

Supplement to: Quantifying the heterogeneous impacts of drought across the distribution of wildfire scale

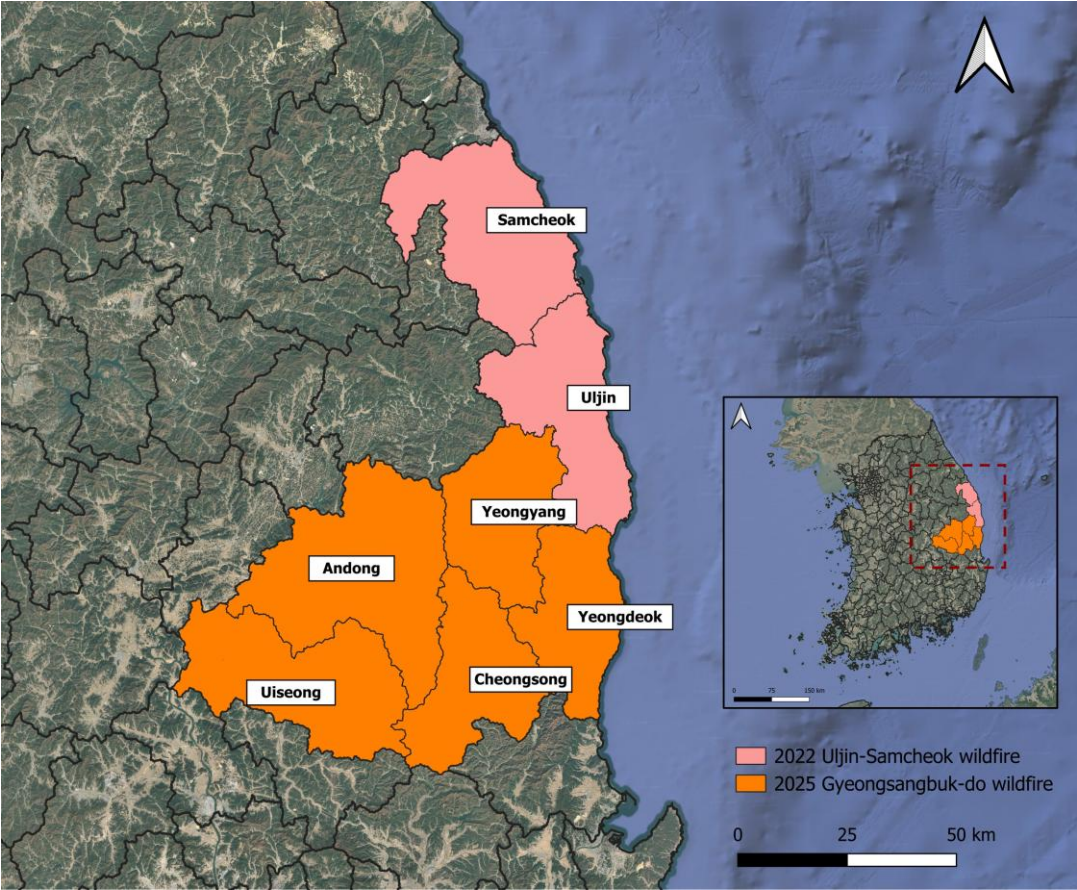
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10 **Figure S1.** Location of large scale wildfires in 2022 and 2025. Map data: © Google Maps 2026.

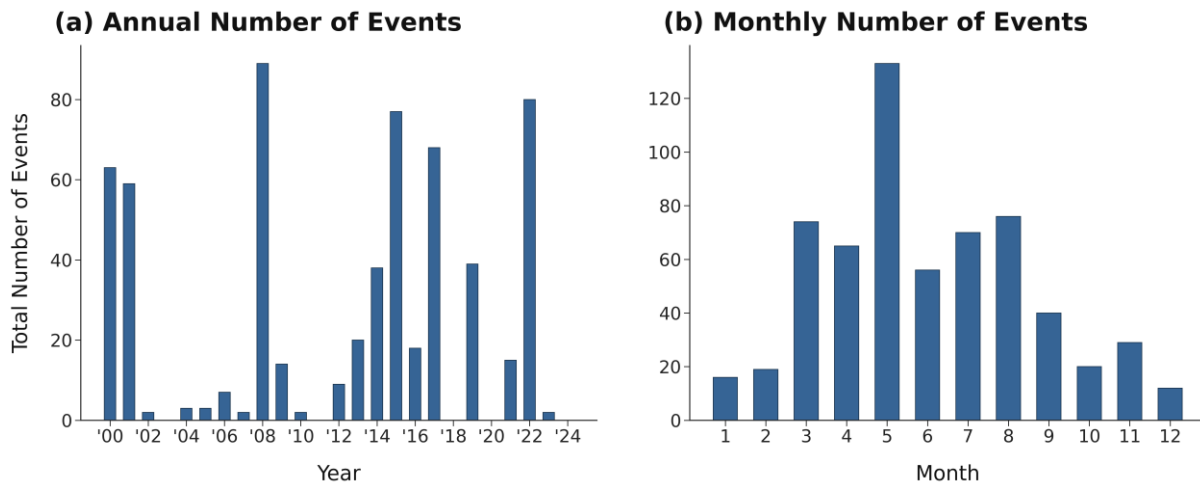


Figure S2. Temporal distribution of drought event in South Korea (2000–2024). (a) annual total number of drought events, and (b) monthly total number of drought events.

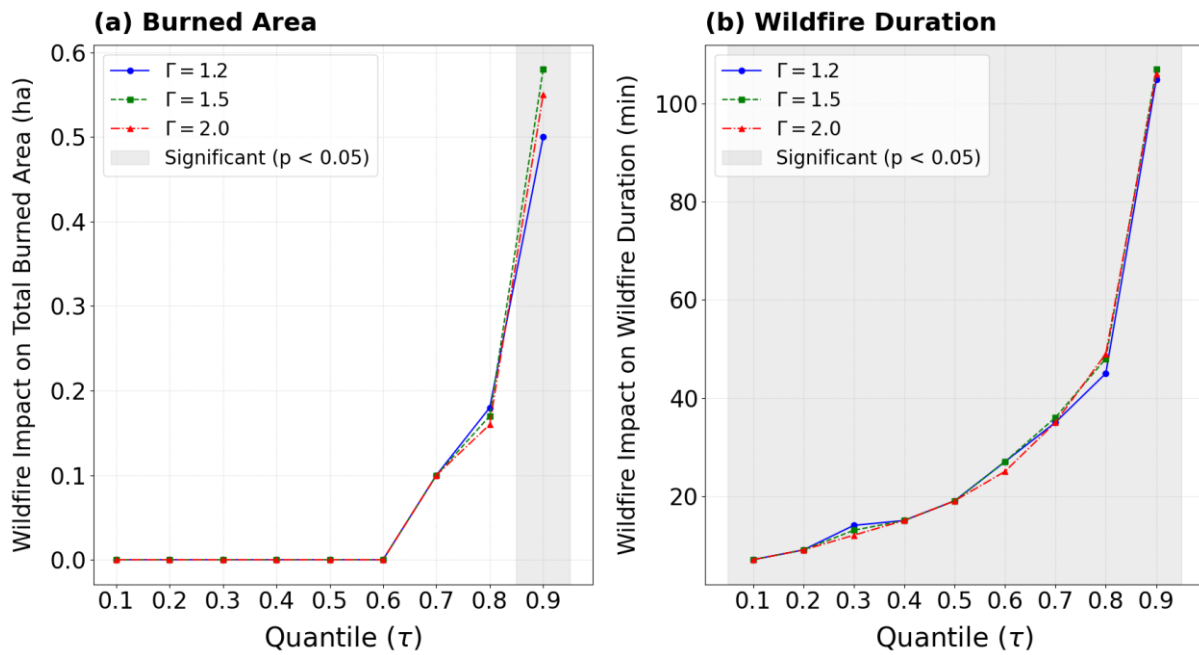


Figure S3. Sensitivity analysis result (all data base). (a) total burned area, and (b) wildfire duration.

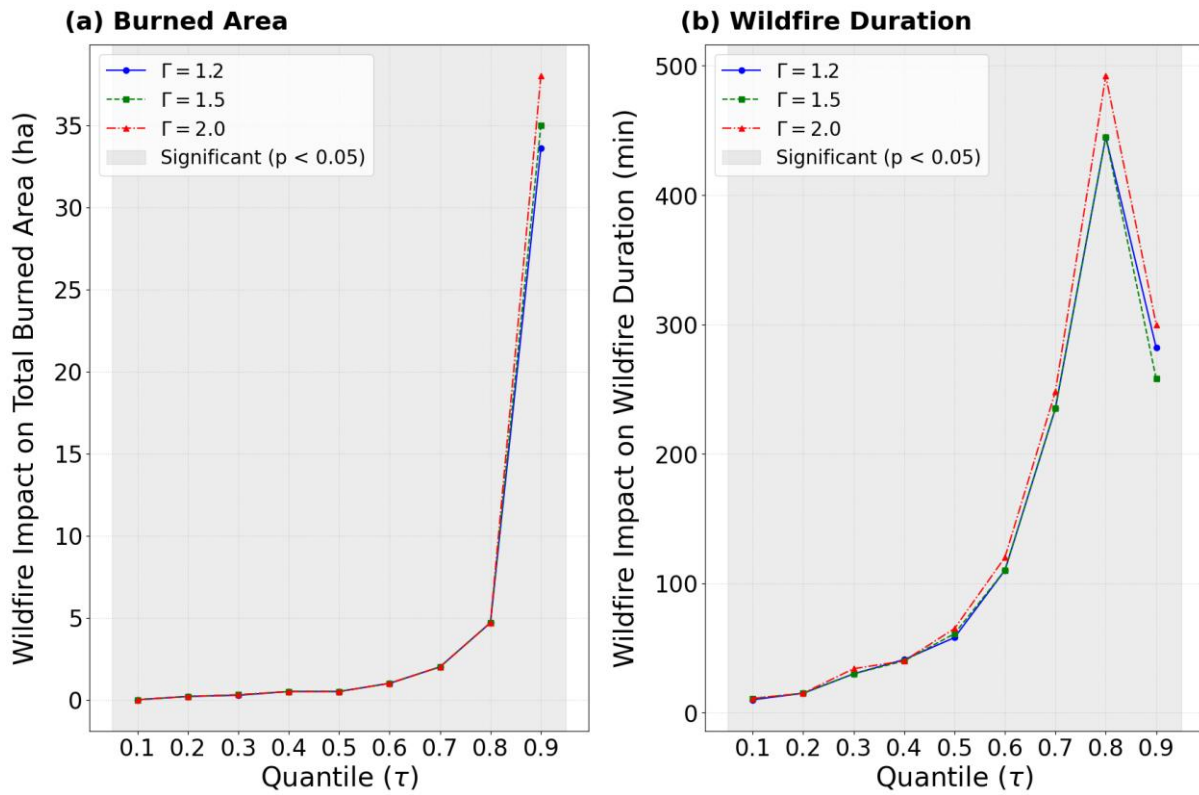


Figure S4. Sensitivity analysis result (more than 1 ha case). (a) total burned area, and (b) wildfire duration.

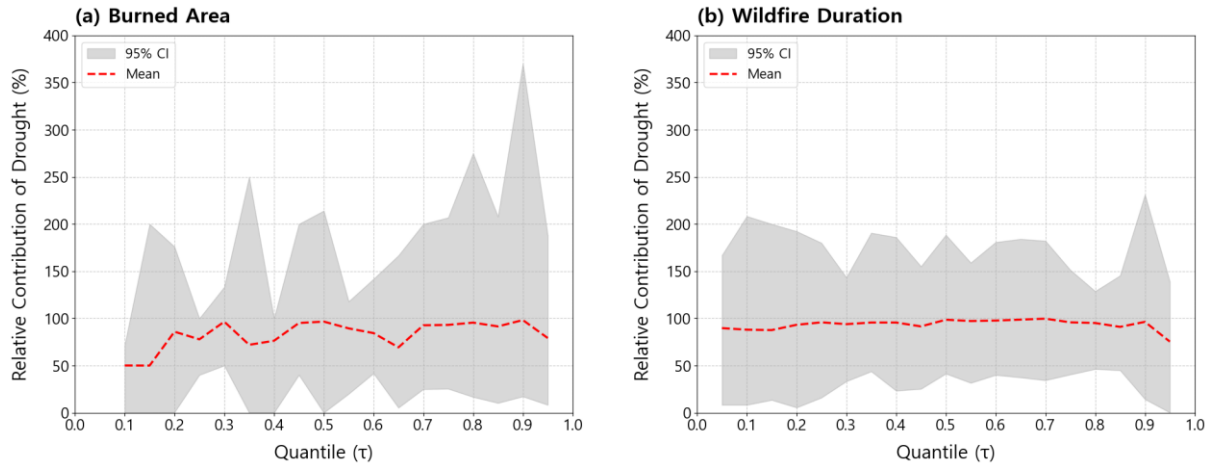


Figure S5. Relative contribution of droughts to the observed differences in empirical cumulative distribution functions for wildfire event (more than 1 ha burned area). Red dotted line is the average relative contribution of drought, and gray shaded area is 95% confidence interval.

Table S1. Descriptions of confounding variables

Variables		Unit	Description
Meteorology	Relative humidity	%	Daily mean and minimum relative humidity during wildfire event
	Temperature	°C	Daily mean, minimum and maximum temperature during wildfire event
	Wind speed	m/s	Daily mean and maximum wind speed during wildfire event
	Precipitation	mm, day	Total precipitation and number of rainy days during wildfire event
Watershed	Elevation	m	Mean elevation of the watershed
	Slope	°	Mean slope of the watershed
	Aspect	%	Proportion of south-facing slopes within the watershed
Landcover		%	Proportion of area covered by each landcover type (water, forest, grass, barren, wetland, agriculture and urban)
Forest	Tree age	%	Proportion of old tree (older than 41 years)
	Tree type	%	Proportion of area covered by each tree type (coniferous tree, broad-leaved tree, and evergreen broad tree)

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Table S2. Logistic regression model result (all data case)

Variable	Coefficient	Stand Error	p-value
Constant	-2.6789	0.406	< 0.01
Mean relative humidity	0.0140	0.005	0.004
Minimum relative humidity	0.0037	0.006	0.522
Mean temperature	-0.0626	0.046	0.173
Minimum temperature	0.1016	0.022	< 0.01
Maximum temperature	0.0149	0.028	0.598
Mean wind speed	-0.0275	0.064	0.670
Maximum wind speed	0.0550	0.034	0.101

Total precipitation	-0.0119	0.014	0.399
Number of rainy days	-0.3599	0.101	< 0.01
Mean elevation	-0.0008	0.000	0.035
Mean slope	0.0311	0.005	< 0.01
Aspect	0.1742	0.845	0.837
Water	-0.2669	0.005	0.594
Forest	0.0029	0.006	< 0.01
Grass	0.0032	0.045	0.558
Barren	0.0672	0.022	0.928
Wetland	-0.0407	0.028	< 0.01
Agriculture	0.0672	0.065	0.725
Tree age	0.0970	0.034	< 0.01
Coniferous tree	0.0141	0.013	< 0.01
Broad-leaved tree	0.0006	0.098	0.877
Evergreen broad tree	0.0005	0.008	0.719

※ Note: Total number of data = 11,800, Pesuedo R-squre = 0.0339 Log-Likelihood Raito p-value: <0.01
(2.117×10^{-50})

Table S3. Homogeneity test based on Standardized Mean Difference (SMD) (all data case)

Variable	SMD	
	Before weight	After weight
Mean relative humidity	0.0985	0.0525
Minimum relative humidity	0.1104	0.0624
Mean temperature	0.3525	0.0601
Minimum temperature	0.3629	0.0523
Maximum temperature	0.3297	0.0656
Mean wind speed	0.0338	0.0289
Maximum wind speed	0.0488	0.0348
Total precipitation	0.0153	0.0121
Number of rainy days	0.0224	0.0125
Mean elevation	0.0841	0.0241
Mean slope	0.1094	0.0275
Aspect	0.0575	0.0295

Water	0.0149	0.0104
Forest	0.1042	0.0398
Grass	0.1534	0.01
Barren	0.0771	0.0205
Wetland	0.0126	0.0047
Agriculture	0.0715	0.0209
Tree age	0.0494	0.0482
Coniferous tree	0.0002	0.0345
Broad-leaved tree	0.0166	0.0015
Evergreen broad tree	0.0255	0.0188

30 **Table S4.** Logistic regression model result (more than 1 ha case)

Variable	Coefficient	Stand Error	p-value
Constant	-2.2599	0.996	0.023
Mean relative humidity	0.0168	0.011	0.131
Minimum relative humidity	-0.0146	0.015	0.334
Mean temperature	-0.1187	0.092	0.197
Minimum temperature	0.1038	0.046	0.024
Maximum temperature	0.0507	0.055	0.360
Mean wind speed	0.1301	0.117	0.265
Maximum wind speed	0.0649	0.064	0.308
Total precipitation	0.0076	0.033	0.818
Number of rainy days	-0.3572	0.245	0.144
Mean elevation	-0.0038	0.001	< 0.01
Mean slope	0.0709	0.014	< 0.01
Aspect	-2.0697	2.025	0.307
Water	-0.0245	0.015	< 0.01
Forest	0.0078	0.090	< 0.01
Grass	0.0525	0.046	0.138
Barren	0.0440	0.056	0.792
Wetland	-0.0388	0.121	< 0.01
Agriculture	0.0171	0.066	0.501
Tree age	0.0363	0.032	0.539

Coniferous tree	0.0371	0.243	< 0.01
Broad-leaved tree	0.229	0.001	< 0.01
Evergreen broad tree	0.0336	0.023	< 0.01

※ Note: Total number of data = 1,812, Pesuedo R-squre = 0.0826, Log-Likelihood Raito p-value: <0.01 (2.162×10^{-15})

Table S5. Homogeneity test based on Standardized Mean Difference (SMD) (more than 1 ha case)

Variable	SMD	
	Before weight	After weight
Mean relative humidity	0.1013	0.0275
Minimum relative humidity	0.1484	0.0015
Mean temperature	0.2732	0.0502
Minimum temperature	0.2786	0.0282
Maximum temperature	0.2654	0.0758
Mean wind speed	0.1932	0.0759
Maximum wind speed	0.2352	0.0046
Total precipitation	0.0063	0.048
Number of rainy days	0.0731	0.0275
Mean elevation	0.0308	0.0417
Mean slope	0.1566	0.0593
Aspect	0.0879	0.0215
Water	0.0614	0.0184
Forest	0.1487	0.0263
Grass	0.3245	0.0651
Barren	0.0819	0.0421
Wetland	0.0244	0.0347
Agriculture	0.1623	0.0736
Tree age	0.0512	0.0346
Coniferous tree	0.025	0.0322
Broad-leaved tree	0.0199	0.028
Evergreen broad tree	0.1315	0.0409