

Streamflow generation in a nested system of intermittent and perennial tropical streams under changing land use

Giovanny M. Mosquera¹, Daniela Rosero-López¹, José Daza¹, Daniel Escobar-Camacho¹,
Annika Künne², Patricio Crespo³, Sven Kralisch², Jordan Karubian^{4,5}, Andrea Encalada¹

¹Laboratorio de Ecología Acuática, Instituto BIOSFERA, Universidad San Francisco de Quito USFQ, Quito, Ecuador

²Geographic Information Science Group, Institute of Geography, Friedrich Schiller University Jena, Jena, Germany

³Departamento de Recursos Hídricos y Ciencias Ambientales & Facultad de Ingeniería, Universidad de Cuenca, Cuenca, Ecuador

⁴Department of Ecology and Evolutionary Biology, Tulane University, New Orleans, LA, USA

⁵Fundación para la Conservación de Los Andes Tropicales, Quito, Ecuador

Correspondence to: Giovanny M. Mosquera (giovamosquera@gmail.com); Andrea C. Encalada (aencalada@usfq.edu.ec)

Supplementary material

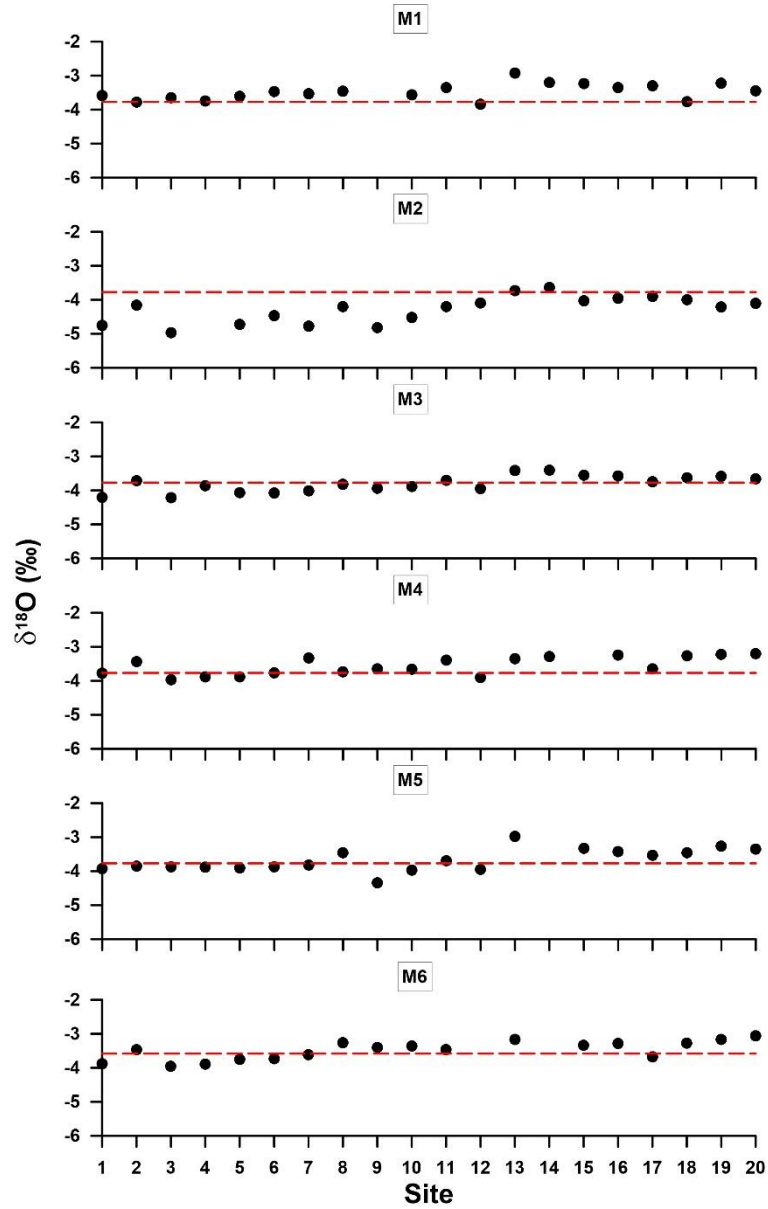


Figure S1. Oxygen-18 isotopic ratios ($\delta^{18}\text{O}$) in stream water samples collected at the 20 sampling sites within the Cube River catchment during six monitoring campaigns during the wet (M1 and M2), transitions (M3), and dry (M4-M6) periods. The dashed lines in all subplots represent the average $\delta^{18}\text{O}$ value (-3.7‰) of the samples collected at all monitoring sites during the six monitoring campaigns carried out in 2021 for reference.

Table S1. Isotopic composition of two stations belonging to the Global Network of Isotopes in Precipitation (GNIP) database located nearby the Cube River catchment in the Esmeraldas province, northwestern Ecuador.

Station	Country	Location		Altitude	Sampling			$\delta^{18}\text{O}$ (‰)				<i>d</i> -excess (‰)				Source of data
		Longitude	Latitude	(m a.s.l.)	Start	End	n	mean	max	min	Sd	mean	max	min	Sd	
Esmeraldas	Ecuador	-79.63	0.97	30	1992	1996	18	-2.54	-0.12	-7.17	1.85	7.75	13.66	1.26	3.35	Garcia <i>et al.</i> , (1998)
La Concordia	Ecuador	-79.28	0.1	360	1992	1996	26	-3.58	-1.09	-10.12	2.14	11.1	13.78	7.78	1.58	Garcia <i>et al.</i> , (1998)

Note: n=number of samples, mean=mean value of the dataset, max=maximum value of the dataset, min=minimum value of the dataset, Sd=standard deviation value of the dataset

Table S2. Detection limits of the chemical elements analysed in this study at each monitoring campaign (M1-M6).

Chemical element	Monitoring campaign					
	M1	M2	M3	M4	M5	M6
F ⁻ (mg/L)	0.05	0.05	0.05	0.05	0.05	0.05
NO ₃ ⁻ (mg/L)	0.11	0.11	0.11	0.11	0.11	0.11
TN (mg/L)	3.71	3.71	3.71	3.71	3.71	3.71
P (mg/L)	0.59	0.59	0.59	0.59	0.59	0.59
TOC (mg/L)	0.93	0.93	0.93	0.93	0.93	0.93
Al (µg/L)	77.22	77.22	84.04	77.22	77.22	77.22
As (µg/L)	23.12	23.12	13.65	23.12	23.12	23.12
Ba (µg/L)	1.03	1.03	1.50	1.03	1.03	1.03
Ca (mg/L)	0.33	0.33	0.29	0.33	0.33	0.33
Cd (µg/L)	0.99	0.99	1.49	0.99	0.99	0.99
Co (µg/L)	1.93	1.93	2.32	1.93	1.93	1.93
Cu (µg/L)	10.42	10.42	2.94	10.42	10.42	10.42
Cr (µg/L)	2.72	2.72	2.56	2.72	2.72	2.72
Fe (mg/L)	0.10	0.10	0.09	0.10	0.10	0.10
K (mg/L)	0.07	0.07	0.00	0.07	0.07	0.07
Mg (mg/L)	0.09	0.09	0.01	0.09	0.09	0.09
Mn (µg/L)	1.12	1.12	1.83	1.12	1.12	1.12
Mo (µg/L)	6.49	6.49	16.72	6.49	6.49	6.49
Na (mg/L)	0.31	0.31	0.44	0.31	0.31	0.31
Ni (µg/L)	2.89	2.89	3.17	2.89	2.89	2.89
Pb (µg/L)	8.16	8.16	6.79	8.16	8.16	8.16
V (µg/L)	3.68	3.68	2.76	3.68	3.68	3.68
Zn (µg/L)	6.11	6.11	9.33	6.11	6.11	6.11