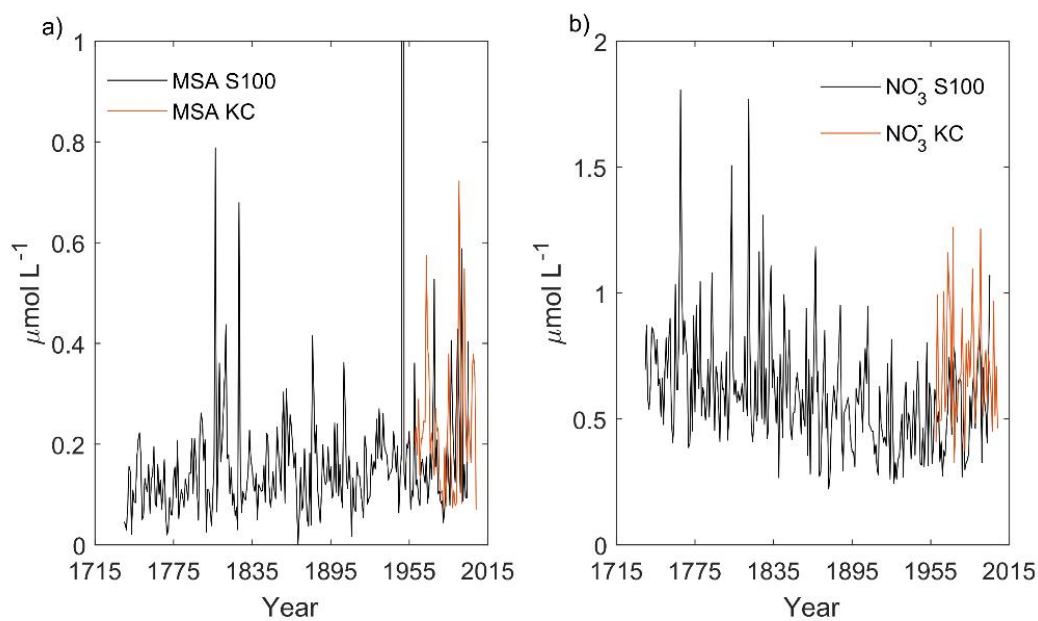


1 **Supplementary material**

2 Table S1. Slope and standard error ( $\sigma$ ) of the linear regression for annual ion  
 3 concentrations ( $\mu\text{mol L}^{-1}$ ) with time (years) at different time periods in the S100 and KC  
 4 cores. Significant values at the 95 % confidence level are shown in bold numbers.

Ion	S100 (1737–1949)		S100 (1950–2000)		KC (1958–2012)	
	Slope	$\sigma$	Slope	$\sigma$	Slope	$\sigma$
	$(\mu\text{mol L}^{-1} \text{y}^{-1})$		$(\mu\text{mol L}^{-1} \text{y}^{-1})$		$(\mu\text{mol L}^{-1} \text{y}^{-1})$	
MSA	$2 \times 10^{-4}$	$\pm 1 \times 10^{-4}$	-0.010	$\pm 0.01$	$8 \times 10^{-4}$	$\pm 1 \times 10^{-3}$
Cl <sup>-</sup>	<b>0.06</b>	$\pm$ <b>0.01</b>	<b>4.05</b>	$\pm$ <b>0.86</b>	0.02	$\pm$ 0.04
NO <sub>3</sub> <sup>-</sup>	<b><math>-1.0 \times 10^{-3}</math></b>	$\pm$ <b><math>2 \times 10^{-4}</math></b>	<b><math>4 \times 10^{-3}</math></b>	$\pm$ <b><math>2 \times 10^{-3}</math></b>	$-1 \times 10^{-3}$	$\pm 2 \times 10^{-3}$
SO <sub>4</sub> <sup>2-</sup>	<b><math>1.0 \times 10^{-3}</math></b>	$\pm$ <b><math>5 \times 10^{-4}</math></b>	<b>0.11</b>	$\pm$ <b>0.03</b>	$-5 \times 10^{-3}$	$\pm 9 \times 10^{-3}$
Na <sup>+</sup>	<b>0.05</b>	$\pm$ <b>0.01</b>	<b>2.9</b>	$\pm$ <b>0.60</b>	-0.10	$\pm$ 0.05
K <sup>+</sup>	<b><math>1.0 \times 10^{-3}</math></b>	$\pm$ <b><math>2 \times 10^{-4}</math></b>	<b>0.07</b>	$\pm$ <b>0.02</b>	$-5 \times 10^{-5}$	$\pm 8 \times 10^{-4}$
Mg <sup>2+</sup>	<b><math>6.0 \times 10^{-3}</math></b>	$\pm$ <b><math>8 \times 10^{-4}</math></b>	<b>0.15</b>	$\pm$ <b>0.03</b>	$3 \times 10^{-3}$	$\pm 4 \times 10^{-3}$
Ca <sup>2+</sup>	<b><math>2.6 \times 10^{-3}</math></b>	$\pm$ <b><math>4 \times 10^{-4}</math></b>	<b>0.08</b>	$\pm$ <b>0.02</b>	-0.02	$\pm$ 0.05

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7 Figure S1. a) MSA and b) NO<sub>3</sub><sup>-</sup> annual concentrations in the S100 and KC cores.

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