Assessing sustainable development of deep aquifers – Supplementary Information

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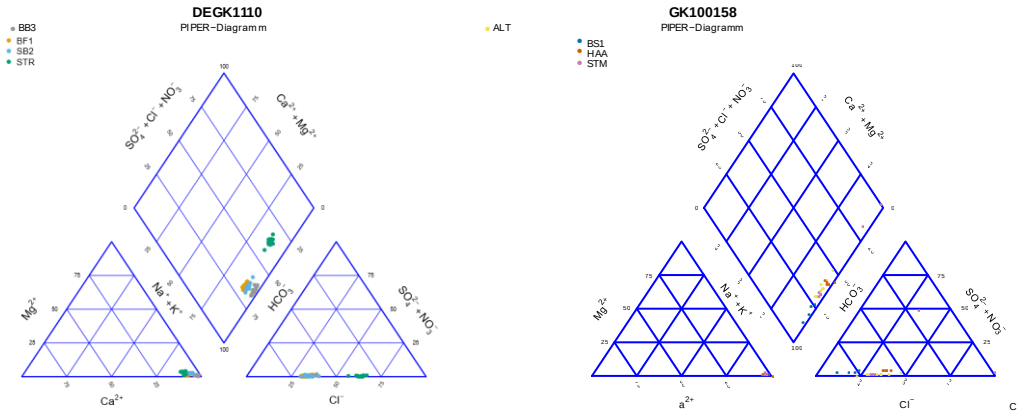

Fig. 1 Piper diagrams showing general hydrochemical composition of the assessed groundwater samples. Top graph shows wells in the GK100158 while those within DEGK1110 are displayed in the bottom graph.

Table 1 Results of mean and RSD values for TDS and each parameter when individual ions (Cl$^-$, HCO$_3^-$ and Na$^+$ were left out in the clustering process in BF1. The top values are calculated by Diana, the bottom values are calculated by kmeans.

		All data w/o Cl$^-$		w/o HCO$_3^-$		w/o Na$^+$	
		Mean	RSD	Mean	RSD	Mean	RSD
		/mg/L	/%	/mg/L	/%	/mg/L	/%
Na$^+$	Diana	295.65	0.03	295.65	0.03	301.26	0.02
	kmeans	295.65	0.03	296.31	0.03	308.01	0.02
K$^+$		19.84	0.21	19.84	0.21	17.75	0.13
		19.84	0.21	19.74	0.20	17.63	0.13
Ca^{2+}		21.11	0.15	21.11	0.15	21.18	0.13
		21.11	0.15	21.20	0.14	20.87	0.10
Mg^{2+}		3.52	0.30	3.52	0.30	3.87	0.25
		3.52	0.30	3.57	0.28	3.85	0.25
F$^-$		6.52	0.08	6.52	0.08	6.00	0.12
		6.52	0.08	6.48	0.08	5.68	0.18
Cl$^-$		162.57	0.04	162.57	0.04	166.39	0.04
		162.57	0.04	163.61	0.04	167.13	0.04
SO$_4^{2-}$		3.41	0.47	3.41	0.47	3.88	0.41
		3.41	0.47	3.52	0.44	4.39	0.31
HCO$_3^-$		593.47	0.01	593.47	0.01	606.85	0.02
		593.47	0.01	595.29	0.01	615.96	0.02
sum		1106.09	0.01	1106.09	0.01	1127.19	0.02
		1106.09	0.01	1109.71	0.01	1143.53	0.01
							1113.84	0.02

Table2 Resultsofmeanand RSDvaluesforTDSandeachparameterwhenindividualions(Cl$^-$ andHCO$_3^-$ wereleftoutintheclustering processinSB2.IncontrasttoBF1,theclusterstructuredidnotchangewhenexcludingNa$^+$,whichiswhythecorrespondingcolumnisnotshown inTable 2.Thetopvaluesarecalculatedby Diana,thebottomvaluesarecalculatedbykmeans.

		All data w/o Cl$^-$		w/o HCO$_3^-$)	
		Mean /mg/L	RSD /%	Mean /mg/L	RSD /%
Na$^+$	Diana	276.64	0.03	277.50	0.04
	kmeans	276.64	0.03	274.73	0.03
K$^+$		15.92	0.05	16.42	0.13
		15.92	0.05	15.90	0.05
Ca^{2+}		12.80	0.12	12.96	0.13
		12.80	0.12	12.51	0.12
Mg^{2+}		4.38	0.02	4.42	0.03
		4.38	0.02	4.38	0.02
F$^-$		5.81	0.05	5.87	0.06
		5.81	0.05	5.80	0.05
Cl$^-$		157.93	0.05	161.64	0.11
		157.93	0.05	156.82	0.05
SO$_4^{2-}$		4.16	0.04	73.62	0.31
		4.16	0.04	77.03	0.24
HCO$_3^-$		547.15	0.02	545.08	0.01
		547.15	0.02	542.75	0.01
sum		1024.80	0.02	1027.52	0.03
		1024.80	0.02	1016.65	0.01
				1034.05	0.02

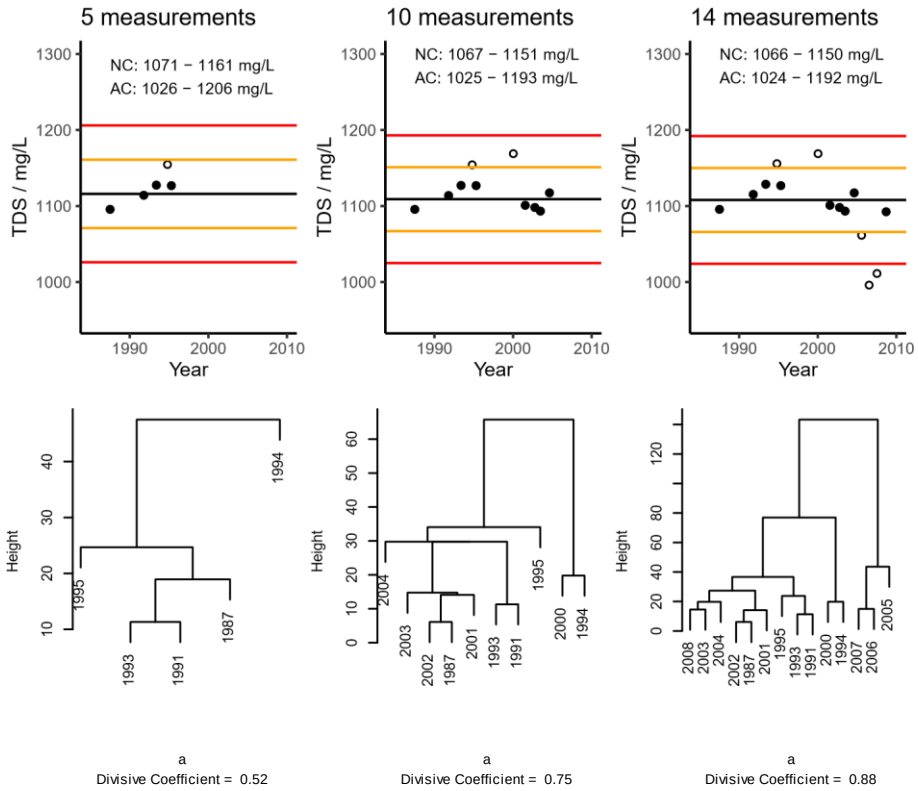

Fig. 2 Development of corridors with growing data set based on the Diana algorithm. The solid black dots represent the data points that were included in the main cluster.

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