125635	9.0	11.0	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	505	7.46	10.7	3.47	0.41
31x	20/435	Sandau Holländerei	24.03.2020	27	52.789347	12.076858	10.9	12.9	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	635	9.96	9.9	6.28	0.56
32x	20/436	Räbel Fl	24.03.2020	26	52.842500	12.014227	3.3	4.3	DE_GB_DEST_MBA 4	Elbe Urstromtal Aaland	568	6.56	8.6	3.64	0.42

nu short	14C [pMC]	δ13C [‰ _{VPOB}]	TIC [mg/l]	DOC [mg/l]	15N (NO3) ref_air	18O (NO3) ref_VSMOW	δ2H [‰]	δ18O [‰]	Excess	PO4 [mg/l]	Cl [mg/l]	SO4 [mg/l]	NO3 [mg/l]	K+ [mg/l]	Na+ [mg/l]	Mg2+ [mg/l]	Ca2+ [mg/l]
0	11.1	-19.3	6.6	-1.9	-0.7	7.1	-65.1	-9.49	10.8	0.12	4.6	27.0	9.2	2.71	4.42	2.82	11
0x	x	-19.2	1.9	-0.7	5.0	0.7	-58.6	-8.39	8.5	0.11	7.8	29.9	31.5	10.7	8.11	3.73	15.4
1x	x	x	2.6	-1.3	-2.4	5.2	-61.7	-8.95	9.9	<0,05	4.4	52.9	9.8	2.02	3.77	4.24	17
1	x	x	4.5	1.4	7.5	1.5	-62.4	-8.89	8.7	<0,05	30.7	119	48.3	3.69	17.9	12.1	51.3
2	95.2	-21.2	15.3	1.4	7.3	2.5	-61.8	-8.84	8.9	<0,05	76.7	94.6	27.1	2.22	19	17	59.1
3	72.4	-20.7	50.3	15.6	8.2	0.2	-60.0	-8.44	7.5	0.51	381	174	37.1	10.9	185	30	137
4	99.5	-20.9	8.9	1.2	5.6	1.3	-59.5	-8.55	8.9	0.11	12.9	85.5	5.0	2.43	11.1	8.67	35.9
6	79.8	-16.9	22.8	14.9	5.0	0.6	-63.9	-9.08	8.7	0.31	53.0	230	115	3.24	27.1	31.8	127
5x	81.4	-21.7	46.0	6.3	x	x	-63.4	-8.82	7.2	1.03	83.5	306	<2,5	15.2	135	27.1	96.8
5	63.4	-20.3	30.3	5.3	6.4	0.8	-62.2	-8.80	8.2	0.53	34.7	548	60.9	3.54	42	88.7	133
8	100.0	-16.4	53.9	9.4	7.5	0.0	-64.3	-9.05	8.1	0.18	54.5	244	88.2	33.7	40.4	68.6	89.8
9	101.0	-19.3	23.6	3.3	8.7	2.2	-66.2	-9.33	8.4	1.44	23.2	179	38.2	9.6	20.1	23.5	76.2
14	96.0	-19.0	26.8	10.2	x	x	-61.2	-8.60	7.6	1.24	116.4	312	<2,5	3.64	40.3	28.6	159
16	68.5	-18.1	37.0	9.0	x	x	-62.4	-8.75	7.6	0.45	91.9	179	<0,5	15.9	56.9	12	111
17	90.1	-21.2	3.0	3.9	x	x	-65.2	-9.31	9.3	0.07	25.0	163	<0,25	3.82	13	7.23	53

18	73.9	-17.9	17.5	4.3	9.1	3.8	-60.6	-8.66	8.7	1.24	26.6	99.1	36.8	15.8	20.9	6.03	56.6
19	x	-21.3	0.0	0.3	x	x	-66.1	-9.43	9.3	0.21	47.0	231	<0,5	2.66	11.4	13.5	71.2
20	73.8	-18.6	37.7	8.9	28.4	13.8	-62.6	-8.82	8.0	0.14	68.7	391.0	<2,5	15.8	51.1	31	162
23	x	-21.2	10.3	6.1	17.1	7.2	-58.6	-8.20	7.0	0.12	14.9	47.9	41.7	9.47	5.48	4.51	38.3
25	74.9	-18.2	44.0	13.2	x	x	-59.9	-8.45	7.7	0.46	286	607	<2,5	15.5	217	30.3	221
24	93.9	-16.9	33.5	14.1	x	x	-55.3	-7.67	6.1	1.68	72.4	238	<0,5	5.07	57.8	15.8	113
26	x	-17.4	10.4	7.1	11.7	6.6	-55.9	-8.06	8.6	0.19	36.4	55.7	57.6	11.1	19.3	6	44.8
27	54.9	-14.0	31.6	5.9	x	x	-62.7	-8.77	7.5	0.47	44.6	160	<0,5	2.95	28.4	9.39	101
28	89.0	-15.8	44.0	12.8	x	x	-44.1	-5.25	-2.1	0.76	110	180	<2,5	5.7	61.4	13.6	139
30	79.2	-19.0	29.6	8.8	x	x	-58.2	-8.19	7.3	0.90	93.0	203	<0,5	2.02	63.1	15.4	94.1
30x	62.9	-19.0	38.4	12.3	x	x	-60.7	-8.66	8.6	0.64	72.5	290	3.6	1.17	30.9	14.7	173
31	60.6	-13.7	33.2	1.9	x	x	-63.6	-9.02	8.6	0.16	17.7	83.9	<0,5	0.793	11.4	3.03	86.8
31x	x	x	26.1	2.8	x	x	-60.3	-8.67	9.1	0.65	37.0	151	<0,5	1.69	13.6	12.3	91
32x	x	x	33.4	4.2	13.7	5.9	-56.1	-8.07	8.5	4.79	15.5	76.6	17.8	31.2	25.1	10.7	47.3

Table S2: Table list of all sampling location and analytical results from 2022. Sampling wells close to the Elbe River and situated in the floodplain are marked with an asterisk in column 'nu short'.

nu short	nu	name	sampling date	elevat [mNN]	Lat	Lon	FOK [m.u. GOK]	FUK [m.u.G OK]	GW body	GW body label	EC [µS/cm]	pH	T [°C]	3H [TU]	3H err [TU]
0	22/1100	Schmilka, Ilmenquelle	19.04.2022	210	50.893036	14.234812	spring	spring	DEGB_DESN_EL-1-6-2	Kirnitzsch	122.3	6.11	8.7	4.2	0.5
1	22/1101	Mockenthal Muttergottsquelle	19.04.2022	126	50.968498	13.953651	spring	spring	DEGB_DESN_EL-1-1-2	Elbe	475	6.03	10.3	88	8.6
2	22/1102	Graupa B7/91	19.04.2022	125	50.985198	13.919065	9.0	10.0	DEGB_DESN_EL-1-1-2	Elbe	559	6.20	11.1	3.7	0.5
3*	22/1103	DD Wachwitz PB1/00	19.04.2022	114	51.049700	13.820106	5.5	11.0	DEGB_DESN_EL-1-1-2	Elbe	2330	6.49	13.1	7.6	0.9
4*	22/1104	DD Koerner Elberadweg	20.04.2022	120	51.065219	13.771030	5.1	9.2	DEGB_DESN_EL-1-1-2	Elbe	394	6.69	10.1	4.9	0.7
5	22/1105	Coswig, Hy Cg Mn 106/90/1	20.04.2022	109	51.124938	13.583199	8.4	10.4	DEGB_DESN_EL-1-1-2	Elbe	1190	6.51	11.9	4.5	0.6
6	22/1106	Meißen Bohnitzsch Neubau 2017	20.04.2022	159	51.180307	13.496056	19.4	21.4	DEGB_DESN_EL-1-1-2	Elbe	931	6.38	11.5	4.3	0.6
7	22/1107	Paußitz	20.04.2022	93	51.391828	13.226512	8.1	10.1	DEGB_DESN_EL-2-5-6	Doellnitz Dahle	18.5	6.06	12.1	5.3	0.6
8*	22/1108	Grödel, HyGdl 1/2007	21.04.2022	101	51.305970	13.367621	9.2	11.2	DEGB_DESN_EL-2-3	Nuenchritz	1230	7.18	11.4	5.5	0.7
9	22/1109	Jacobsthal (Alt. Lorenzkirch)	21.04.2022	96	51.360740	13.300935	9.0	11.0	DEGB_DEBB_SE-4-2	Elbe Urstromtal	619	6.66	10.9	3.9	0.5

10	22/1110	Dörschnitz	08.06.2022	132	51.228376	13.330335	6.0	8.0	DEGB_DESN_EL-2-4	Jahna	927	7.11	11.7	3.7	0.5
12	22/1112	Torgau Ost	06.04.2022	84	51.524858	13.031508	11.0	13.0	DEGB_DESN_EL-2-1	Schwarzer Graben	662	5.32	10.9	3.2	0.5
13*	22/1113	Torgau Betonwerk	06.04.2022	83	51.568567	12.987833	11.9	14.0	DEGB_DESN_EL-2-1	Schwarzer Graben	1012	6.93	12.7	3.6	0.5
14	22/1114	Klößen	06.04.2022	75	51.757777	12.853710	7.1	12.0	DE_GB_DEBB_SE 4-2	Elbe Urstromtal	1187	6.96	11.6	2.9	0.5
15	22/1115	Dabrun	08.04.2022	68	51.833993	12.715290	7.2	9.2	DE_GB_DEST_EL 3-1	Elbtal Moraenenlandschaft Duebener Heide	945	6.50	10.8	4.1	0.6
16	22/1116	Wittenberg	08.04.2022	77	51.874752	12.651775	12.0	14.0	DE_GB_DEST_EL 3-3	Suedflaeming und Elbtal Zahna	837	7.12	13.4	2.8	0.4
17	22/1117	Thießen	08.04.2022	129	51.917329	12.673387	12.0	14.0	DE_GB_DEST_EL 3-3	Suedflaeming und Elbtal Zahna	423	5.66	10.2	2.2	0.4
18*	22/1118	Piesteritz, vor Kläranlage	08.04.2022	79	51.870978	12.594170	5.0	7.0	DE_GB_DEST_EL 3-2	Elbtal Wittenberg	555	6.33	11.6	4.1	0.5
19	22/1119	Coswig	11.04.2022	116	51.911650	12.455420	20.0	24.0	DE_GB_DEST_EL 3-4	Suedflaeming und Elbtal Rossel	617	5.66	9.5	5.7	0.7
20*	22/1120	Ziebigk	11.04.2022	62	51.850334	12.227230	4.0	6.0	DE_GB_DEST_EL 3-4	Suedflaeming und Elbtal Rossel	1226	6.81	10.1	4.1	0.5
21	22/1121	Aken	11.04.2022	54	51.844489	12.044278	9.0	11.0	DE_GB_DEST_SAL GW 023	Akener Elbaue	1413	6.88	11.6	4.4	0.5
22	22/1122	Schönebeck Agip	11.04.2022	50	52.025753	11.706561	4.9	6.9	DE_GB_DEST_EN 3	Magdeburger Triaslandschaft und Elbtal	1776	7.24	11.2	4.7	0.5
23*	22/1123	Walternienburg	13.04.2022	59	51.973541	11.947903	2.1	3.1	DE_GB_DEST_EN 2	Leitzkauer Moränenplatte und Elbtal Nuth	340	6.36	8.2	8.2	0.8
24	22/1124	MD Ehlegrund Brunnen 9 an B1 (Alt. GübserDa)	13.04.2022	47	52.124760	11.692929	7.6	9.6	DE_GB_DEST_EN 1	Westflaeming und Elbtal Ehle	944	7.10	12	5	0.6
25*	22/1125	MD Fr. Ebert Str. Cracau	13.04.2022	49	52.120657	11.660480	6.2	8.2	DE_GB_DEST_EN 1	Westflaeming und Elbtal Ehle	2310	6.70	13.9	4.3	0.5
26*	22/1126	Hohenwarte Ost	26.04.2022	51	52.228987	11.725113	5.0	7.0	DE_GB_DEST_OT 2	Colbitz-Letzlinger- Heide, Moränenlandschaft	437	6,22	10,3	7.8	0.8
27	22/1127	Schartau	26.04.2022	42	52.288733	11.815321	21.0	23.0	DE_GB_DEST_HAV _UH_8	Rogaetzer Elbaue	690	7,62	11,5	0.7	0.2
28	22/1128	Parey Siedlung	26.04.2022	38	52.376969	11.968339	13.5	15.5	DE_GB_DEST_HAV _UH_7	Burg-Ziesar Fläming, Moränenlandschaft	1353	7,69	13,6	4.7	0.6
29*	22/1129	Schelldorf	21.04.2022	34	52.470010	11.971709	7.0	9.0	DE_GB_DEST_OT 3	Elbe Ohre Urstromtal	714	6.78	10.6	3.4	0.4
30*	22/1130	Schönhausen NW	21.04.2022	31	52.587270	12.025109	9.6	11.6	DE_GB_DEST_HAV _UH_5	Elburstromtal und westbrandenburgisc he Endmoraene	916	6.88	11	3.3	0.5

31	22/1131	Schönhausen D #Alt	21.04.2022	34	52.590782	12.125635	9.0	11.0	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	524	7.71	10.6	5.7	0.7
32	22/1132	Scharlibbe	22.04.2022	30	52.699828	12.082418	15.4	17.4	DE_GB_DEST_HAV_UH_5	Elburstromtal und westbrandenburgische Endmoraene	493	7.18	11.1	6.5	0.7
34	22/1134	Neukirchen	22.04.2022	33	52.880529	11.848241	3.4	5.4	DE_GB_DEST_MBA_4	Elbe Urstromtal Aaland	958	6.68	9.6	4.5	0.5
35	22/1135	Hassel	22.04.2022	23	52.644932	11.929619	6.5	8.0	DE_GB_DEST_MBA_3	Atmaerkische Moraenenlandschaft Uchte	814	7.43	10.8	5	0.6

run nu	trit 3He [TU]	trit 3He error [TU]	3H+3He	4He [ccSTP/kg]	4He error	Ne [ccSTP/kg]	3He/4He	3He/4He error	Ne/He	Ne/He error	T/H age	d13C [‰]	¹⁴ C [pmc]	Trad (J.BP)	DIC mg/l	DO C mg/l	CO2 [ppm] headsp	N2O [ppb] headsp	SF6 [ppt] headsp	CFC12 [ppt] headsp	CFC11 [ppt] headsp
0	0.54	0.50	4.74	4.74E-05	4.74E-07	2.06E-04	1.40E-06	1.40E-08	4.34	0.04	2	x	x	x	1.9	3.2	1214.5	10696.9	6.60	284.7	301.3
1	2.24	0.50	90.24	5.45E-05	5.45E-07	2.21E-04	1.05E-05	1.05E-07	4.05	0.04	x	-19.72	373.03	recent/aktic	3.8	5.8	4672.6	45241.2	5.18	255.8	91.8
2	3.94	0.50	7.64	5.48E-05	5.48E-07	2.26E-04	1.52E-06	1.52E-08	4.13	0.04	13	-20.09	101.46	recent/aktic	6.0	12.1	2616.1	8475.1	3.82	196.6	125.7
3*	0.92	0.50	8.52	4.87E-05	4.87E-07	2.05E-04	1.38E-06	1.38E-08	4.21	0.04	2	-19.42	71.17	3321	80.2	23.4	x	x	x	x	x
4*	1.51	0.50	6.41	5.67E-05	5.67E-07	2.37E-04	1.42E-06	1.42E-08	4.19	0.04	5	-20.58	84.54	1926	6.6	9.6	3701.4	20378.9	4.40	255.3	99.6
5	5.57	0.50	10.07	6.26E-05	6.26E-07	2.55E-04	1.58E-06	1.58E-08	4.08	0.04	14	-18.43	376.33	recent/aktic	21.7	12.8	6573.2	39397.7	5.14	266.5	164.4
6	11.43	0.50	15.73	8.00E-05	8.00E-07	1.95E-04	1.13E-06	1.13E-08	2.43	0.02	23	-15.67	75.86	2796	13.6	13.4	1256.7	15781.3	4.26	128.7	78.5
7	13.33	0.50	18.63	4.44E-05	4.44E-07	1.64E-04	1.79E-06	1.79E-08	3.70	0.04	22	-19.43	106.6	recent	8.3	14.2	2683.3	5157.3	7.61	320.5	146.0
8*	0.76	0.50	6.26	5.90E-05	5.90E-07	2.43E-04	1.39E-06	1.39E-08	4.12	0.04	2	-15.77	99.1	662	56.1	11.6	341.9	7600.6	6.93	718.3	34916.5
9	8.82	0.50	12.72	6.23E-05	6.23E-07	2.25E-04	1.54E-06	1.54E-08	3.61	0.04	21	-18.91	99.58	610	16.0	13.4	2345.6	2773.2	6.03	355.6	268.3
10	x	x	x	x	x	x	x	x	x	x	x	-15.86	74.51	2292	55.0	10.7	4041.0	19322.3	5.85	275.5	97.2
12	29.40	0.50	32.60	2.75E-04	2.75E-06	2.37E-04	5.69E-07	5.69E-09	0.86	0.01	41	-19.11	88.7	1505	2.6	8.5	266.0	5717.8	5.28	144.4	78.6
13*	9.22	0.50	12.82	1.29E-04	1.29E-06	4.98E-04	1.62E-06	1.62E-08	3.97	0.04	23	x	x	x	27.7	13.5	933.3	1597.0	3.79	133.7	109.4
14	19.12	0.50	22.02	7.45E-05	7.45E-07	2.07E-04	1.54E-06	1.54E-08	2.78	0.03	36	-18.17	94.8	1003	22.2	17.2	109.0	184.9	2.48	79.4	37.5
15	25.88	0.50	29.98	2.48E-05	2.48E-07	1.13E-04	2.94E-06	2.94E-08	4.57	0.05	35	-19.73	88.2	939	13.0	13.8	5537.5	264.9	6.53	243.9	19.9
16	11.04	0.50	13.84	5.00E-05	5.00E-07	1.91E-04	1.74E-06	1.74E-08	3.81	0.04	28	-16.86	61.78	3781	32.5	12.2	1699.1	175.4	4.58	138.9	14.4

17	4.71	0.50	6.91	5.14E-05	5.14E-07	2.32E-04	1.60E-06	1.60E-08	4.51	0.05	20	x	x	x	0.7	7.1	1124.0	295.2	7.64	367.7	70.5
18 *	8.02	0.50	12.12	3.09E-05	3.09E-07	1.36E-04	1.84E-06	1.84E-08	4.41	0.04	19	-17.96	54.18	5466	7.8	13.5	921.1	279.5	8.75	392.6	60.1
19	102.38	0.50	108.08	5.46E-05	5.46E-07	2.36E-04	6.05E-06	6.05E-08	4.31	0.04	52	x	x	x	0.3	3.9	1944.6	273.8	43.9	151.0	38.4
20 *	9.03	0.50	13.13	5.70E-05	5.70E-07	2.02E-04	1.53E-06	1.53E-08	3.55	0.04	21	-18.13	80.04	2378	36.0	13.6	72.3	326.6	30.8	139.6	68.3
21	31.65	0.50	36.05	8.10E-05	8.10E-07	1.53E-04	1.36E-06	1.36E-08	1.89	0.02	37	-18.73	64.12	4113	37.6	16.1	230.7	225.6	6.88	150.5	73.7
22	3.86	0.50	8.56	4.68E-05	4.68E-07	1.94E-04	1.51E-06	1.51E-08	4.14	0.04	11	-19.88	72.57	2504	67.8	10.9	197.2	1741.0	6.01	368.6	99.9
23 *	1.68	0.50	9.88	6.13E-05	6.13E-07	1.98E-04	1.09E-06	1.09E-08	3.23	0.03	3	-22.60	81.42	2228	5.5	18.3	1110.9	1109.6	27.0	<50	88.9
24	0.84	0.50	5.84	5.10E-05	5.10E-07	2.20E-04	1.41E-06	1.41E-08	4.32	0.04	3	-15.11	57.87	4937	28.0	14.1	x	x	x	x	x
25 *	7.05	0.50	11.35	1.24E-04	1.24E-06	2.02E-04	6.73E-07	6.73E-09	1.63	0.02	17	-17.84	67.95	3680	46.6	15.7	37.4	160.8	12.0	190.9	30.9
26 *	2.77	0.50	10.57	3.30E-05	3.30E-07	1.41E-04	1.50E-06	1.50E-08	4.29	0.04	5	18.46	64.31	4135	3.1	17.7	1295.9	1634.7	974	335.0	87.9
27	11.95	0.50	12.65	9.38E-05	9.38E-07	2.27E-04	1.12E-06	1.12E-08	2.42	0.02	51	-14.31	64.94	4011	28.0	10.4	273.4	379.6	180	399.1	107.8
28	8.63	0.50	13.33	5.67E-05	5.67E-07	2.23E-04	1.66E-06	1.66E-08	3.93	0.04	19	-14.48	58.01	4918	25.8	11.2	23.9	320.6	344	381.8	111.8
29 *	4.73	0.50	8.13	4.23E-05	4.23E-07	1.34E-04	1.20E-06	1.20E-08	3.18	0.03	15	-17.69	76.9	2039	21.6	11.0	921.4	3098.0	7.76	420.8	138.7
30 *	15.59	0.50	18.89	1.59E-04	1.59E-06	2.11E-04	6.88E-07	6.88E-09	1.33	0.01	31	-17.88	70.81	3362	26.6	14.8	900.3	1984.9	3.68	174.0	49.2
31	34.18	0.50	39.88	5.04E-05	5.04E-07	2.15E-04	3.06E-06	3.06E-08	4.26	0.04	35	-13.24	65.91	3938	27.6	11.7	395.1	3096.7	4.63	211.2	65.5
32	15.57	0.50	22.07	4.48E-05	4.48E-07	1.90E-04	2.17E-06	2.17E-08	4.23	0.04	22	-18.94	65.99	3268	19.9	22.9	848.3	2824.0	4.80	112.8	67.2
34	5.60	0.50	10.10	4.63E-05	4.63E-07	2.08E-04	1.67E-06	1.67E-08	4.50	0.04	14	-18.43	104.2	261	37.9	16.4	3468.7	4354.5	7.16	348.9	103.8
35	1.77	0.50	6.77	2.82E-05	2.82E-07	1.30E-04	1.56E-06	1.56E-08	4.60	0.05	5	-12.27	73.25	3090	27.6	11.2	<10	838.7	3.06	132.8	32.8

run nu	SF6 [mol/l] water	CFC12 [Mol/l] water	CFC11 [mol/l] water	15N (NO3) ref_air	18O (NO3) ref_VSMOW	δ2H [‰]	δ18O [‰]	excess	PO4 [mg/l]	Cl [mg/l]	SO4 [mg/l]	NO3 [mg/l]	K [mg/l]	Na [mg/l]	Mg [mg/l]	Ca [mg/l]
0	2.52E-15	1.09E-13	1.15E-13	0.7	12.9	-64.3	-9.47	11.46	<0,05	4.9	26.9	9.7	1.59	2.64	1.69	7.02
1	2.00E-15	9.85E-14	3.54E-14	8.3	2.6	-61.9	-8.86	8.98	0.08	30.5	116	47.6	2.31	11.9	7.63	34.6
2	1.47E-15	7.57E-14	4.84E-14	6.6	1.5	-61.4	-8.76	8.68	<0,05	63.4	91.2	36.1	1.97	22.1	13.3	49.9
3*	x	x	x	12.2	1.2	-59.2	-8.24	6.72	0.17	286	399	35.9	8.09	94	21.1	236
4*	1.70E-15	9.84E-14	3.84E-14	9.3	12.9	-61.2	-8.81	9.28	<0,05	17.9	103	5.6	2.91	11.2	9.32	47.6

5	1.99E-15	1.03E-13	6.35E-14	7.1	0.0	-61.5	-8.68	7.94	0.10	36.8	386	62.2	2.59	32.2	62.3	111
6	1.63E-15	4.94E-14	3.01E-14	7.3	-1.4	-63.3	-8.99	8.62	0.15	53.2	214	131	2.8	22.4	25.7	108
7	2.94E-15	1.24E-13	5.65E-14	22.4	21.2	-63.4	-8.86	7.48	<0,05	55.7	288	7.4	1.98	19.5	26.1	83.1
8*	2.68E-15	2.77E-13	1.35E-11	6.3	-0.7	-62.1	-8.71	7.58	0.13	47.1	201	112	19.6	25.9	41.2	56
9	2.33E-15	1.37E-13	1.04E-13	8.5	1.1	-65.4	-9.22	8.36	0.06	22.8	153	40.0	16.1	18.8	20	68.5
10	2.25E-15	1.06E-13	3.74E-14	17.7	58.4	-62.8	-8.96	8.88	2.97	58.2	158.8	0.4	3.66	29.2	20	139
12	2.05E-15	5.59E-14	3.04E-14	6.8	0.8	-63.8	-8.96	7.88	<0,05	48.1	161	90.8	4.35	16.5	12.4	73.4
13*	1.47E-15	5.18E-14	4.24E-14	33.6	62.1	-61.9	-8.64	7.22	1.69	52.1	280	<2,5	13	24.9	25.8	118
14	9.60E-16	3.08E-14	1.45E-14	x	x	-61.2	-8.78	9.04	1.11	102	290	<2,5	3.62	43	26.4	150
15	2.53E-15	9.46E-14	7.71E-15	x	x	-60	-8.59	8.72	0.30	54.9	335	<0,5	0.977	25	26.4	126
16	1.77E-15	5.38E-14	5.59E-15	x	x	-62.6	-8.82	7.96	0.23	72.4	158	<0,5	15.3	45.8	11.9	111
17	2.94E-15	1.42E-13	2.71E-14	x	x	-65.3	-9.36	9.58	0.06	24.8	148	<0,25	3.24	12.2	5.98	44.3
18*	3.39E-15	1.52E-13	2.33E-14	7.8	2.7	-60.8	-8.68	8.64	0.75	27.0	145	28.1	12.1	25.8	6.82	69
19	1.69E-14	5.82E-14	1.48E-14	x	x	-66.4	-9.44	9.12	0.12	47.3	228	<0,5	2.55	11.4	13.5	72.8
20*	1.19E-14	5.42E-14	2.65E-14	25.2	36.8	-61.8	-8.73	8.04	0.11	63.2	387	<2,5	14.5	50	32.2	176
21	2.67E-15	5.85E-14	2.86E-14	x	x	-61.8	-8.66	7.48	1.47	72.6	467	<2,5	12.2	37.8	30.1	248
22	2.34E-15	1.43E-13	3.88E-14	24.4	12.6	-60.2	-8.4	7	<0,05	124	447	50.3	8.89	101	40	262
23*	1.05E-14	1.90E-14	3.45E-14	17.4	8.9	-60.4	-8.46	7.28	<0,05	17.5	59.2	51.5	7.31	6.64	5.58	45.3
24	x	x	x	x	x	-52.4	-6.84	2.32	1.06	76.7	235	1.1	4.45	51.1	15.2	115
25*	4.67E-15	7.42E-14	1.20E-14	x	x	-60.2	-8.4	7	0.28	286	563	<2,5	14.5	229	30.3	229
26*	3.78E-13	1.30E-13	3.42E-14	12.4	8.1	-57.5	-8.15	7.7	<0,05	36.1	66.0	71.5	13.3	16	7.3	53.4
27	7.01E-14	1.55E-13	4.20E-14	x	x	-62.2	-8.73	7.64	0.36	45.3	148	<0,5	2.97	30.2	9.5	104
28	1.34E-13	1.49E-13	4.35E-14	x	x	-43.7	-5.25	-1.7	0.54	85.0	445	<2,5	5.01	46.8	16.5	203
29*	3.02E-15	1.64E-13	5.40E-14	21.6	14.0	-57.6	-8.26	8.48	<0,05	47.7	171	12.7	1.08	10.6	9.47	71
30*	1.43E-15	6.78E-14	1.92E-14	x	x	-57.2	-7.95	6.4	1.09	87.9	183	<0,5	1.55	55.2	13.6	81.8
31	1.80E-15	8.23E-14	2.55E-14	x	x	-63.2	-8.94	8.32	0.13	19.6	84.8	<0,5	0.339	4.89	1.27	39.8
32	1.87E-15	4.40E-14	2.62E-14	x	x	-60.2	-8.56	8.28	0.12	21.6	89.0	<0,25	16.9	11	5.92	62.3
34	2.79E-15	1.36E-13	4.04E-14	x	x	-57	-8.13	8.04	8.49	86.2	133	<0,5	76	32	10.4	57.4
35	1.19E-15	5.18E-14	1.28E-14	10.5	10.4	-58.9	-8.32	7.66	0.97	14.2	135	154	10.9	13.1	11.5	119

Figure S1: Figure of CFC-11 versus CFC-12 using a PFM (blue line) as approximation for the aquifer geometry. Groundwater samples are represented by a black point. A zoom into the sample cluster is marked by a red frame.

