

## Supplementary material

**Table S2. Basic statistics for the diatom abundance (n yr<sup>-1</sup>), chemical species (ppb) and MPC (particles mL<sup>-1</sup>) annual records from each ice core. Bold numbers indicate statistically significant linear trend values (p<0.05). (\*) MPC record from JUR covers the interval 1992-2011 CE due to missing data.**

	Mean	Stdv	Max	Min	Linear trend
<b>SHIC (1999-2019 CE)</b>					
<b>Diatom abundance</b>	54.4	33.7	110	10	2.16
<b>MPC</b>	554.80	287.44	1536.12	269.04	18.63
<b>nssCa<sup>2+</sup></b>	20.62	7.67	41.17	12.51	<b>-0.7</b>
<b>nssK<sup>+</sup></b>	20.56	14.13	52.65	6.71	-0.48
<b>ssNa<sup>+</sup></b>	295.38	94.38	526.82	182.34	1.61
<b>MSA</b>	26.09	10.96	48.3	3.76	-0.09
<b>JUR (1992-2012 CE)</b>					
<b>Diatom abundance</b>	57.0	34.0	166	20	2.07
<b>MPC*</b>	126.33	31.72	174.55	50.16	2.26
<b>nssCa<sup>2+</sup></b>	69.41	26.45	136.46	45.08	<b>3.35</b>
<b>nssK<sup>+</sup></b>	15.6	12.16	50.62	1.83	<b>1.23</b>
<b>ssNa<sup>+</sup></b>	43.30	19.84	85.36	7.64	<b>2.01</b>
<b>MSA</b>	15.12	4.56	24.36	5.58	0.02
<b>SKBL (1999-2019 CE)</b>					
<b>Diatom abundance</b>	29.2	14.9	77	15	-0.41
<b>MPC</b>	537.60	250.19	1239.19	230.46	<b>-23.74</b>
<b>nssCa<sup>2+</sup></b>	15.71	4.43	24.52	9.48	-0.28
<b>nssK<sup>+</sup></b>	7.00	1.41	9.57	4.44	<b>-0.2</b>
<b>ssNa<sup>+</sup></b>	61.04	34.94	137.62	7.44	1.31
<b>MSA</b>	5.91	2.52	12.35	2.44	-0.01