Supplementary Data for

Signatures of Urbanization in Temperate Highland Peat Swamps on Sandstone (THPSS) of the Blue Mountains World Heritage Area

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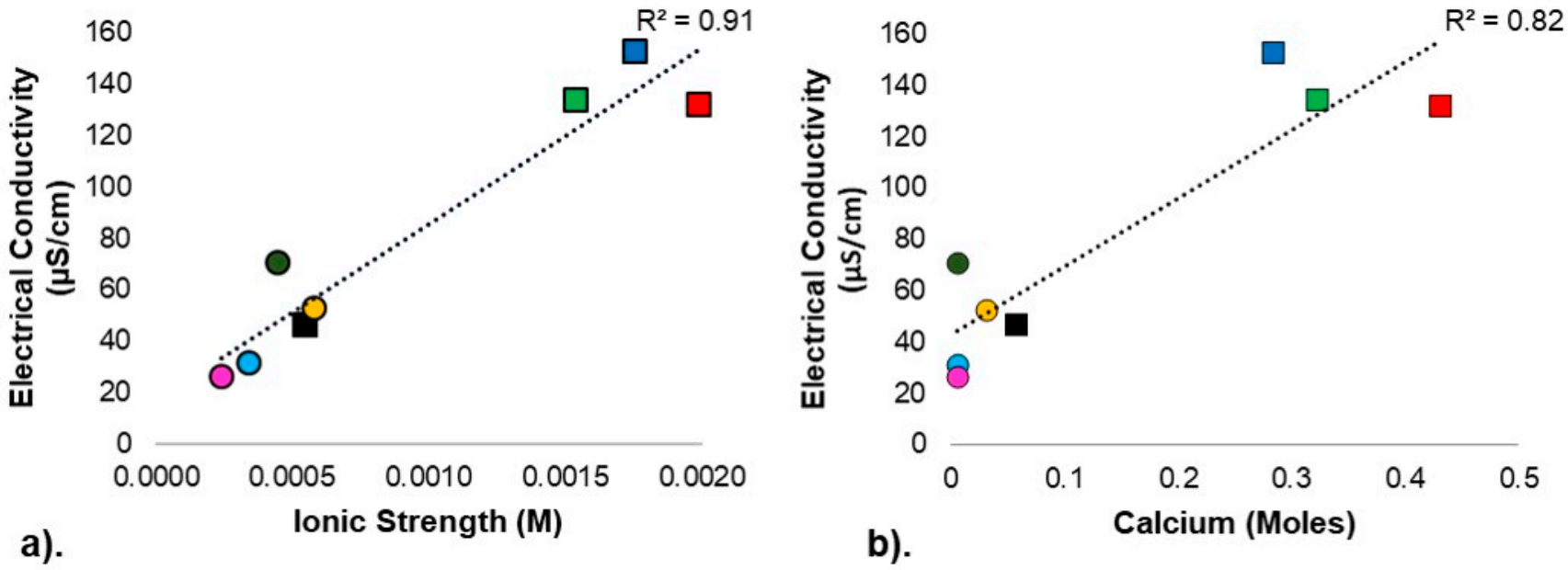
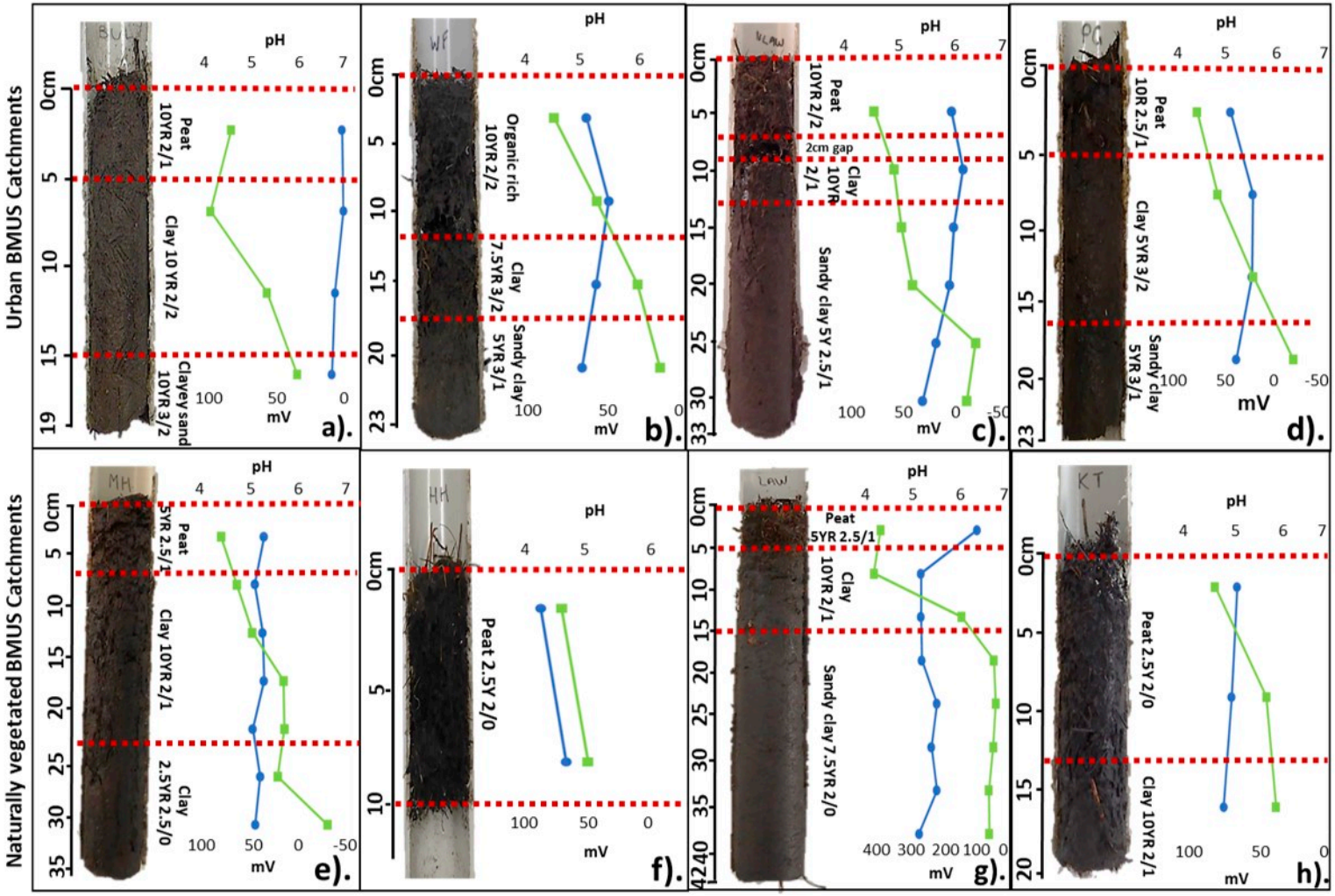


Supplementary Data Figure S1. Electrical conductivity compared to a). ionic strength (Moles; M) and b). calcium (M). Urban catchments are indicated by squares and naturally vegetated catchments by circles. Sites are indicated as Bullaburra (red), Wentworth Falls (black), North Lawson (dark blue), Popes Glen (light green), Mount Hay (light blue), Hat Hill (pink), Lawson (dark green) and Kings Tableland (orange). The R^2 values and trendlines are also included.



Supplementary Data Figure S2. Summary of Redox (mV; indicated in green) and pH (pH units; indicated in blue) data for sediment cores from urban Temperate Highland Peat Swamps on Sandstone (THPSS) a). Bullaburra, b). Wentworth Falls, c). North Lawson, d). Popes Glen, and naturally vegetated THPSS catchments e). Mount Hay, f). Hat Hill, g). Lawson and h). Kings Tableland. Horizons are indicated by red dotted lines and descriptive data on colors per layer are identified.

Supplementary Data Table S1. Eigenvalues for the Principal Component Analysis (PCA) conducted in R for the eight Temperate Highland Peat Swamps on Sandstone (THPSS) assessed in the Blue Mountains (with four urban and four naturally vegetated sites) over three sampling events (from April – June 2018).

Eigenvalues

	Dim.1	Dim.2	Dim.3	Dim.4	Dim.5	Dim.6	Dim.7	Dim.8	Dim.9	Dim.10	Dim.11	Dim.12	Dim.13	Dim.14
Variance	14.050	7.287	3.422	2.557	1.915	1.386	1.097	0.828	0.409	0.347	0.275	0.149	0.095	0.084
% of var.	41.322	21.432	10.065	7.522	5.631	4.077	3.226	2.434	1.204	1.021	0.810	0.439	0.280	0.248
Cumulative % of var.	41.322	62.754	72.819	80.341	85.972	90.049	93.275	95.709	96.913	97.934	98.744	99.183	99.464	99.711

	Dim.15	Dim.16	Dim.17	Dim.18	Dim.19	Dim.20	Dim.21
Variance	0.043	0.022	0.012	0.010	0.006	0.004	0.002
% of var.	0.128	0.063	0.035	0.028	0.018	0.012	0.005
Cumulative % of var.	99.839	99.902	99.937	99.966	99.984	99.995	100.000

Supplementary Data Table S2. Summary of variables for the Principal Component Analysis (PCA) conducted in R for the eight Temperate Highland Peat Swamps on Sandstone (THPSS) assessed in the Blue Mountains (with four urban and four naturally vegetated sites) over three sampling events (from April – June 2018). Dist refers to the distance matrix, Dim refers to the dimension number (first three are shown), ctr refers to the contribution of each variable to a given principal component (as a percentage (%)), and cos2 refers to the squared cosine for each principal component that indicates the quality of representation for variables.

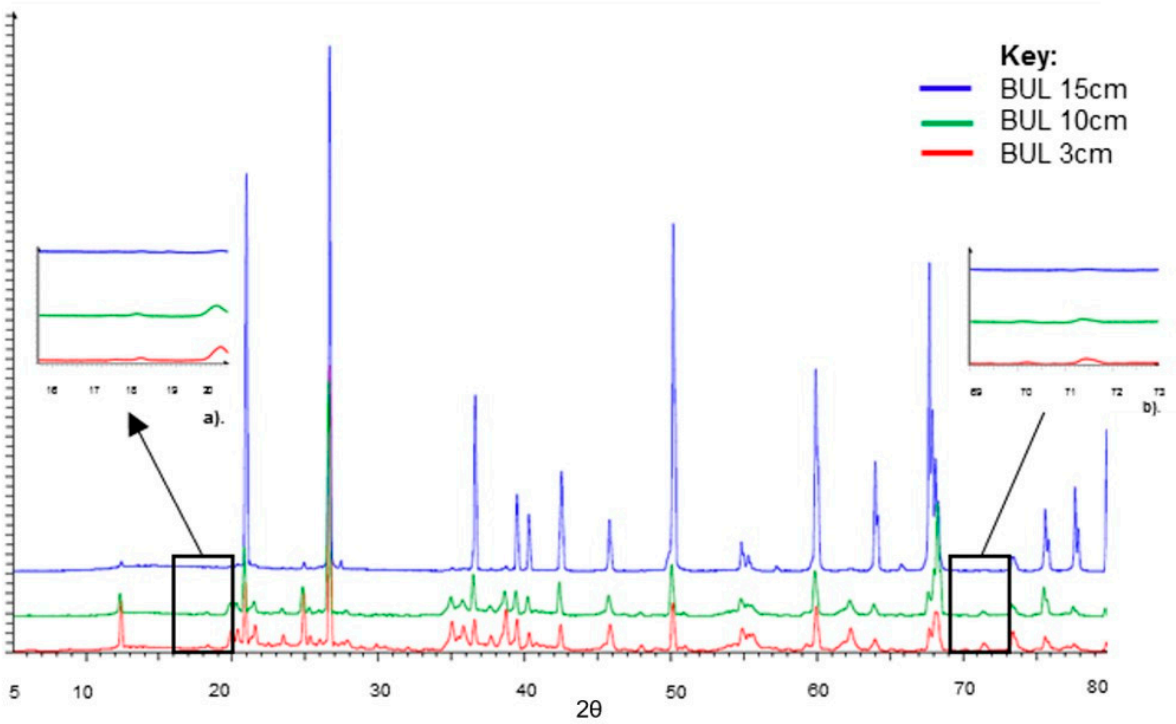
Variables

	Dim.1	ctr	cos2	Dim.2	ctr	cos2	Dim.3	ctr	cos2
Site	-0.734	3.832	0.538	0.319	1.397	0.102	0.133	0.515	0.018
Site_no	-0.734	3.832	0.538	0.319	1.397	0.102	0.133	0.515	0.018
Catchment_Type	-0.743	3.926	0.552	0.497	3.387	0.247	0.166	0.800	0.027
Sampling_event	0.093	0.062	0.009	0.309	1.314	0.096	-0.872	22.219	0.760
IA	0.752	4.027	0.566	-0.521	3.721	0.271	-0.136	0.544	0.019
pH	0.859	5.248	0.737	-0.337	1.558	0.113	-0.120	0.420	0.014
EC	0.743	3.927	0.552	-0.474	3.086	0.225	-0.047	0.066	0.002
DO	-0.248	0.438	0.061	0.606	5.038	0.367	-0.225	1.480	0.051
Temp	-0.030	0.006	0.001	-0.106	0.153	0.011	0.869	22.086	0.756
NTU	0.842	5.051	0.710	0.497	3.388	0.247	0.086	0.214	0.007
N	0.253	0.457	0.064	0.226	0.703	0.051	0.668	13.030	0.446
P	-0.219	0.340	0.048	0.254	0.885	0.065	-0.511	7.632	0.261
Ca	0.848	5.123	0.720	-0.466	2.981	0.217	0.024	0.017	0.001
K	0.804	4.599	0.646	-0.228	0.713	0.052	-0.169	0.832	0.028
Na	0.401	1.145	0.161	-0.647	5.742	0.418	0.088	0.227	0.008
Mg	0.804	4.599	0.646	-0.389	2.080	0.152	0.052	0.079	0.003
HCO3	0.849	5.131	0.721	-0.397	2.161	0.157	0.060	0.107	0.004
SO42	0.649	3.001	0.422	0.262	0.942	0.069	-0.201	1.177	0.040
Cl	0.363	0.935	0.131	-0.607	5.062	0.369	-0.131	0.499	0.017
Al	0.562	2.250	0.316	0.788	8.518	0.621	0.072	0.150	0.005
Mn	0.787	4.412	0.620	0.241	0.794	0.058	0.165	0.793	0.027
Fe	0.794	4.487	0.630	0.205	0.579	0.042	0.079	0.184	0.006
Ni	0.715	3.638	0.511	0.673	6.213	0.453	-0.023	0.016	0.001
Zn	0.094	0.064	0.009	0.426	2.492	0.182	0.446	5.818	0.199
Ba	0.900	5.767	0.810	-0.190	0.495	0.036	0.144	0.606	0.021
Cd	0.156	0.174	0.024	-0.145	0.290	0.021	-0.015	0.007	0.000
Cr	0.715	3.638	0.511	0.673	6.213	0.453	-0.023	0.016	0.001
Cu	-0.103	0.076	0.011	-0.090	0.111	0.008	0.810	19.180	0.656
Pb	0.646	2.970	0.417	0.726	7.241	0.528	0.074	0.162	0.006
Mo	0.000	0.000	NaN	0.000	0.000	NaN	0.000	0.000	NaN
U	0.000	0.000	NaN	0.000	0.000	NaN	0.000	0.000	NaN
Sr	0.873	5.423	0.762	-0.387	2.059	0.150	0.058	0.097	0.003
Co	0.715	3.638	0.511	0.673	6.213	0.453	-0.023	0.016	0.001
As	0.715	3.638	0.511	0.673	6.213	0.453	-0.023	0.016	0.001
Li	0.260	0.481	0.068	-0.268	0.986	0.072	0.115	0.388	0.013
Ti	0.718	3.665	0.515	0.654	5.871	0.428	0.057	0.096	0.003

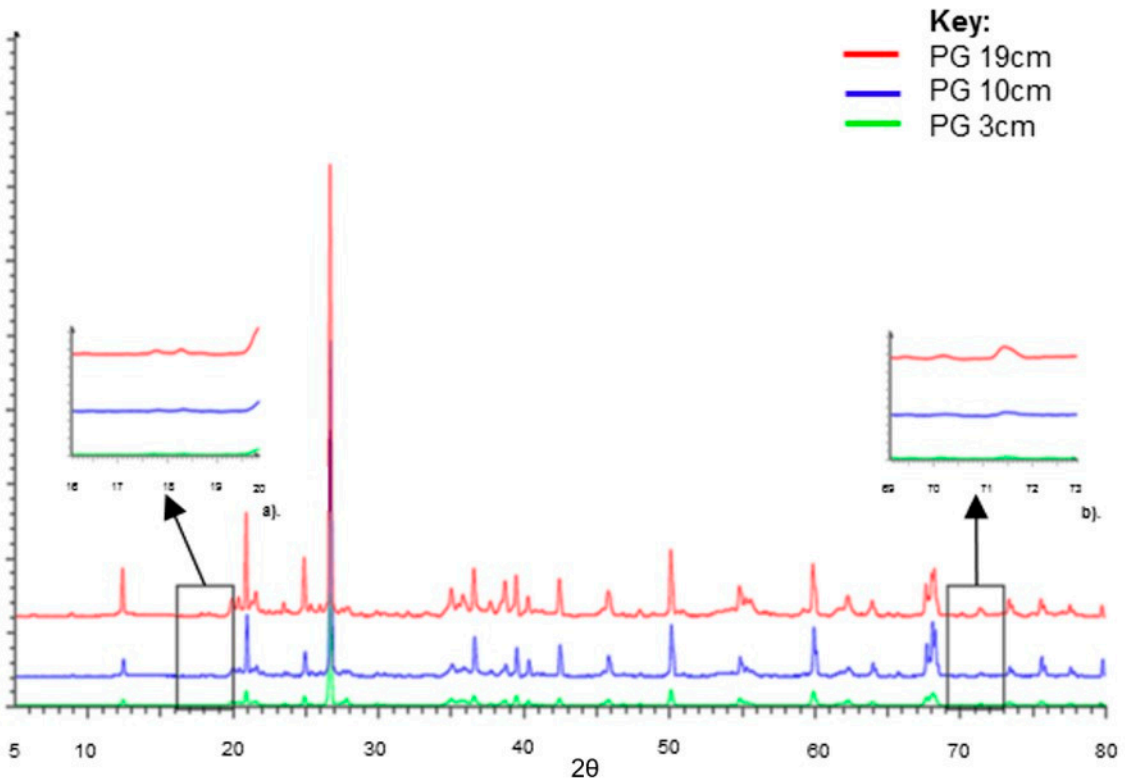
Supplementary Data Table S3. Summary of individuals for the Principal Component Analysis (PCA) conducted in R for the eight Temperate Highland Peat Swamps on Sandstone (THPSS) assessed in the Blue Mountains (with four urban and four naturally vegetated sites) over three sampling events (from April – June 2018). Dist refers to the distance matrix, Dim refers to the dimension number (first three are shown), ctr refers to the contribution of each individual to a given principal component (as a percentage (%)), and cos2 refers to the squared cosine for each principal component that indicates the quality of representation for individuals. The individuals are indicated as urban Bullaburra (1-3), Wentworth Falls (4-6), North Lawson (7-9), and Popes Glen (10-12), and naturally vegetated Mount Hay (13), Hat Hill (14-16), Lawson (17-19), and Kings Tableland (20-22).

Individuals

	Dist	Dim.1	ctr	cos2	Dim.2	ctr	cos2	Dim.3	ctr	cos2
1	7.844	4.463	6.445	0.324	-3.316	6.860	0.179	0.977	1.269	0.016
2	5.800	3.527	4.026	0.370	-2.504	3.910	0.186	-1.245	2.060	0.046
3	14.867	12.280	48.789	0.682	8.324	43.218	0.313	-0.196	0.051	0.000
4	3.897	-0.359	0.042	0.008	-0.294	0.054	0.006	1.971	5.161	0.256
5	3.258	-0.821	0.218	0.064	-0.348	0.076	0.011	-1.019	1.380	0.098
6	3.740	-0.506	0.083	0.018	0.145	0.013	0.001	-2.493	8.257	0.445
7	5.004	1.942	1.220	0.151	-3.638	8.257	0.529	1.571	3.279	0.099
8	4.851	1.412	0.645	0.085	-3.154	6.207	0.423	-0.844	0.947	0.030
9	3.993	0.521	0.088	0.017	-2.274	3.225	0.324	-2.245	6.692	0.316
10	6.282	3.469	3.894	0.305	-3.193	6.360	0.258	2.869	10.934	0.209
11	6.905	3.188	3.288	0.213	-2.866	5.123	0.172	-0.139	0.026	0.000
12	4.352	1.376	0.612	0.100	-1.571	1.540	0.130	-2.560	8.705	0.346
13	5.888	-2.678	2.320	0.207	1.612	1.620	0.075	3.744	18.621	0.404
14	4.217	-3.318	3.561	0.619	1.197	0.894	0.081	1.518	3.062	0.130
15	4.083	-3.499	3.962	0.735	1.287	1.033	0.099	-0.519	0.357	0.016
16	5.761	-3.835	4.759	0.443	1.826	2.079	0.100	-2.495	8.271	0.188
17	4.339	-3.187	3.287	0.539	0.467	0.136	0.012	1.726	3.956	0.158
18	3.812	-3.122	3.154	0.671	0.944	0.556	0.061	-1.158	1.781	0.092
19	4.368	-3.145	3.200	0.519	1.193	0.887	0.075	-2.299	7.018	0.277
20	4.718	-2.576	2.146	0.298	1.944	2.358	0.170	2.378	7.513	0.254
21	4.671	-2.553	2.109	0.299	1.933	2.331	0.171	0.672	0.601	0.021
22	4.753	-2.580	2.153	0.295	2.288	3.264	0.232	-0.214	0.061	0.002



Supplementary Data Figure S3. X-ray diffraction (XRD) spectra for sediment samples from the core collected from urban Bullaburra (BUL) Temperate Highland Peat Swamps on Sandstone (THPSS), where samples were collected at a depth of 3 cm (red), 10 cm (green) and 15 cm (blue). Key peaks associated with the presence of calcium hydroxide ($Ca(OH)_2$) are indicated, including at a). 18 degrees 2θ and b). 71.5 degrees 2θ. The y axis refers to intensity.



Supplementary Data Figure. S4. X-ray diffraction (XRD) spectra for sediment samples from the core collected from urban Popes Glen (PG) Temperate Highland Peat Swamps on Sandstone (THPSS), where samples were collected at a depth of 3 cm (light green), 10 cm (blue) and 19 cm (red). Key peaks associated with the presence of calcium hydroxide ($Ca(OH)_2$) are indicated, including at a). 18 degrees 2θ and b). 71.5 degrees 2θ. The y axis refers to intensity.