Supplementary Figures and Tables

Supplementary Figures

Figure S1. Study site in the Wielkie Bagno peatland, Solska Forest, SE Poland: palaeoecological sampling in the Scots pine bog forest (a), one of the existing ditches (b). Photo: Kamil Pilch (a), Michał Słowiński (b).

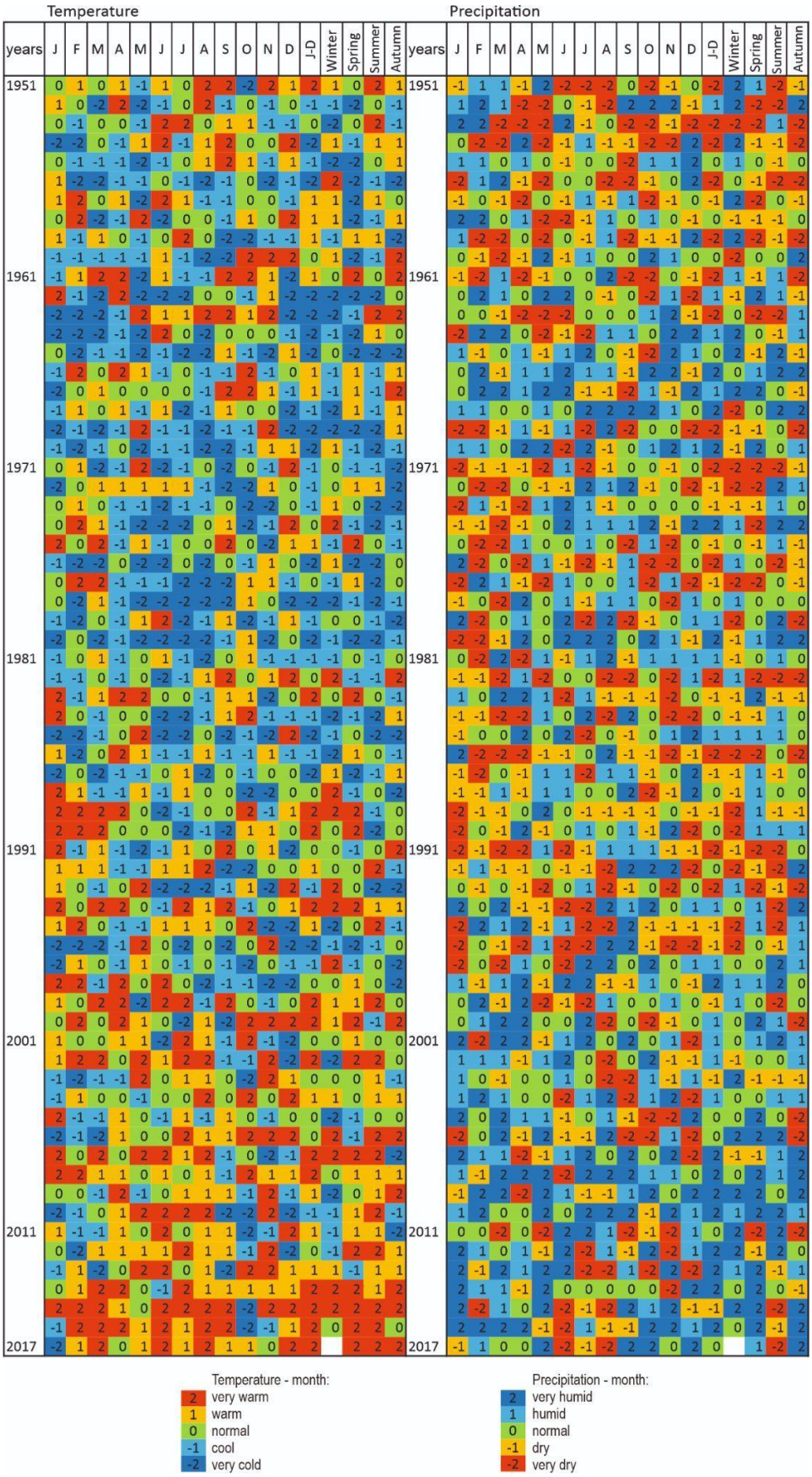

Figure S2. Classification of thermal and pluvial conditions in Tomaszów Lubelski in each month (J, F, M, A, M, J, J, A, S, O, N, D), season (Winter, Spring, Summer, Autumn) and year (J–D) in the period 1951–2017.

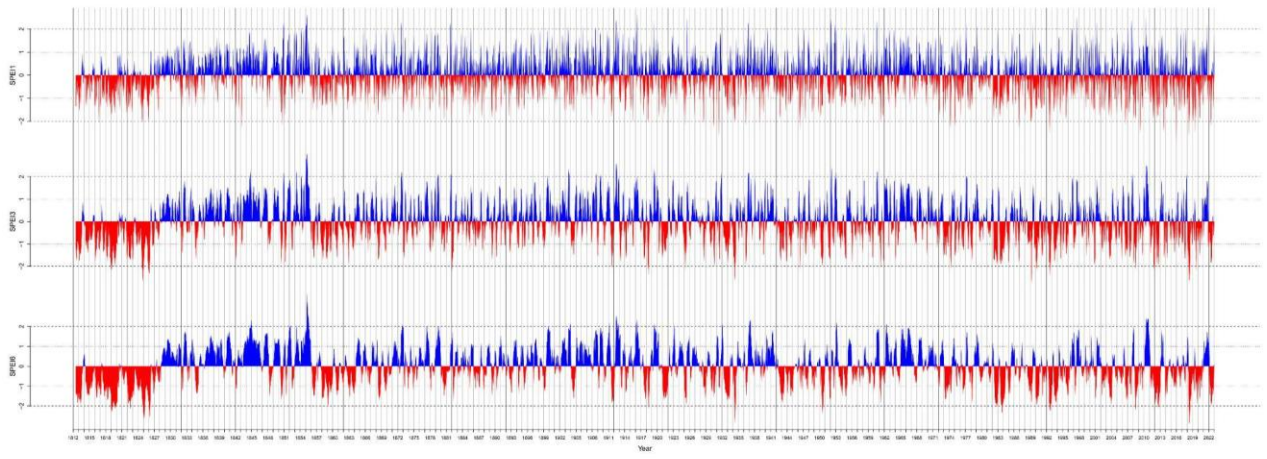

Figure S3. Standardized precipitation evapotranspiration index (SPEI) calculated based on the climatic data from Kraków (1812–2022), aggregated over one (SPEI1), three (SPEI3) and six (SPEI6) months. For calculation of the SPEI indices, the water balance was estimated as the difference between precipitation and potential evapotranspiration. Positive value of the index (SPEI > 0) reflects the positive water balance (Vicente-Serrano et al., 2010).

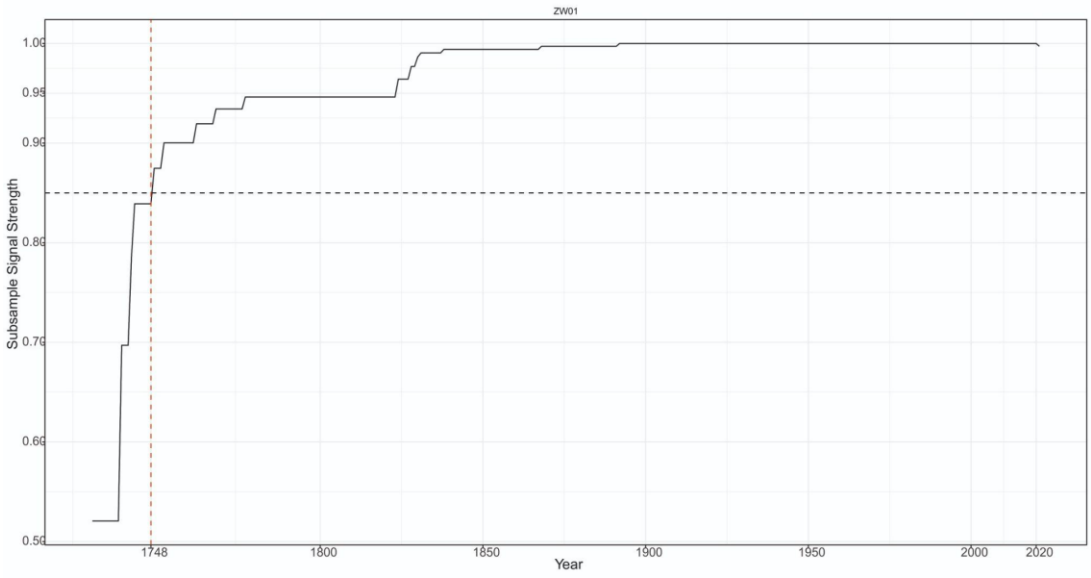

Figure S4. Sub-sample signal strength (SSS) of the Scots pine (*Pinus sylvestris* L.) chronology of living peatland trees in Wielkie Bagno, Solska Forest. The vertical dashed line marks the year in which the SSS exceeded the 0.85 threshold.

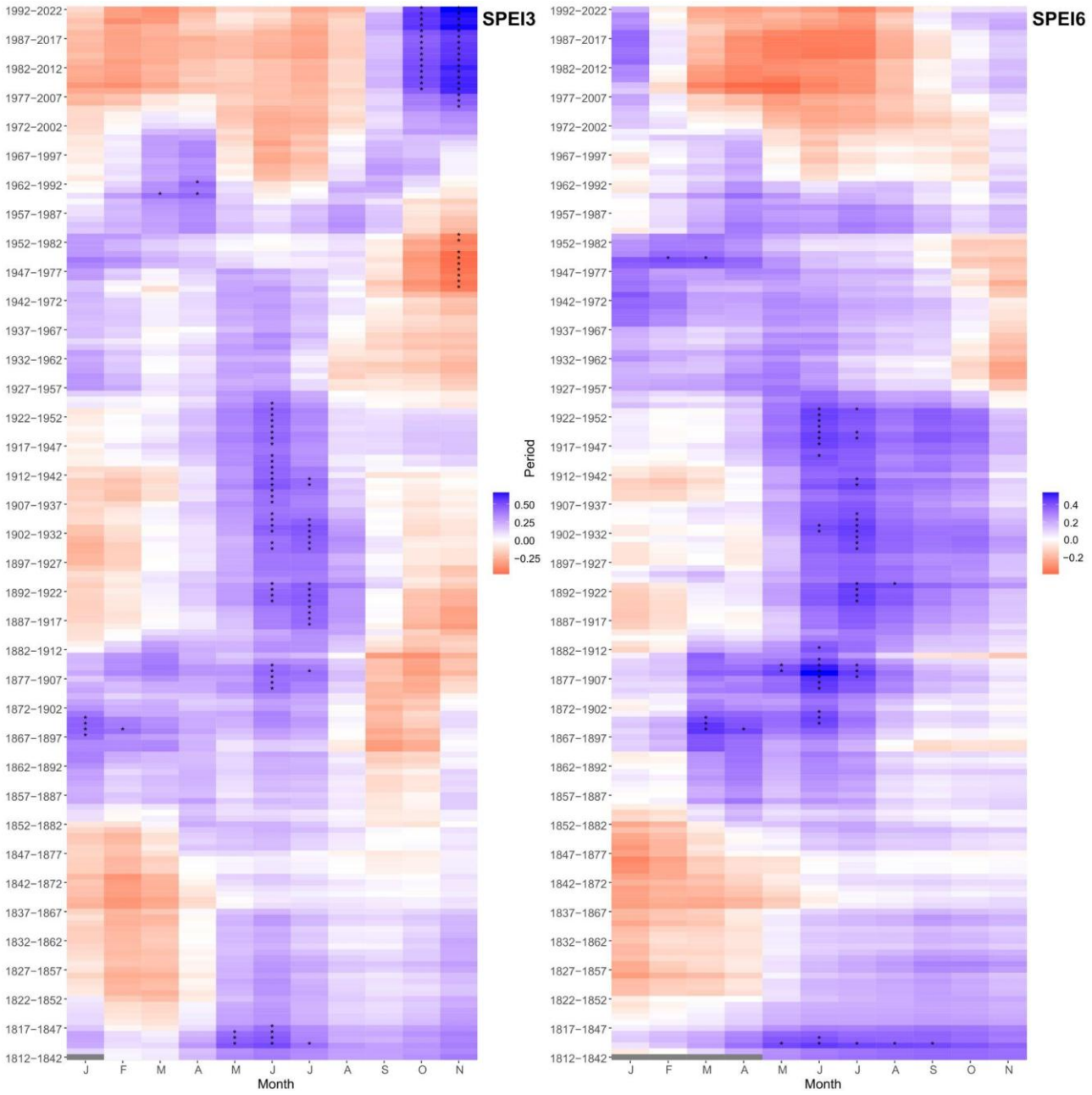

Figure S5. Correlation in the 30-year moving window during the period 1812–2022 between indexed tree ring width (RWI) of peatland pines and standardised precipitation evapotranspiration indices aggregated over three (SPEI3) and six (SPEI6) months, calculated for the current year (January–November, J–N). Asterisks (*) indicate the significant correlations ($p < 0.05$).

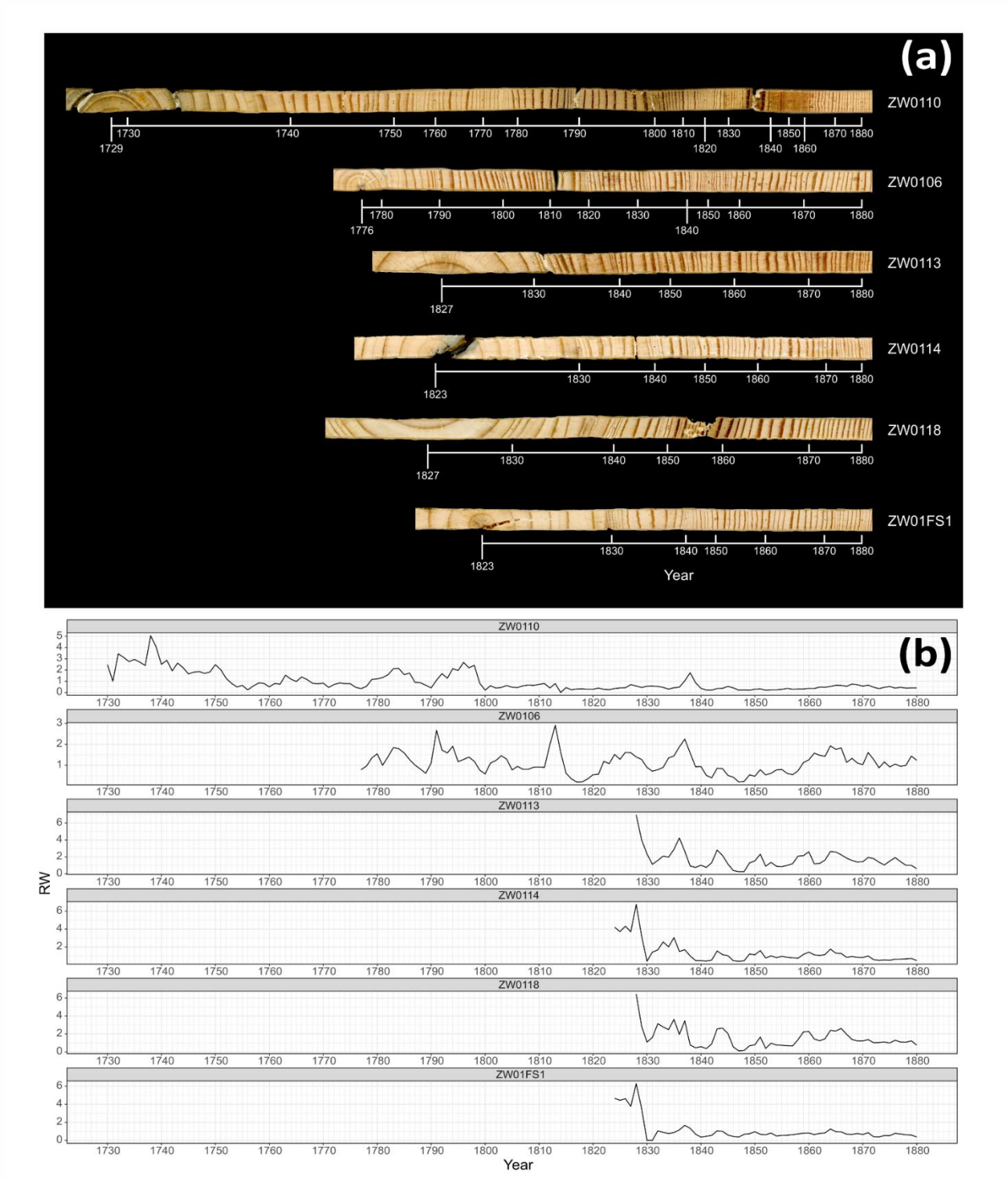

Figure S6. Growth rate of selected sample trees of Scots pine (*Pinus sylvestris* L.) from the Wielkie Bagno peatland, Solska Forest, visible in the scans of wood samples (a) and individual growth series (b). The trees presented include individuals belonging to the cohort from the first half of the 19th century (trees: ZW0113, ZW0114, ZW0118, ZW01FS1) as well as older individuals recruited in the 18th century (trees: ZW0110, ZW0106). RW – ring width.

Table S1. Comparison of monthly, seasonal and annual mean values of climatic data (temperature: average, minimum and maximum, and precipitation totals) derived from the meteorological stations in Tomaszów Lubelski and Kraków during the overlapping period of measurements from both stations, 1951–2017 (67 years). Tmean – mean air temperature, Tmin – minimum air temperature, Tmax – maximum air temperature, TL – Tomaszów Lubelski, Krk – Kraków, r – Spearman's rank correlation coefficient (all values significant at p = 0.05), p – T-test, Mann-Whitney U Test, p > 0.05 no significant statistical differences between stations.

	Tmean				Tmin				Tmax				Precipitation			
Month/Season	TL	Krk	r	p	TL	Krk	r	p	TL	Krk	r	p	TL	Krk	r	p
Jan	-3,9	-1,4	0,950	0,000	-7,2	-3,9	0,943	0,000	-0,8	1,3	0,928	0,000	34,3	37,2	0,700	0,479
Feb	-2,9	-0,1	0,975	0,009	-6,5	-2,9	0,959	0,000	0,6	3,1	0,954	0,000	31,2	32,5	0,719	0,778
March	1,1	3,8	0,962	0,000	-2,9	0,4	0,970	0,000	5,6	8,1	0,934	0,026	35,7	36,7	0,700	0,702
April	7,4	9,5	0,897	0,000	2,8	5,1	0,913	0,000	12,9	14,7	0,663	0,007	41,8	47,8	0,419	0,240
May	13,0	14,7	0,885	0,000	6,9	9,9	0,862	0,000	18,7	20,2	0,680	0,000	72,5	77,5	0,415	0,671
June	16,3	17,9	0,835	0,000	10,3	13,3	0,808	0,000	21,8	23,2	0,547	0,004	76,6	93,9	0,295	0,012
July	17,9	19,6	0,917	0,000	11,9	15,0	0,871	0,000	23,6	25,0	0,558	0,000	94,3	94,9	0,583	0,612
August	17,0	19,0	0,850	0,000	11,1	14,5	0,897	0,000	23,2	24,5	0,584	0,032	65,5	82,5	0,492	0,017
September	12,4	14,5	0,887	0,000	7,4	10,6	0,927	0,000	18,3	19,5	0,606	0,002	56,7	59,2	0,711	0,996
October	7,5	9,6	0,903	0,000	3,2	6,2	0,898	0,000	12,6	13,9	0,774	0,000	46,5	44,4	0,795	0,968
November	2,5	4,4	0,950	0,001	-0,6	2,0	0,935	0,000	5,8	7,4	0,907	0,000	41,9	42,4	0,595	0,836
December	-1,7	0,5	0,952	0,002	-4,7	-1,8	0,935	0,000	1,1	3,0	0,940	0,019	40,1	36,6	0,528	0,208
Spring (Mar-May)	7,2	9,3	0,933	0,000	2,0	5,2	0,887	0,000	12,4	14,3	0,783	0,002	150,0	162,0	0,385	0,329
Summer (Jun-Aug)	17,1	18,8	0,891	0,000	11,1	14,2	0,840	0,000	22,9	24,3	0,513	0,000	236,3	271,2	0,429	0,015
Autumn (Sep-Nov)	7,5	9,5	0,902	0,017	3,4	6,2	0,896	0,000	12,2	13,6	0,736	0,016	145,1	146,0	0,766	0,818
Winter (Dec-Feb)	-2,8	-0,4	0,906	0,000	-6,2	-2,9	0,890	0,000	0,3	2,5	0,761	0,000	105,5	106,3	0,562	0,845
Apr-Sep	14,0	15,9	0,892	0,000	8,3	11,4	0,828	0,000	19,8	21,2	0,520	0,002	407,4	455,7	0,393	0,024
Oct-Mar	0,4	2,8	0,953	0,000	-3,1	0,0	0,937	0,000	4,2	6,1	0,924	0,000	229,6	229,8	0,718	0,876
Year	7,2	9,3	0,906	0,000	2,6	5,7	0,890	0,000	12,0	13,7	0,761	0,000	637,0	685,5	0,562	0,113

Table S2. Number of archival sources with information on Wielkie Bagno and its surroundings that were used in the study, out of a total of 161 sources.

Number of archival sources with qualitative and/or quantitative information on	**Total**
Forest structure	45
Land use/economy	109
Demography	47
Settlement structure	77
Drainage	21
Forest management	44
Timber harvesting	33

Table S3. Amount of rent paid by forest settlers in the 2nd half of the 18th century in the Tereszpol area. Source: State Archives in Lublin (APL), AOZ, sign. 1538–1539.

Year	The amount of rent (in złoty) from fields and meadows near Tereszpol	Source
1757	2399	APL, AOZ, sign. 1538, k. 579–586
1760	2727	APL, AOZ, sign. 1538, k. 710–720
1762	2973	APL, AOZ, sign. 1539, k. 16–20A
1765	3241	APL, AOZ, sign. 1539, k. 134–145
1771	3365	APL, AOZ, sign. 1539, k. 410–419A
1775	3644	APL, AOZ, sign. 1539, k. 597–607

Table S4. Number of hutters in the 2nd half of the 18th century and in the early 19th century in the Zwierzyniec Key of the Zamoyski Family Estate (1759–1767) and the vicinity of the Tereszpol village (1789–1802), including direct surroundings of our study site (Wielkie Bagno peatland). Source: State Archives in Lublin (APL), AOZ, sign. 163, 732, 1538–1539, 2637.

Year	Number of hutters	Source
	in the Zwierzyniec Key	
1759	42	APL, AOZ, sign. 1538, p. 652
1765	45	APL, AOZ, sign. 1539, p. 120
1767	47	APL, AOZ, sign. 1539, p. 244
	in the vicinity of the Tereszpol village	
1789	43	APL, AOZ, sign. 163, p. 15
1792	50	APL, AOZ, sign. 732, p. 41
1802	29	APL, AOZ, sign. 2637, p. 28