Supplementary to "The browning and re-browning of lakes: Divergent lake-water organic carbon trends linked to acid deposition and climate change"

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8 pages, 1 table, 6 figures

Table S1. Location, morphometric characteristics and selected water chemistry data (mean of available data for the period 2005 to 2015 (May-October)) for the study lakes.

Lake	Coordinates	Elevation (m a.s.l.)	Lake area (ha)	Z_{max} (m)	Z_{mean} (m)	DOC (mg L^{-1})	pH	TP (µg L^{-1})	SO_4^{2-} (mg L^{-1})	CaMg* (µeq L^{-1})
Sudbury										
Tilton	46°21.40 N, 81°04.30 W	252	52	12	7	2.9	6.8	5.6	7.5	77
Clearwater	46°22.20 N, 81°03.04 W	267	76	22	8	3.0	6.5	4.1	8.7	85
Middle	46°26.34 N, 81°01.44 W	278	28	15	6	4.0	7.1	6.9	15.4	270[1]
Ramsey	46°28.60 N, 80°56.90 W	251	795	21	8	3.6	7.5	10.3	17.3	372
McFarlane	46°24.85 N, 80°57.85 W	226	166	18	7	4.4	7.6	9.0	17.5	361
Richard	46°26.25 N, 80°55.00 W	258	84	9	4	3.1	7.3	9.6	8.4	242
Killarney Provincial Park										
Lumsden	46°01.52 N, 81°25.97 W	238	22	22	7	1.4	5.5	2.8	5.2	32
George	46°01.79 N, 81°23.83 W	189	189	40	19	2.1	6.5	3.6	5.7	50
Experimental Lakes Area										
L127	49°38.47 N, 93°51.30 W	427	5	5	2	5.7	6.8	7.6	2.0	75
L129	49°38.67 N, 93°50.12 W	406	5	5	2	9.6	6.5	8.3	1.6	114
L164	49°37.25 N, 93°49.20 W	369	20	7	5	8.8	6.7	5.1	1.5	136
L224	49°41.40 N, 93°43.00 W	408	26	27	12	3.6	7.0	2.2	1.9	117
L239	49°39.75 N, 93°43.35 W	386	54	32	11	7.2	7.1	2.3	2.4	199
L373	49°44.65 N, 93°47.98 W	424	27	21	11	4.2	7.2	3.5	1.9	191
L377	49°43.25 N, 93°46.42 W	392	27	18	9	5.5	7.0	4.0	2.3	163
L378	49°42.64 N, 93°46.58 W	396	24	18	7	7.4	6.9	2.3	1.9	140

Abbreviations: maximum lake depth (Z_{max}), mean lake depth (Z_{mean}), dissolved organic carbon (DOC), total phosphorus (TP), sulphate (SO_4^{2-}), and calcium (Ca^{2+}) + magnesium (Mg^{2+}) concentrations (CaMg*). [1]Middle Lake was limed in 1973 prior to the beginning of water-chemistry monitoring.

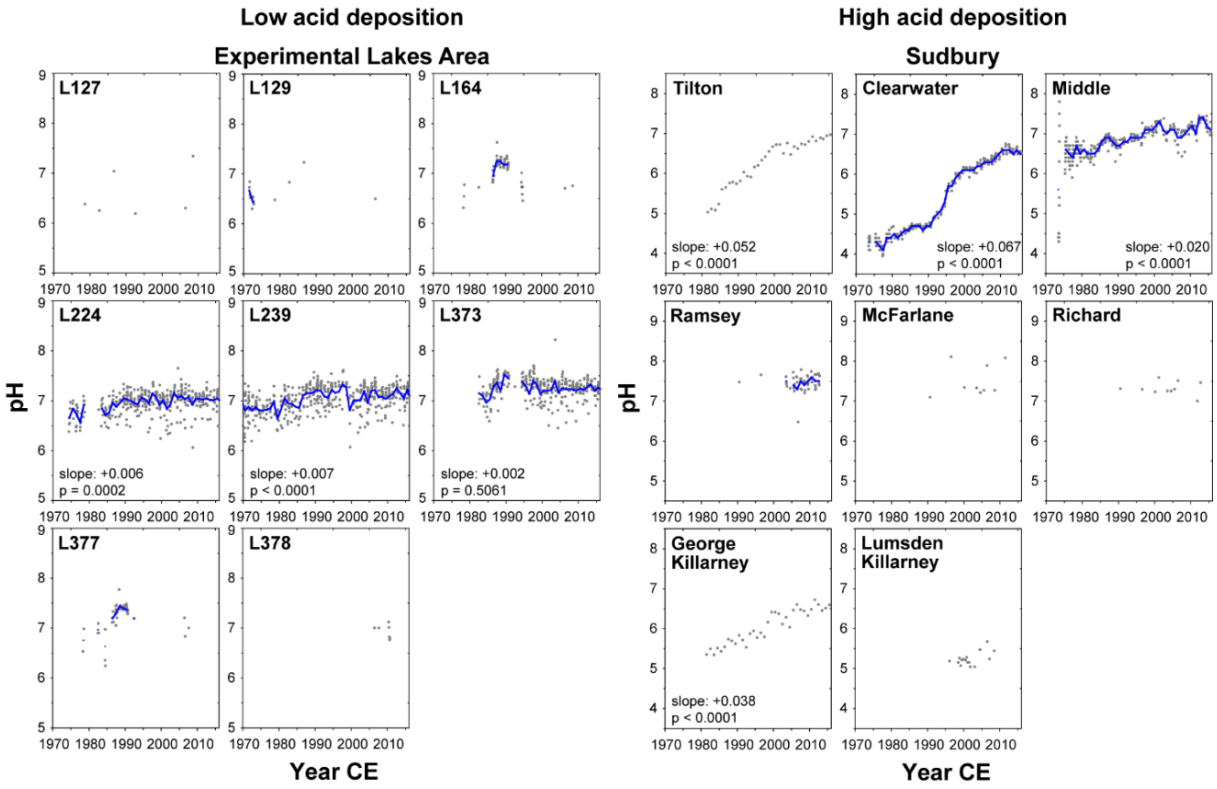

Figure S1. pH monitoring data for the study lakes. Grey circles represent individual measurements, while blue lines represent annual means. Slopes (annual change) and significance levels resulting from trend analyses are given for records with at least 25 years of data.

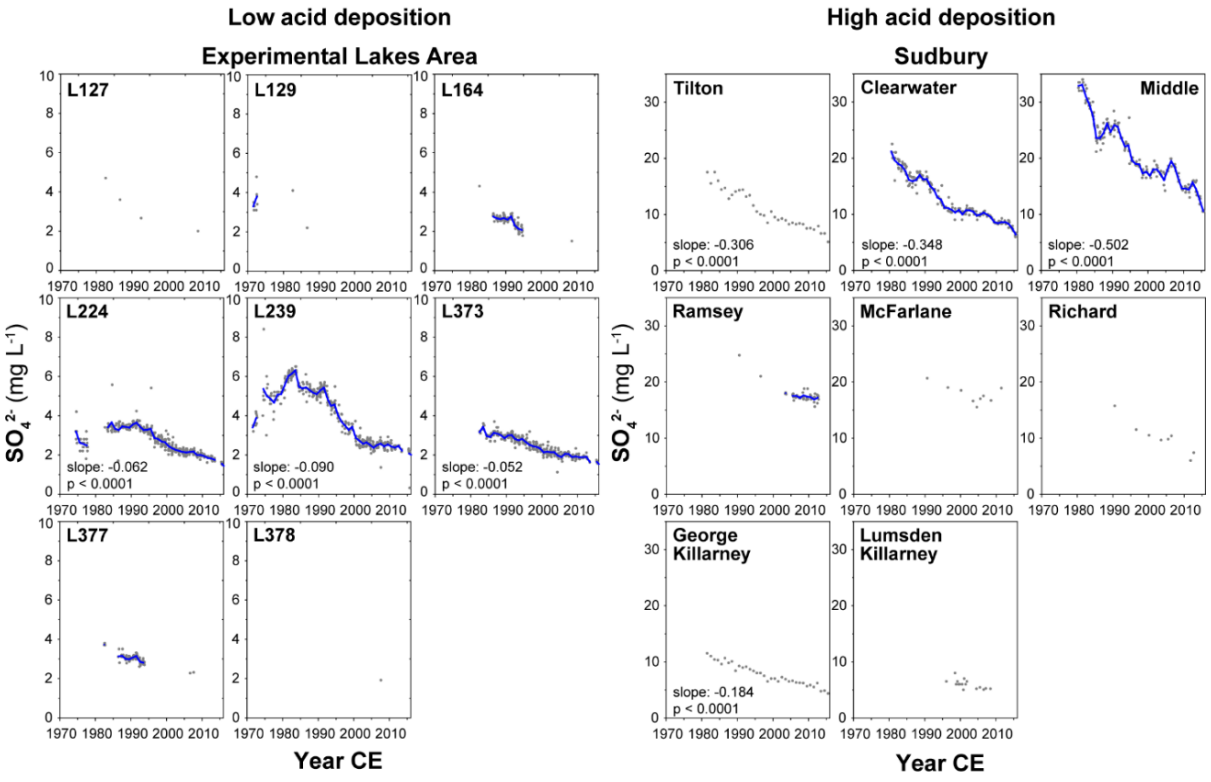

Figure S2. Sulphate (SO_4^{2-}) monitoring data for the study lakes. Grey circles represent individual measurements, while blue lines represent annual means. Slopes (annual change) and significance levels resulting from trend analyses are given for records with at least 25 years of data.

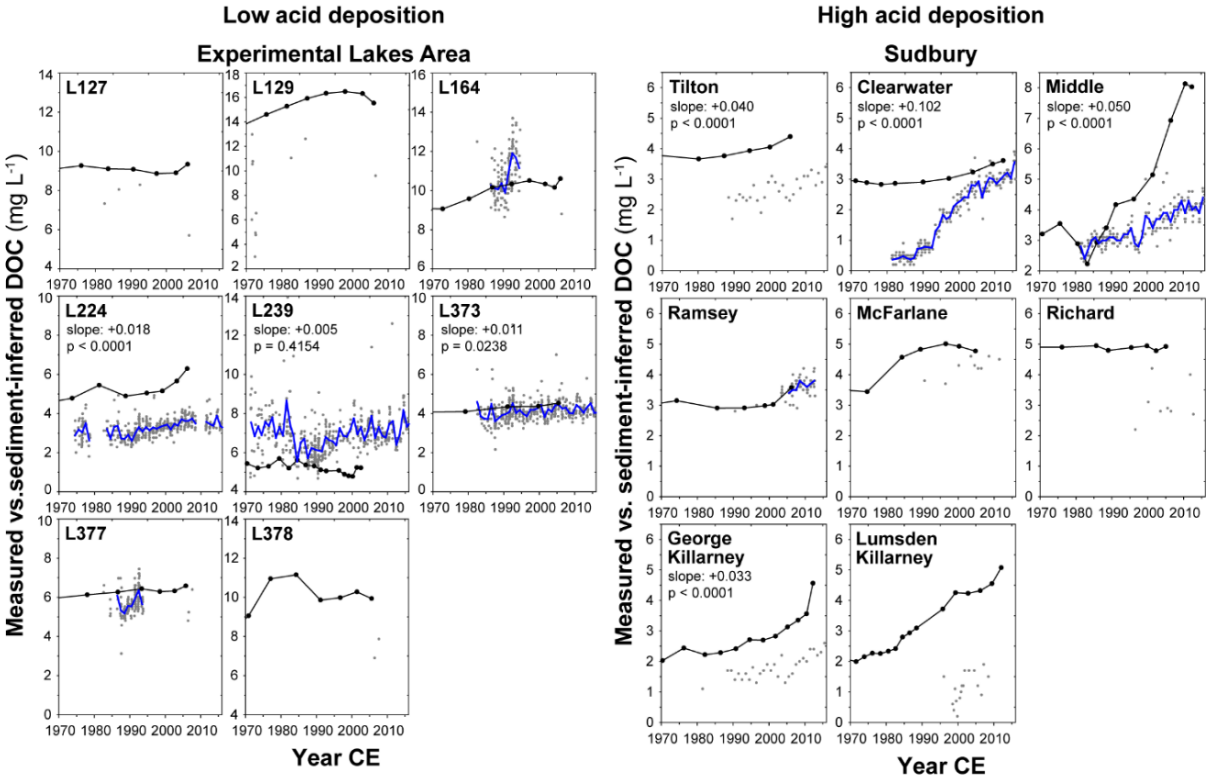

Figure S3. Monitored (grey circles; annual mean – blue line plot) versus sediment-inferred (black circles) lake-water dissolved organic carbon (DOC) concentrations for the study lakes. Slopes (annual change) and significance levels resulting from trend analyses are given for records with at least 25 years of monitoring data.

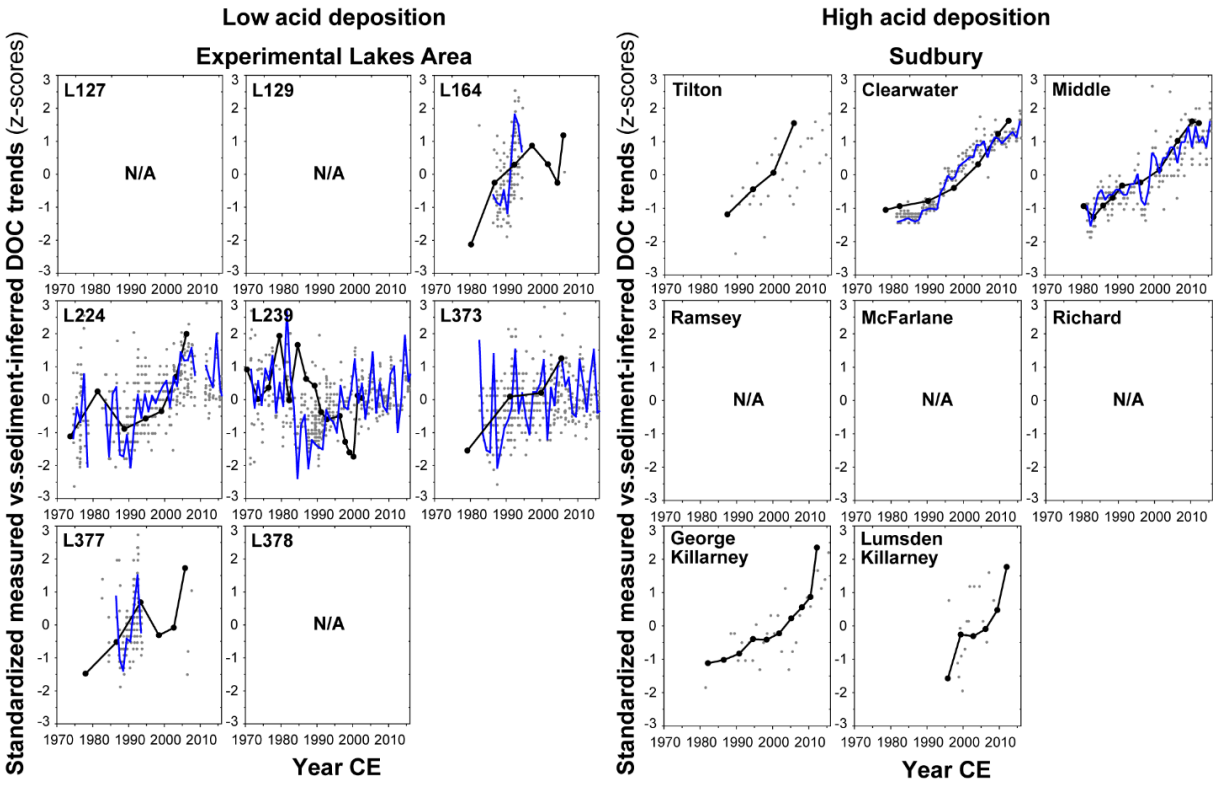

Figure S4. Comparison of standardized (z-scores) monitored (grey circles; annual mean – blue line plot) and sediment-inferred (black circles) lake-water dissolved organic carbon (DOC) trends for study lakes with at least 10 years of overlapping monitoring and sediment-inferred data.

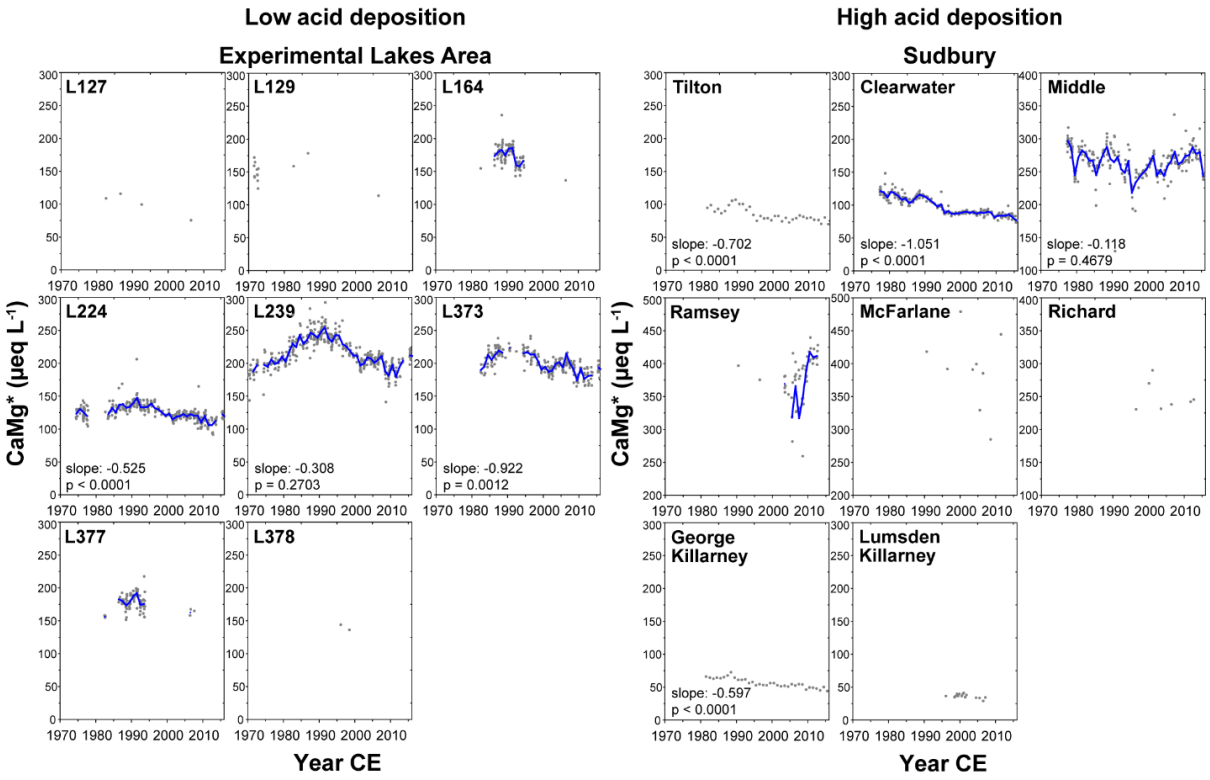

Figure S5. Concentrations of Ca^{2+} and Mg^{2+} (CaMg*) monitoring data for the study lakes. Grey circles represent individual measurements, while blue lines represent annual means. Slopes (annual change) and significance levels resulting from trend analyses are given for records with at least 25 years of data.

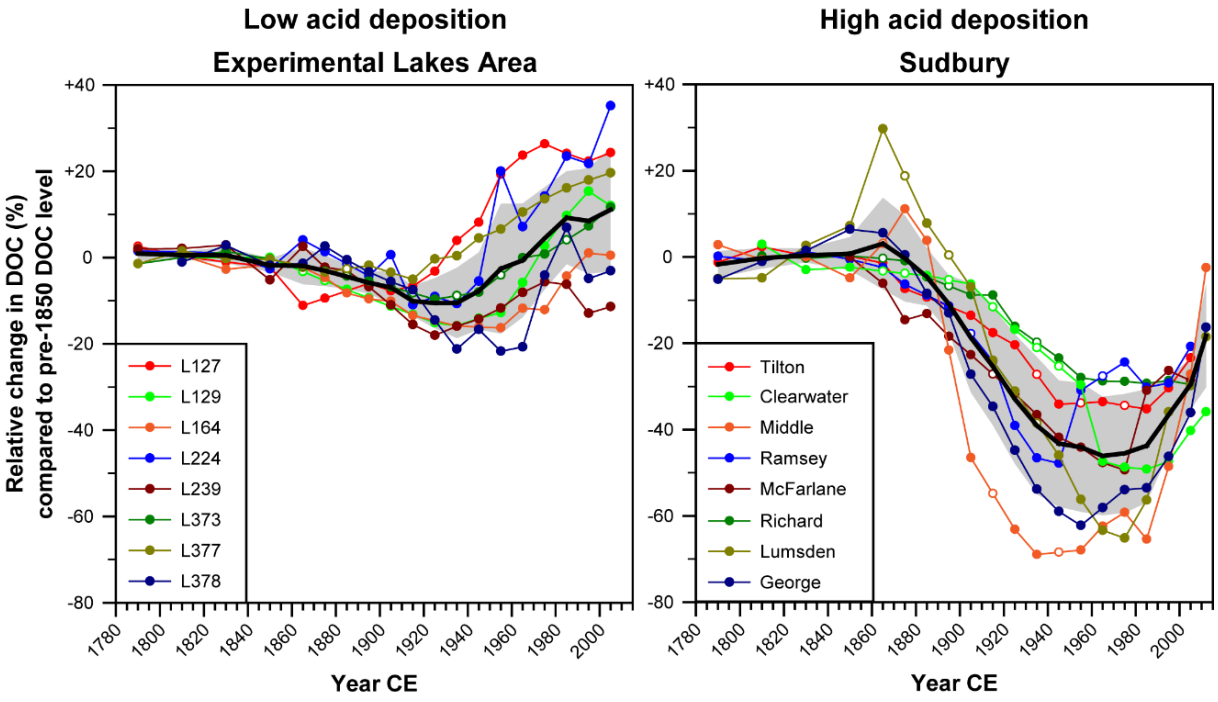

Figure S6. Relative change in sediment-inferred dissolved organic carbon (DOC) compared to the pre-industrial (1780–1850) mean DOC concentration. Coloured circles represent binned DOC reconstructions in 20- (1780–1860) and 10-year intervals (from 1860 onwards) for the individual lakes (open circles indicate bins with interpolated data), while the black line plot and the grey envelope represent the regional DOC trend and its standard deviation for the Experimental Lakes Area and Sudbury, based on the eight individual records for each region.