

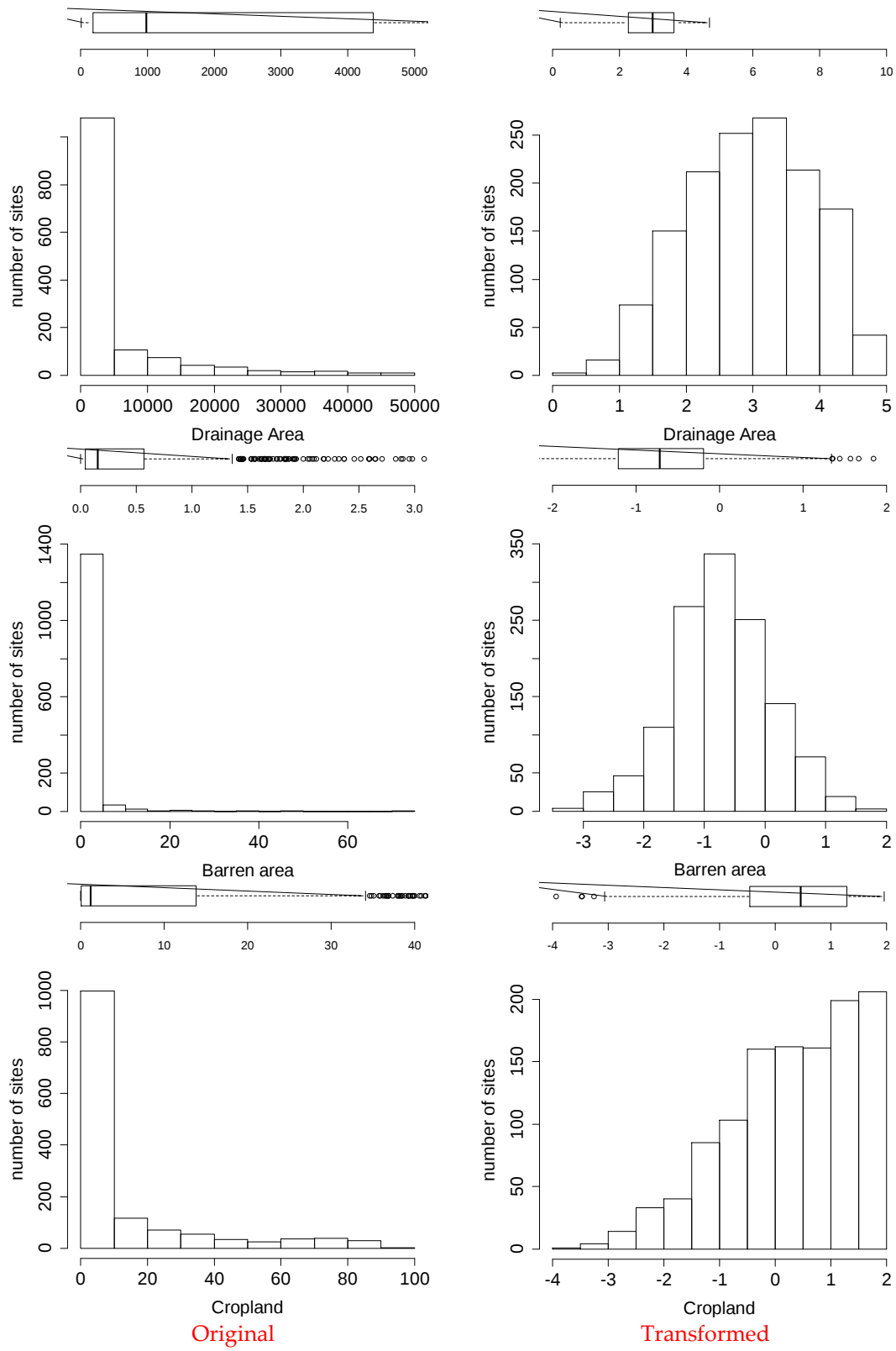
Supplementary Materials: An Analysis of Terrestrial and Aquatic Environmental Controls of Riverine Dissolved Organic Carbon in the Conterminous United States

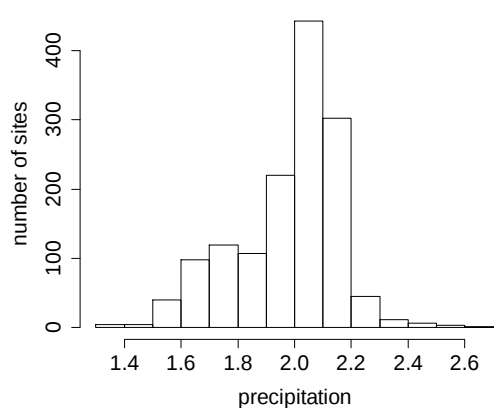
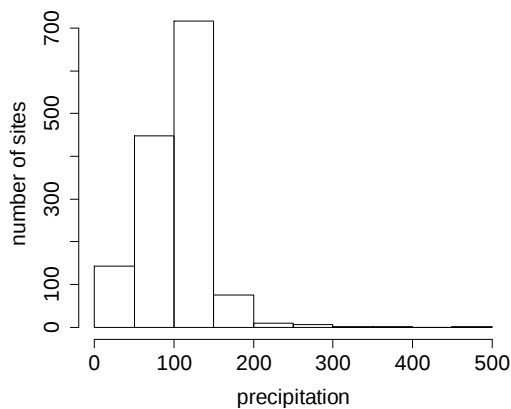
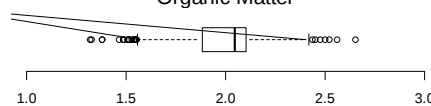
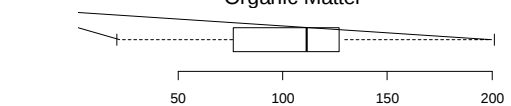
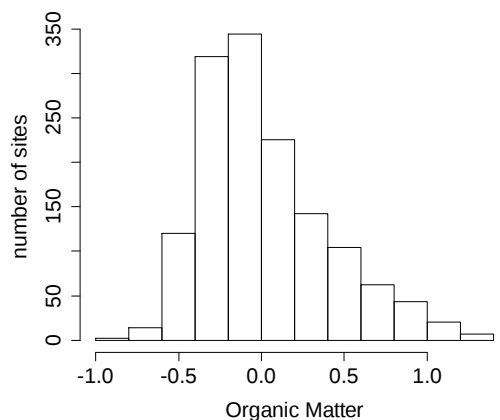
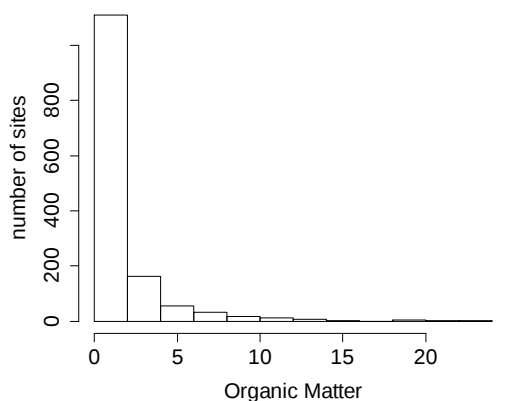
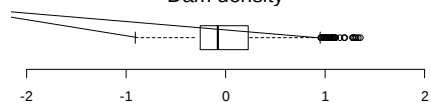
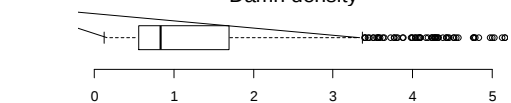
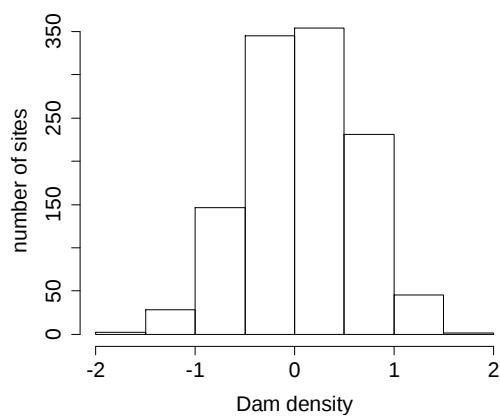
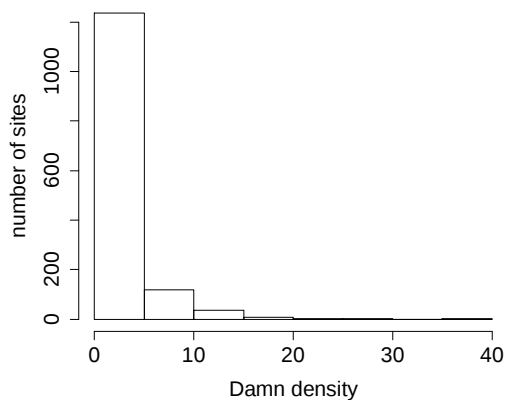
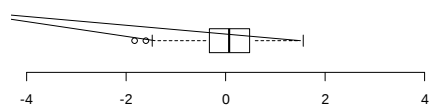
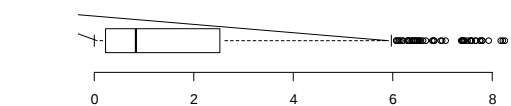
Qichun Yang, Xuesong Zhang, Xingya Xu and Ghassem Asrar

S1. Units of the variables selected for the statistical analyses

Variables	Units
DOC	g C/L
slope	%
wetlands	%
forest	%
total phosphorus	mg P/L
% of 1 st order river	%
total nitrogen	mg N/L
soil organic matter	%
cropland	%
soil sand	%
soil water	%
soil bulk density	mg/cm ³
barren surface	%
Temperature	Celcius degree
precipitation	mm/year
drainage area	Km ²
runoff	mm/year
urban area	%
dam density	dams/ Km ²
soil clay	%
shrub land	%

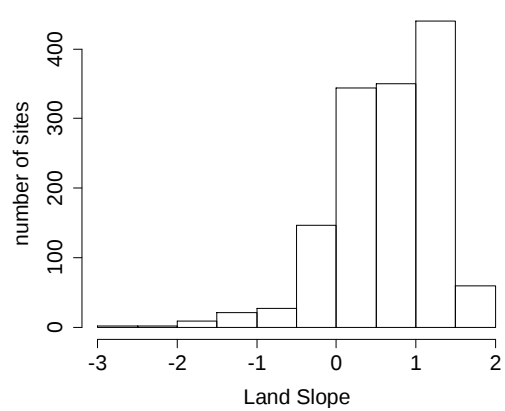
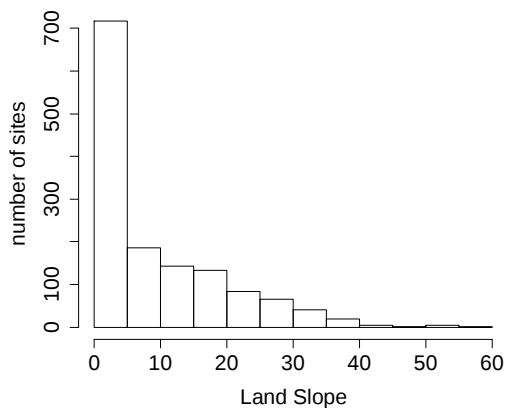
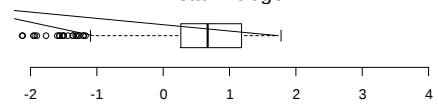
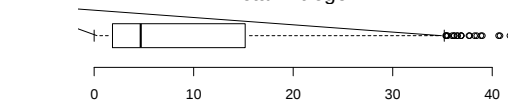
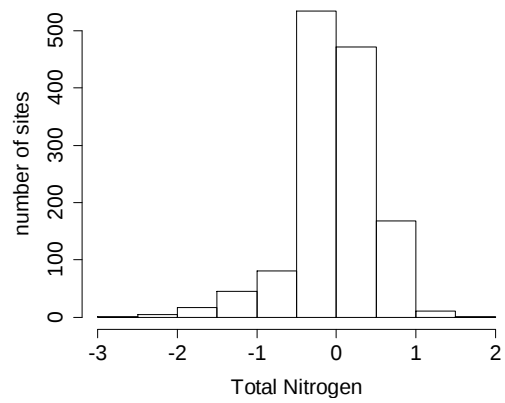
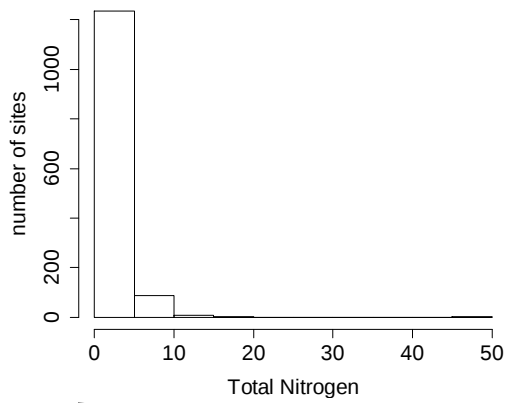
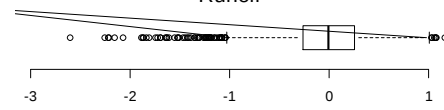
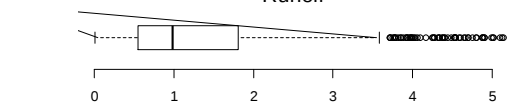
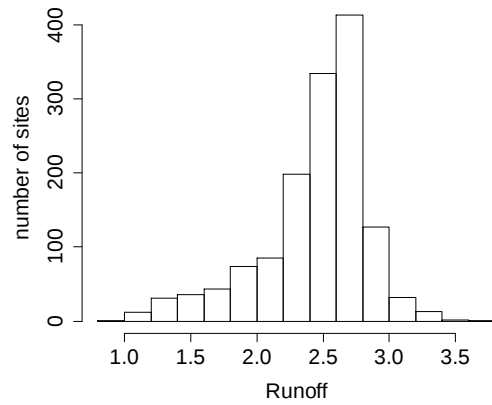
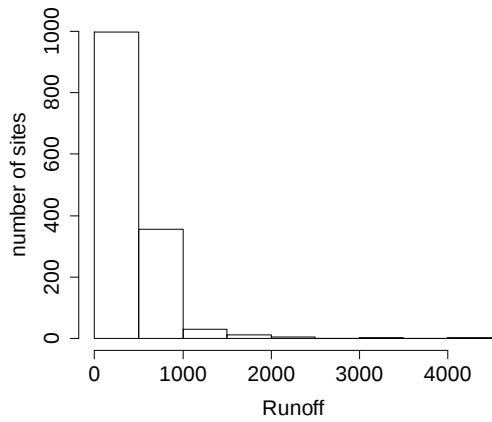
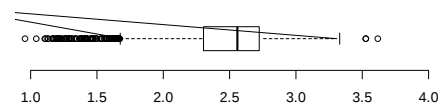
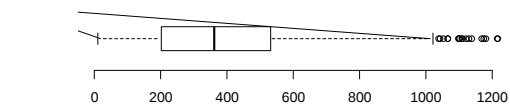
S2. Variables transformed for statistical analyses





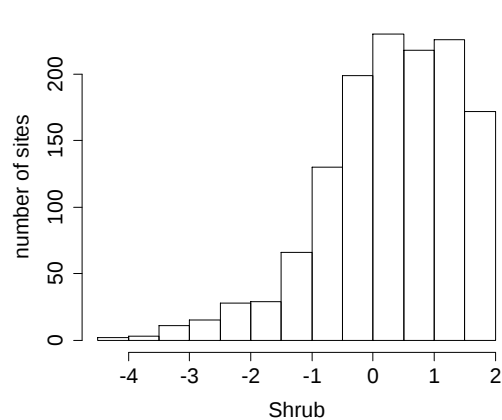
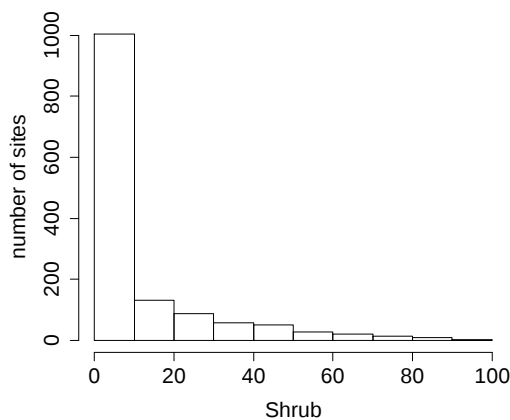
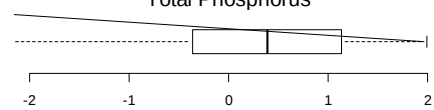
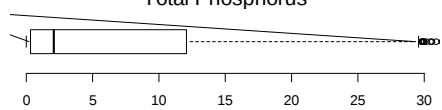
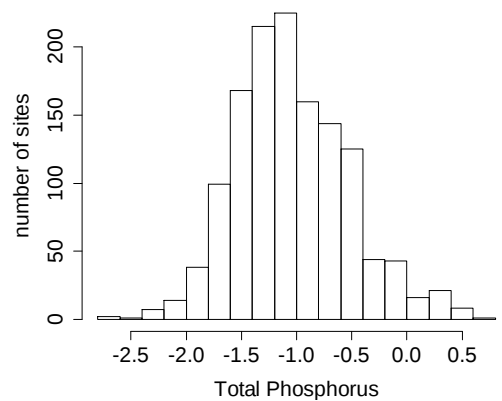
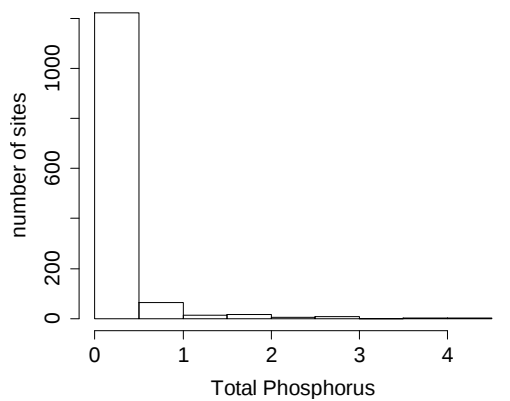
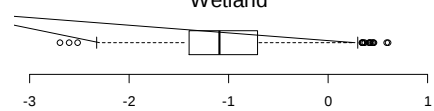
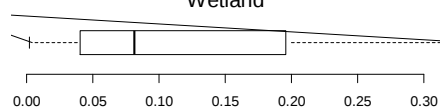
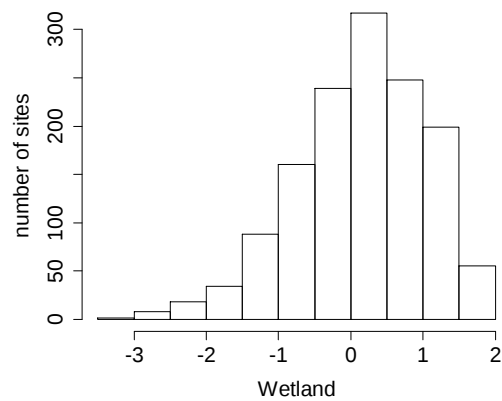
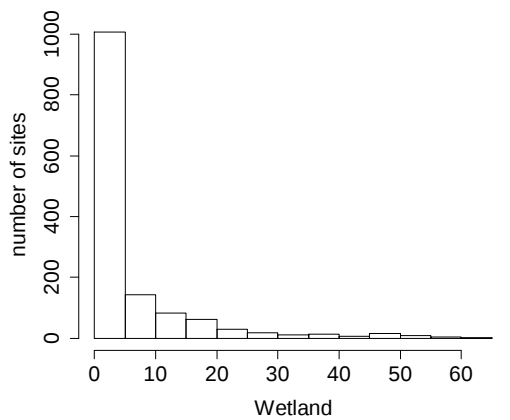
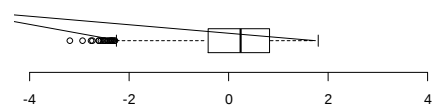
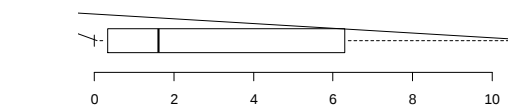
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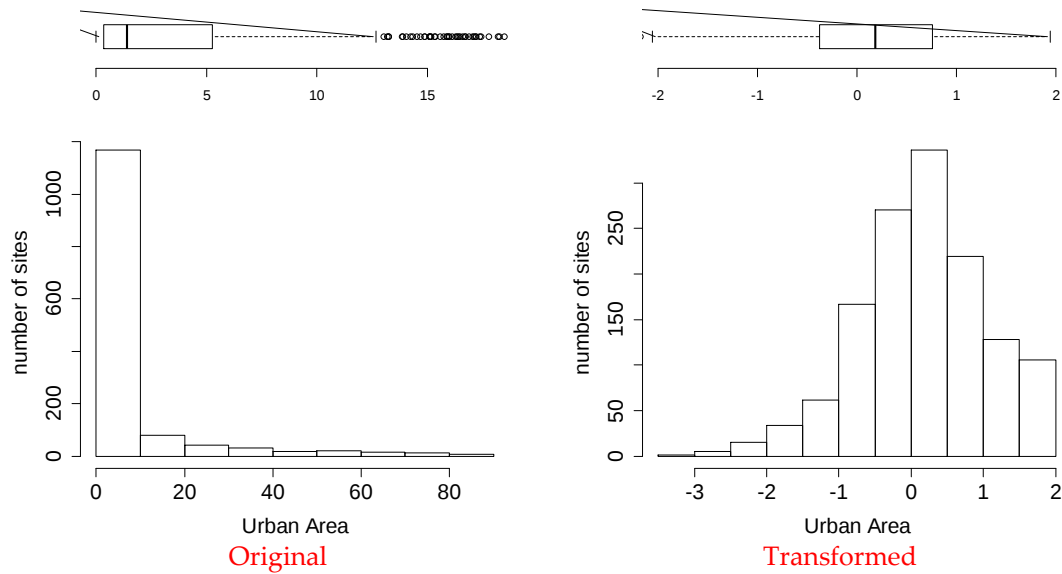
Original

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Original

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S3. General linear regression models for the national and regional analyses

National:

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Sand + Clay + Crop + Shrub + Forest + Barr + Urban + R1st + R + T + Sd

Region 1:

DOC~ Damd + Wet + Area + Om + Tn + Tp + Slop + Sand + Clay + Crop + Shrub + Barr+ Urban + R1st + R + Sd

Region 2:

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

Region 3:

DOC~ Wet + Area + Om + Tp + TN + TP + Clay + Crop + Shrub + Forest + Barr+ R1st + R + Sd

Region 5:

DOC~ Damd + Area + Wet + TN + Tp + Sw + Slop + Clay + Crop + Shrub + Barr+ Urban + R1st + R

Region 6:

DOC~ Damd +Wet + Area + Tn + TP + Om + Sw + Slop + Clay + Crop + Shrub + Barr+ R1st

Region 7:

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Sand + Clay + Crop + Shrub + Barr+ Urban + Forest + R1st + R +T + Sd

Region 8:

DOC~ Damd + Wet + Area + Om + TN + Tp + Sw + Clay + Slop + Crop + Shrub + Barr+ Urban + R1st + R + T

Region 9:

DOC~ lnnewet + Area + Tn + Tp + Clay + Crop + Shrub + Barr+ Urban + T + Sd

Region10:

DOC~ Damd + Wet + Area + Om + Tn + Tp + SW + Slop + Sand + Clay + Crop + Barr+ Urban + Shrub + R1st + R + Sd

Region 11:

DOC~ Damd + Wet + Area + Om + TN + Tp + Sw + Sand + Clay + Shrub + Barr+ Urban + R1st + R + T + Sd

Region 13:

DOC~ Damd +Wet + Area + Om + Tn + Tp + SW + Clay + Shrub + Barr+ Urban + R1st + T + Sd

Region 15:

DOC~ Damd + Wet + Area +Om+ Tn + Tp + Sw + Slop + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

Region 17:

DOC~ Damd + Wet + Area + Om + SW + Sand + Clay + Crop + Barr+ Shrub + R1st + R + T + Sd

Region 18:

DOC~ Damd + Wet + Area + Om + Tn + Crop + Shrub + Forest + Barr+ Urban + R1st + T + R+ Sd

River order group 1 (Order 1–3):

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

River order group 2 (Order 4):

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Sand + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

River order group 3 (Order 5):

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Sand + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

River order group 4 (Order 6 and higher orders):

DOC~ Damd + Wet + Area + Om + Tn + Tp + Sw + Slop + Sand + Clay + Crop + Shrub + Forest + Barr+ Urban + R1st + R + T + Sd

Acronyms: Om: soil organic matter; Wet: wetland area; T: temperature; R: runoff; Area: drainage area for each station; Barr: percentage of barren land; Urban: percentage of urban area; Shrub: percentage of shrub area; Crop: percentage of cropland; Clay: percentage of soil clay; Sand: percentage of soil sand; Sw: soil water content; Sd soil bulk density; Slop: average slope of the drainage area; R1st: percentage of first order watersheds; Tn: total nitrogen in waters; Tp: total phosphorus in waters; Damd: dam density.

S4. Summary of GLM models for the U.S. and 18 water resource regions

	F-value	P value	Residual STD	R ²	Ad-R ²
The U.S.	54.22	<0.0001	0.19	0.57	0.56
Region 1	3.74	0.0003	0.13	0.63	0.48
Region 2	7.40	<0.0001	0.16	0.63	0.54
Region 3	3.65	<0.0039	0.16	0.53	0.48
Region 4					NA
Region 5	4.08	0.0006	0.11	0.66	0.47
Region 6	2.15	0.0361	0.12	0.54	0.29

Region 7	5.21	<0.0001	0.14	0.52	0.44
Region 8	3.53	0.0073	0.22	0.61	0.54
Region 9	26.09	0.0375	0.03		0.49
Region 10	4.68	<0.0001	0.15	0.70	0.70
Region 11	6.53	<0.0001	0.10	0.60	0.58
Region 12					NA
Region 13	19.39	<0.0001	0.13	0.80	0.78
Region 14					NA
Region 15	19.86	<0.0001	0.19	0.72	0.67
Region 16					NA
Region 17	4.64	0.0060	0.07	0.73	0.64
Region 18	2.35	0.0259	0.16	0.47	0.34

S5. Summary of GLM models for the four river order groups

	F-value	P value	Residual STD	R²	Ad-R²
Group1.	3.989	<0.0001	0.25	0.5383	0.4034
Group2.	9.403	<0.00001	0.2041	0.5858	0.5235
Group3.	22.83	<0.00001	0.192	0.6809	0.6511
Group4.	28.64	<0.00001	0.1635	0.6101	0.589

S6. Detailed statistics of DOC concentration observations in the U.S. and 18 water resource regions

	Median	Max	Min	Mean
The U.S.	4.806	76.9	0.01	6.41
Region 1	2.331	7.64	0.52	2.65
Region 2	6.094	58.03	0.01	7.977
Region 3	5.49	12.16	1.51	5.858
Region 4	13.000	32.47	8.063	14.45
Region 5	7.68	22.19	4.078	8.514
Region 6	5.976	16.00	2.494	6.141
Region 7	3.761	24	1.15	4.449
Region 8	2.898	27.5	0.65	4.115
Region 9	5.095	9.669	0.5	4.602
Region 10	4.37	12.1	1.00	4.779
Region 11	3.470	8.209	1.123	3.687
Region 12	4.907	18.26	0.80	5.413
Region 13	4.16	12.63	0.731	4.982
Region 14	3.357	7.022	1.200	3.908
Region 15	6.301	76.9	0.4	10.49
Region 16	2.267	9.857	0.462	2.863
Region 17	6.362	10.77	2.986	6.679

Region 18	5.734	19	0.42	6.188
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S7. Detailed statistics of DOC concentration observations of six river order groups

	Median	Max	Min	Mean
Order 1	3.85	32.5	0.4615	5.3010
Order 2	4.751	76.9	0.400	8.367
Order 3	4.287	58.03	0.42	5.646
Order 4	4.657	40.62	0.01	6.263
Order 5	5.15	45.5	0.52	6.937
Order 6 and higher orders	5.26	32.02	0.7429	6.049

S8. *P* values for ANOVA analysis among the six river groups

	Order 1	Order 2	Order 3	Order 4	Order 5	Order 6
Order 1	1	0.03*	0.73	0.33	0.11	0.43
Order 2		1	0.02*	0.05*	0.22	0.04*
Order 3			1	0.27	0.02*	0.42
Order 4				1	0.18	0.89
Order 5					1	0.03*
Order 6						1

*: $P < 0.05$