

SUPPORTING INFORMATION for

Intermittent streamflow generation in a merokarst headwater catchment

Camden M. Hatley¹, Brooklyn Armijo¹, Katherine Andrews¹, Christa Anhold¹, Jesse Nippert²,
Matthew F. Kirk^{1*}

¹Department of Geology, Kansas State University, Manhattan, KS 66506, USA

²Division of Biology, Kansas State University, Manhattan, KS 66506, USA

*Correspondence: mfkirk@ksu.edu

SUPPORTING METHODS

Uncertainty in chemical data

A summary of the precision and detection limits of our ion chromatography and carbon analyzer results for stream and groundwater samples is provided in Table SI1. We calculated the precision as twice the standard deviation (SD) of values obtained from replicate analysis of quality control samples¹. We calculated method detection limits (MDLs) by U.S. EPA method 300.1:

$$MDL = t \times SD \quad (1)$$

Where *t* is Student's *t* value for a 99% confidence level and a standard deviation estimate with *n*-1 degrees of freedom.

SUPPORTING FIGURES AND TABLES*

*Note that additional supporting data tables are provided as separate spreadsheet files.

Figure S11. Average total precipitation (a) and average daily discharge (b) by month at watershed N04D over the 10-year period 2011-2020. These data are publicly from the online Konza data catalog (<http://lter.konza.ksu.edu/data>).

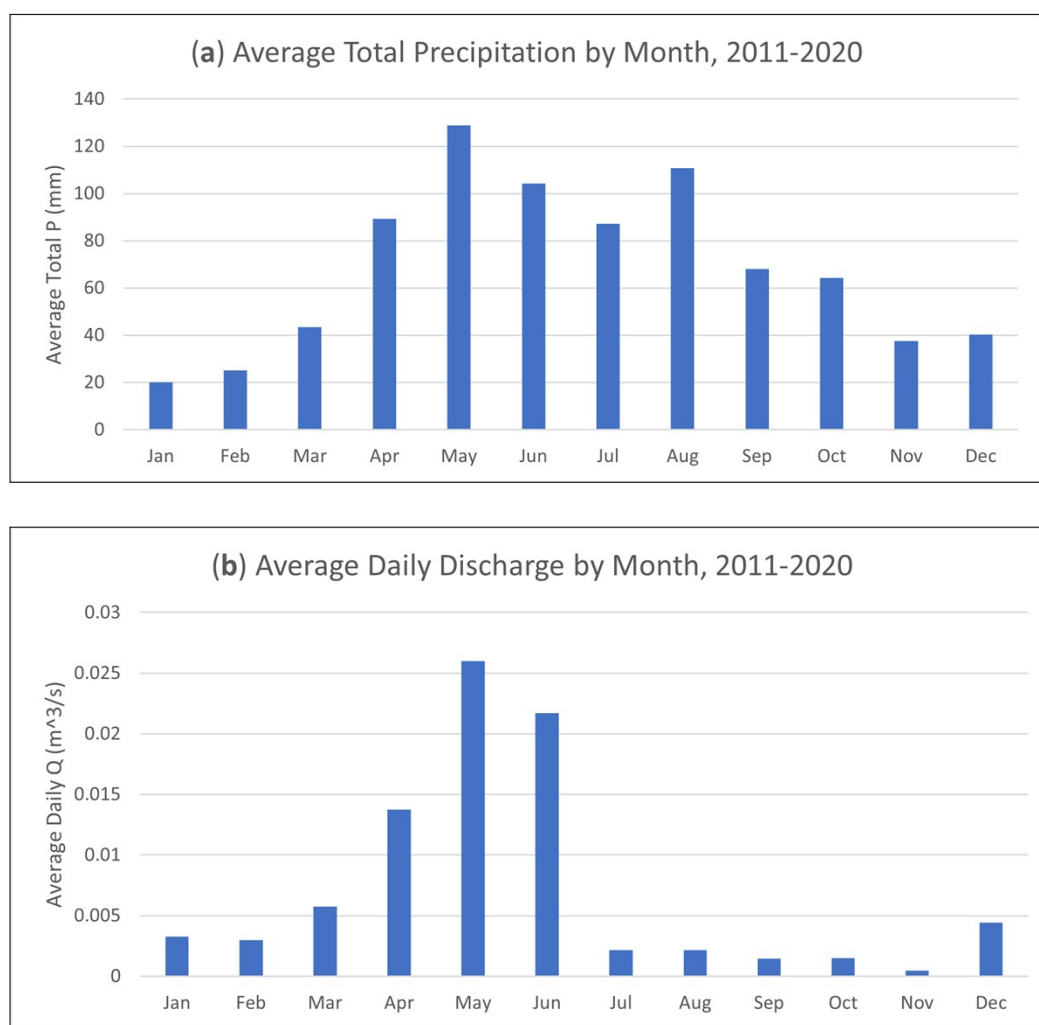


Figure SI2. $\text{Ca}^{2+}/\text{Mg}^{2+}$ vs. SO_4^{2-} for all stream and groundwater samples. Groundwater samples from wells that were not used in the mixing analysis are marked with unfilled triangles. Note that samples from 3-5 and 4-6 MOR plot in the same space as stream samples, evidence that these wells are recharged directly by the stream.

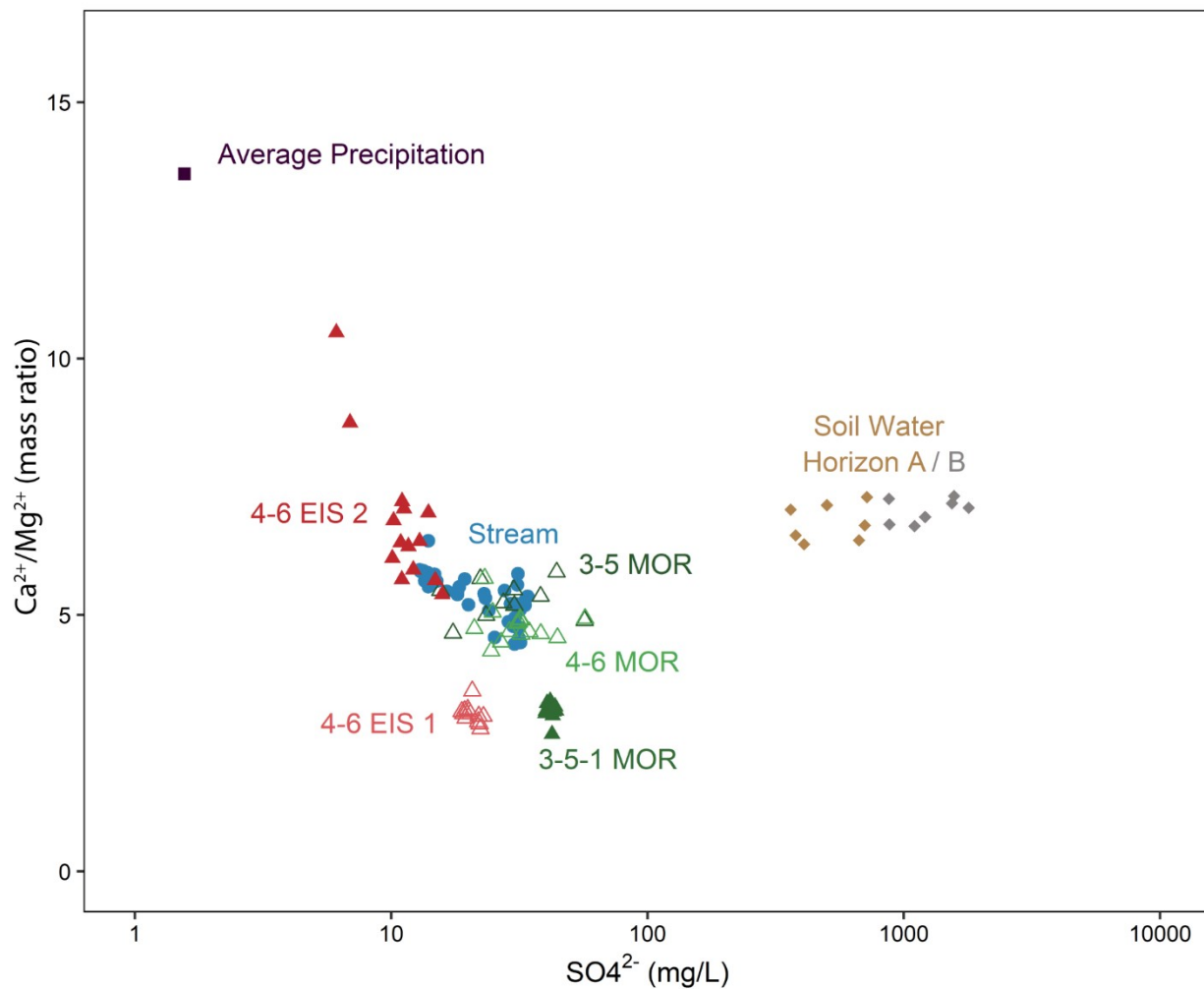


Table SI1. Precision and detection limits for major ions in stream and groundwater samples

Analyte	Precision (mg/L)	Detection Limit (mg/L)
F⁻	0.05	0.08
Cl⁻	0.43	0.68
NO₂⁻	0.45	0.71
Br⁻	0.04	0.058
NO₃⁻	0.38	0.59
SO₄²⁻	0.52	0.81
Na⁺	1.01	1.51
NH₄⁺	0.16	0.24
K⁺	0.29	0.44
Mg²⁺	0.27	0.40
Ca²⁺	0.27	0.41
Sr²⁺	0.35	0.53
NPOC	0.15	0.20
TN	0.68	0.95

Table SI2. Endmember SO₄²⁻ and Ca²⁺/Mg²⁺ compositions for mixing analysis, calculated as the mean value across all samples.

Endmember	SO ₄ ²⁻ (mg/L)	Ca ²⁺ /Mg ²⁺ (concentration ratio)
Eiss Limestone	11.1059	6.427251
Morrill Limestone	41.87291	3.125705
Soil Water	907.1429	6.921927