Supplementary Material

Table S1: Annual total number of PPA events (n) and mean duration (mean_dur) of PPA events based on sigma 1, sigma 1.5, and sigma 2 (standard deviations of the Z500 anomaly) magnitude thresholds for detecting PPAs.

year	n Sigma 1	n Sigma 1.5	n Sigma 2	mean_dur Sigma 1	mean_dur Sigma 1.5	mean_dur Sigma 2
2001	12	3	1	15	9	5
2002	9	7	2	18	11	12
2003	16	7	4	13	10	8
2004	16	11	4	13	12	6
2005	12	4	1	14	9	7
2006	12	4	2	16	22	13
2007	12	8	5	17	13	12
2008	19	11	9	13	11	8
2009	16	5	3	11	12	8
2010	13	9	2	16	14	9
2011	7	6	3	16	11	7
2012	13	7	3	17	18	7
2013	9	1	1	21	41	19
2014	16	5	3	12	12	9
2015	12	8	1	20	15	6
2016	11	5	NA	18	9	NA
2017	16	7	1	12	9	5
2018	10	9	3	18	16	16
2019	12	8	3	16	13	6
2020	12	6	1	13	10	9
2021	18	10	3	17	15	10
Average	13.00	6.70	2.75	15.44	13.90	9.04
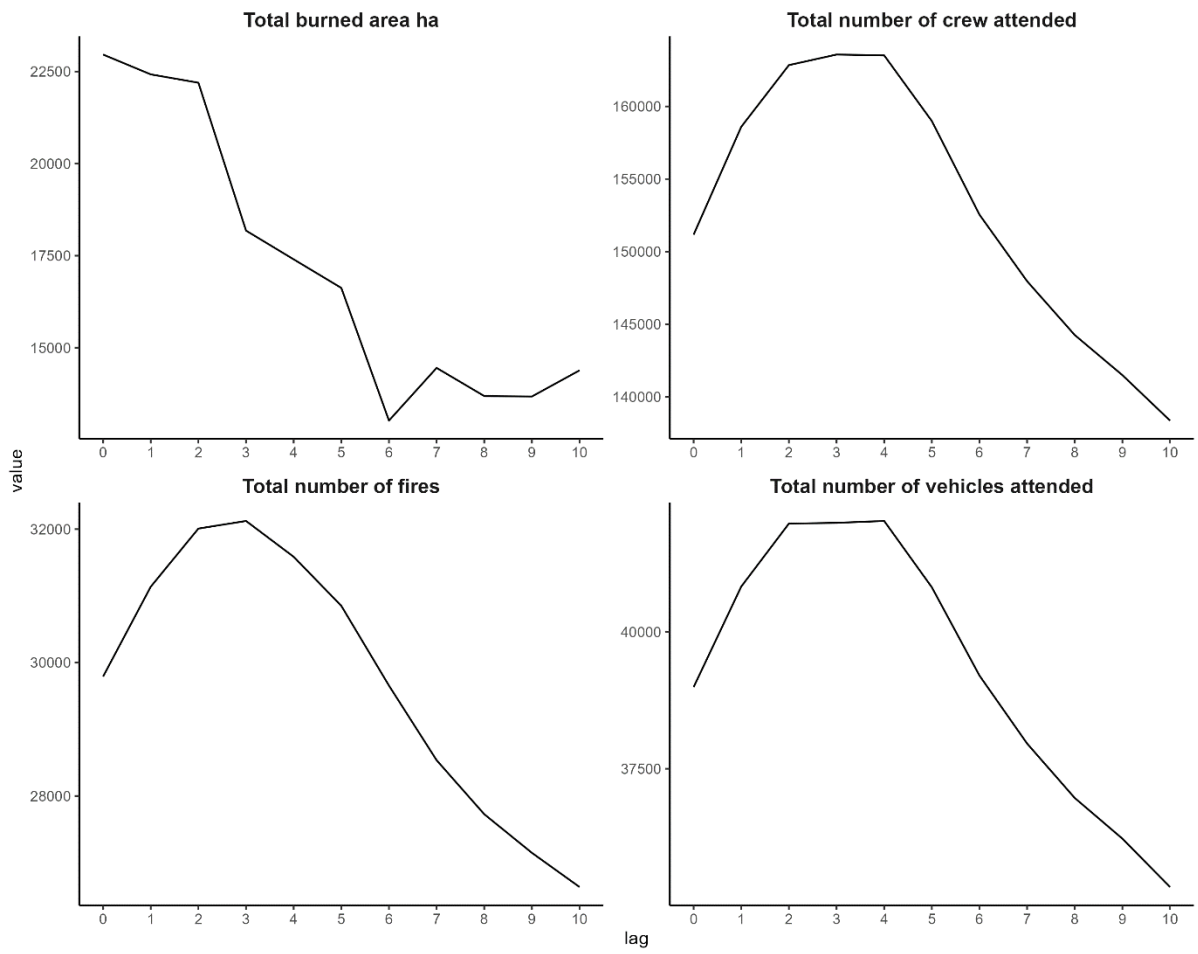
Figure S1: Total burned area in hectares (a), number of crew in attendance (b), number of fires (c), and number of vehicles in attendance (d) either during or up to 10 days following the presence of a PPA in a grid cell.
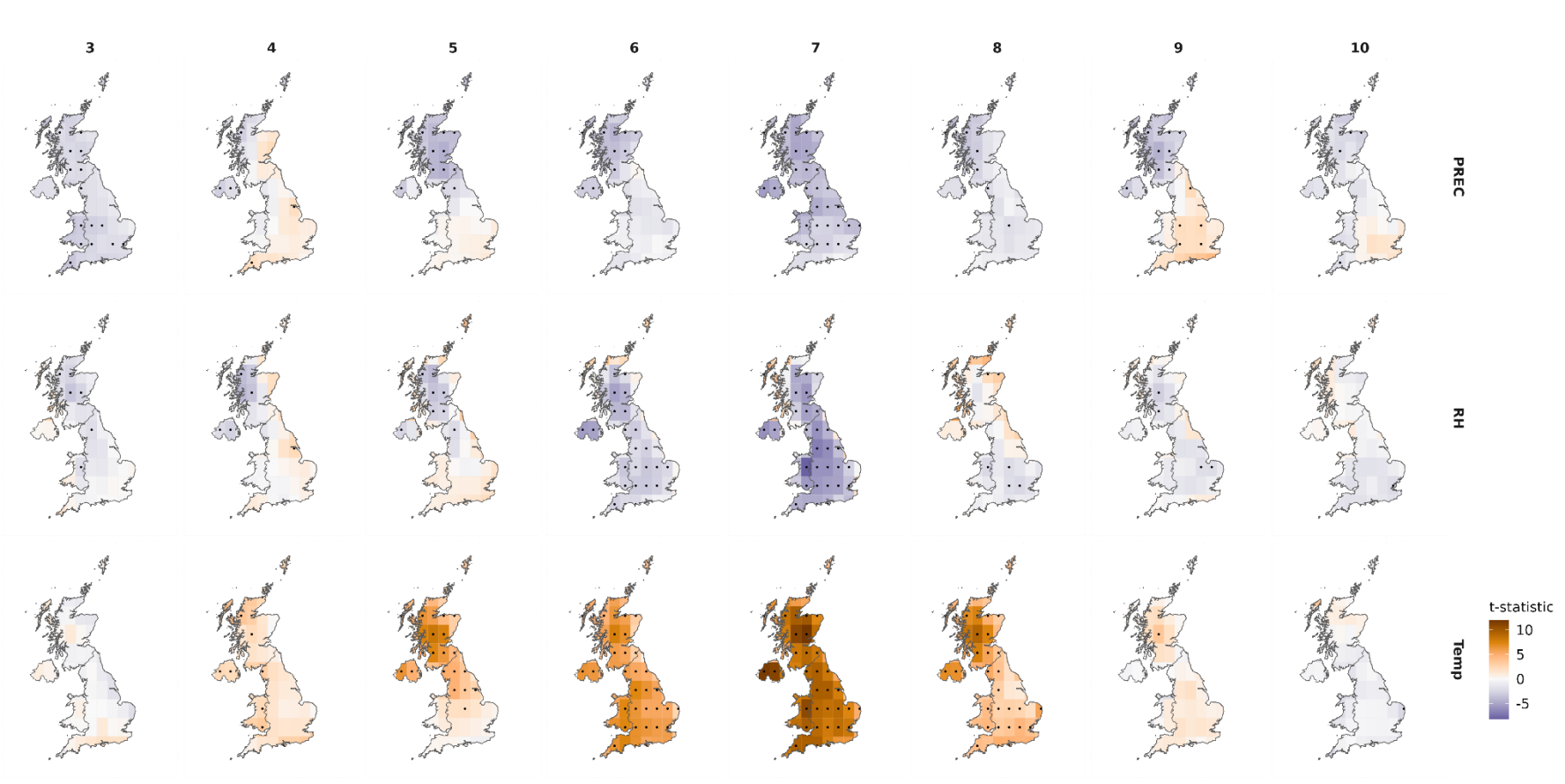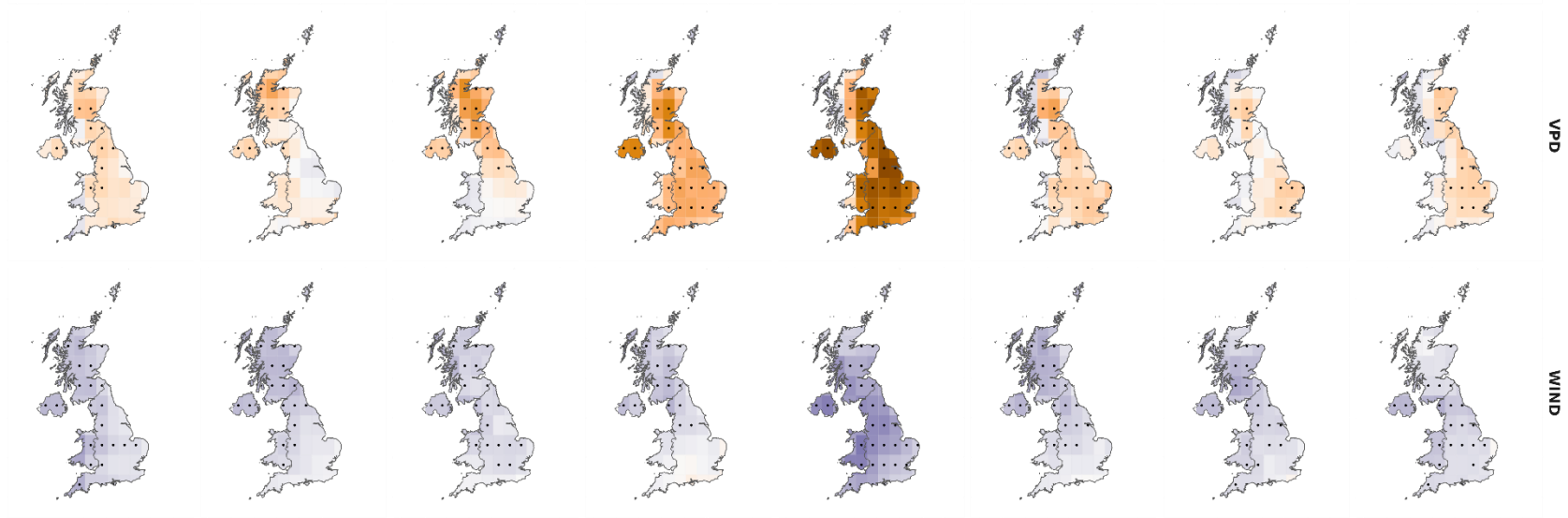
Figure S2: T-statistic for monthly linear regression models comparing surface weather anomalies (precipitation (PREC); relative humidity (RH); temperature (Temp); vapour pressure deficit (VPD); wind speed (WIND)) during PPA days compared to non-PPA days for each 1x1 grid cell over the UK between March (3) and October (10). T-statistics > 0 (orange) show grid cells where surface anomalies are higher when there is a PPA present (larger t-statistics indicate a larger difference between PPA and non-PPA days). T-statistics < 0 (purple) show grid cells where surface anomalies are lower on PPA days. Significant differences ($P < 0.05$) are marked by a dot in the corresponding grid cell.
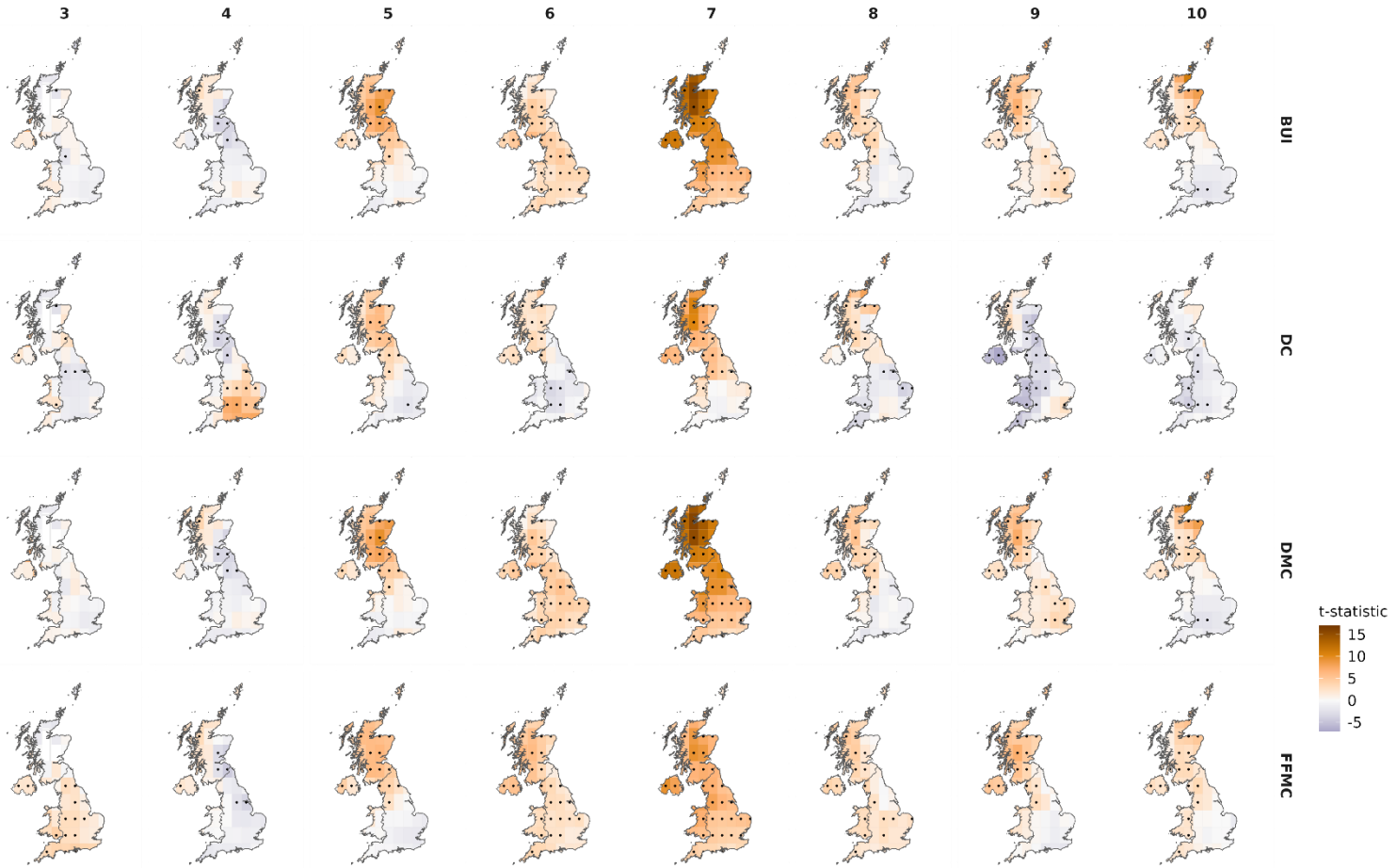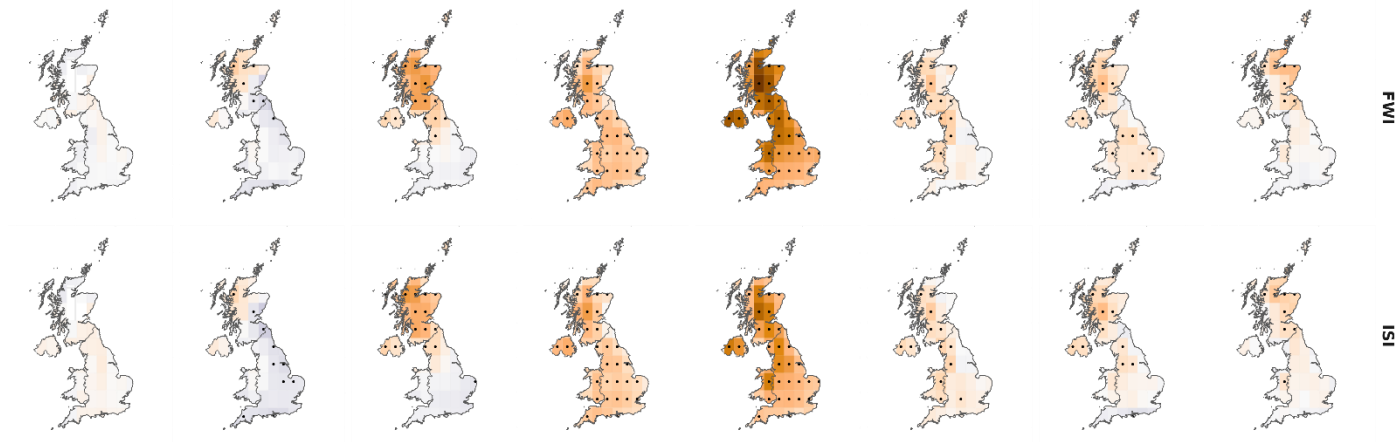
Figure S3: T-statistic for monthly linear regression models comparing Canadian Fire Weather Index System (CFWIS) anomalies (build-up index (BUI); drought code (DC); duff moisture code (DMC); fine fuel moisture code (FFMC); fire weather index (FWI); initial spread index (ISI)) during PPA days compared to non-PPA days for each 1x1 grid cell over the UK between March (3) and October (10). T-statistics > 0 (orange) show grid cells where surface anomalies are higher when there is a PPA present (larger t-statistics indicate a larger difference between PPA and non-PPA days). T-statistics < 0 (purple) show grid cells where surface anomalies are lower on PPA days. Significant differences (*P < 0.05*) are marked by a dot in the corresponding grid cell.
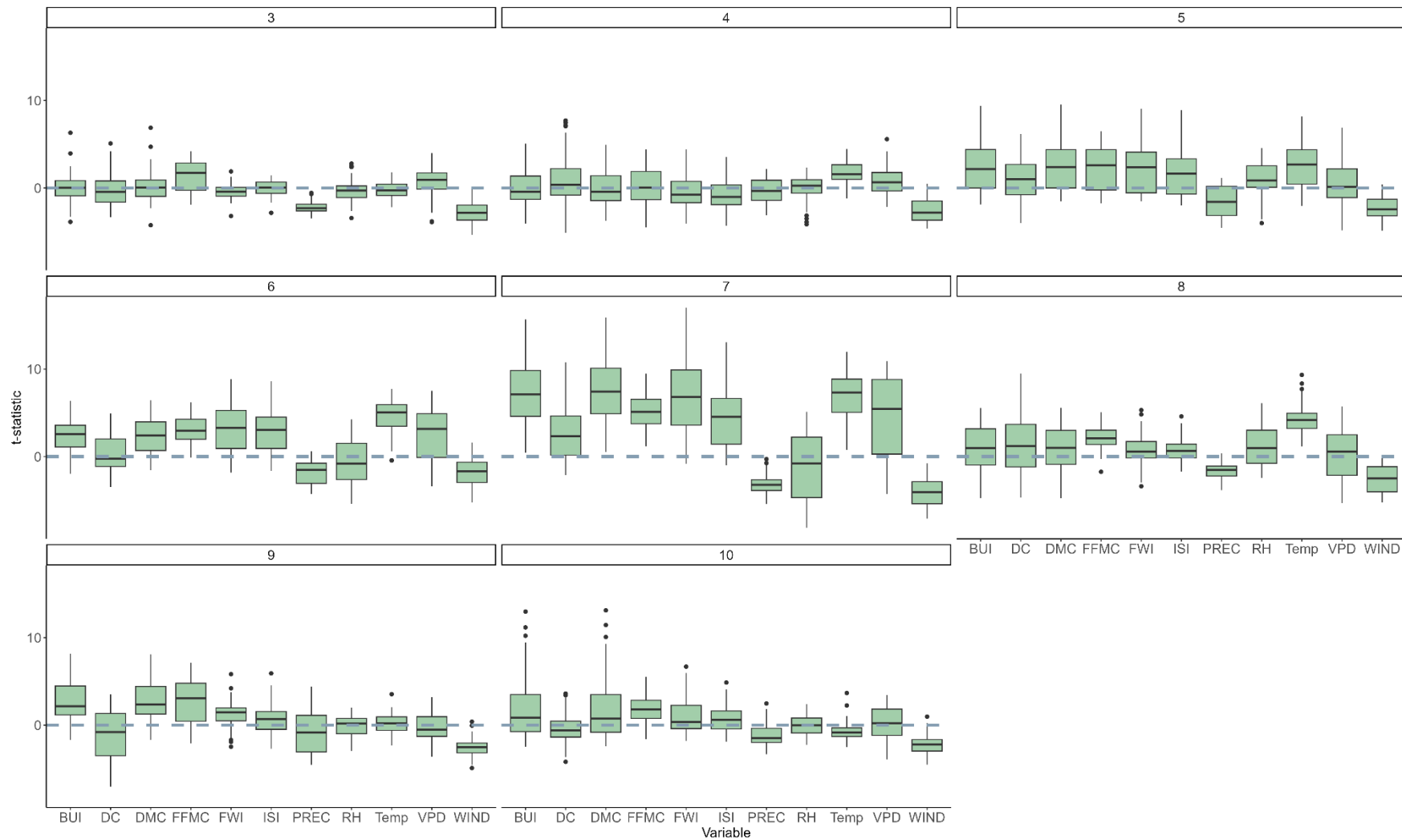
Figure S4: Boxplots showing the range of t-statistics for monthly grid cell linear regression models of surface variable anomalies between PPA and non-PPA days across the UK. T-statistics > 0 indicate larger positive anomalies when there is a PPA present.

Table S2: Comparison of monthly percentage burned area and percentage number of wildfires (N fire) during or up to five days following the presence of a PPA under different thresholds of Z500 magnitude anomaly (sigma = 1 x standard deviation; 1.5 x standard deviation; 2 x standard deviation).

Month	Burned area (%) Sigma 1	Burned area (%) Sigma 1.5	Burned area (%) Sigma 2	N fire (%) Sigma 1	N fire (%) Sigma 1.5	N fire (%) Sigma 2
3	28.9	1.9	0.1	28.6	10.1	0.5
4	78.9	15.4	0.0	42.4	16.1	0.7
5	27.4	7.4	0.0	17.7	8.3	0.0
6	95.5	94.8	88.2	36.1	20.7	9.3
7	58.4	56.1	54.2	43.7	29.3	22.4
8	42.4	9.9	0.0	18.8	3.3	0.0
9	26.2	12.8	0.6	23.4	9.5	1.8
10	55.0	14.9	4.0	39.3	23.0	8.6
annual	61.7	34.4	26.3	32.0	15.6	6.3