

1 **Supplementary Information for:**

2 **Anthropogenic and catchment characteristic signatures in**
3 **the water quality of Swiss rivers: a quantitative assessment**

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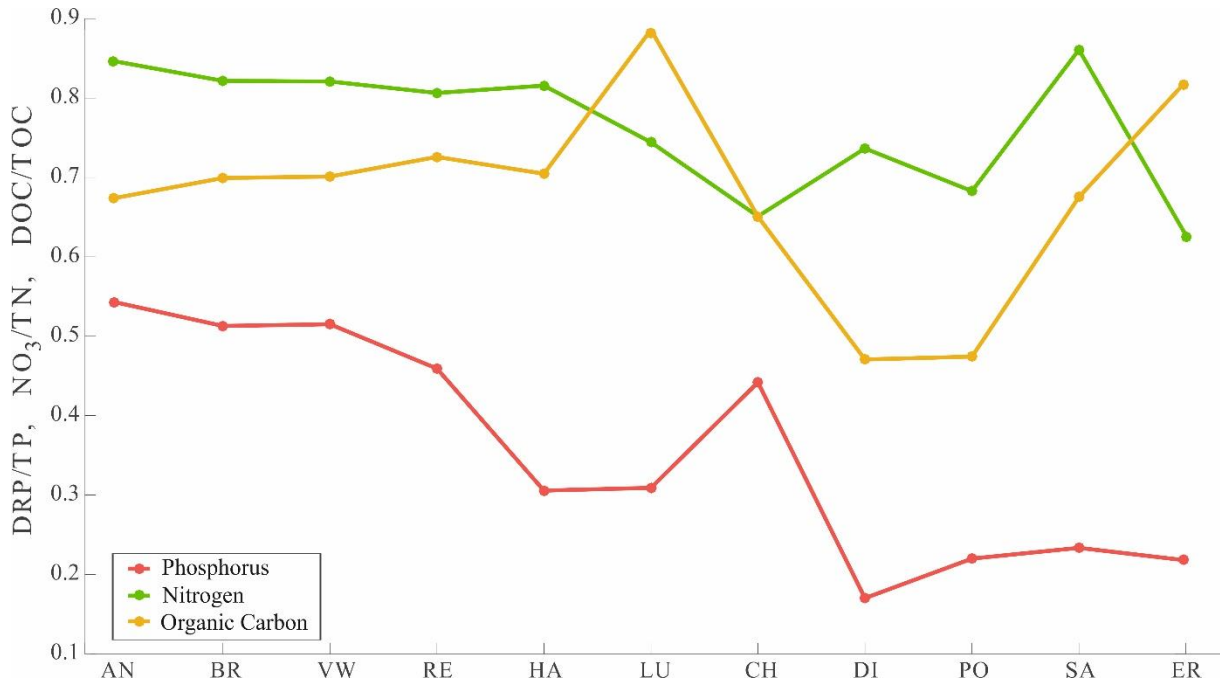
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16 **Contents**

17 Figures from S1 to S6 and Table S1.

18 **Introduction**

19 This Supporting Information contains a series of figures showing additional data analysis.
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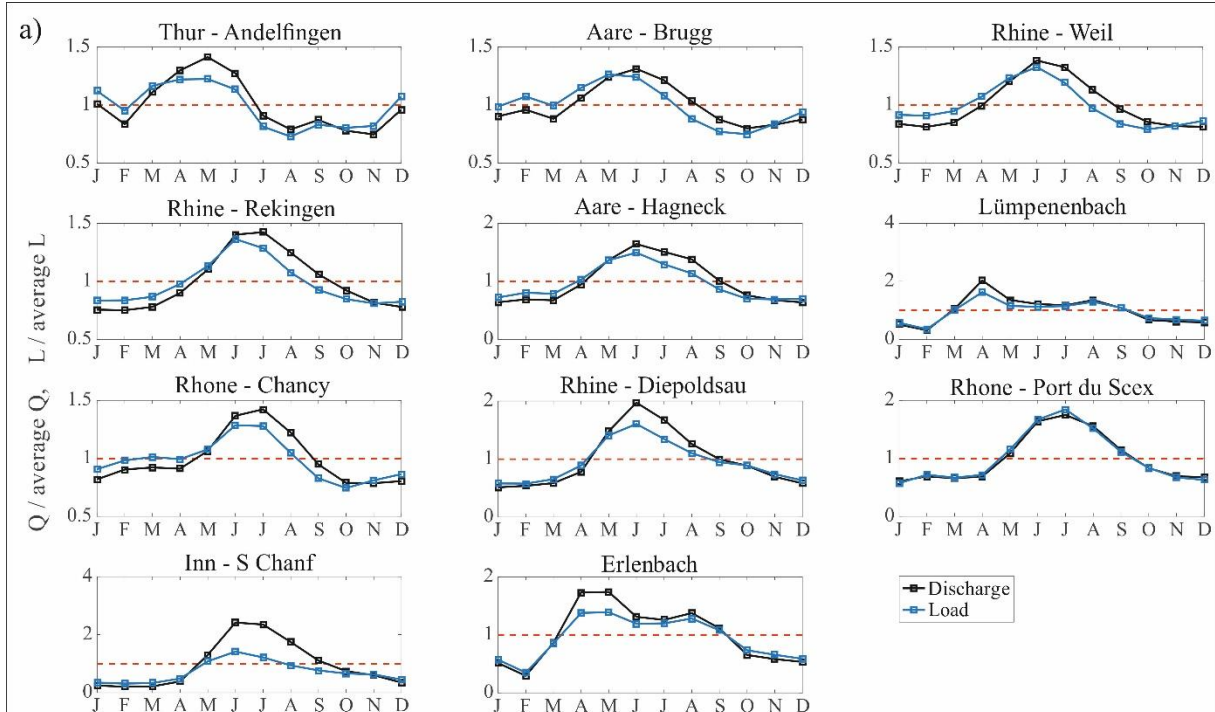


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23 **Figure S1.** Ratios of NO_3/TN (red), DRP/TP (green) and DOC/TOC (yellow) across catchments. Only
 24 phosphorus species show a visible decreasing trend from more to less anthropogenically affected catchments
 25 (left-to-right of x axes).

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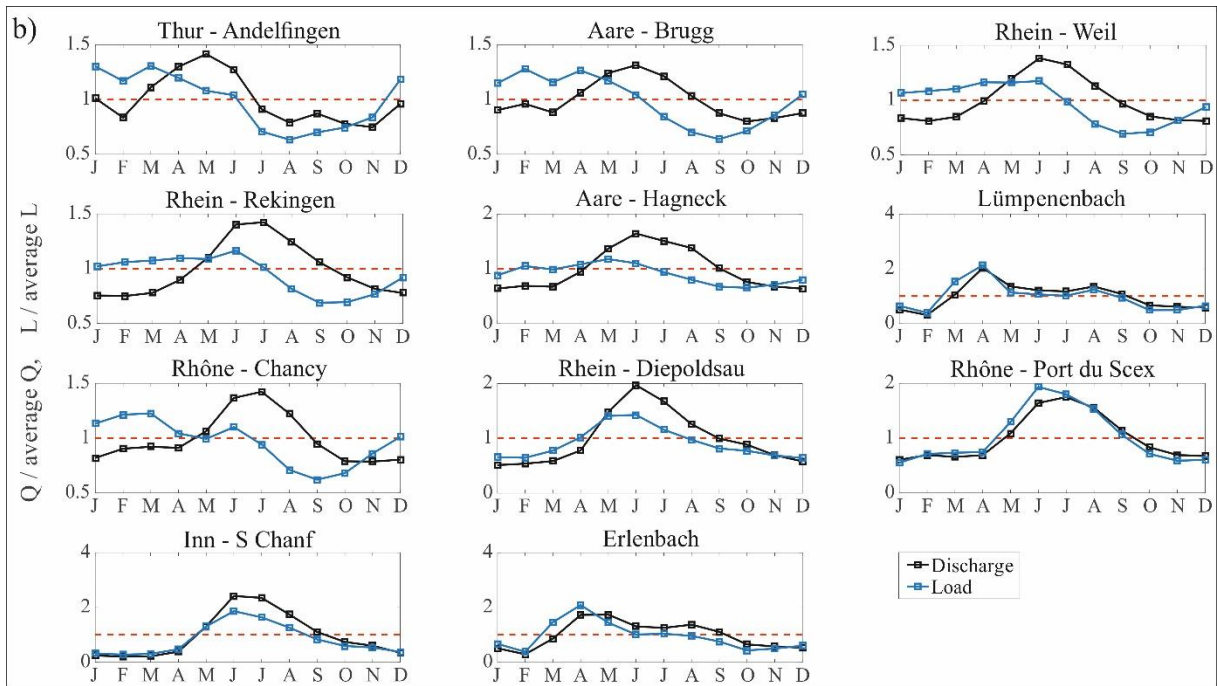
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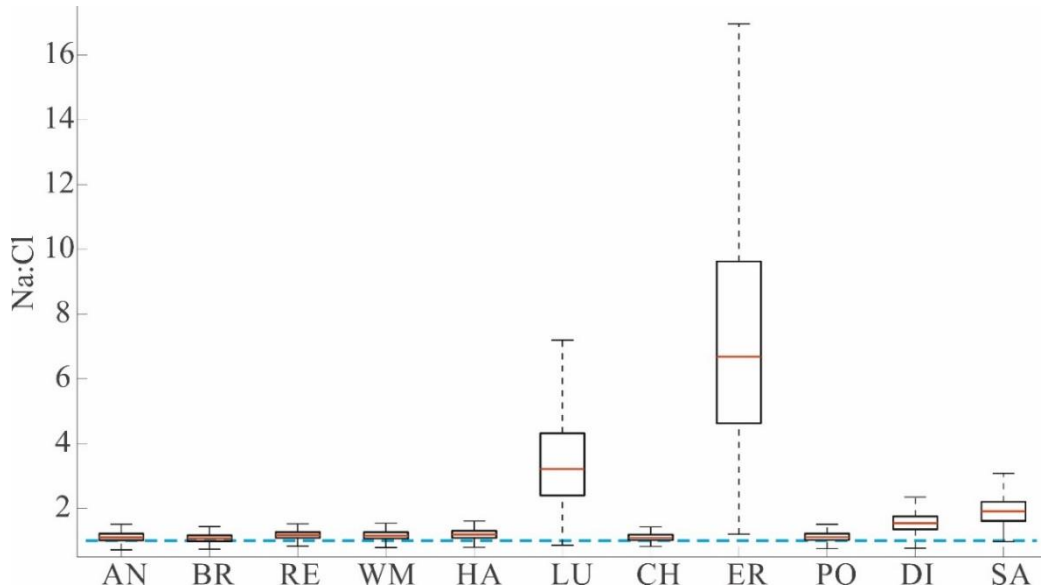
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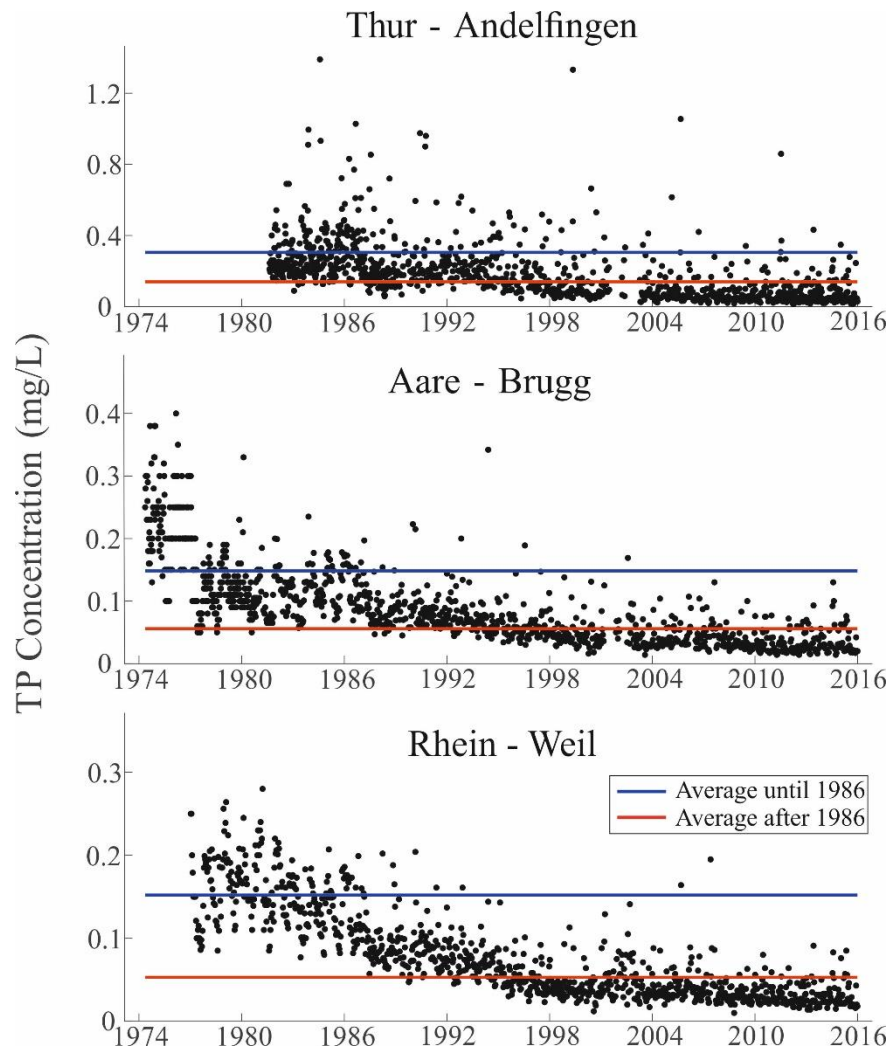
32 **Figure S2.** Monthly average of discharge (black) and solute load (blue) normalized to the average on the entire
 33 monitoring period. The red horizontal line represents the vale 1 (i.e., mean). The subpanel (a) refers to Calcium
 34 and subpanel (b) to Nitrate. Calcium is originated by rock weathering and it follows the seasonality of discharge.
 35 Nitrate, instead, is related to the anthropogenic activities and in the most impacted catchments (i.e. Thur –
 36 Brugg) the load has its own seasonality, which is different from the seasonality of discharge.

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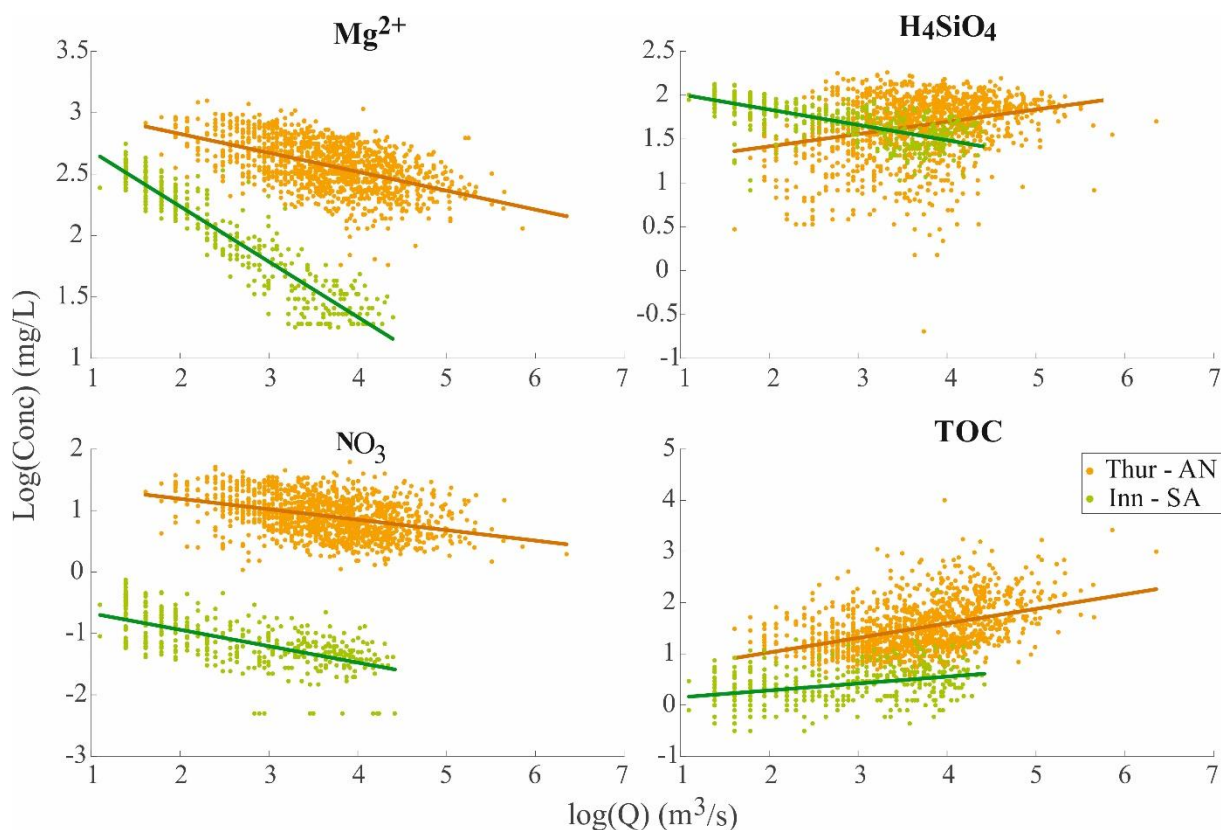
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39 **Figure S3.** Molar Na:Cl ratio across catchments. Catchments with higher inhabitant density (AN, BR, RE, WM,
 40 HA, CH) show molar ratio between Na^{2+} and Cl^- close to 1, while catchments with lower human presence (PO,
 41 DI, SA) show higher values. Lämpenenbach and Erlenbach catchments show very high molar Na:Cl ratio, as the
 42 number of their inhabitants is 0 and deicing salt is not used.



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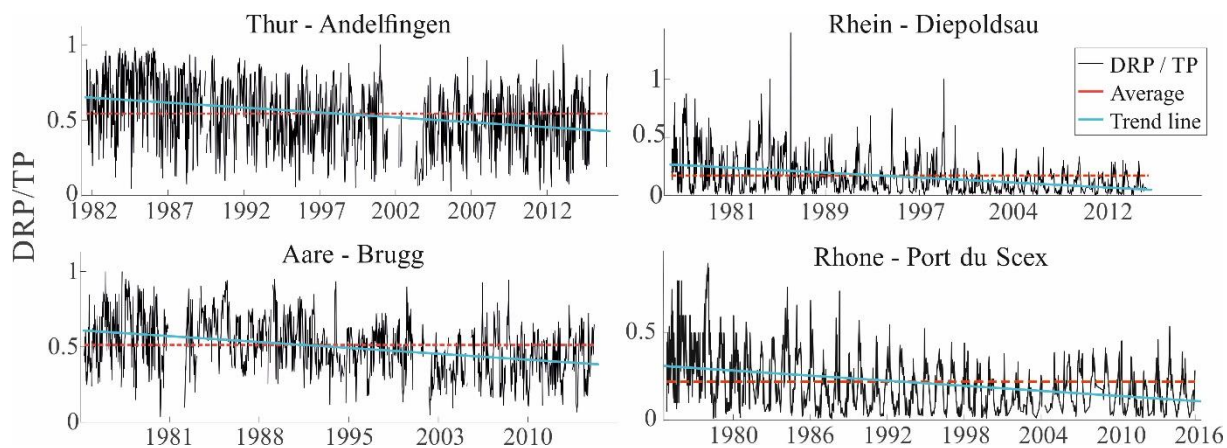
45 **Figure S4.** Observed TP concentrations in the three most impacted catchments (i.e. Thur-Andelfingen, Aare-
 46 Brugg, Rhein-Rekingen). The blue line represents the mean until 1986, whereas the red line represents the mean
 47 after 1986, until the end of the monitoring period. After the introduction of the phosphate ban in 1986, the DRP
 48 concentrations showed an evident decrease.



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50 **Figure S5.** Examples of C-Q relations. The patterns of the linear C-Q relation of some solutes (Mg^{2+} , H_4SiO_4 ,
 51 NO_3 and TOC) are plotted in a log-log space. Orange points and line refer to the Swiss Plateau catchment Thur
 52 (AN), while green ones refer to the Alpine catchment Inn (SA). The variability of concentrations of all the
 53 solutes across all the catchments is a few orders of magnitude less than the variability of discharge.

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56 **Figure S6.** Ratios of DRP/TP in time across four different catchments. The red dashed line represents the
 57 average value of the DRP/TP ratio computed on the entire monitoring period. All the selected catchments show
 58 significant decrease of DRP/TP ratio in time.

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		AN	BR	VW	RE	HA	LU	CH	DI	PO	SA	ER			AN	BR	VW	RE	HA	LU	CH	DI	PO	SA	ER				
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	Feb						+																						
	Mar	-															-												
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