

SUPPLEMENT MATERIALS

Accumulation and provenance of pollutant metals into a remote shallow peat bog from the Massif Central mountains (France)

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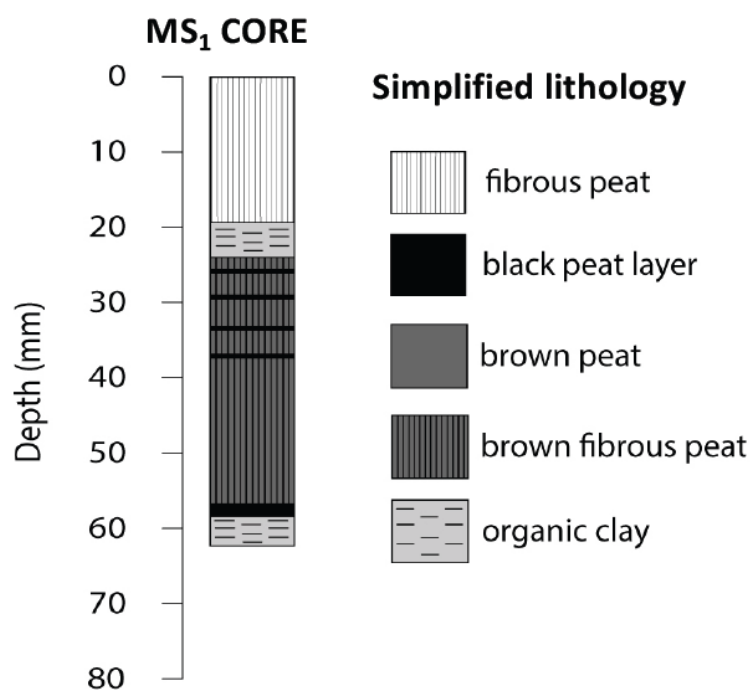
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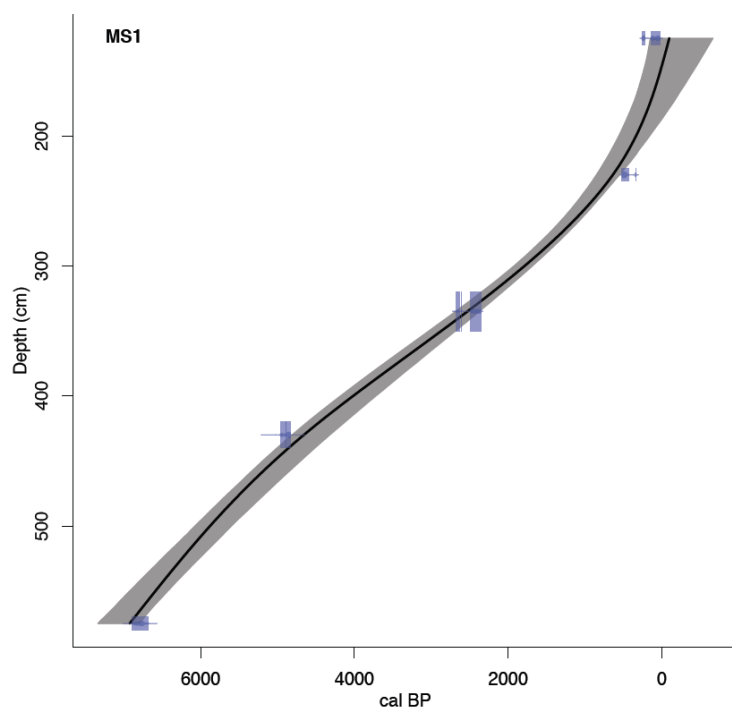
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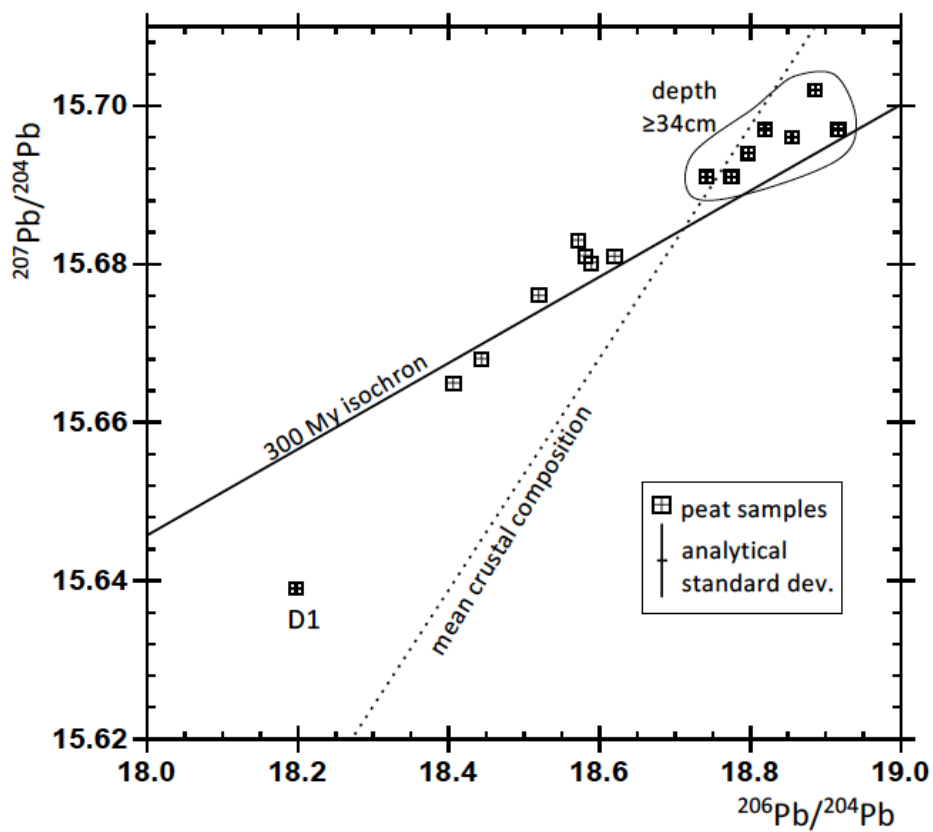
Supplement Figure 1. Lithography of the peat core MS₁.



Supplement Figure 2. Smooth-spline age curve from calibrated measured ^{14}C dates (and corresponding probability density) and linear interpolation.



Supplement Figure 3. Pb isotope systematic in the peat core MS1.



Supplement Table 1. Accuracy of ICP-MS analyses versus the HISS-1 NRCC standard. Concentration ranges are presented according to Analytical Standard Deviation and uncertainties on HISS-1 certified values.

	Pb	Cu	Zn	Ni	As	Ti	Al
ICP-MS	3.12-3.28	2.04-2.12	4.67-4,75	2.14-2.22	0.80-0.83	633-673	6792-6826
HISS-1	2.73-3.53	1.92-2.66	4.15-5.73	1,87-2.66	0.70-0.90	720-800	6800-7800

Supplement Table 2. Trace metal concentrations (ppm) in the Narcettes peat core. Depth intervals are in cm. Analytical Relative Deviation is below 5% for analyzed elements.

Depth	Al	Ti	Pb	Sb	Ni	Cu	Zn	As
2-4	22220	11.3	108	1.31	11.3	18.8	26.6	7.06
6-8	27462	8.71	127	2.25	8.71	16.9	24.5	11.3
10-12	35210	10.4	144	2.76	10.4	18.9	28.5	21.2
14-16	52811	13.8	98.1	2.29	13.8	13.0	33.6	28.6
18-20	74937	19.0	84.6	1.69	19.0	14.9	38.2	28.6
22-24	75678	17.9	89.2	1.63	17.9	13.8	35.9	22.7
26-28	46397	10.1	73.6	0.98	10.1	4.75	15.6	3.92
30-32	38754	11.1	49.6	0.66	11.1	5.82	14.6	5.45
34-36	48976	13.8	32.8	0.58	13.8	9.02	17.7	6.12
38-40	48779	15.9	36.3	0.61	15.9	12.7	19.2	4.83
42-44	40476	10.0	20.3	0.48	10.0	7.67	15.0	4.34
46-48	28346	10.8	15.4	0.30	10.8	9.90	13.4	2.91
50-52	19473	11.7	9.39	0.23	11.7	13.5	14.1	2.49
54-56	33608	12.2	23.5	0.48	12.2	9.55	20.5	3.67
58-60	66727	15.2	39.2	0.63	15.2	14.5	20.5	7.92

Supplement Table 3. Stable Pb isotope ratios in the "Narcettes" peat core. Depth intervals are in cm. Analytical uncertainties are presented in the main text (section 2).

Depth	$^{206}\text{Pb}/^{207}\text{Pb}$	$^{208}\text{Pb}/^{206}\text{Pb}$	$^{206}\text{Pb}/^{204}\text{Pb}$	$^{207}\text{Pb}/^{204}\text{Pb}$	$^{208}\text{Pb}/^{204}\text{Pb}$
2-4	1.1635	2.1018	18.197	15.639	38.245
6-8	1.1749	2.0939	18.406	15.665	38.539
10-12	1.1772	2.0921	18.444	15.668	38.587
14-16	1.1814	2.0875	18.519	15.676	38.657
18-20	1.1856	2.0816	18.590	15.680	38.697
22-24	1.1850	2.0824	18.581	15.681	38.694
26-28	1.1842	2.0851	18.572	15.683	38.724
30-32	1.1874	2.0807	18.619	15.681	38.741
34-36	1.1976	2.0667	18.796	15.694	38.844
38-40	1.2013	2.0605	18.856	15.696	38.853
42-44	1.1990	2.0645	18.820	15.697	38.853
46-48	1.1944	2.0685	18.742	15.691	38.768
50-52	1.1965	2.0659	18.775	15.691	38.787
54-56	1.2052	2.0596	18.918	15.697	38.962
58-60	1.2027	2.0596	18.885	15.702	38.896
Galena USS23-238	1.1807	2.0972	18.520	15.686	38.721

Supplement Table 4. References and modelled ages calculated from the smooth spline model for each mean sample depth in the Narcettes core.

Reference	Mean sample depth	Dates
D1	3 cm	< 250 yr
D2	7 cm	< 250 yr
D3	11 cm	< 250 yr
D4	15 cm	< 250 yr
D5	19 cm	< 500 yr
D6	23 cm	1400-1100 CE
D7	27 cm	800-560 CE
D8	31 cm	70 CE-180 BCE
D9	35 cm	740-1080 BCE
D10	39 cm	1570-2010 BCE
D11	43 cm	2370-2860 BCE
D12	47 cm	3120-3600 BCE
D13	51 cm	3820-4290 BCE
D14	55 cm	4480-4970
D15	59 cm	> 5400 BCE

Supplement Table 5. Number of European mines that explain IC_{xs} imprints in the peat core. The bracketed number stands for the specific number of Sardinian mines contributing to all of the IT source. See text for heading references and calculated dates.

Ref.	depth	dates	FR	SP	IT	GB	GE	GR
D1	3 cm	< 250 yr	6	7	9(7)	5	1	0
D2	7 cm	< 250 yr	21	47	9(7)	7	9	1
D3	11 cm	< 250 yr	26	36	8(6)	1	4	1
D4	15 cm	< 250 yr	24	51	13(10)	3	3	0
D5	19 cm	< 500 yr	27	92	23(13)	5	3	0
D6	23 cm	1400-1100 CE	30	91	36(13)	5	7	0
D7	27 cm	800-560 CE	22	30	9(4)	2	9	1
D8	31 cm	70 CE-180 BCE	35	31	8(3)	1	9	1
D9	35 cm	740-1080 BCE	1	10	8(6)	1	0	0
D10	39 cm	1570-2010 BCE	1	14	4(0)	1	0	1

Supplement Table 6. Number of French mines that explain IC_{xs} imprints in the peat core with an emphasis on regional ores from the Massif Central. See text for heading references and calculated dates.

Ref.	depth	dates	LO	MCS	MCN	MCE	ALPS	OTH
D1	3 cm	< 250 yr	0	1	3	0	0	2
D2	7 cm	< 250 yr	0	8	10	1	2	0
D3	11 cm	< 250 yr	8	7	6	0	5	0
D4	15 cm	< 250 yr	8	5	8	1	2	0
D5	19 cm	< 500 yr	3	3	19	1	0	1
D6	23 cm	1400-1100 CE	2	3	23	1	0	1
D7	27 cm	800-560 CE	6	6	5	0	5	0
D8	31 cm	70 CE-180 BCE	8	8	7	0	6	6
D9	35 cm	740-1080 BCE	0	1	0	0	0	0
D10	39 cm	1570-2010 BCE	0	0	0	0	1	0

Supplement Table 7. Scaled posterior densities (0 to 1) of groups investigated using MixSIAR. The Mean ($\pm$ standard deviation) of the probability density is shown for each source at each sample depth Di. No data is presented when no source was evidenced from EDs. Statistically significant densities are marked in bold at each sample depth.

SOURCE	D1	D2	D3	D4	D5	D6	D7	D8
FR	0.29 ± 0.20	0.17 ± 0.13	0.13 ± 0.11	0.23 ± 0.17	0.25 ± 0.17	0.25 ± 0.18	0.14 ± 0.13	0.13 ± 0.12
SP	0.15 ± 0.12	0.14 ± 0.11	0.12 ± 0.10	0.23 ± 0.17	0.19 ± 0.15	0.21 ± 0.17	0.15 ± 0.13	0.15 ± 0.12
IT	0.20 ± 0.15	0.15 ± 0.11	0.21 ± 0.15	0.23 ± 0.15	0.20 ± 0.14	0.23 ± 0.15	0.26 ± 0.19	0.26 ± 0.18
GB	0.20 ± 0.13	0.13 ± 0.11	0.13 ± 0.07	0.12 ± 0.11	0.22 ± 0.17	0.18 ± 0.15	0.12 ± 0.11	0.10 ± 0.09
GE	0.16 ± 0.12	0.17 ± 0.13	0.20 ± 0.15	0.20 ± 0.15	0.13 ± 0.11	0.13 ± 0.11	0.08 ± 0.07	0.12 ± 0.10
GR	—	0.25 ± 0.15	0.21 ± 0.15	—	—	—	0.25 ± 0.18	0.24 ± 0.17
LO	—	—	0.22 ± 0.16	0.26 ± 0.15	0.18 ± 0.13	0.27 ± 0.16	0.30 ± 0.19	0.23 ± 0.16
MCN	0.16 ± 0.12	0.27 ± 0.19	0.26 ± 0.17	0.21 ± 0.16	0.24 ± 0.18	0.33 ± 0.22	0.21 ± 0.16	0.18 ± 0.14
MCS	0.12 ± 0.06	0.15 ± 0.13	0.17 ± 0.13	0.14 ± 0.12	0.17 ± 0.12	0.16 ± 0.14	0.15 ± 0.14	0.12 ± 0.12
MCE	—	0.19 ± 0.14	—	0.14 ± 0.12	0.20 ± 0.15	0.24 ± 0.17	—	—
ALPS	—	0.39 ± 0.22	0.36 ± 0.21	0.24 ± 0.17	0.21 ± 0.15	—	0.34 ± 0.21	0.34 ± 0.20
OTH	0.72 ± 0.17	—	—	—	—	—	—	0.13 ± 0.10