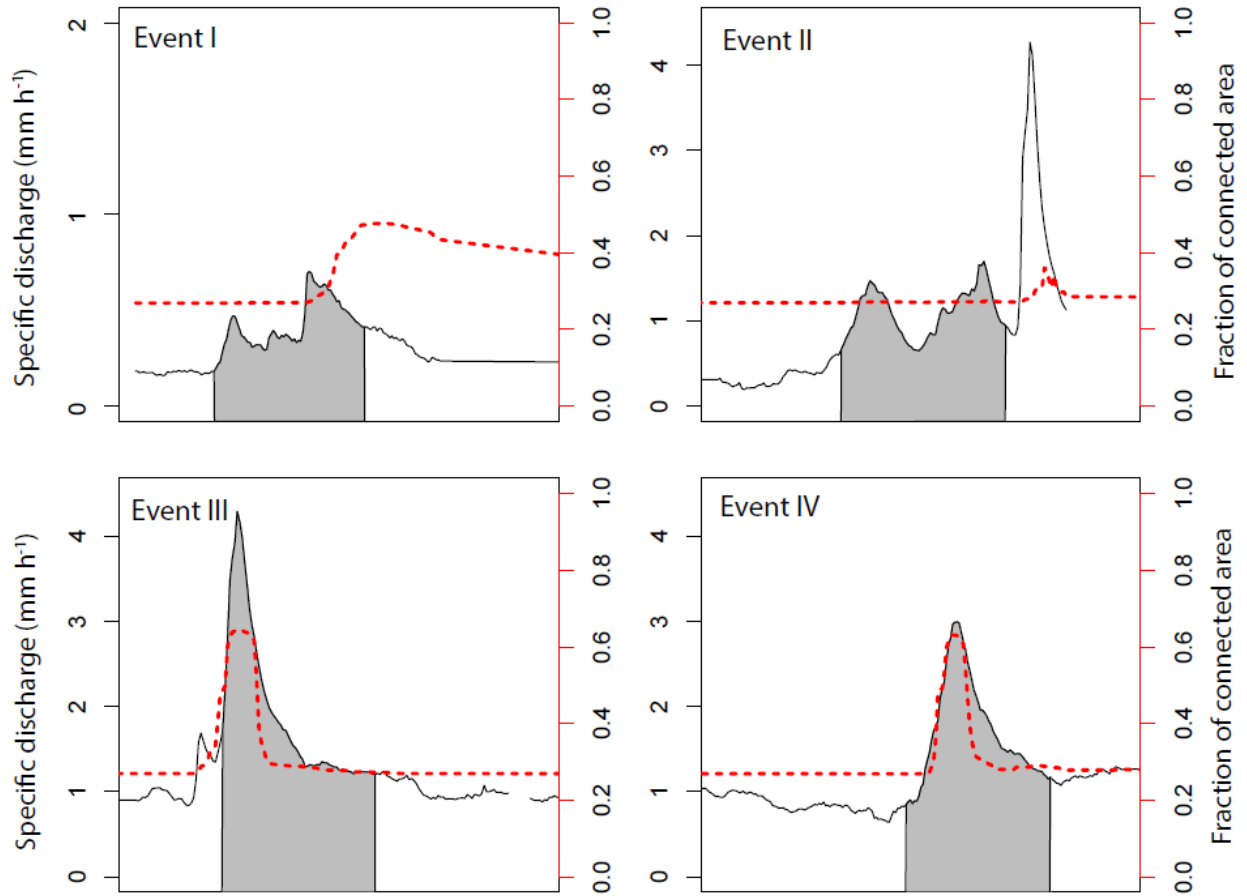
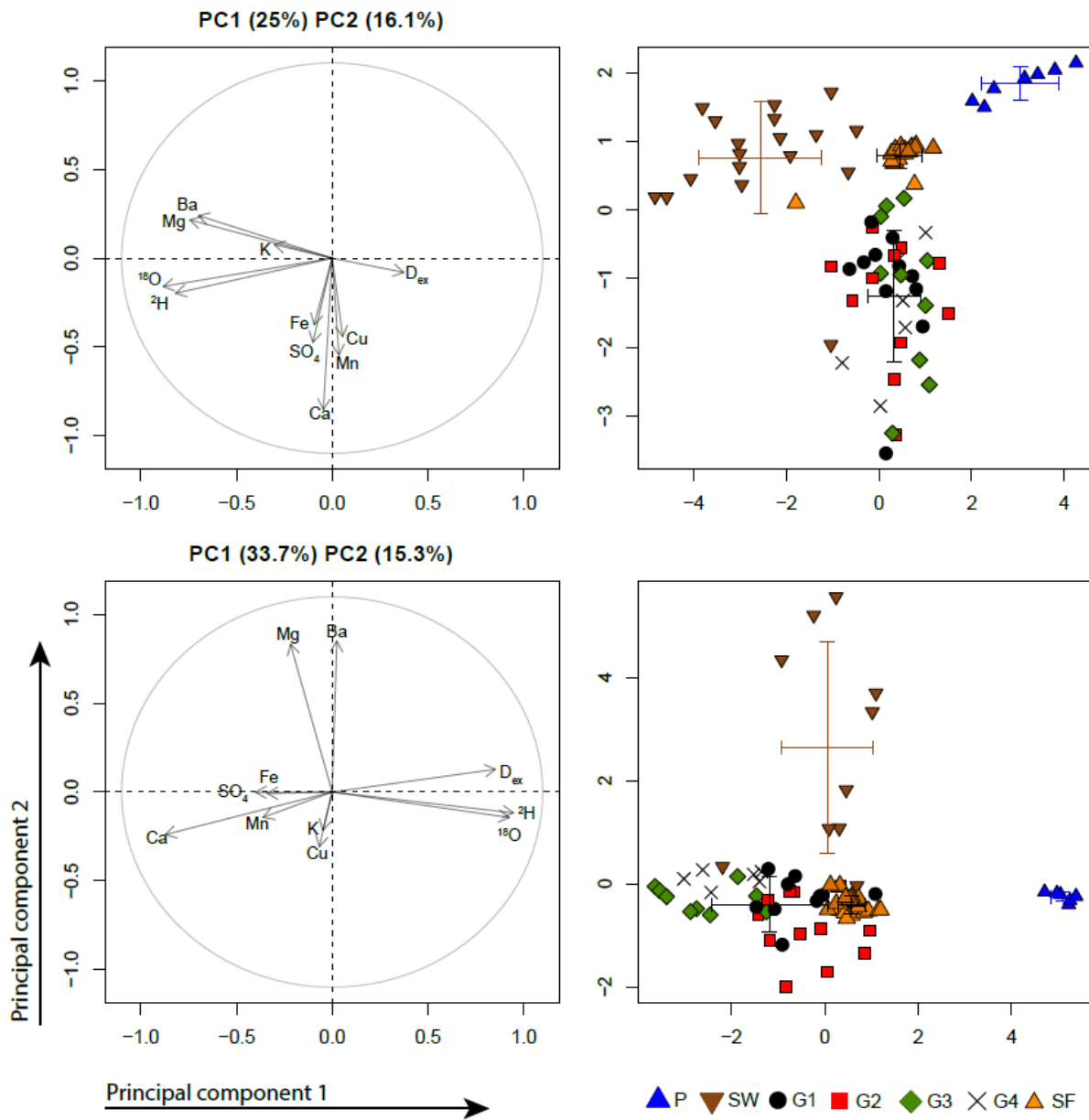
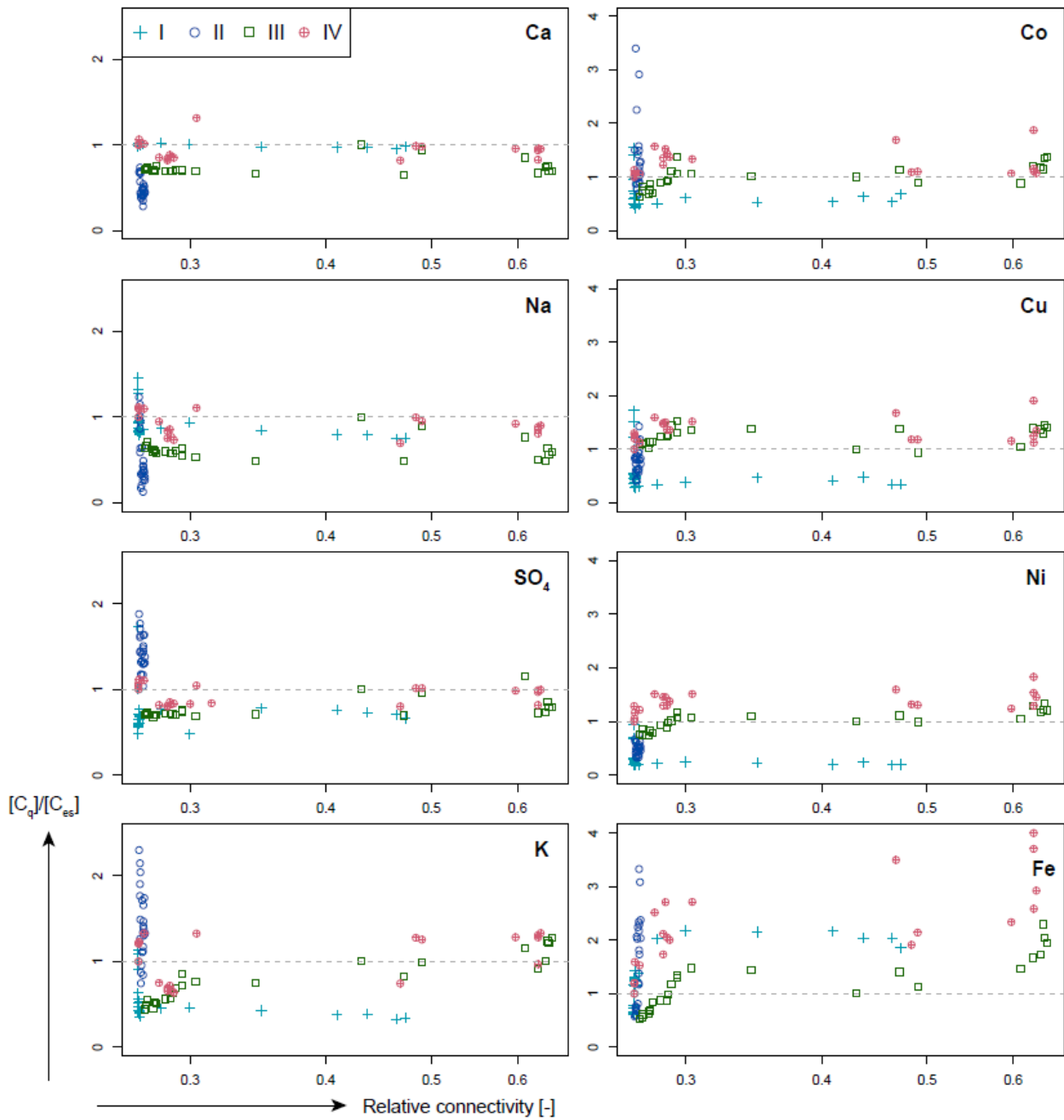
2 **S1: PCA results for all groundwater (n=335) and soil water samples (n=116) taken during the nine baseflow snapshot**
3 **campaigns (Kiewiet et al., 2019). In the biplot (left) the length of the arrow represents the explanatory power for the**
4 **solutes, the explanatory power of the first two principal components (PC1 and PC2) was 25.5 and 15.4%, respectively. The**
5 **mixing diagram (right) shows the individual soil water samples (brown reversed triangles) and groundwater samples**
6 **(black circles, red squares, green diamonds and black crosses, representing groundwater types 1-4 based on Kiewiet et al.,**
7 **2019) for the first two principal components, as well as the average and standard deviation for each component (yellow**
8 **and orange error bars, for soil water and groundwater respectively).**

9

10

11 **S2: Specific discharge (solid black line), fraction of the catchment area that was connected (red dashed lines), and the time**
12 **during which stormflow samples were collected (grey area) for events I to IV.**

13

14

15

S3: PCA results and mixing diagrams for events II (top) and IV (bottom). In the biplots (left; explanatory power of the
first two dimensions is given on top), the length of the arrow represents the explanatory power for each solute. The mixing
diagrams based on the first two principle components (right) show the individual rainfall (blue triangles), soil water
(brown reversed triangles), and groundwater samples (black circles, red squares, green diamonds and black crosses,
representing groundwater types 1-4 based on Kiewiet et al., 2019), as well as the stream water samples (SF, orange
triangles), and the average and standard deviation for groundwater, soil water, rainfall and streamwater (error bars). The
biplots and mixing plots of events I and III are shown in Fig. 7 of the manuscript.

23

24   **S4: Ratio of measured (C_q) and estimated stormflow concentrations (C_{es}; Eq. 3) for calcium, sodium, sulfate, potassium,**
25   **cobalt, copper, nickel and iron as a function of the fraction of the catchment that was connected to the stream, based on**
26   **the data driven model. The dashed grey line indicates that C_Q and C_{es} are equal; the different symbols reflect the different**
27   **events (I-IV).**

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