

## **Variable description**

### **Trends in groundwater chemistry across Sweden during 1980–2020**

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**Table 1** Variable description for the dataset on decadal trends in groundwater chemistry across Sweden during 1980–2020. NA is not available.

Variable	Unit	Characteristic	Period	Measure	Comment
Station_name	unitless	Name of groundwater well location			
Station_ID	unitless	ID of groundwater well location			
Latitude	°N	Latitude (WGS84) of groundwater well location			
Longitude	°E	Longitude (WGS84) of groundwater well location			
Aquifer_type	unitless	Aquifer type (unconfined/confined)			
Well_Depth	m	Depth of water intake in groundwater well (set to zero for wells in springs)			
Screen_Length	m	Vertical extent of water intake in well			
Lithology	unitless	Dominant minerals in reservoir bedrock (Silicate / Carbonate)			
Median_1980-2000_DIC	mg C / L	Dissolved inorganic carbon concentration	1980–2000	Median	

Median_2000-2020_DIC	mg C / L	Dissolved inorganic carbon concentration	2000-2020	Median	
Median_1980-2020_DIC	mg C / L	Dissolved inorganic carbon concentration	1980-2020	Median	
Median_1980-2000_CO2	mg C / L	Dissolved carbon dioxide concentration	1980-2000	Median	
Median_2000-2020_CO2	mg C / L	Dissolved carbon dioxide concentration	2000-2020	Median	
Median_1980-2020_CO2	mg C / L	Dissolved carbon dioxide concentration	1980-2020	Median	
Median_1980-2000_HCO3	mEq / L	Dissolved bicarbonate concentration	1980-2000	Median	
Median_2000-2020_HCO3	mEq / L	Dissolved bicarbonate concentration	2000-2020	Median	
Median_1980-2020_HCO3	mEq / L	Dissolved bicarbonate concentration	1980-2020	Median	
Median_1980-2000_pH	unitless	pH value	1980-2000	Median	
Median_2000-2020_pH	unitless	pH value	2000-2020	Median	
Median_1980-2020_pH	unitless	pH value	1980-2020	Median	

Median_1980-2000_Ca	mEq / L	Ca2+ concentrations	1980-2000	Median	
Median_2000-2020_Ca	mEq / L	Ca2+ concentrations	2000-2020	Median	
Median_1980-2020_Ca	mEq / L	Ca2+ concentrations	1980-2020	Median	
Median_1980-2000_Mg	mEq / L	Mg2+ concentration	1980-2000	Median	
Median_2000-2020_Mg	mEq / L	Mg2+ concentration	2000-2020	Median	
Median_1980-2020_Mg	mEq / L	Mg2+ concentration	1980-2020	Median	
Median_1980-2000_Na	mEq / L	Na+ concentration	1980-2000	Median	
Median_2000-2020_Na	mEq / L	Na+ concentration	2000-2020	Median	
Median_1980-2020_Na	mEq / L	Na+ concentration	1980-2020	Median	
Median_1980-2000_K	mEq / L	K+ concentration	1980-2000	Median	
Median_2000-2020_K	mEq / L	K+ concentration	2000-2020	Median	

Median_1980-2020_K	mEq / L	K+ concentration	1980-2020	Median	
Median_1980-2000_SO4	mEq / L	SO4 2- concentration	1980-2000	Median	
Median_2000-2020_SO4	mEq / L	SO4 2- concentration	2000-2020	Median	
Median_1980-2020_SO4	mEq / L	SO4 2- concentration	1980-2020	Median	
Median_1980-2000_NO3	mEq / L	NO3- concentrations	1980-2000	Median	
Median_2000-2020_NO3	mEq / L	NO3- concentrations	2000-2020	Median	
Median_1980-2020_NO3	mEq / L	NO3- concentrations	1980-2020	Median	
Median_1980-2000_Cl	mEq / L	Cl- concentration	1980-2000	Median	
Median_2000-2020_Cl	mEq / L	Cl- concentration	2000-2020	Median	
Median_1980-2020_Cl	mEq / L	Cl- concentration	1980-2020	Median	
Median_1980-2000_SO4_SO4HCO3	(mEq / L) / (mEq / L)	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980-2000	Median	

Median_2000-2020_SO4_SO4HCO3	(mEq / L) / (mEq / L)	SO42-/(SO42-+HCO3-) (proxy of acidification)	2000-2020	Median	
Median_1980-2020_SO4_SO4HCO3	(mEq / L) / (mEq / L)	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980-2020	Median	
Median_1980-2000_CaMg_HCO3	(mEq / L) / (mEq / L)	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980-2000	Median	
Median_2000-2020_CaMg_HCO3	(mEq / L) / (mEq / L)	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	2000-2020	Median	
Median_1980-2020_CaMg_HCO3	(mEq / L) / (mEq / L)	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980-2020	Median	
Median_1980-2000_T	°C	Water temperature	1980-2000	Median	
Median_2000-2020_T	°C	Water temperature	2000-2020	Median	
Median_1980-2020_T	°C	Water temperature	1980-2020	Median	
Median_2000-2020_TOC	mg C / L	Total organic carbon concentration	2000-2020	Median	
Median_1980-2000_O2	mg / L	dissolved oxygen concentration	1980-2000	Median	
Median_2000-2020_O2	mg / L	dissolved oxygen concentration	2000-2020	Median	

Median_1980-2020_O2	mg / L	dissolved oxygen concentration	1980-2020	Median	
Median_1980-2000_WL	m	Groundwater level	1980-2000	Median	
Median_2000-2020_WL	m	Groundwater level	2000-2020	Median	
Median_1980-2020_WL	m	Groundwater level	1980-2020	Median	
Median_1980-2000_DSi	mg / L	Dissolved silica concentration	1980-2000	Median	Trends were not calculated because of significant data gaps
Median_2000-2020_DSi	mg / L	Dissolved silica concentration	2000-2020	Median	Trends were not calculated because of significant data gaps
Median_1980-2020_DSi	mg / L	Dissolved silica concentration	1980-2020	Median	Trends were not calculated because of significant data gaps
Median_1980-2000_NH4	mEq / L	NH4+ concentration	1980-2000	Median	Trends were not calculated because of many values below detection limit and decreasing detection limit over time
Median_2000-2020_NH4	mEq / L	NH4+ concentration	2000-2020	Median	Trends were not calculated because of many values below detection limit and decreasing detection limit over time
Median_1980-2020_NH4	mEq / L	NH4+ concentration	1980-2020	Median	Trends were not calculated because of many values

					below detection limit and decreasing detection limit over time
Trend_1980-2000_DIC	mg C / L / yr	Dissolved inorganic carbon concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_DIC	mg C / L / yr	Dissolved inorganic carbon concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_DIC	mg C / L / yr	Dissolved inorganic carbon concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_CO2	mg C / L / yr	Dissolved carbon dioxide concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_CO2	mg C / L / yr	Dissolved carbon dioxide concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_CO2	mg C / L / yr	Dissolved carbon dioxide concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_HCO3	mEq / L / yr	Dissolved bicarbonate concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_HCO3	mEq / L / yr	Dissolved bicarbonate concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_HCO3	mEq / L / yr	Dissolved bicarbonate concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_pH	1 / yr	pH value	1980-2000	Theil Sen slope (trend)	

Trend_2000-2020_pH	1 / yr	pH value	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_pH	1 / yr	pH value	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_Ca	mEq / L / yr	Ca <sup>2+</sup> concentrations	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_Ca	mEq / L / yr	Ca <sup>2+</sup> concentrations	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_Ca	mEq / L / yr	Ca <sup>2+</sup> concentrations	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_Mg	mEq / L / yr	Mg <sup>2+</sup> concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_Mg	mEq / L / yr	Mg <sup>2+</sup> concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_Mg	mEq / L / yr	Mg <sup>2+</sup> concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_Na	mEq / L / yr	Na <sup>+</sup> concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_Na	mEq / L / yr	Na <sup>+</sup> concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_Na	mEq / L / yr	Na <sup>+</sup> concentration	1980-2020	Theil Sen slope (trend)	

Trend_1980-2000_K	mEq / L / yr	K+ concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_K	mEq / L / yr	K+ concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_K	mEq / L / yr	K+ concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_SO4	mEq / L / yr	SO4 2- concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_SO4	mEq / L / yr	SO4 2- concentration	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_SO4	mEq / L / yr	SO4 2- concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_NO3	mEq / L / yr	NO3- concentrations	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_NO3	mEq / L / yr	NO3- concentrations	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_NO3	mEq / L / yr	NO3- concentrations	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_Cl	mEq / L / yr	Cl- concentration	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_Cl	mEq / L / yr	Cl- concentration	2000-2020	Theil Sen slope (trend)	

Trend_1980-2020_Cl	mEq / L / yr	Cl- concentration	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_SO4_SO4HCO3	(mEq / L) / (mEq / L) / yr	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_SO4_SO4HCO3	(mEq / L) / (mEq / L) / yr	SO42-/(SO42-+HCO3-) (proxy of acidification)	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_SO4_SO4HCO3	(mEq / L) / (mEq / L) / yr	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_CaMg_HCO3	(mEq / L) / (mEq / L) / yr	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_CaMg_HCO3	(mEq / L) / (mEq / L) / yr	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_CaMg_HCO3	(mEq / L) / (mEq / L) / yr	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980-2020	Theil Sen slope (trend)	
Trend_1980-2000_T	°C / yr	Water temperature	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_T	°C / yr	Water temperature	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_T	°C / yr	Water temperature	1980-2020	Theil Sen slope (trend)	
Trend_2000-2020_TOC	mg C / L / yr	Total organic carbon concentration	2000-2020	Theil Sen slope (trend)	Evaluation for period 1980-2000 not possible

					because of significant data gaps
Trend_1980-2000_O2	mg / L / yr	dissolved oxygen concentration	1980-2000	Theil Sen slope (trend)	Time series have significant data gaps
Trend_2000-2020_O2	mg / L / yr	dissolved oxygen concentration	2000-2020	Theil Sen slope (trend)	Time series have significant data gaps
Trend_1980-2020_O2	mg / L / yr	dissolved oxygen concentration	1980-2020	Theil Sen slope (trend)	Time series have significant data gaps
Trend_1980-2000_WL	m / yr	Groundwater level	1980-2000	Theil Sen slope (trend)	
Trend_2000-2020_WL	m / yr	Groundwater level	2000-2020	Theil Sen slope (trend)	
Trend_1980-2020_WL	m / yr	Groundwater level	1980-2020	Theil Sen slope (trend)	
p_1980-2000_DIC	unitless	Dissolved inorganic carbon concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_DIC	unitless	Dissolved inorganic carbon concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_DIC	unitless	Dissolved inorganic carbon concentration	1980-2020	p-value of trend based on the seasonal Kendall test with	

				corrections for serial dependence	
p_1980-2000_CO2	unitless	Dissolved carbon dioxide concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_CO2	unitless	Dissolved carbon dioxide concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_CO2	unitless	Dissolved carbon dioxide concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_HCO3	unitless	Dissolved bicarbonate concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_HCO3	unitless	Dissolved bicarbonate concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_HCO3	unitless	Dissolved bicarbonate concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	

p_1980-2000_pH	unitless	pH value	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_pH	unitless	pH value	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_pH	unitless	pH value	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_Ca	unitless	Ca <sup>2+</sup> concentrations	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_Ca	unitless	Ca <sup>2+</sup> concentrations	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_Ca	unitless	Ca <sup>2+</sup> concentrations	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_Mg	unitless	Mg <sup>2+</sup> concentration	1980-2000	p-value of trend based on the seasonal Kendall test with	

				corrections for serial dependence	
p_2000-2020_Mg	unitless	Mg <sup>2+</sup> concentration	2000–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_Mg	unitless	Mg <sup>2+</sup> concentration	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_Na	unitless	Na <sup>+</sup> concentration	1980–2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_Na	unitless	Na <sup>+</sup> concentration	2000–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_Na	unitless	Na <sup>+</sup> concentration	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_K	unitless	K <sup>+</sup> concentration	1980–2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	

p_2000-2020_K	unitless	K+ concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_K	unitless	K+ concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_SO4	unitless	SO4 2- concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_SO4	unitless	SO4 2- concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_SO4	unitless	SO4 2- concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_NO3	unitless	NO3- concentrations	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_NO3	unitless	NO3- concentrations	2000-2020	p-value of trend based on the seasonal Kendall test with	

				corrections for serial dependence	
p_1980-2020_NO3	unitless	NO3- concentrations	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_Cl	unitless	Cl- concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_Cl	unitless	Cl- concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_Cl	unitless	Cl- concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_SO4_SO4HCO3	unitless	SO42-/ (SO42-+HCO3-) (proxy of acidification)	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_SO4_SO4HCO3	unitless	SO42-/ (SO42-+HCO3-) (proxy of acidification)	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	

p_1980-2020_SO4_SO4HCO3	unitless	SO4 <sup>2-</sup> /(SO4 <sup>2-</sup> +HCO <sub>3</sub> <sup>-</sup> ) (proxy of acidification)	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_CaMg_HCO3	unitless	(Ca <sup>2+</sup> + Mg <sup>2+</sup> )/HCO <sub>3</sub> <sup>-</sup> (proxy of acidification)	1980–2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_CaMg_HCO3	unitless	(Ca <sup>2+</sup> + Mg <sup>2+</sup> )/HCO <sub>3</sub> <sup>-</sup> (proxy of acidification)	2000–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_CaMg_HCO3	unitless	(Ca <sup>2+</sup> + Mg <sup>2+</sup> )/HCO <sub>3</sub> <sup>-</sup> (proxy of acidification)	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_T	unitless	Water temperature	1980–2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_T	unitless	Water temperature	2000–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_T	unitless	Water temperature	1980–2020	p-value of trend based on the seasonal Kendall test with	

				corrections for serial dependence	
p_2000-2020_TOC	unitless	Total organic carbon concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_O2	unitless	dissolved oxygen concentration	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_O2	unitless	dissolved oxygen concentration	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2020_O2	unitless	dissolved oxygen concentration	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_1980-2000_WL	unitless	Groundwater level	1980-2000	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
p_2000-2020_WL	unitless	Groundwater level	2000-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	

p_1980-2020_WL	unitless	Groundwater level	1980-2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	
n_1980-2020_DIC	unitless	Dissolved inorganic carbon concentration	1980-2020	number of observations	
n_1980-2020_CO2	unitless	Dissolved carbon dioxide concentration	1980-2020	number of observations	
n_1980-2020_HCO3	unitless	Dissolved bicarbonate concentration	1980-2020	number of observations	
n_1980-2020_pH	unitless	pH value	1980-2020	number of observations	
n_1980-2020_Ca	unitless	Ca <sup>2+</sup> concentrations	1980-2020	number of observations	
n_1980-2020_Mg	unitless	Mg <sup>2+</sup> concentration	1980-2020	number of observations	
n_1980-2020_Na	unitless	Na <sup>+</sup> concentration	1980-2020	number of observations	
n_1980-2020_K	unitless	K <sup>+</sup> concentration	1980-2020	number of observations	
n_1980-2020_SO4	unitless	SO <sub>4</sub> <sup>2-</sup> concentration	1980-2020	number of observations	

n_1980-2020_NO3	unitless	NO3- concentrations	1980-2020	number of observations	
n_1980-2020_Cl	unitless	Cl- concentration	1980-2020	number of observations	
n_1980-2020_SO4_SO4HCO3	unitless	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980-2020	number of observations	
n_1980-2020_CaMg_HCO3	unitless	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980-2020	number of observations	
n_1980-2020_T	unitless	Water temperature	1980-2020	number of observations	
n_1980-2020_TOC	unitless	Total organic carbon concentration	1980-2020	number of observations	monitoring started in 1992
n_1980-2020_O2	unitless	dissolved oxygen concentration	1980-2020	number of observations	
n_1980-2020_WL	unitless	Groundwater level	1980-2020	number of observations	
n_19802020_DSi	unitless	Dissolved silica concentration	1980-2020	number of observations	
n_19802020_NH4	unitless	NH4+ concentration	1980-2020	number of observations	
Changepoint_DIC	yr	Dissolved inorganic carbon concentration	1980-2020	Year of change point (a point in time when the local linear trend	

				changed significantly in slope)	
Changepoint_CO2	yr	Dissolved carbon dioxide concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_HCO3	yr	Dissolved bicarbonate concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_pH	yr	pH value	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_Ca	yr	Ca <sup>2+</sup> concentrations	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_Mg	yr	Mg <sup>2+</sup> concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_Na	yr	Na <sup>+</sup> concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	

Changepoint_K	yr	K+ concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_SO4	yr	SO4 2- concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_NO3	yr	NO3- concentrations	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_Cl	yr	Cl- concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_SO4_SO4HCO3	yr	SO42-/(SO42-+HCO3-) (proxy of acidification)	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_CaMg_HCO3	yr	(Ca2+ + Mg2+)/HCO3- (proxy of acidification)	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)
Changepoint_T	yr	Water temperature	1980–2020	Year of change point (a point in time when the local linear trend

				changed significantly in slope)	
Changepoint_O2	yr	dissolved oxygen concentration	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Changepoint_WL	yr	Groundwater level	1980–2020	Year of change point (a point in time when the local linear trend changed significantly in slope)	
Median_19802020_DICplr	arbitrary unit	Pivot coordinates of DIC concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , DIC
Median_19802020_CO2plr	arbitrary unit	Pivot coordinates of CO <sub>2</sub> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_HCO3plr	arbitrary unit	Pivot coordinates of HCO <sub>3</sub> <sup>-</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>

Median_19802020_Hplr	arbitrary unit	Pivot coordinates of H+ concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_Caplr	arbitrary unit	Pivot coordinates of Ca <sup>2+</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_Mgplr	arbitrary unit	Pivot coordinates of Mg <sup>2+</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_Naplr	arbitrary unit	Pivot coordinates of Na <sup>+</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_Kplr	arbitrary unit	Pivot coordinates of K <sup>+</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_SO4plr	arbitrary unit	Pivot coordinates of SO <sub>4</sub> <sup>2-</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the

					composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_NO3plr	arbitrary unit	Pivot coordinates of NO <sub>3</sub> <sup>-</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Median_19802020_Clplr	arbitrary unit	Pivot coordinates of Cl <sup>-</sup> concentrations	1980–2020	Median	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_DICplr	arbitrary unit	Pivot coordinates of DIC concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , DIC
Trend_19802020_CO2plr	arbitrary unit	Pivot coordinates of CO <sub>2</sub> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_HCO3plr	arbitrary unit	Pivot coordinates of HCO <sub>3</sub> <sup>-</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>

Trend_19802020_Hplr	arbitrary unit	Pivot coordinates of H+ concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_Caplr	arbitrary unit	Pivot coordinates of Ca <sup>2+</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_Mgplr	arbitrary unit	Pivot coordinates of Mg <sup>2+</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_Naplr	arbitrary unit	Pivot coordinates of Na <sup>+</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_Kplr	arbitrary unit	Pivot coordinates of K <sup>+</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_SO4plr	arbitrary unit	Pivot coordinates of SO <sub>4</sub> <sup>2-</sup> concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the

					composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_NO3plr	arbitrary unit	Pivot coordinates of NO <sub>3</sub> - concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
Trend_19802020_Clplr	arbitrary unit	Pivot coordinates of Cl- concentrations	1980–2020	Theil Sen slope (trend)	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_DICplr	arbitrary unit	Pivot coordinates of DIC concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , DIC
P_19802020_CO2plr	arbitrary unit	Pivot coordinates of CO <sub>2</sub> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_HCO3plr	arbitrary unit	Pivot coordinates of HCO <sub>3</sub> - concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>

P_19802020_Hplr	arbitrary unit	Pivot coordinates of H+ concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_Caplr	arbitrary unit	Pivot coordinates of Ca <sup>2+</sup> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_Mgplr	arbitrary unit	Pivot coordinates of Mg <sup>2+</sup> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_Naplr	arbitrary unit	Pivot coordinates of Na <sup>+</sup> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_Kplr	arbitrary unit	Pivot coordinates of K <sup>+</sup> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_SO4plr	arbitrary unit	Pivot coordinates of SO <sub>4</sub> <sup>2-</sup> concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the

				corrections for serial dependence	composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_NO3plr	arbitrary unit	Pivot coordinates of NO <sub>3</sub> - concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>
P_19802020_Clplr	arbitrary unit	Pivot coordinates of Cl- concentrations	1980–2020	p-value of trend based on the seasonal Kendall test with corrections for serial dependence	calculated using 'PivotCoord' function in R package 'robcompositions' <sup>1</sup> for the composition of Ca <sup>2+</sup> , Mg <sup>2+</sup> , Na <sup>+</sup> , K <sup>+</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , Cl <sup>-</sup> , H <sup>+</sup> , CO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup>

<sup>1</sup> Matthias Templ, Karel Hron, P. F. robCompositions: an R-package for robust statistical analysis of compositional data. v. 2.3.1. in *Compositional Data Analysis. Theory and Applications* (eds. Pawlowsky-Glahn, V. & Buccianti, A.) 341–355 (John Wiley & Sons, 2011).