Supplementary Materials:

How do terrestrial determinants impact the response of water quality to climate drivers? – An elasticity perspective on water-land-climate nexus

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Table S1. Summary of rivers and monitoring stations investigated in this study.

River	Monitoring sites code	Record length	Time Series	Country/ies station located	Climate type[a]
Mekong	Mek-070002	9–24 yrs	1985-2008	Cambodia, Laos, Thailand, Vietnam	Aw
	Mek-064002		2000-2008		
	Mek-054010		1985-2008		
	Mek-054009		1985-2008		
Yukon	Yuk-028003	6, 21, 27 yrs	1979-2005	US	Dfc, Dsc
	Yuk-028540		1985-2005		
	Yuk-028546		2000-2005		
Murray	Mur-119	36–39 yrs	1970-2008	Australia	Aw
	Mur-118		1970-2008		
	Mur-117		1973-2008		
	Mur-116		1970-2007		
	Mur-102[b]		1972-2007		

[a] Köppen–Geiger climate classification 1976–2000 for stations in the given rivers (Rubel and Kottek, 2010).

[b] Cooper river

Table S2. Summary of water quality parameters evaluated in the study.

Class	Abb.[a]	Name	Unit
Phys.	Turb	Turbidity	NTU
	Temp	Water temperature	^{0}C
O	DO	Dissolved oxygen	mg O_2/L
C	DOC	Dissolved organic carbon	mg C/L
N	TN-UF	Total nitrogen i.e. TN	mg N/L
	NH_4^+-F	Ammonia as N	mg N/L
	NO_2^--F	Nitrite as N	mg N/L
	NOx^--F	Nitrate + Nitrite as N	mg N/L
P	P-F	Dissolved phosphorus	mg P/L
	P-UF	Total phosphorus i.e. TP	mg P/L
	PO_4^{3-}-F	Dissolved orthophosphate as P	mg P/L
	PO_4^3-UF	Total orthophosphate as P	mg P/L

a. Abbreviation. F: filtered(dissolved), UF: unfiltered(total).

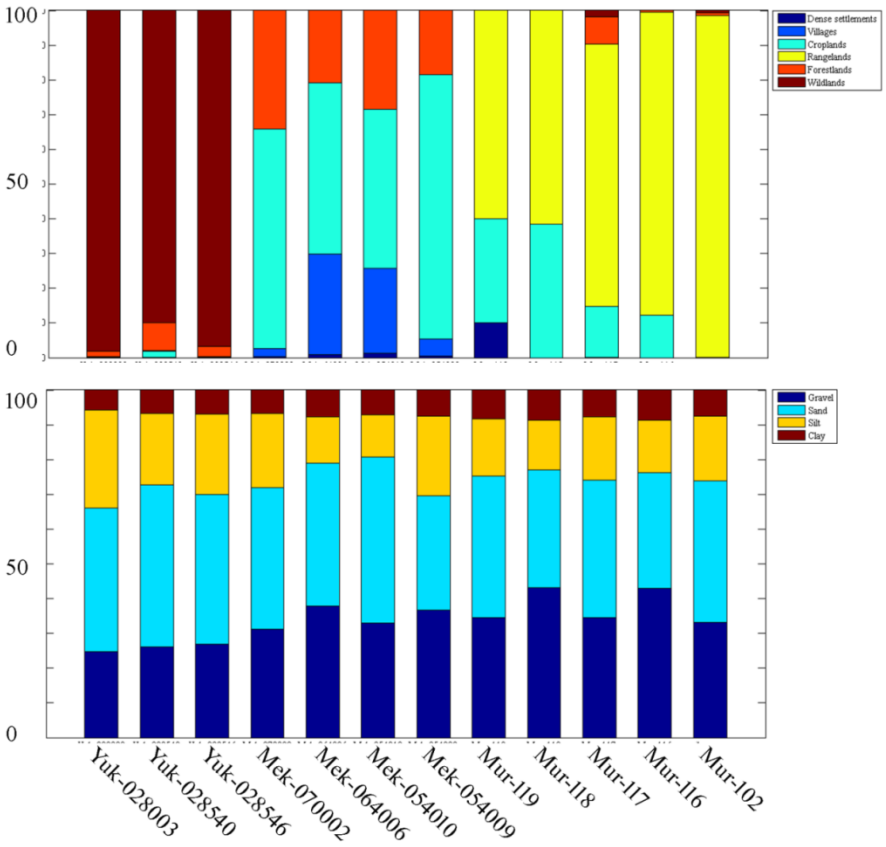

Figure S1. Percent anthropogenic biomes and surficial geology at sub watersheds scale for each monitoring station.

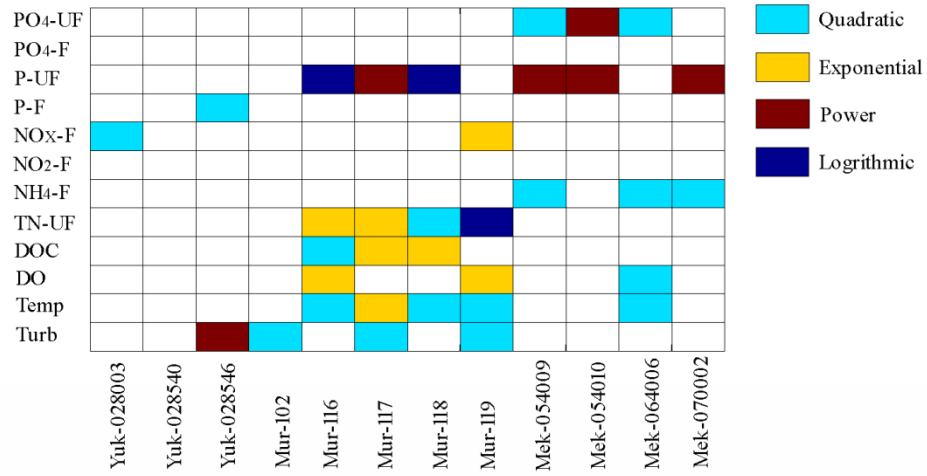

Figure S2. Best fitted time series trend models for water quality parameters at Yukon, Mekong and Murray monitoring sites.

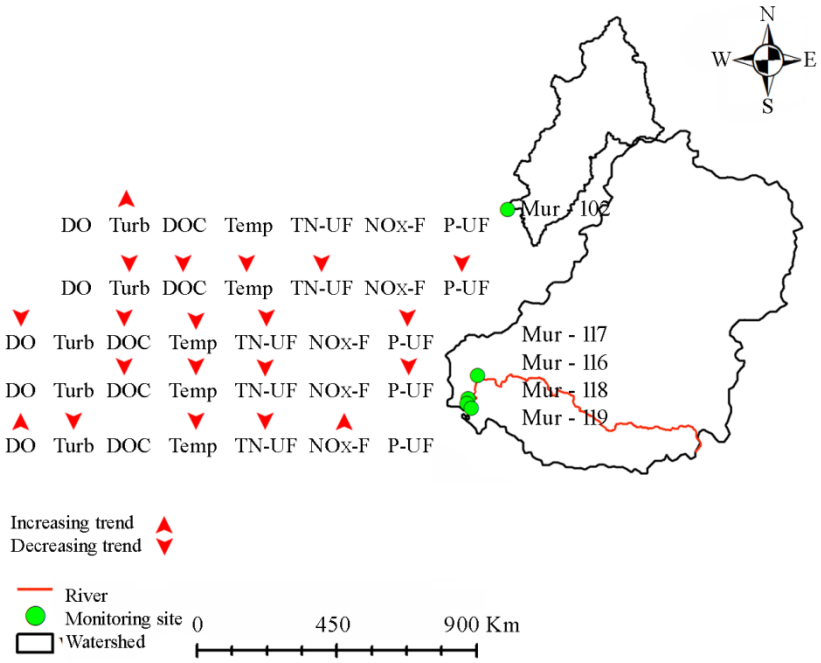

Figure S3. Spatial trend patterns at Murray monitoring sites.

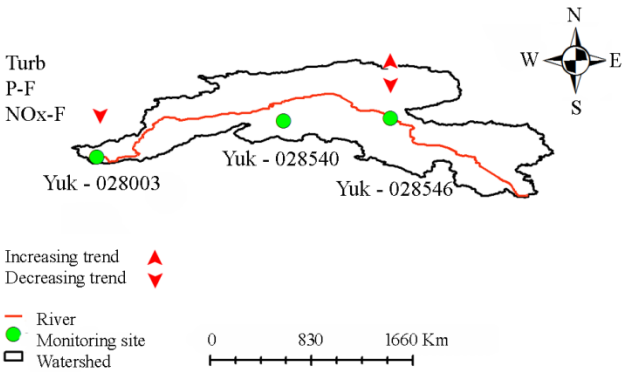

Figure S4. Spatial trend patterns at Yukon monitoring sites.

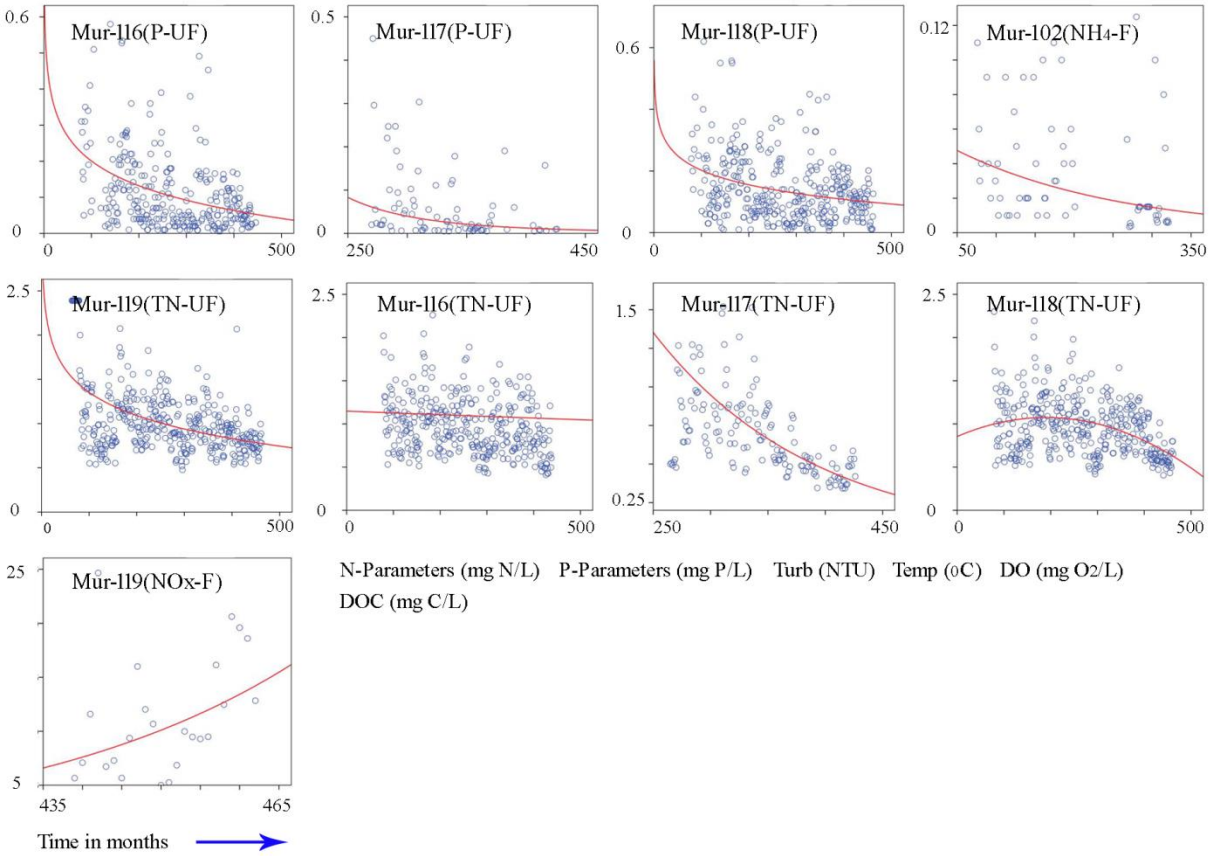

Figure S5. Significant time series trend patterns of nitrogen and phosphorous parameters at Murray monitoring sites.

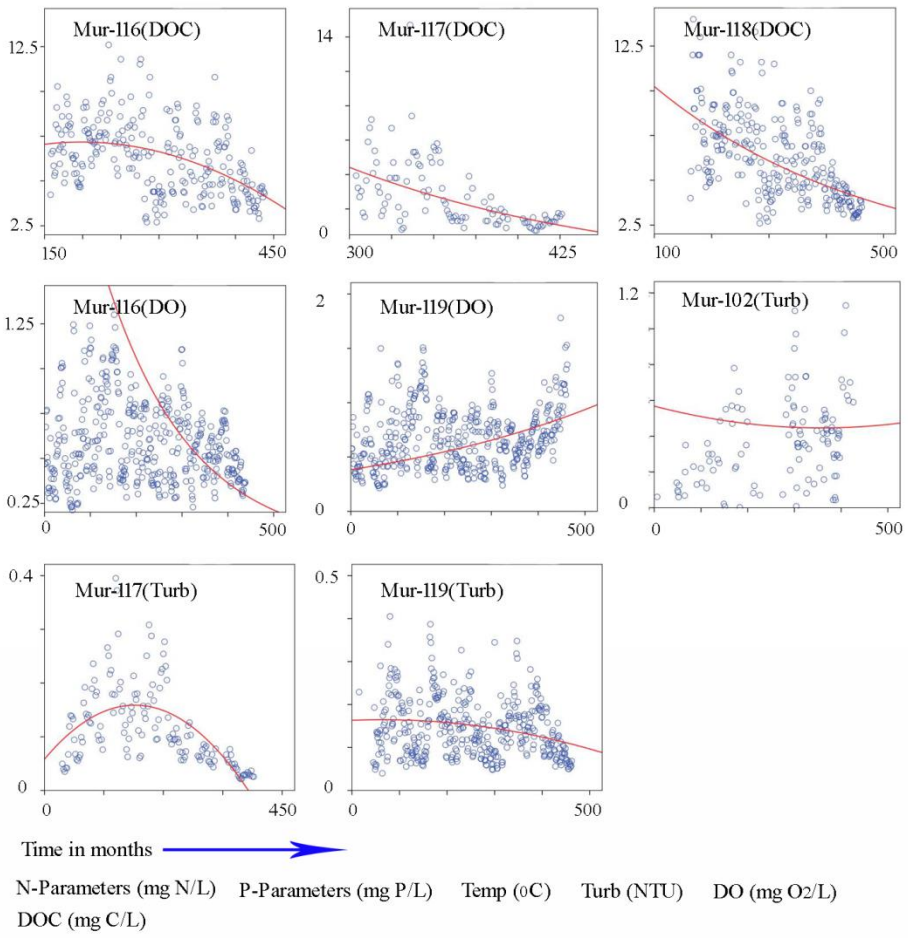

Figure S6. Significant time series trend patterns of turbidity, water temperature, DOC and DO at Murray monitoring sites.

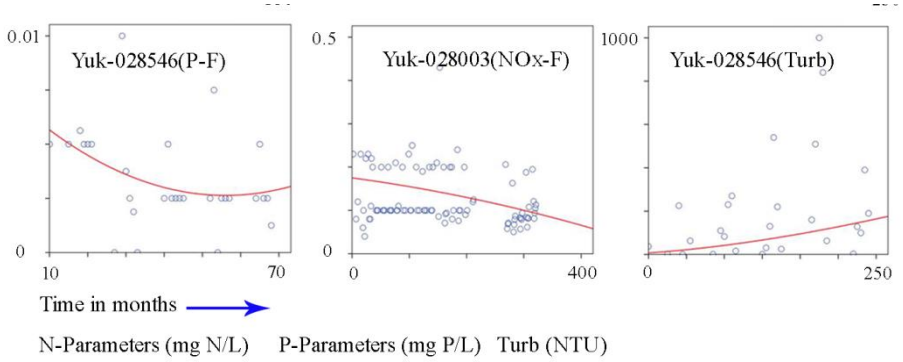

Figure S7. Significant time series trend patterns at Yukon monitoring sites.