

To extract or not to extract? Influence of chemical extraction treatment of wood samples on element concentrations in tree-rings measured by X-ray fluorescence

Supplementary Figures & Tables

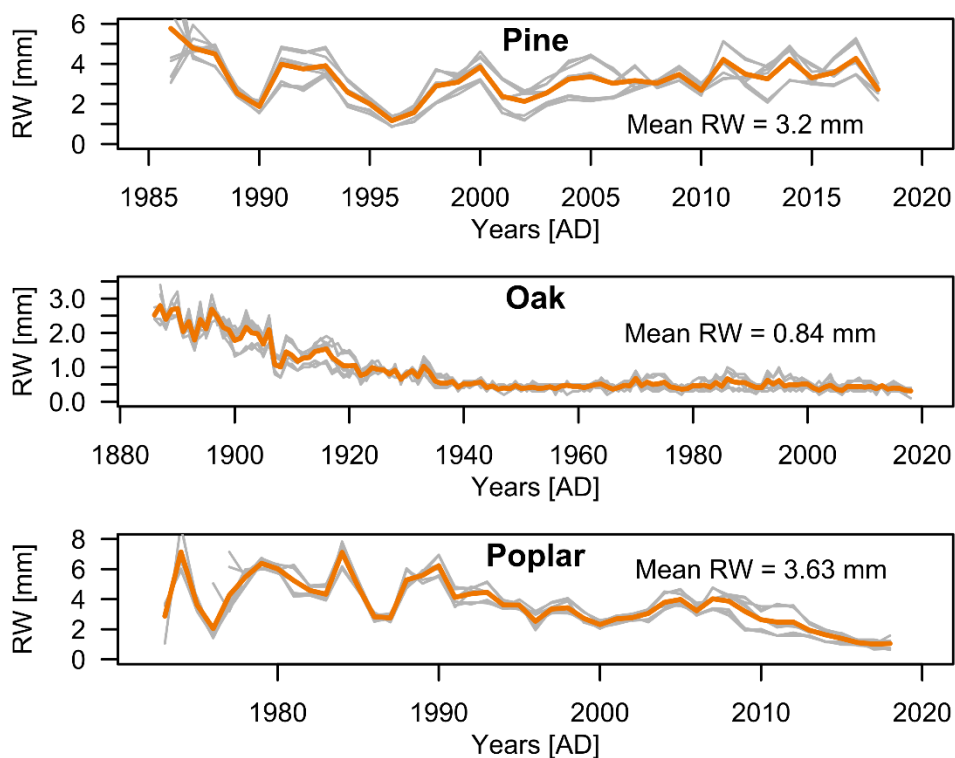


Figure S1: Ring-width (RW) curves of the nine radii per species and the respective mean curve (chronology) in orange

Table S1: Mineral content of Evian-mineral water used for the experiment. Values according to “*Evian Natural Spring Water California Bottled Water report*” available at:

https://www.evian.com/en_us/wpcontent/themes/evian/assets/report_files/Evian_CA_Annual_Report_English_2022.pdf

Mineral	Content [mg/l]
<i>Bicarbonate (HCO₃⁻)</i>	360
<i>Calcium (Ca)</i>	82
<i>Chloride (Cl)</i>	11
<i>Dissolved solids at 180° C</i>	345
<i>Iron (Fe)</i>	ND
<i>Magnesium (Mg)</i>	26
<i>Manganese (Mn)</i>	ND
<i>Nickel (Ni)</i>	0.002
<i>Nitrates (NO₃⁻)</i>	3.8
<i>Potassium (K)</i>	1
<i>Silica (SiO₂)</i>	15
<i>Sodium (Na)</i>	6.5
<i>Sulfate (S)</i>	14

Table S2: mean correlation (Rbar) between the countrates of three radii (replicates) for the analysed elements and the three extractives alcohol, water and acetone

<i>Element</i>	<i>Alcohol</i>			<i>Water</i>			<i>Acetone</i>		
	Pine Counts / trend	Poplar Counts / trend	Oak Counts / trend	Pine Counts / trend	Poplar Counts / trend	Oak Counts / trend	Pine Counts / trend	Poplar Counts / trend	Oak Counts / trend
<i>S</i>	0.61	0.70	0.67	0.66	0.58	0.59	0.66	0.51	0.62
<i>Cl</i>	0.43	0.66	0.58	0.58	0.54	0.57	0.42	0.67	0.69
<i>K</i>	0.90	0.96	0.98	0.94	0.98	0.97	0.94	0.97	0.88
<i>Ca</i>	0.83	0.28 (0.9)*	0.93	0.88	0.97	0.90	0.89	0.69	0.93
<i>Ti</i>	0.18	0.53	0.60	0.15	0.64	0.58	0.50	0.43	0.61
<i>Mn</i>	0.93	0.81	0.94	0.92	0.77	0.94	0.95	0.70	0.86
<i>Fe</i>	0.45	0.61	0.73	0.64	0.66	0.63	0.64	0.84	0.62
<i>Ni</i>	0.72	0.98	0.58	0.80	0.97	0.58	0.78	0.91	0.58

*one radius shows a contamination, if excluded the correlation of the other two radii with the mean curve is 0.9

Table S3: Details on the linear models from Fig. 4 in the main manuscript

Model	Intercept	Slope	Degrees of freedom	Significance slope	Adj.R²
<i>Pine: K~density</i>	0.022	-0.0088	2441	p< 0.001	0.07
<i>Pine: Mn~density</i>	0.013	-0.0076	2441	p< 0.001	0.09
<i>Pine: Cl~density</i>	0.0004	-0.0003	2441	p< 0.001	0.02
<i>Poplar: K~density</i>	0.01	0.007	4291	p< 0.001	0.02
<i>Poplar: Cl~density</i>	0.00009	0.0013	4291	p< 0.001	0.013
<i>Poplar: Ca~density</i>	-0.05	0.034	4291	p< 0.001	0.09

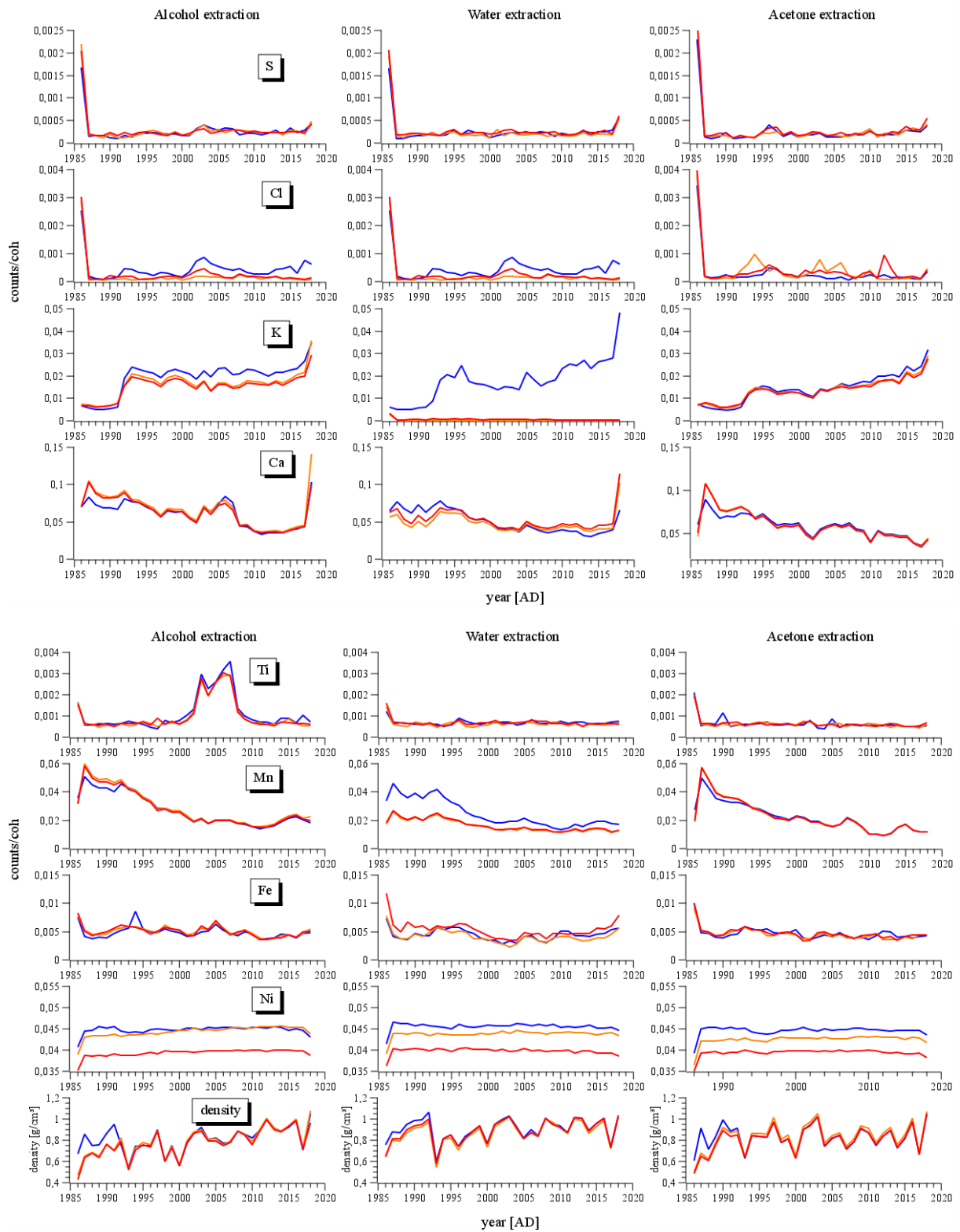


Figure S2: Temporal trends of selected elements before and after extraction with alcohol (left), water (centre) and acetone (right) for the pine samples. All curves are averaged over the three replications per treatment.

Blue: Control; orange: 12 hours extraction time; red: 24 hours extraction time

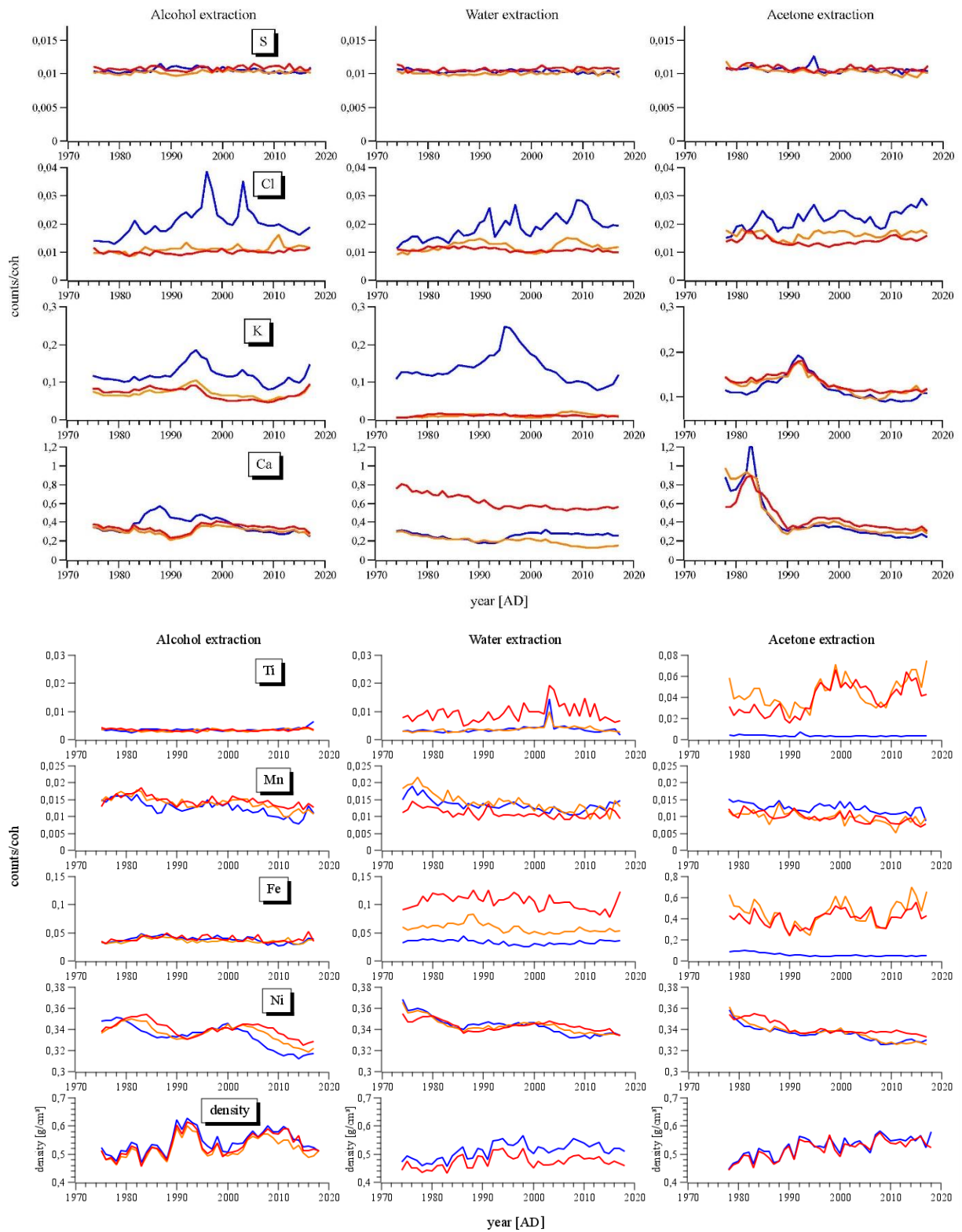


Figure S3: Temporal trends of selected elements before and after extraction with alcohol (left), water (centre) and acetone (right) for the poplar samples. All curves are averaged over the three replications per treatment.

Blue: Control; orange: 12 hours extraction time; red: 24 hours extraction time

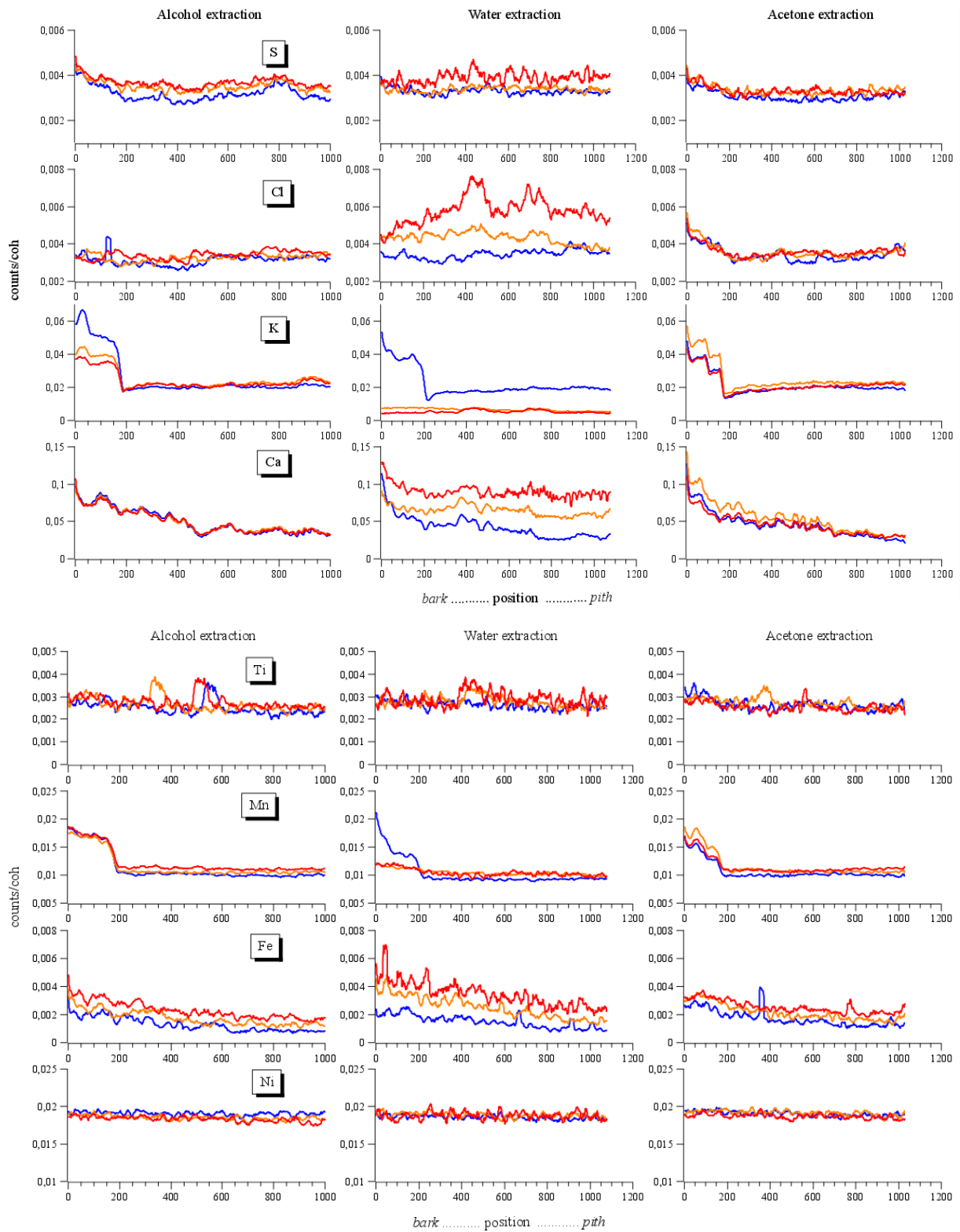


Figure S4: Temporal trends of selected elements before and after extraction with alcohol (left), water (centre) and acetone (right) for the oak samples. All curves are averaged over the three replications per treatment. In contrast to pine and poplar (Figs S1 & S2) elements were not averaged within ring boundaries but position on the sample is used as common x-axis
Blue: Control; orange: 12 hours extraction time; red: 24 hours extraction time

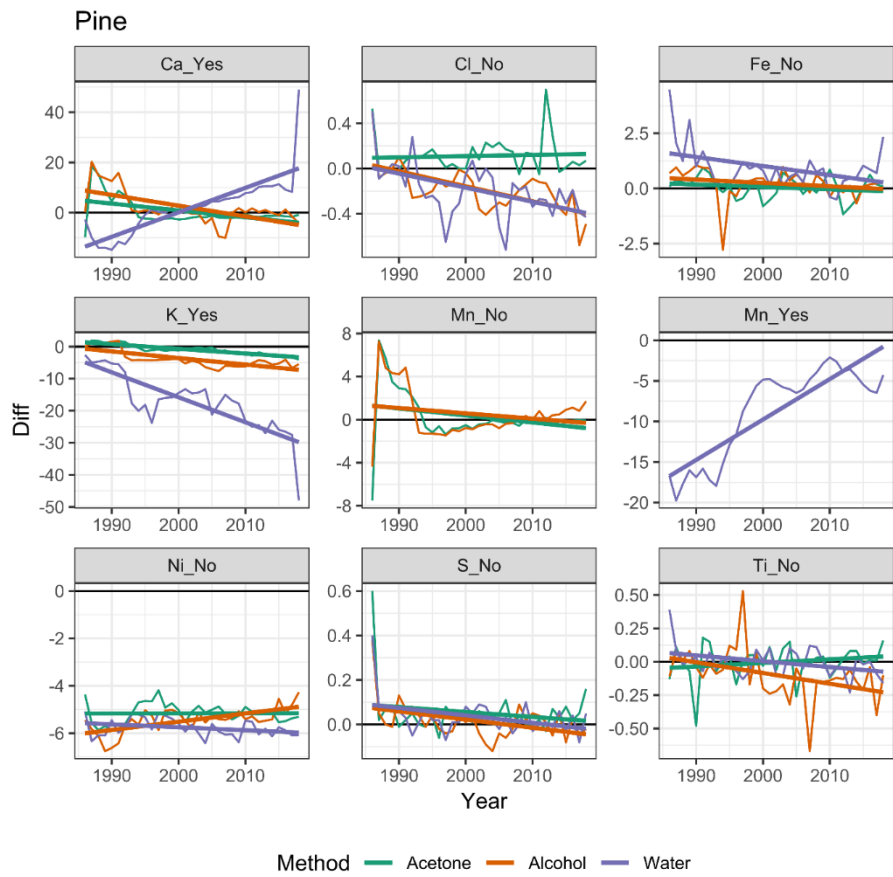


Figure S5: Differences between control (unextracted) and 24hrs extraction plotted as timelines and linear models fitted for pine, significance of the slope of the linear models is indicated with “Yes” or “No”; note the individually scaled y-axes

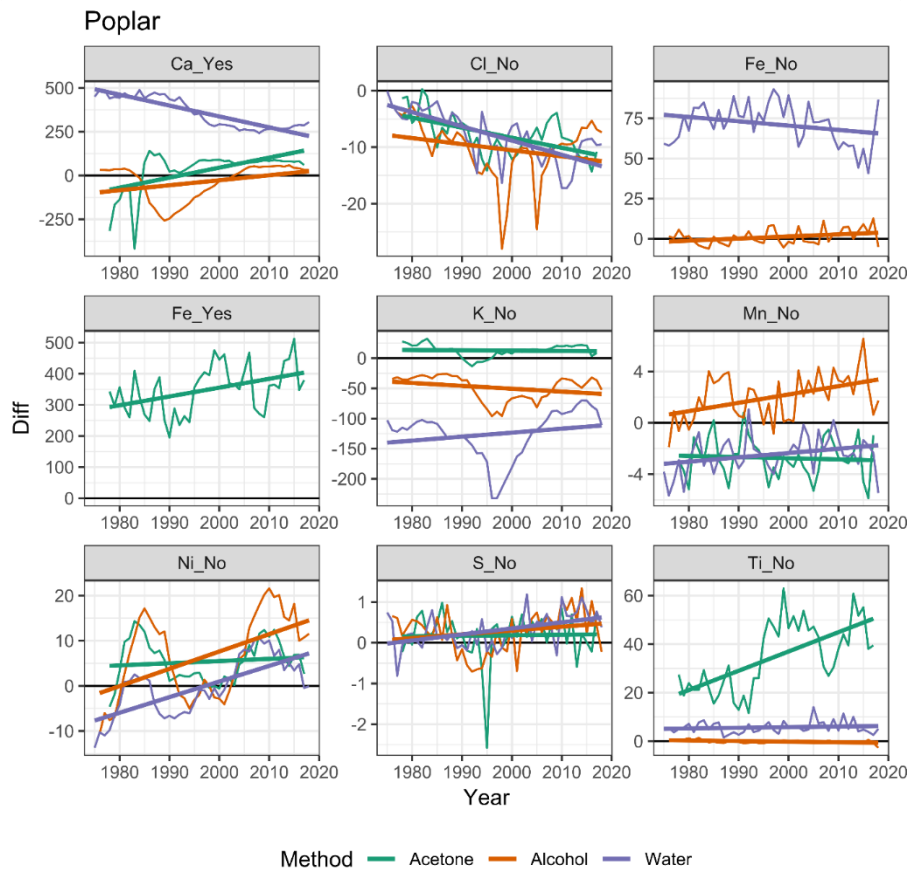


Figure S6: Differences between control (unextracted) and 24hrs extraction plotted as timelines and linear models fitted for poplar, significance of the slope of the linear models is indicated with “Yes” or “No”; note the individually scaled y-axes

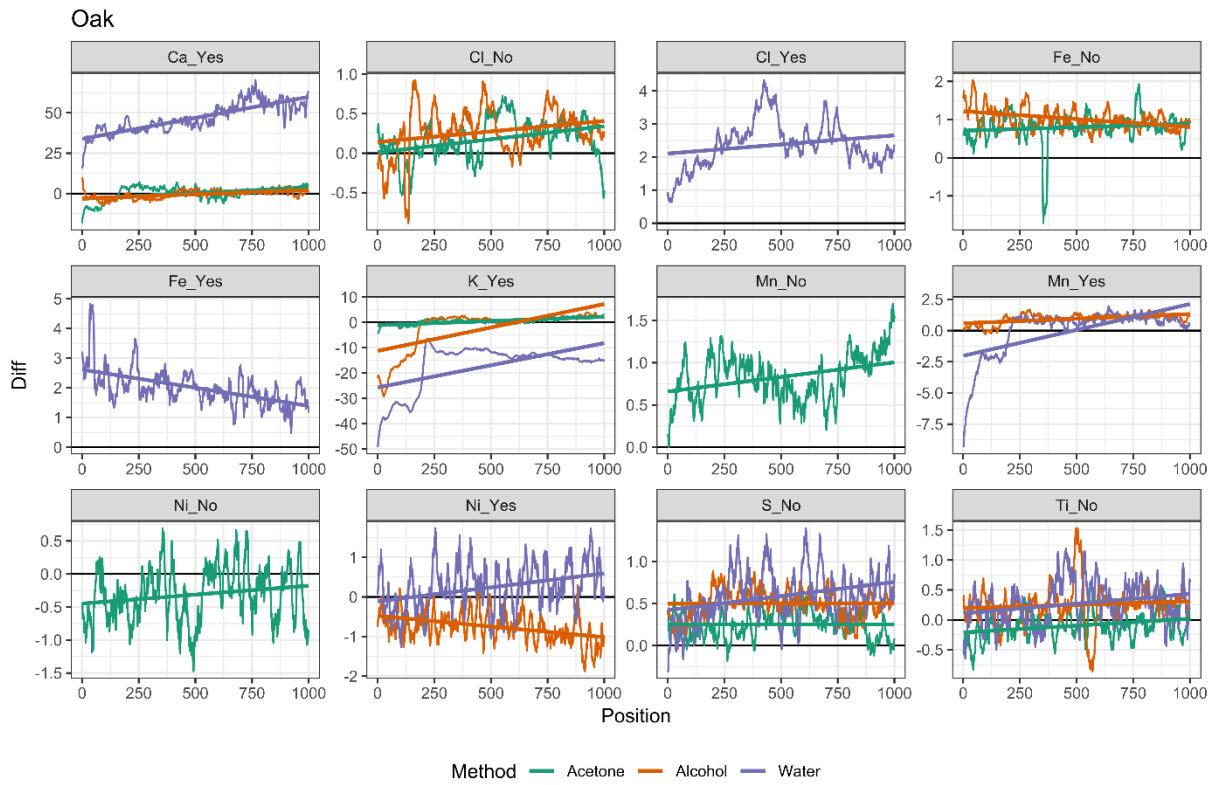


Figure S7: Differences between control (unextracted) and 24hrs extraction plotted as timelines and linear models fitted for oak, significance of the slope of the linear models is indicated with “Yes” or “No”; note the individually scaled y-axes