

Online Resource 1 - Supplementary Information

Five Decades of Warming Without a Parallel Trend in Day-to-Day Temperature Variability Across a Bangladesh Station Network

Theoretical and Applied Climatology | Sujana Azmi Polin and Hameem Ahsan

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Table S1. Station inclusion/exclusion audit

Table S1. All raw-network stations and primary eligibility outcome. Manuscript display names are standardized only where unambiguous; source labels are preserved in the analytical files.

Station	Code	Lat	Lon	Record	Completeness %	Primary status / reason
Ambagan (Ctg)	41977	22.350	91.817	1999-2024	52.0	Excluded : record begins after 1975; completeness <90%
Badalgachhi	41881	24.967	88.900	2018-2024	13.7	Excluded : record begins after 1975; completeness <90%
Barishal	11704	22.750	90.333	1970-2024	99.5	Retained
Bhola	11706	22.683	90.650	1970-2024	97.9	Retained
Bogura	10408	24.850	89.367	1970-2024	96.1	Retained
Chandpur	11316	23.267	90.700	1970-2024	94.8	Retained
Chittagon g	11921	22.267	91.817	1970-2024	89.3	Excluded : completeness <90%
Cumilla	11313	23.433	91.183	1970-2024	98.0	Retained
Cox's Bazar	11927	21.433	91.933	1970-2024	99.1	Retained
Dhaka	11111	23.767	90.383	1970-2024	100.0	Retained
Dimla	41851	26.150	88.933	2018-2024	14.0	Excluded : record begins after 1975; completeness <90%

Station	Code	Lat	Lon	Record	Complete %	Primary status / reason
Dinajpur	10120	25.650	88.683	1970-2024	88.0	Excluded : completeness <90%
Faridpur	11505	23.600	89.850	1970-2024	99.3	Retained
Feni	11805	23.033	91.417	1974-2024	98.8	Retained
Gopalganj	41938	23.033	89.833	2018-2024	14.0	Excluded : record begins after 1975; completeness <90%
Hatiya	11814	22.433	91.100	1970-2024	97.7	Retained
Ishurdi	10910	24.133	89.050	1970-2024	99.7	Retained
Jashore	11407	23.183	89.167	1970-2024	98.0	Retained
Khepupara	12110	21.983	90.233	1974-2024	98.4	Retained
Khulna	11604	22.783	89.533	1970-2024	97.3	Retained
Kumarkhali	41927	23.867	89.250	2018-2024	13.0	Excluded : record begins after 1975; completeness <90%; conflicting duplicate dates present
Kutubdia	11925	21.817	91.850	1985-2024	79.7	Excluded : record begins after 1975; completeness <90%
Maijdi Court	11809	22.867	91.100	1970-2024	94.1	Retained
Madaripur	11513	23.167	90.183	1977-2024	93.1	Excluded : record begins after 1975
Mongla	41958	22.333	89.600	1991-2024	68.0	Excluded : record begins after 1975; completeness <90%

Station	Code	Lat	Lon	Record	Complete %	Primary status / reason
Mymensingh	10609	24.717	90.433	1970-2024	99.7	Retained
Natragon	41888	24.900	90.733	2018-2024	14.0	Excluded : record begins after 1975; completeness <90%
Patuakhali	12103	22.333	90.333	1973-2024	96.0	Retained
Rajshahi	41856	25.850	89.533	2018-2024	14.0	Excluded : record begins after 1975; completeness <90%
Rangamati	10320	24.367	88.700	1970-2024	99.9	Retained
Rangpur	12007	22.533	92.200	1970-2024	99.0	Retained
Sandwip	10208	25.733	89.233	1970-2024	99.0	Retained
Satkhira	11916	22.483	91.433	1970-2024	93.8	Retained
Sitakunda	11610	22.717	89.083	1970-2024	99.7	Retained
Srimangal	11912	23.583	91.700	1977-2024	95.2	Excluded : record begins after 1975
Sylhet	10724	24.300	91.733	1970-2024	95.0	Retained
Tangail	10705	24.900	91.883	1970-2024	99.5	Retained
Tarash	41909	24.250	89.917	1987-2024	75.6	Excluded : record begins after 1975; completeness <90%
Teknaf	41897	24.933	89.383	2018-2024	14.0	Excluded : record begins after 1975; completeness <90%
	11929	20.867	92.300	1977-2024	91.5	Excluded : record begins after 1975

Station	Code	Lat	Lon	Record	Complete %	Primary status / reason
Tetulia	41850	26.500	88.350	2022-2024	5.9	Excluded : record begins after 1975; completeness <90%
chuadang a	41926	23.650	88.867	1999-2024	52.0	Excluded : record begins after 1975; completeness <90%
sydpur	41858	25.783	88.883	2000-2024	50.0	Excluded : record begins after 1975; completeness <90%

Table S2. Homogeneity/breakpoint screening

Table S2. Strong candidate-break summary. Breakpoint screening was applied separately to annual mean temperature and annual mean DTV for each station. A strong station-outcome flag required at least two of the three tests to produce $p < 0.01$ with candidate years within a five-year window; a station was excluded in the homogeneity sensitivity if either outcome was strongly flagged.

Station	Complete %	Strong flag	Candidate year	Retained in homogeneity sensitivity
Barishal	99.5	No		Yes
Bhola	97.9	No		Yes
Bogura	96.1	No		Yes
Chandpur	94.8	No		Yes
Cumilla	98.0	No		Yes
Cox's Bazar	99.1	No		Yes
Dhaka	100.0	No		Yes
Faridpur	99.3	No		Yes
Feni	98.8	No		Yes
Hatiya	97.7	No		Yes
Ishurdi	99.7	No		Yes
Jashore	98.0	No		Yes
Khepupara	98.4	No		Yes
Khulna	97.3	No		Yes
Maijdi Court	94.1	No		Yes
Mymensingh	99.7	Yes	1986	No
Patuakhali	96.0	Yes	1987	No
Rajshahi	99.9	No		Yes

Station	Complete %	Strong flag	Candidate year	Retained in homogeneity sensitivity
Rangamati	99.0	No		Yes
Rangpur	99.0	No		Yes
Sandwip	93.8	No		Yes
Satkhira	99.7	Yes	1988	No
Srimangal	95.0	No		Yes
Sylhet	99.5	No		Yes

Table S3. Abrupt-threshold multiplicity sensitivity

Table S3. Multiplicity adjustment across the three abrupt-transition thresholds.

Threshold d	TFPW p	TFPW BH	TFPW Bonf.	HR p	HR BH	HR Bonf.
DTV $\geq$ 2.5 °C	0.301	0.301	0.903	0.162	0.162	0.487
DTV $\geq$ 3 °C	0.196	0.294	0.588	0.101	0.152	0.303
DTV $\geq$ 4 °C	0.020	0.060	0.060	0.016	0.049	0.049

Table S4. Fixed-station-network sensitivities

Table S4a. Fixed-network station sets.

Network	n	Stations	Strong breakpoint flags in panel
Primary equal-station network	24	Barishal; Bhola; Bogura; Chandpur; Cumilla; Cox's Bazar; Dhaka; Faridpur; Feni; Hatiya; Ishurdi; Jashore; Khepupara; Khulna; Maijdi Court; Mymensingh; Patuakhali; Rajshahi; Rangamati; Rangpur; Sandwip; Satkhira; Srimangal; Sylhet	Mymensingh; Patuakhali; Satkhira
Strict fixed-station network ($\geq$ 90% every year)	3	Dhaka; Ishurdi; Rajshahi	
Relaxed fixed-station network ($\geq$ 80% every year)	7	Cox's Bazar; Dhaka; Ishurdi; Mymensingh; Rajshahi; Satkhira; Sylhet	Mymensingh; Satkhira
Relaxed fixed network excluding strong breakpoint flags	5	Cox's Bazar; Dhaka; Ishurdi; Rajshahi; Sylhet	

Table S4b. Complete fixed-network trend results.

Network	Outcome	Sen slope/decade	95% CI	Classical p	TFPW p	HR p
Strict fixed-station network (≥90% every year)	Annual mean temperature	0.130	0.067 to 0.185	<0.001	<0.001	<0.001
Strict fixed-station network (≥90% every year)	Annual mean DTV	0.000	-0.009 to 0.009	0.967	0.877	0.973
Strict fixed-station network (≥90% every year)	Abrupt DTV ≥ 2.5 °C	-0.222	-1.111 to 0.639	0.651	0.803	0.657
Strict fixed-station network (≥90% every year)	Abrupt DTV ≥ 3 °C	-0.275	-1.006 to 0.351	0.344	0.361	0.408
Strict fixed-station network (≥90% every year)	Abrupt DTV ≥ 4 °C	-0.331	-0.667 to -0.000	0.020	0.068	0.021
Relaxed fixed-station network (≥80% every year)	Annual mean temperature	0.082	0.015 to 0.139	0.016	0.002	0.061
Relaxed fixed-station network (≥80% every year)	Annual mean DTV	-0.015	-0.025 to -0.004	0.005	0.018	0.020
Relaxed fixed-station network (≥80% every year)	Abrupt DTV ≥ 2.5 °C	-1.097	-2.000 to -0.317	0.008	0.017	0.008
Relaxed fixed-station network (≥80% every year)	Abrupt DTV ≥ 3 °C	-0.844	-1.429 to -0.303	0.004	0.010	0.004
Relaxed fixed-station network (≥80% every year)	Abrupt DTV ≥ 4 °C	-0.562	-0.929 to -0.286	<0.001	0.002	<0.001

Network	Outcome	Sen slope/decade	95% CI	Classical p	TFPW p	HR p
Relaxed fixed network excluding strong breakpoint flags	Annual mean temperature	0.160	0.111 to 0.209	<0.001	<0.001	<0.001
Relaxed fixed network excluding strong breakpoint flags	Annual mean DTV	-0.001	-0.010 to 0.006	0.770	0.783	0.776
Relaxed fixed network excluding strong breakpoint flags	Abrupt DTV ≥ 2.5 °C	-0.105	-0.790 to 0.566	0.688	0.836	0.694
Relaxed fixed network excluding strong breakpoint flags	Abrupt DTV ≥ 3 °C	-0.145	-0.625 to 0.400	0.536	0.480	0.588
Relaxed fixed network excluding strong breakpoint flags	Abrupt DTV ≥ 4 °C	-0.227	-0.528 to 0.000	0.079	0.079	0.098

Table S5. Seasonal DTV trends

Table S5. Seasonal network mean-DTV trends (°C decade⁻¹). Winter assigns December to the following seasonal year.

Season	n	Sen slope	95% CI	Classical p	TFPW p	HR p
Winter	49	0.007	-0.012 to 0.028	0.418	0.414	0.423
Pre-monsoon	50	-0.022	-0.050 to 0.007	0.130	0.088	0.132
Monsoon	50	-0.004	-0.013 to 0.006	0.357	0.769	0.362
Post-monsoon	50	-0.002	-0.020 to 0.014	0.808	0.836	0.837

Table S6. Station-level annual mean-DTV trends

Table S6. Station-specific annual mean-DTV trends. Benjamini-Hochberg adjustment was applied across the 24 station tests within the DTV outcome family.

Station	n	Sen slope/decade	95% CI	Classical p	TFPW p	BH-adjusted p
Barishal	49	-0.002	-0.014 to 0.007	0.750	0.557	0.743
Bhola	49	0.002	-0.009 to 0.011	0.679	0.776	0.847
Bogura	47	0.011	0.001 to 0.022	0.039	0.044	0.262
Chandpur	46	0.009	-0.005 to 0.023	0.201	0.028	0.227
Cumilla	49	0.005	-0.007 to 0.018	0.443	0.394	0.590
Cox's Bazar	49	-0.006	-0.016 to 0.005	0.356	0.286	0.590
Dhaka	50	0.005	-0.007 to 0.018	0.403	0.352	0.590
Faridpur	49	-0.004	-0.018 to 0.008	0.552	0.901	0.901
Feni	49	-0.005	-0.023 to 0.010	0.518	0.644	0.813
Hatiya	49	0.005	-0.005 to 0.014	0.317	0.384	0.590
Ishurdi	50	-0.006	-0.016 to 0.002	0.153	0.241	0.590
Jashore	49	-0.007	-0.016 to 0.004	0.241	0.270	0.590
Khepupara	48	0.009	-0.008 to 0.025	0.286	0.300	0.590
Khulna	48	-0.003	-0.014 to 0.009	0.670	0.891	0.901
Maijdi Court	46	0.004	-0.016 to 0.021	0.726	0.233	0.590
Mymensingh	48	-0.018	-0.044 to -0.002	0.025	0.077	0.368
Patuakhali	46	-0.003	-0.018 to 0.012	0.670	0.434	0.613
Rajshahi	50	-0.002	-0.010 to 0.006	0.676	0.692	0.825
Rangamati	48	-0.011	-0.030 to 0.007	0.223	0.354	0.590
Rangpur	48	0.025	0.010 to 0.040	0.001	0.001	0.016
Sandwip	44	0.009	-0.005 to 0.028	0.175	0.140	0.560
Satkhira	49	-0.023	-0.038 to -0.010	0.002	<0.001	0.013
Srimangal	43	-0.012	-0.036 to 0.005	0.140	0.324	0.590
Sylhet	49	0.000	-0.011 to 0.013	1.000	0.722	0.825

Figure S1. Station-level DTV trends

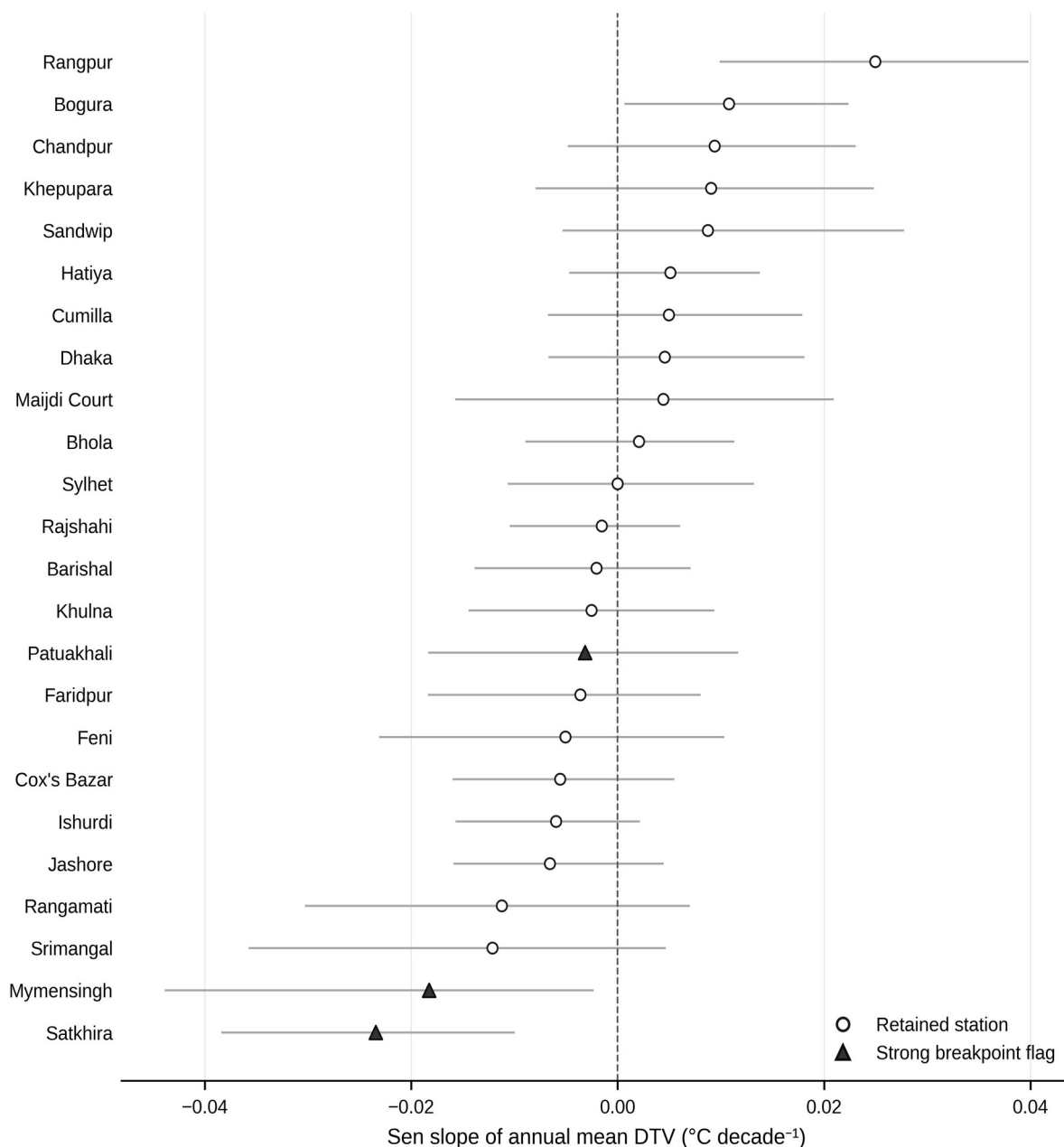


Fig. S1. Station-specific Sen slopes for annual mean DTV. Horizontal lines are unadjusted 95% Sen-slope confidence intervals. Triangles denote the three strong candidate-break stations. Station-level Benjamini-Hochberg correction was applied separately within the 24-station DTV family.

Supplementary reproducibility files

The accompanying archive contains annual station-level and network-level derived metrics, station-level trend/FDR tables, complete breakpoint-test details, QC logs that do not reconstruct the original daily observations, duplicate and label-correction audits, early-versus-recent comparisons, geographic- and fixed-network sensitivities, raw-file SHA-256 inventory, numerical results, software-version information and all analysis/figure scripts. Original BMD observations and source-equivalent cleaned daily series are not redistributed.