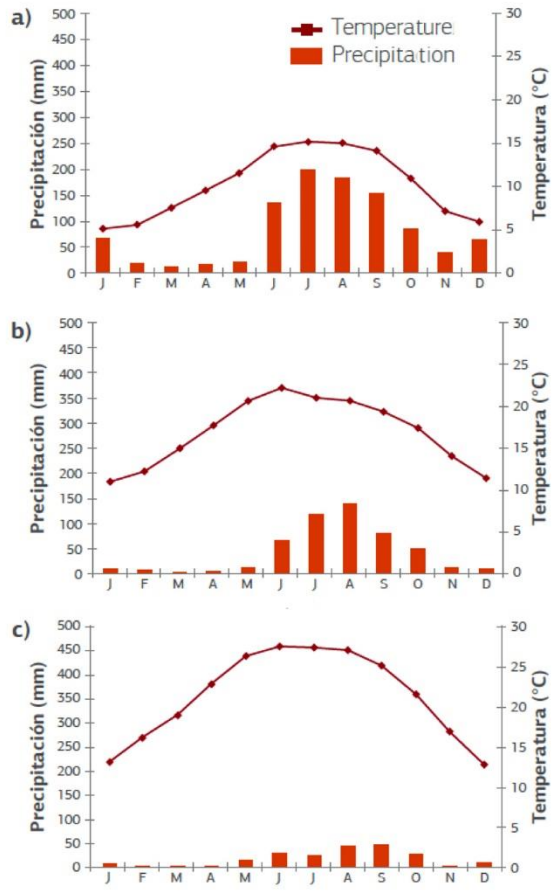
S1. Seasonality effect in trend analysis

The database of our study contained yearly data of groundwater quality; however, the samples were not collected on the same date every year, but at seemingly random days. Besides, not every sample contained all four parameters of interest (NO_3-N, TDS, Na^+, and RAS). Rather, some wells had one or more of these parameters missing. In average, the study area comprised 200 wells, 150 of which contained 10 or more yearly data, and 26 that contained 10 or more yearly data after the September samples were removed. Therefore, the effect of seasonality was verified in 26 wells. The seasonality effect was addressed by removing measurements collected in September from the calculations (the reasons for choosing September are explained below) and recalculating the trends for those wells with a remaining 10 or more data. The original Z and recalculated Z (Z -Sep) were then compared (see Table S1).



Why September?

According to official reports [39], the climate of Aguascalientes, Durango and Zacatecas varies greatly with slope (topography), for which it is divided into three zones: a) high mountains, b) valleys, and c) arid and semiarid basins.

Despite the rainy season extending from June to September in all three (a, b, and c) zones, the amount of water is not the same; it decreases sharply from regions a to c, as shown in the figure at left [39].

During September, rain infiltrating throughout the ongoing rainy season would produce the largest effect on groundwater quality.

Table S1. Variation of Z (statistics Mann-Kendal trend analysis) of wells containing 10 or more data and with the September samples removed (Z -Sep.). Measurements whose trends switched from significant (Z > 1.98) to not significant, or *vice versa,* are shown in bold, n.a. = data not reported.

Well	NO_3-N		TDS		Na^+		SAR	
	Z	Z -Sep.	Z	Z -Sep.	Z	Z -Sep.	Z	Z -Sep.
AGU19	2.96	3.04	0.78	0.00	0.16	0.89	-0.47	0.00
AGU42	1.71	1.79	1.09	0.90	**1.40**	**2.33**	n.a.	n.a.
AGU49	2.49	2.15	0.63	0.72	0.62	0.18	n.a.	n.a.
AGU7	0.93	1.07	0.16	-0.35	-0.93	-0.36	-1.71	-1.07
AGU9	1.40	1.43	0.78	0.72	-0.47	0.00	-1.09	-0.54
DUR733	-2.25	-2.00	0.07	0.06	n.a.	n.a.	n.a.	n.a.
DUR734	-1.06	-0.79	0.25	0.45	n.a.	n.a.	n.a.	n.a.
DUR785	-1.40	-1.61	0.79	0.72	-0.78	-0.89	-1.26	-1.25
CCN5240	0.00	1.07	0.47	1.43	n.a.	n.a.	n.a.	n.a.
CCN5245M1	2.65	2.68	0.08	0.45	-0.31	-0.18	-0.47	0.00
CCN5247M1	2.96	3.22	3.11	3.04	n.a.	n.a.	n.a.	n.a.
CCN5248M1	**2.49**	**1.97**	-0.23	0.00	n.a.	n.a.	n.a.	n.a.
CCN5249M1	3.11	3.04	1.56	1.07	n.a.	n.a.	n.a.	n.a.
CCN5263M1	-2.80	-2.68	-0.31	0.00	n.a.	n.a.	n.a.	n.a.
CCN5284M1	1.09	0.33	**2.18**	**1.79**	n.a.	n.a.	n.a.	n.a.
ZAC2586	0.78	0.78	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ZAC2589M1	0.31	0.54	0.00	0.00	2.80	2.68	n.a.	n.a.
ZAC2593	0.16	0.16	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ZAC2595M1	1.43	1.43	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ZAC2598	-0.16	-0.18	0.16	0.54	n.a.	n.a.	n.a.	n.a.
ZAC2606	1.40	1.61	0.62	1.07	n.a.	n.a.	n.a.	n.a.
ZAC2611	0.47	0.54	-0.78	1.07	n.a.	n.a.	n.a.	n.a.
ZAC2612	-1.71	-1.79	-0.23	-0.18	n.a.	n.a.	n.a.	n.a.
ZAC2623M1	0.62	0.89	-0.70	-0.63	n.a.	n.a.	n.a.	n.a.
ZAC2632	-1.09	-1.07	-0.62	-0.54	-0.16	-0.18	0	0
ZAC2633	n.a.	n.a.	-0.16	0.00	n.a.	n.a.	n.a.	n.a.

Table S1 shows that three wells (out of 26 wells and 63 measurements) changed their trend once the September data were removed; two of them became not statistically significant for each NO_3-N and TDS, and one Na^+ measurement changed its trend from not significant to significantly increasing. The small number of changes leads to the conclusion that seasons do not substantially affect the trends. However, the number of data involved in the analysis were limited. A future study with a larger dataset is needed to confirm this finding.