

1 **Supplementary Information for “No evidence of**
2 ***statistically significant Eurasian winter warming or***
3 ***cooling caused by large eruptions over the Last***
4 ***Millennium”***

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10

11 **Contents**

12 1. Table S1.

13 2. Figures S1–[S9](#).

Table S1. The 20 tropical volcanic eruptions larger than the 1991 Pinatubo eruption in the eVolv2k_v3 database, ordered chronologically. Unknown month, day, or latitude is indicated as “–”. The notation “-/-” indicates no dating uncertainty in the eruption year, while σ denotes uncertainty. Asterisks denote eruptions occurring after 1500 CE. The month code “w” is retained from the source database notation. This table is identical, in every respect, to Table 1 in ref. [25], and is reproduced for the sake of completeness.

Name	Year	Year (σ)	Month	Day	VSSI (TgS)	VSSI (σ)	Latitude ($^{\circ}$)
*Krakatau	1883	-/-	8	27	9.34	1.91	-6
*Cosiguina	1835	-/-	1	20	9.48	2.21	13
*Babuyan Claro	1831	± 1	–	–	12.98	3.41	19.5
*Tambora	1815	-/-	4	10	28.08	4.49	-8
*Unknown	1809	-/-	–	–	19.26	3.54	–
*Unknown	1695	± 1	–	–	15.74	2.88	–
*Parker	1640	-/-	w	26	18.68	4.28	6.1
*Huaynaputina	1600	-/-	2	17	18.95	4.03	-16.6
*Nevado del Ruiz	1595	-/-	3	9	8.87	1.51	4.9
*Colima	1585	-/-	1	10	8.51	2.34	19.5
Unknown	1458	± 1	–	–	32.98	4.8	–
Kuwae	1453	± 1	–	–	9.97	3.07	–
Unknown	1345	-/-	–	–	15.11	2.86	–
Unknown	1286	± 1	–	–	15.06	2.79	–
Unknown	1276	-/-	–	–	11.53	1.63	–
Samalas	1257	-/-	7	–	59.42	10.86	-8.4
Unknown	1230	± 1	–	–	23.78	5.24	–
Unknown	1191	-/-	–	–	8.53	1.49	–
Unknown	1171	± 1	–	–	18.05	3.67	–
Unknown	1108	± 1	–	–	19.16	4.71	–

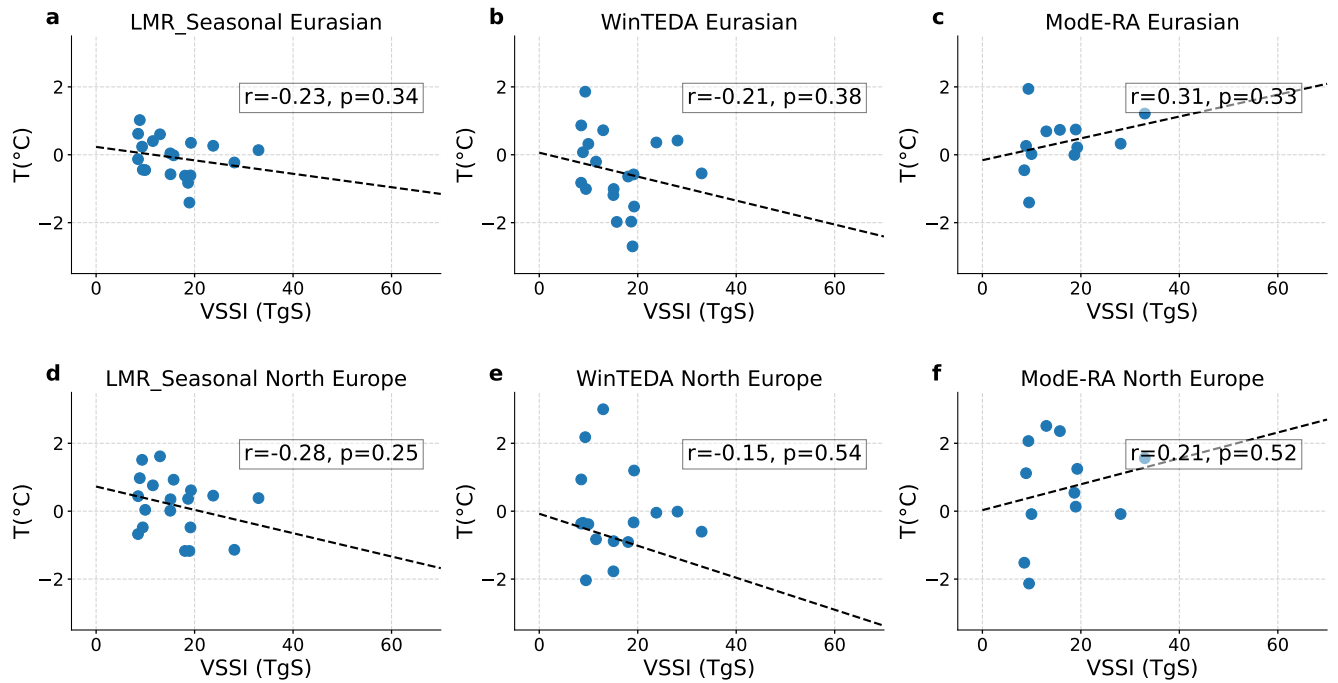


Figure S1. Sensitivity of the VSSI–temperature relationship to exclusion of the 1257 Samalas eruption. The panels are analogous to Figure 4 in the main text, but the Samalas (1257) eruption is omitted from the regression analysis. Volcanic stratospheric sulfur injection (VSSI; TgS) is plotted against the first post-eruption December–January–February (DJF) temperature anomaly in LMR Seasonal, WinTEDA, and ModE-RA over Eurasia and Northern Europe. Each point denotes one eruption, and the dashed black line denotes the least-squares linear fit.

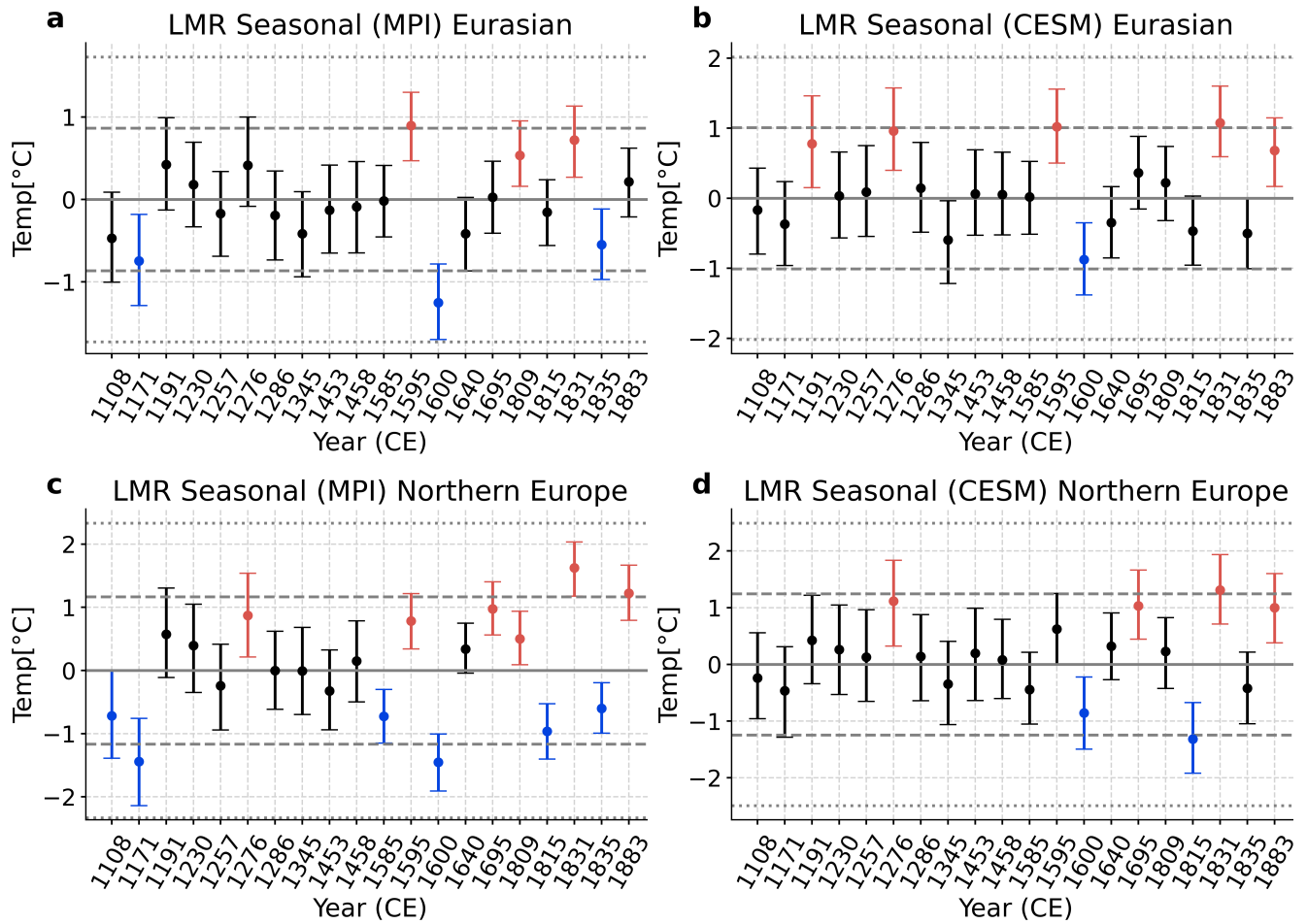


Figure S2. Sensitivity of post-eruption temperature anomalies to the climate-model prior used in LMR Seasonal. The panels are analogous to Figure 3 in the main text, but use LMR Seasonal reconstructions generated with LIMs trained on MPI-ESM-P (left column) and CESM (right column). Red bars denote significant warming, blue bars denote significant cooling, and black bars denote non-significant anomalies. LIM stands for Linear Inverse Model.

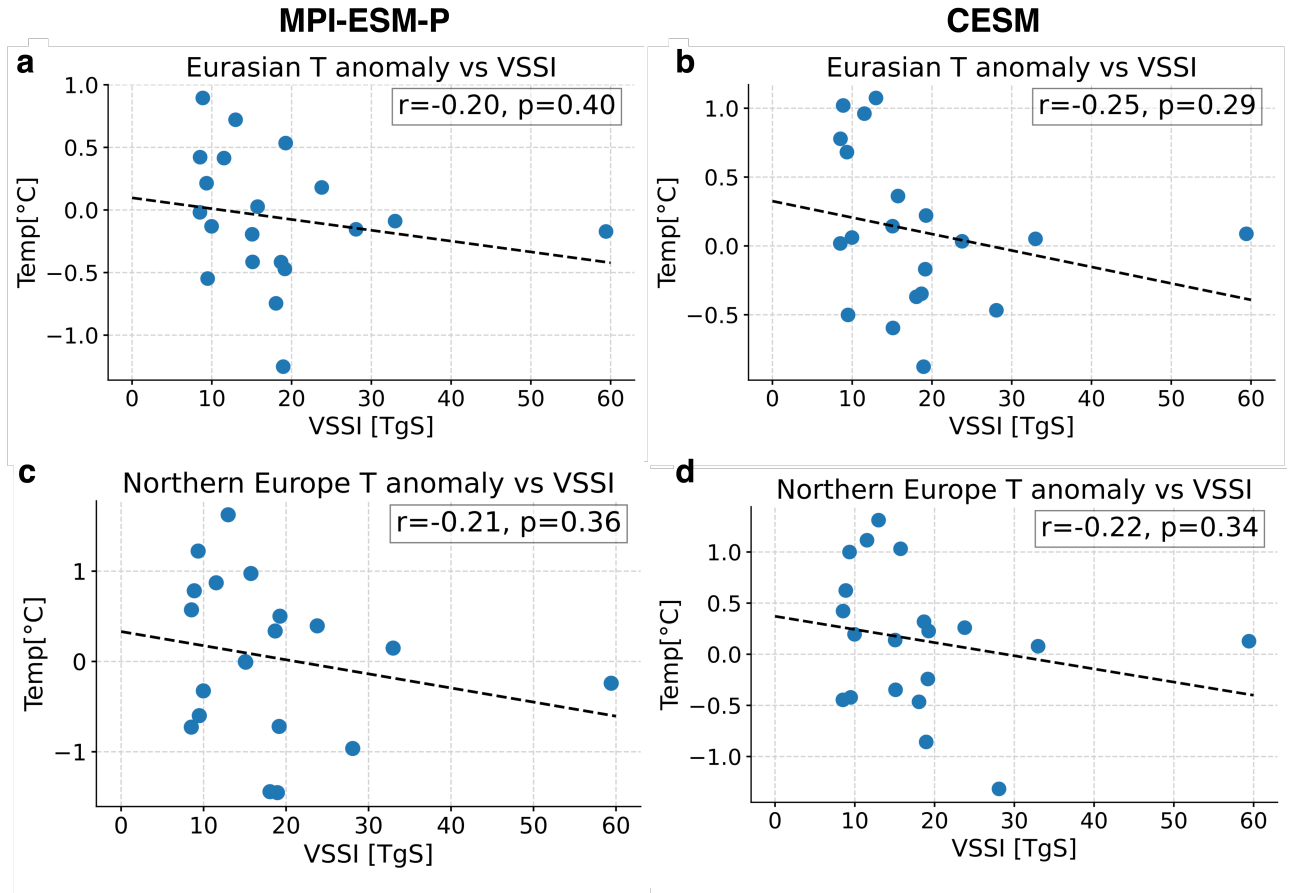


Figure S3. Sensitivity of the VSSI–temperature relationship to the climate-model prior used in LMR Seasonal. The panels are analogous to Figure 4 in the main text, but use LMR Seasonal reconstructions generated with LIMs trained on MPI-ESM-P (left column) and CESM (right column). Volcanic stratospheric sulfur injection (VSSI; TgS) is plotted against the first post-eruption DJF temperature anomaly, and the dashed black line denotes the least-squares linear fit. LIM stands for Linear Inverse Model.

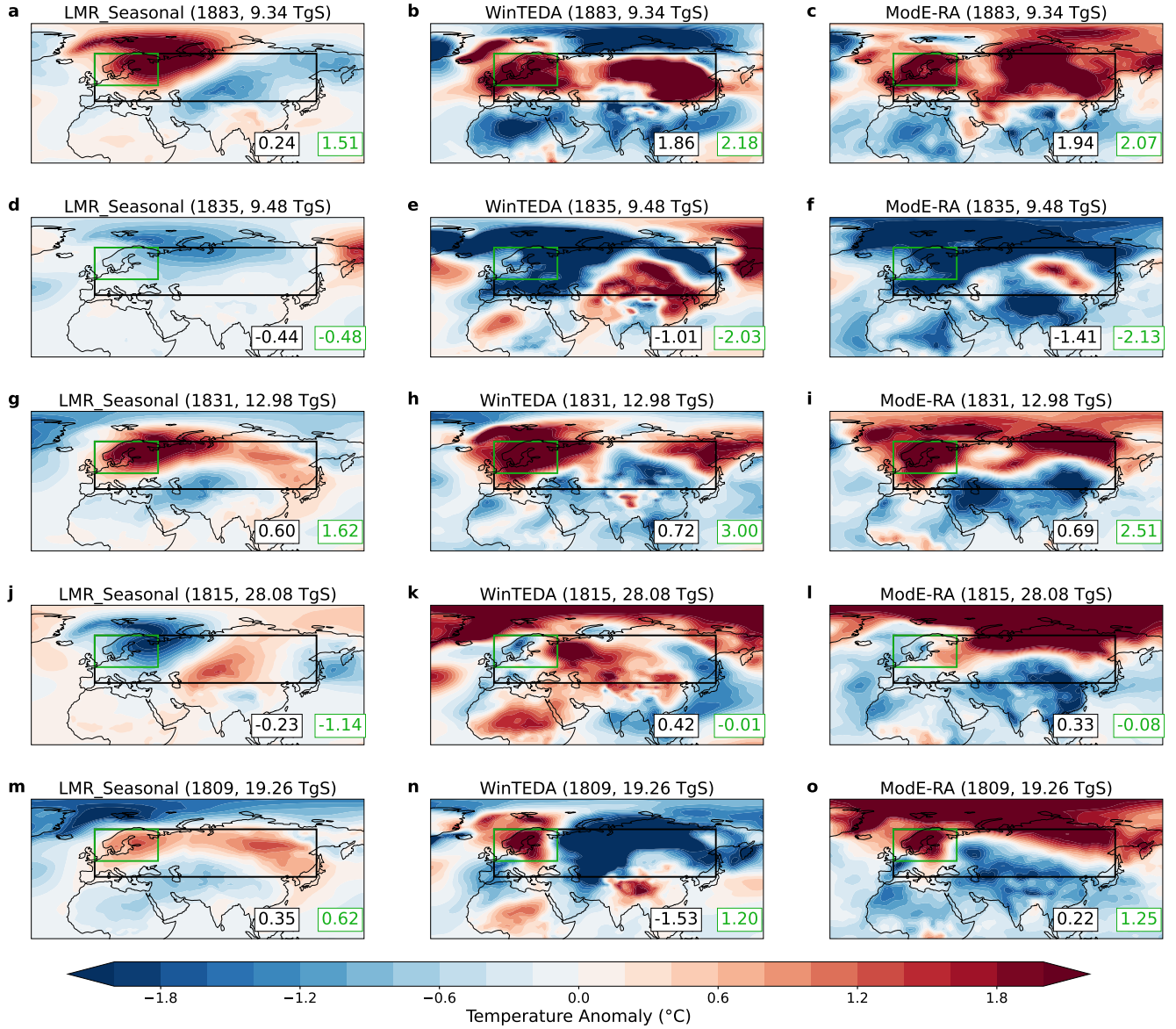


Figure S4. Event-by-event winter temperature anomalies for the nineteenth-century tropical eruptions. The panels show ensemble-mean DJF temperature anomalies from three paleo-data assimilation (PDA) datasets: LMR Seasonal (left), WinTEDA (middle), and ModE-RA (right), for eruptions between 1809 and 1883. Panel titles give the eruption year and the corresponding volcanic stratospheric sulfur injection (VSSI). Black rectangles denote the Eurasian domain, and green rectangles denote the Northern European domain. The numbers in the black and green boxes report the domain-averaged temperature anomalies over Eurasia and Northern Europe, respectively.

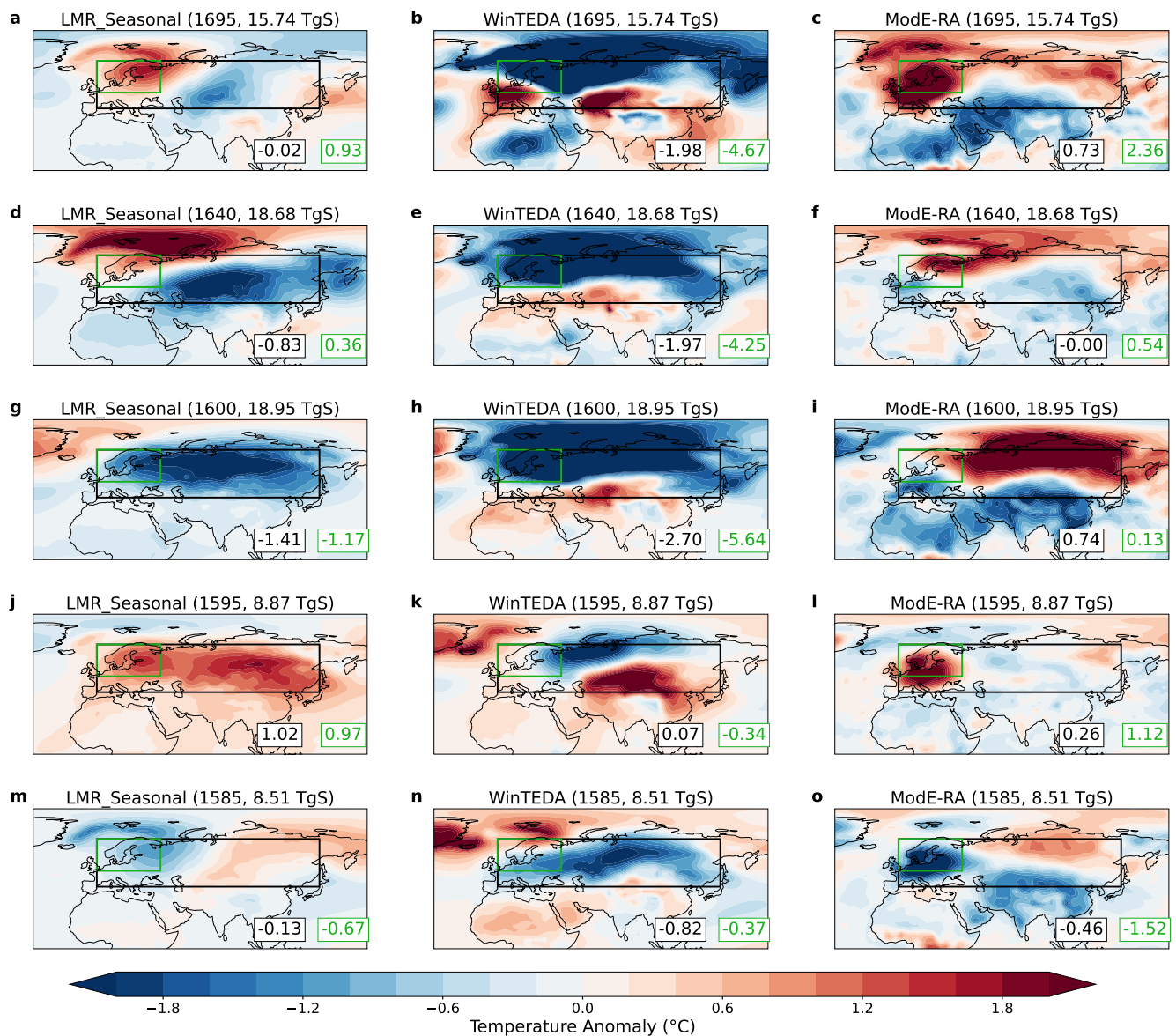


Figure S5. Event-by-event winter temperature anomalies for the tropical eruptions from 1585 to 1695. The panels are analogous to Figure S4, but for the eruptions spanning 1585–1695. LMR Seasonal, WinTEDA, and ModE-RA are shown from left to right, and the black and green rectangles denote the Eurasian and Northern European domains, respectively.

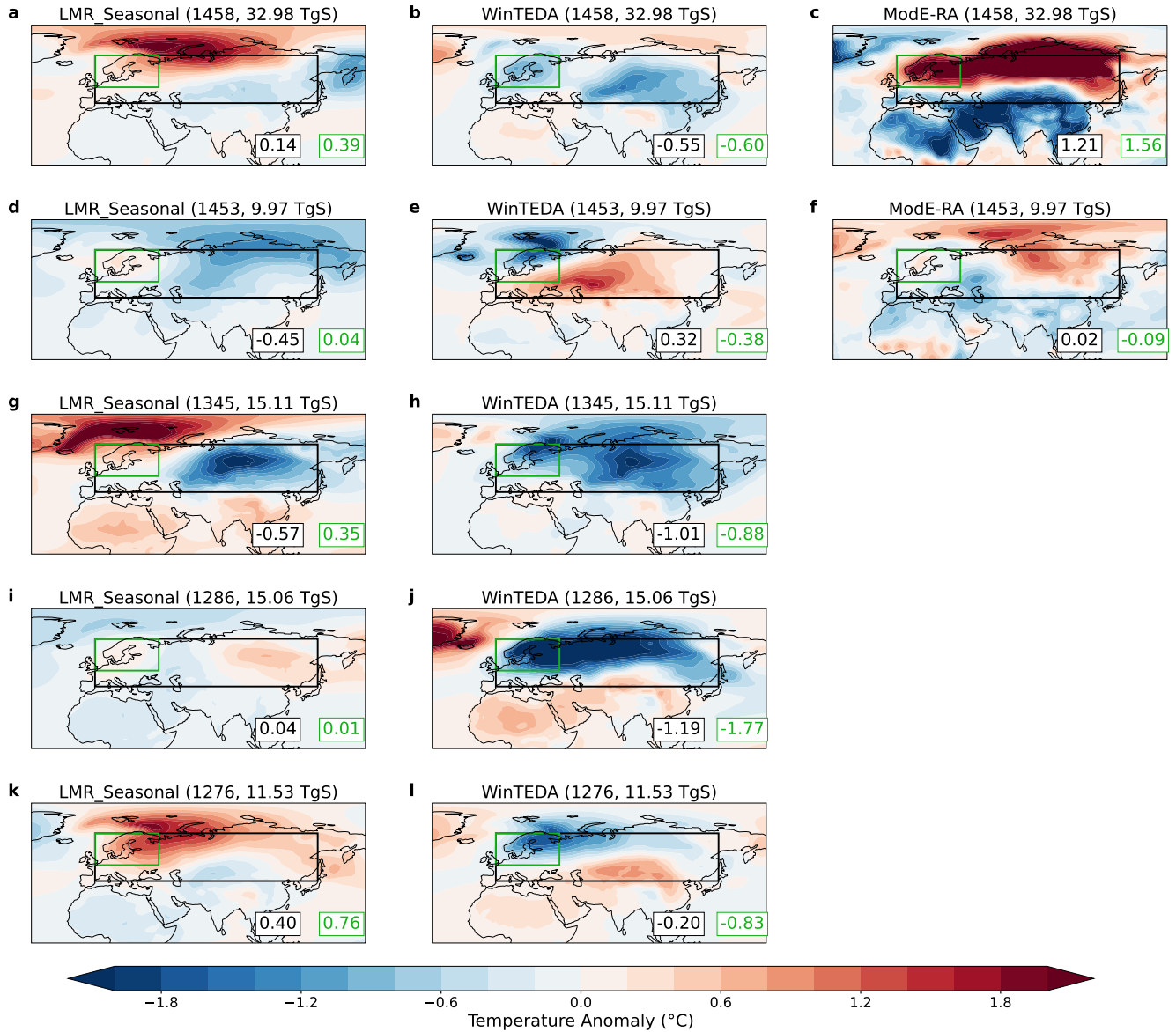


Figure S6. Event-by-event winter temperature anomalies for the tropical eruptions from 1276 to 1458. The panels are analogous to Figure S4, but for the eruptions spanning 1276–1458. LMR Seasonal, WinTEDA, and ModE-RA are shown from left to right, and the black and green rectangles denote the Eurasian and Northern European domains, respectively.

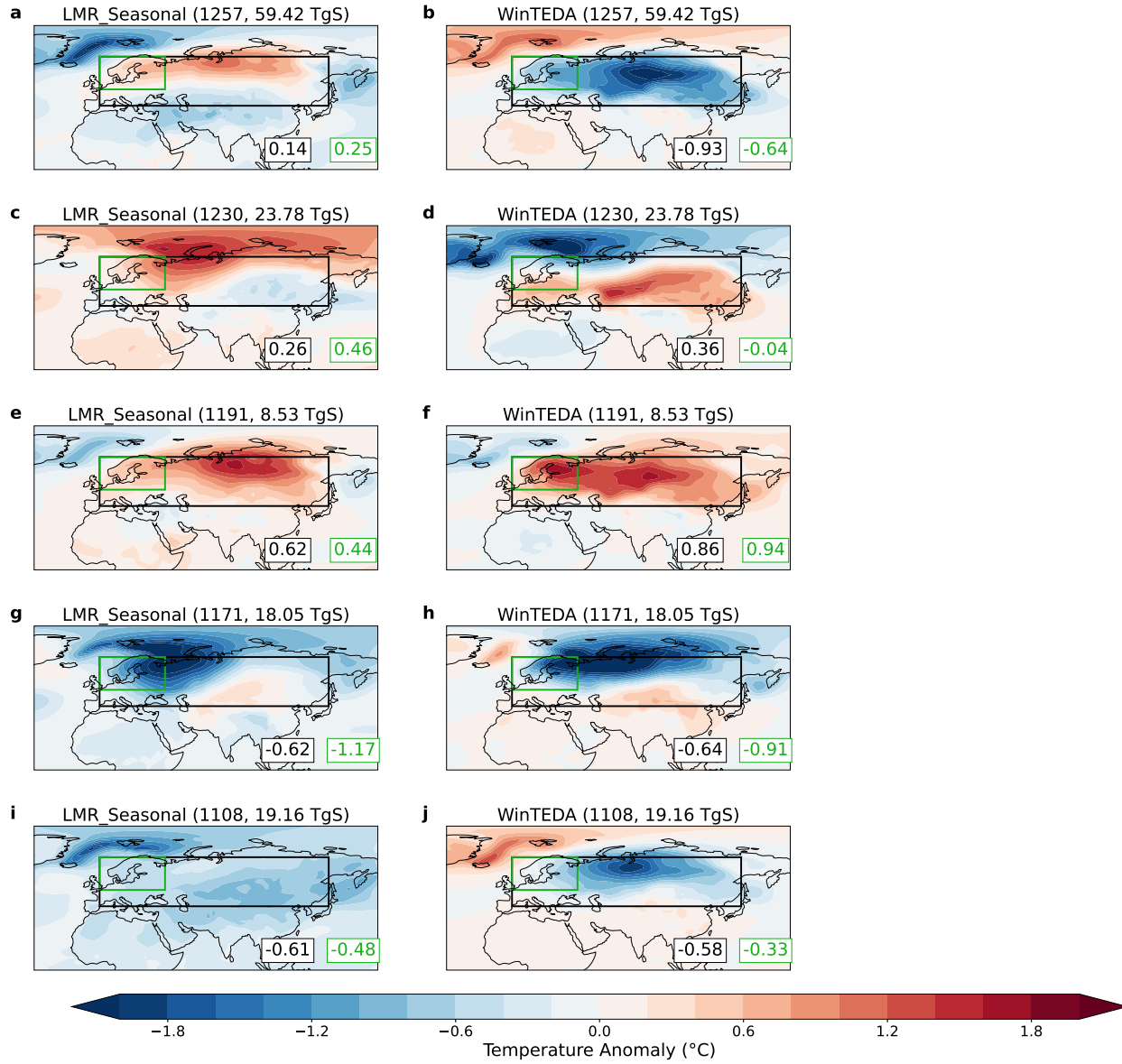
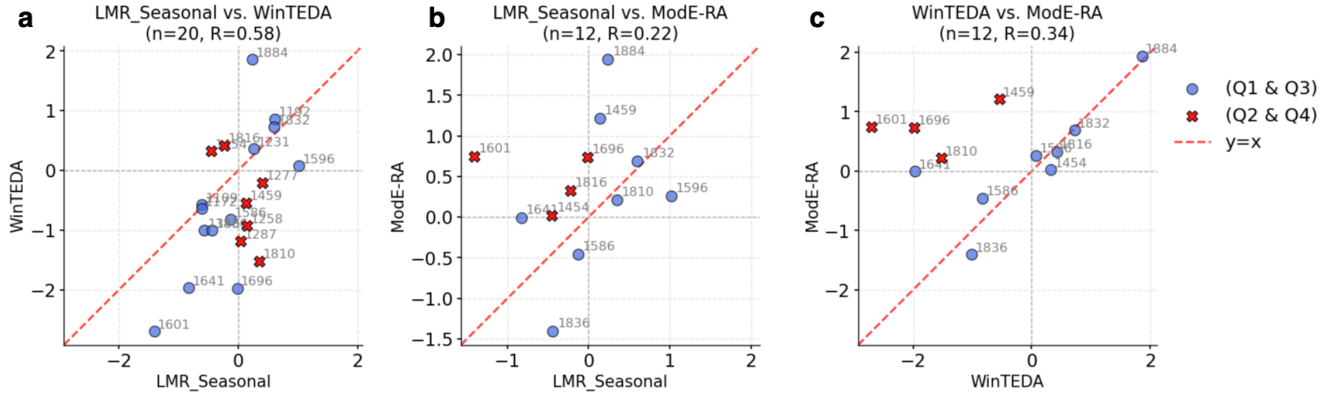


Figure S7. Event-by-event winter temperature anomalies for the tropical eruptions from 1108 to 1257. The panels are analogous to Figure S4, but for the eruptions spanning 1108–1257. LMR Seasonal, WinTEDA, and Mode-RA are shown from left to right, and the black and green rectangles denote the Eurasian and Northern European domains, respectively.

Eurasia



Northern Europe

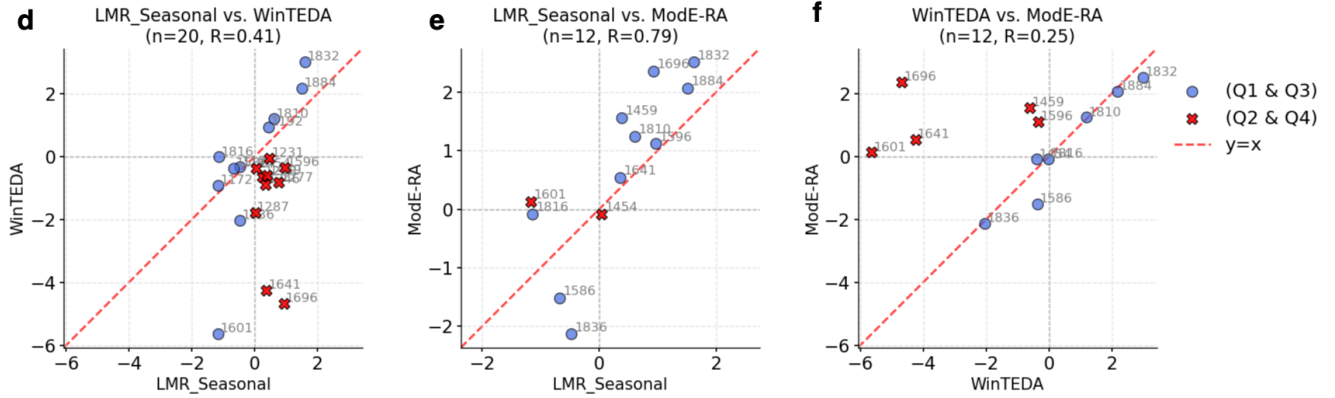


Figure S8. Cross-dataset agreement in event-level winter temperature anomalies. The upper panel compares Eurasian DJF temperature anomalies and the lower panel compares Northern European DJF temperature anomalies among LMR Seasonal, WinTEDA, and ModE-RA for the large tropical eruptions considered here. Blue circles denote events for which the compared datasets agree on the sign of the anomaly, whereas red X symbols denote sign disagreement. PDA stands for paleo-data assimilation, and DJF denotes December–January–February.

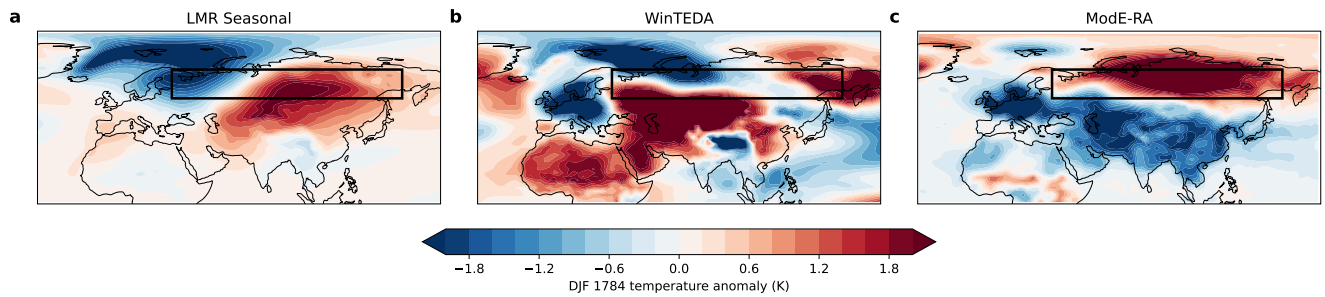


Figure S9. Spatial patterns of winter temperature anomalies after the 1783 Laki eruption. The panels show DJF 1784 temperature anomalies in LMR Seasonal, WinTEDA, and ModE-RA. Anomalies are defined relative to the ensemble-mean DJF temperature over the previous five winters (1779–1783), and the winter year 1784 denotes December 1783–February 1784. Shading indicates temperature anomalies in kelvin, and the black rectangle marks the Northern Eurasia domain (55–70°N, 30–150°E). DJF denotes December–January–February.