

Table S1. River segments sub-watershed characteristics.

Segment	Extension (m)	Dominant Geology	Dominant Geomorphology	Dominant Land Use	Basin area (km²)	Basin average slope (%)	Valley depth (m)	Channel sinuosity	Curvature/ Channel entrenchment	Channel gradient
T1	1600	Limestones	Limestone mountains and karstified platforms	Grassland	47.40	40.50	106.92	1.29	-0.16	2.00
T2	3400	Limestones	Limestone mountains and karstified platforms	Forest and Grassland	51.60	41.28	68.27	1.57	-0.13	0.80
T3	2000	Clays	Alluvial plain – colluvial	Dry Crop and Grassland	54.23	40.86	50.51	1.13	-0.05	0.50
T4	1800	Clays and marly limestones	Mountain ranges on conglomerates and granular rocks in general	Forest and grassland	107.36	39.67	50.87	1.26	-0.04	1.10
T5	8400	Clays and marly limestones	Fault-block hills	Dry crops	123.90	37.95	52.42	2.31	-0.06	0.70
T6	6200	Marly limestones	Alluvial plain - colluvial Marl and limestone mountains	Forest and grassland	161.52	37.88	75.66	1.79	-0.04	0.90
T7	3200	Marly limestones	Marl and limestone mountains	Forest and grassland	193.80	37.72	80.23	1.09	-0.12	1.50
T8	2200	Clays and marls	Alluvial plain - colluvial Hills and ridges of dissection	Dry crops	220.38	37.35	47.33	1.45	-0.04	0.30
FS	6600	Clays and marls	Marl mountains. Clays	Forest	22.80	44.02	55.55	1.66	-0.07	1.20
AB	2800	Clays and marls	Marl mountains. Clays	Dry crops and forest	23.06	44.32	63.57	1.31	-0.04	0.90

Table S2. Macroinvertebrate taxa presence-absence in the studied sampling points.

[illegible]

	Culicidae								X		
DECAPODA											
	Astacidae	X									
ODONATA											
	Lestidae			X					X		
	Calopterygidae	X	X	X				X		X	
	Gomphidae	X	X	X	X	X	X	X	X	X	X
	Aeshnidae	X	X	X		X			X	X	
	Libellulidae										X
	Corduliidae										X
	Platycnemididae						X	X			
GASTROPODA											
	Viviparidae			X							
	Ancylidae	X	X	X		X		X		X	
	Valvatidae	X	X								
	Hydrobiidae							X			
	Lymnaeidae	X		X			X			X	
	Physidae				X	X	X		X		
	Planorbidae		X	X				X		X	X
	Bithyniidae							X			
	Bythinellidae		X								
BIVALVIA											
	Unionidae							X			
	Sphaeridae	X									
DECAPODA											
	Atyidae		X	X			X	X	X		X
COLEOPTERA											
	Dryopidae		X								
	Elmidae	X	X	X	X	X	X	X	X	X	X
	Hydraenidae	X	X	X		X	X	X	X	X	X
	Haliplidae	X								X	X
	Hydrophilidae	X	X		X	X	X	X	X	X	X
	Hygrobiidae				X				X		
	Dytiscidae	X		X	X	X			X	X	
	Gyrinidae		X			X	X				
TRICLADIDA											
Dugessiidae			X	X		X	X	X	X	X	X
MEGALOPTERA											
Sialidae										X	
ACARIFORMES											
Hidracarina	X	X	X	X	X	X	X	X	X	X	X
HETEROPTERA											
Mesoveliidae		X				X					

[illegible]

Table S3. Results of spatial autocorrelation analysis (Moran's index)

Factor	Moran's index	P value	Pattern
Siliceous lithology	0,357456	P<0.05	Clustered
LUw (urban)	-0,089817	not significant	Random
LUw (irrigated crop)	-0,109996	not significant	Random
LUw (dry crop)	0,607352	P<0.05	Clustered
Watershed gradient	0,180391	not significant	Random
Valley depth	0,210390	not significant	Random
Curvature	0,285544	P<0.1	Clustered
Channel gradient	-0,165519	not significant	Random
HASmed	-0,117732	not significant	Random
QBRmed	-0,295782	not significant	Random
Elevation	0,432352	P<0.05	Clustered
LU100 (irrigated crop)	0,11091	not significant	Random
LU30 (irrigated crop)	0,029605	not significant	Random
LU100 (forest land)	0,153517	P<0.1	Clustered
HASs	-0,035989	not significant	Random
Temperature	-0,252965	P<0.1	Dispersed
pH	0,037933	not significant	Random
Alkalinity	0,448870	P<0.01	Clustered
IBMPW	0,590503	P<0.01	Clustered
EPT	0,47695	P<0.01	Clustered

Table S4. RDA statistically significant results

Season	Level	Factor	Df	AIC	F Pr(>F)	Signif. code
Spring	Watershed	LUW (dry crop)	20.587	1.7475	0.010	**
		LUW (Urban)	20.620	1.7154	0.015	*
		LUW (irrigated crop)	20.692	1.6464	0.020	*
	Segment	Valley depth index	20.266	2.0661	0.005	**
		Curvature	20.372	1.9591	0.005	**
		Channel gradient	20.707	1.6314	0.025	*
	Local	HASs	21	1.4589	0.050	*
Summer	Watershed	LUW (dry crop)	24.151	1.8116	0.005	**
		LUW (Urban)	24.465	1.5084	0.030	*
	Segment	Curvature	24	1.5287	0.035	*
		HASmed	24	1.5366	0.040	*
	Local	pH	24	1.6188	0.010	**
		HASs	24	1.5316	0.020	*
		Alkalinity	24	1.5503	0.045	*
Autumn	Watershed	LUW (dry crop)	22.987	2.088	0.020	*
		HASmed	22.896	2.1801	0.005	**
	Segment	Curvature	23.263	1.8137	0.040	*
		QBRmed	23.351	1.7276	0.040	*
	Local	HASs	23.209	18.662	0.010	**
		pH	23.168	19.068	0.015	*
		Alkalinity	23.527	15.577	0.035	*
LU30m (irrigated crop)		23.115	19.601	0.050	*	
Winter	Watershed	LUW (irrigated crop)	20.806	2.1323	0.005	**
		LUW (dry crop)	20.738	2.2015	0.010	**
		LUW (Urban	20.826	2.1120	0.015	*
		Siliceous lithology	21.433	1.5163	0.030	*
	Segment	--	--	--	--	--
	Local	Temperature	21.260	1.6831	0.030	*

Signif. codes: 0.001 '***' 0.01 '**'