Table S1. Overview of CO2 flux data of all locations. When a certain location has no statistically significant (thus linear R2 < 0.7) CO2 flux measurements, the CO2 flux is presented as NS. At each location, 4 measurements were done, but only the statistically significant CO2 fluxes are shown.

LocationID	Age	Year of deglaciation	CO2 flux (mg C m2 hr)
X08	1	2023	-7.13
X08	1	2023	-9.03
X08	1	2023	7.60
W85	6	2019	13.28
X09	6	2019	-8.89
A56	8	2017	14.65
A56	8	2017	5.98
W63	8	2017	10.08
W63	8	2017	-8.55
W63	8	2017	-5.47
Y63	8	2017	-65.20
Y63	8	2017	-21.04
Y63	8	2017	-9.44
Y63	8	2017	-25.33
A60	9	2016	5.59
A60	9	2016	5.27
A60	9	2016	-7.72
A64	10	2015	5.06
A64	10	2015	3.73
W83	10	2015	-9.13
A35	11	2014	-2.19
A35	11	2014	-3.98
A46	11	2014	-5.08
A46	11	2014	-6.76
A46	11	2014	-3.39
A48	11	2014	11.63
A48	11	2014	-15.89

A48	11	2014	-3.32
A54	13	2012	6.69
A54	13	2012	-8.95
A55	13	2012	9.77
A55	13	2012	5.34
A63	13	2012	-5.47
A63	13	2012	-3.08
A63	13	2012	-2.60
A63	13	2012	-8.94
W04	13	2012	-8.81
W04	13	2012	-4.62
W04	13	2012	-17.42
W04	13	2012	-16.82
Y19	13	2012	-12.85
Y19	13	2012	7.59
Y19	13	2012	3.75
Y19	13	2012	-18.13
A45	15	2010	7.05
A45	15	2010	-2.84
W60	16	2009	-2.68
W60	16	2009	-4.63
W60	16	2009	-4.67
X04	18	2007	3.40
X04	18	2007	5.62
X04	18	2007	8.98
X10	21	2004	-13.45
X10	21	2004	-6.42
A31	22	2003	-9.78
A36	25	2000	10.31
A36	25	2000	-19.85
A36	25	2000	-3.85
B15	30	1995	-9.23
B15	30	1995	-12.54
W07	42	1983	-16.92
W07	42	1983	-16.77
W07	42	1983	-18.90
W07	42	1983	-14.61
Y31	42	1983	-14.57
Y31	42	1983	7.71
A47	43	1982	4.44
A47	43	1982	6.57
A59	44	1980	11.83

W16	46	1979	-18.07
W16	46	1979	-17.24
W16	46	1979	-28.64
W16	46	1979	-10.75
Y22	46	1979	-8.42
Y22	46	1979	12.67
Y22	46	1979	-7.92
Y22	46	1979	-5.36
A52	49	1976	-7.49
A52	49	1976	-5.83
A42	50	1975	-18.09
A42	50	1975	-5.72
A42	50	1975	-6.86
X03	54	1971	8.56
A43	55	1969	23.09
A43	55	1969	-13.93
A43	55	1969	17.95
A43	55	1969	-3.31
A69	55	1970	-11.07
A69	55	1970	-10.70
A69	55	1970	-5.52
X11	55	1969	-9.96
X11	55	1969	-15.34
W69	56	1969	-33.23
W69	56	1969	-22.25
W69	56	1969	-31.90
W69	56	1969	-41.87
W71	56	1969	-22.07
W71	56	1969	-19.36
Y71	56	1969	-5.32
Y71	56	1969	-11.30
Y71	56	1969	12.17
W58	58	1967	-2.60
X12	58	1967	-9.22
X12	58	1967	-9.78
X12	58	1967	-18.41
Y21	58	1967	-10.15
Y21	58	1967	-3.52
Y20	66	1959	-4.06
Y20	66	1959	-3.32
Y20	66	1959	-2.79
W01	67	1958	-10.80

W01	67	1958	-3.99
W01	67	1958	-10.33
W01	67	1958	11.58
Y16	67	1958	3.72
Y16	67	1958	-3.56
Y24	73	1952	5.99
Y24	73	1952	-9.43
W05	83	1942	-3.64
W05	83	1942	-4.11
W03	90	1935	-21.52
W03	90	1935	-41.33
W03	90	1935	-17.40
W03	90	1935	-32.20
Y18	90	1935	7.24
Y18	90	1935	-10.46
W53	121	1904	-3.54
W53	121	1904	-7.29
A57	125	1900	-25.39
A57	125	1900	-36.87
A57	125	1900	-26.40
A57	125	1900	-23.44
W12	128	1897	-32.39
W12	128	1897	-13.15
W12	128	1897	-39.00
W12	128	1897	-19.95
Y27	130	1895	-28.02
Y27	130	1895	-11.69
Y27	130	1895	-22.71
Y27	130	1895	-10.29
Y28	131	1894	NS
A65	134	1891	-30.12
A65	134	1891	-17.25
A65	134	1891	14.31
B23	144	1881	-35.42
B23	144	1881	-34.47
A41	149	1875	-14.84
A41	149	1875	-4.07
A41	149	1875	-15.24
A41	149	1875	-2.89
B21	159	1866	-7.49
B21	159	1866	-8.92
B21	159	1866	-6.54

B17	160	1865	-30.77
B17	160	1865	-13.48
B17	160	1865	-24.79
Y26	160	1865	-10.64
Y26	160	1865	-31.25
B20	163	1862	7.13
B20	163	1862	-4.29
W11	163	1862	-10.99
W11	163	1862	-9.66
W11	163	1862	-8.11
W11	163	1862	-9.43
W14	166	1859	-75.48
W14	166	1859	-26.38
W14	166	1859	-42.69
W14	166	1859	-33.17
Y29	166	1859	-6.00
Y29	166	1859	-9.10
A49	171	1854	-12.59
A49	171	1854	-46.56
A50	171	1854	-7.21
A50	171	1854	-2.87
A50	171	1854	-5.20
A50	171	1854	-3.61
W10	173	1852	-36.92
W10	173	1852	-19.33
W10	173	1852	-25.90
W10	173	1852	-17.39
A62	174	1851	-12.17
A62	174	1851	-10.50
Y25	174	1851	-15.40
A58	175	1850	-30.79
A58	175	1850	-29.13
A68	175	1850	-14.99
A68	175	1850	-4.84
A68	175	1850	-11.45
A68	175	1850	-6.75
B18	175	1850	-20.74
B25	175	1850	-27.39
B25	175	1850	-30.83
W08	175	1850	-23.60
W08	175	1850	-11.13
W08	175	1850	-7.74

W08	175	1850	-4.89
W15	175	1850	-80.79
W15	175	1850	-56.98
W15	175	1850	-30.68
W15	175	1850	-34.93
W54	175	1850	-9.52
W54	175	1850	-6.92
Y23	175	1850	-16.76
Y23	175	1850	-16.29
Y23	175	1850	-18.33
Y30	175	1850	-8.71
Y30	175	1850	-27.59
Y30	175	1850	-29.44
Y30	175	1850	-14.98
A70	175	1850	NS

Table S2. Overview of soil laboratory data of all locations. The provided soil depth is the sum of all horizons that are taken into account for the organic carbon stock at that particular location. Note: the depth of the C horizon (when sampled for LOI measurement) is always taken as 10 cm, to get an equal contribution of the C horizon, also when the true depth is unknown. NA means no measurements was performed.

LocationID	Age	pH topsoil	GWC topsoil	Total horizons thickness (cm, cumulative)	Organic carbon stock (cumulative, kg m2)
X08	1	6.45	8.59	10	0.66
W85	6	6.77	27.2	11.5	0.85
X09	6	NA	NA	NA	NA
A56	8	6.24	7	10	0.30
W63	8	4.77	27.87	10	1.13
Y63	8	4.64	8.13	10	0.96
A60	9	5.13	9.77	10	0.85
A64	10	5.93	10.35	10	0.99
W83	10	NA	NA	NA	NA
A35	11	6.31	9.35	10	0.89
A46	11	5.11	12.07	10	0.52

A48	11	7.03	9.33	10	0.54
A54	13	5.23	39.72	12.5	3.43
A55	13	5.9	11.28	10	0.98
A63	13	5.33	7.1	10	0.93
W04	13	6.33	16.93	10	0.50
Y19	13	5.65	26.81	16.3	1.86
A45	15	NA	NA	NA	NA
W60	16	4.95	3.47	10	0.48
X04	18	5.25	39.31	10.5	NA
X10	21	4.92	20.97	12.25	1.35
A31	22	6.19	9.14	10	0.80
A36	25	6.33	5.66	10	0.66
B15	30	5.46	17.82	7.6	1.63
W07	42	5.35	5.33	11.2	1.55
Y31	42	5.94	31.72	17.6	1.55
A47	43	NA	NA	NA	NA
A59	44	4.8	30.09	17.8	3.86
W16	46	5.92	34.36	10	1.41
Y22	46	5.94	2.66	11.2	1.48
A52	49	5.14	9.57	10	0.89
A42	50	4.36	27.06	11.2	1.33
X03	54	4.93	19.93	11.2	1.00
A43	55	6.38	11.57	10	1.02
A69	55	4.93	16.56	2	0.50
X11	55	5.81	12.22	10.1	2.99
W69	56	5.24	159.39	2	2.20
W71	56	5.63	19.87	1	0.07
Y71	56	4.69	33.24	11	1.80
W58	58	5.1	300.25	10.5	3.81
X12	58	5.46	86.66	18	2.20
Y21	58	5.05	119.05	11	7.88
Y20	66	4.16	19.22	5.1	4.75
W01	67	5.48	21.77	12	0.55
Y16	67	4.8	22.89	12	1.17
Y24	73	4.85	10.76	10	0.89
W05	83	5.91	31.72	10	1.81
W03	90	4.43	43.87	12	1.85
Y18	90	4.49	30.59	11	1.39
W53	121	NA	NA	NA	NA
A57	125	NA	200.6	19.5	34.73
W12	128	NA	1545.2	15.2	113.41
Y27	130	4.51	151.05	11.2	7.83

Y28	131	3.86	51.71	12	3.13
A65	134	5.9	11.64	15.2	4.91
B23	144	4.56	43.59	14	12.18
A41	149	4.36	23.66	10.1	4.67
B21	159	4.33	155.13	12.5	13.67
B17	160	5.48	44.02	10	NA
Y26	160	4.51	61.97	10.75	1.51
B20	163	5.26	114.19	10.1	23.21
W11	163	5.91	78.15	5	3.30
W14	166	4.78	429.47	20.1	59.24
Y29	166	4.84	53.42	17.6	6.95
A49	171	4.72	69.7	3.5	5.50
A50	171	4.67	66.75	17.6	18.86
W10	173	4.79	234.33	8	17.53
A62	174	4.22	19	13	1.93
Y25	174	3.99	60.43	13	5.88
A58	175	4.52	104.62	14	16.09
A68	175	3.89	82.13	20.3	8.54
B18	175	4.73	55.33	17	5.92
B25	175	4.14	12.83	5	1.09
W08	175	4.67	24.24	17.6	80.83
W15	175	5.11	687.66	18.9	70.48
W54	175	4.61	27.66	10	1.83
Y23	175	4.28	157.39	15.1	20.73
Y30	175	4.38	64.97	22.8	7.67
A70	175	4.3	24.04	12	2.02