Biogeosciences

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Supplement of

Tropical wet season runoff mobilises younger carbon in rainforest streams but older carbon in agricultural streams

Clément Duvert et al.

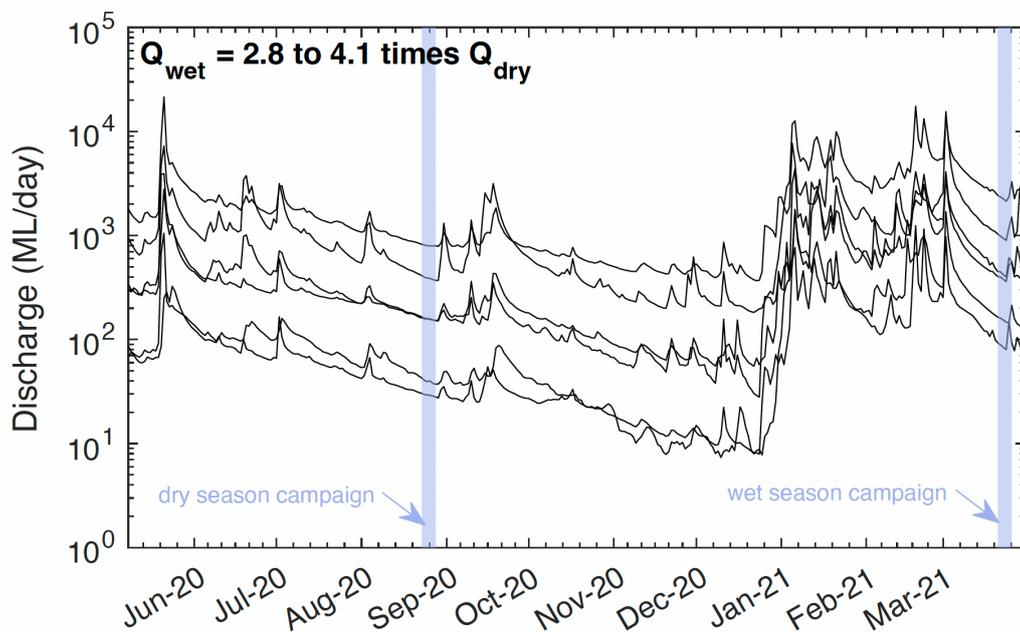*Correspondence to:* Clément Duvert (clem.duvert@cdu.edu.au)

Figure S1. Daily discharge time-series at six gauging stations managed by the Queensland Government and located within the study area (South Johnstone River upstream of Central Mill (112101B); Mulgrave River at the Fisheries (111005A); Liverpool Creek at Upper Japoonvale (112102A); Fisher Creek at Nerada (112002A); Cochable Creek at Powerline (113004A); Millstream at Ravenshoe (116011A)). Mean discharge during the wet season field campaign was on average 3.0 times (min–max 2.8–4.1) higher than mean discharge during the dry season field campaign.
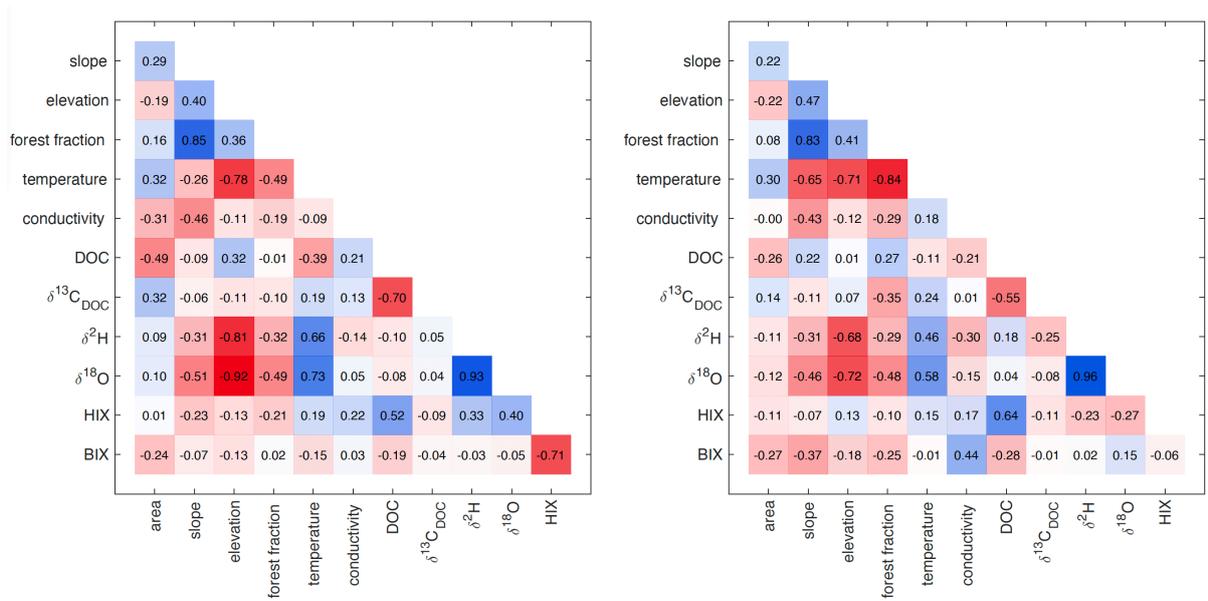
Figure S2. Pearson correlation matrices between all predictors for the dry season (left) and wet season (right) datasets.
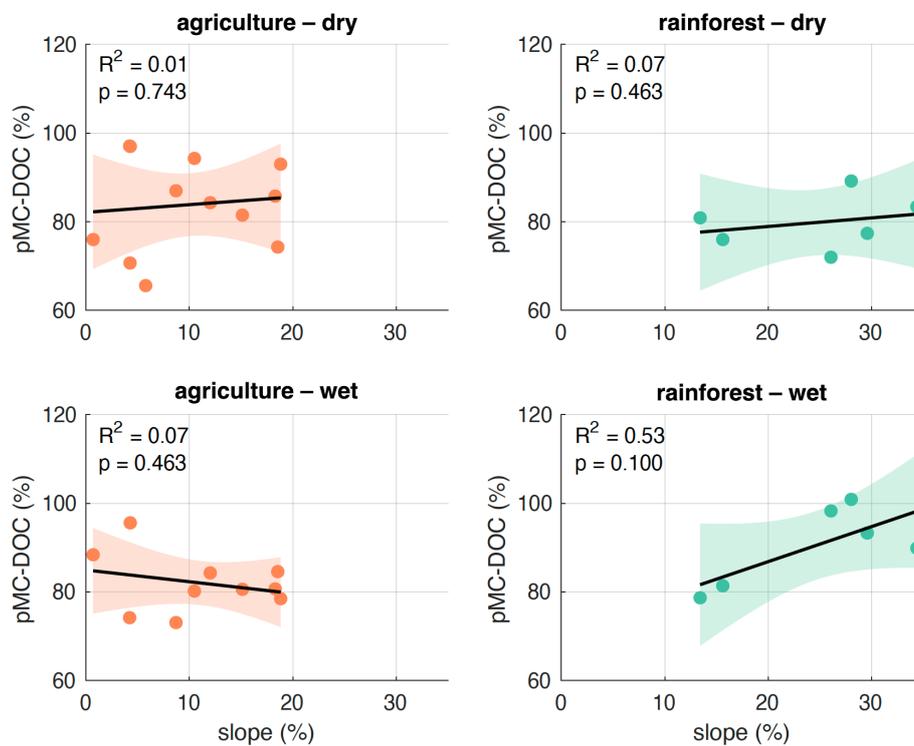

Figure S3. Linear relationships between catchment slope and ^{14}C-DOC across land use categories and seasons.

Table S1. Statistical differences in environmental variables between the six pasture sites and six cropland sites. The p-values are based on Mann-Whitney U tests, with bold values indicating significance at the 90% confidence level.

Variable	p-value (dry)	p-value (wet)
electrical conductivity	0.818	0.223
temperature	0.180	0.180
δ^2H	**0.017**	0.370
$\delta^{18}O$	**0.004**	0.394
DOC	0.900	0.589
$\delta^{13}C_{DOC}$	0.485	0.818
pMC-DOC	0.394	0.690
HIX	0.937	0.662
BIX	0.699	0.329
slope	0.310	
area	0.818	
elevation	**0.004**	

Table S2. Linear relationships between ^{14}C-DOC and various environmental variables. Significant relationships at the 90% confidence level are in bold.

Predictor	R^2 (dry)	p-value (dry)	R^2 (wet)	p-value (wet)
electrical conductivity	0.08	0.249	0.05	0.425
temperature	0.09	0.223	0.04	0.439
DOC	0.00	0.809	**0.58**	**0.001**
$\delta^{13}C_{DOC}$	0.00	0.806	0.01	0.665
δ^2H	0.07	0.320	0.03	0.513
slope	0.00	0.819	**0.23**	**0.059**
area	0.03	0.519	0.01	0.720
elevation	0.11	0.185	0.04	0.473

Table S3. Radiocarbon values for soil organic carbon (SOC) in two soil cores.

site ID	depth	date	^{14}C-SOC (pMC)	SOC age (years BP)
R3	0-5cm	26/8/2020	102.8	Modern
	10-15cm	26/8/2020	99.1	76
	20-30cm	26/8/2020	83.4	1458
R6	0-5cm	27/8/2020	106.5	Modern
	10-15cm	27/8/2020	108.8	Modern
	20-30cm	27/8/2020	104.6	Modern

Table S4. Coordinates of the 18 stream sampling sites.

site ID	stream name	latitude	longitude
C1	Victory Creek	-17.48122	145.99363
C2	Mullins Rd Creek	-17.95959	145.84126
C3	Scheu Creek	-17.58070	146.00357
C4	Utchee Creek	-17.64116	145.92248
C5	Mistake Creek	-17.75285	146.01787
C6	Diggers Creek	-17.79293	146.02380
P1	Short Creek	-17.38218	145.66591
P2	Theresa Creek	-17.48909	145.61590
P3	Tranter Creek	-17.52930	145.60649
P4	Wadda Creek	-17.59486	145.84216
P5	Gregory Creek	-17.59148	145.87203
P6	Mena Creek	-17.67318	145.90815
R1	Kauri Creek	-17.13496	145.59885
R2	Boulders Creek	-17.34134	145.86922
R3	Gooligan Creek	-17.59765	145.75864
R4	Douglas Creek	-17.59272	145.73322
R5	Bridge 15 Creek	-17.74417	145.63106
R6	Coochable Creek	-17.76864	145.65875