

Performance of Climate Projections for Yukon and Adjacent Northwest Territories, 1991–2020

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APPENDIX

TABLE A1. Reconstruction relations used for gap filling at the four representative stations. Slope and intercept refer to least-squares regression parameters required to estimate temperature values at representative stations from values at reconstruction stations. The overlap period is the time for which daily temperature data are available for both stations and were used to develop the relations.

Representative station	Reconstruction station	Month	Slope	Intercept	R2	Overlap period
Inuvik A	Fort Good Hope 2	January	0.80	-4.73	0.705	1957–66
		February	0.84	-4.38	0.711	
		March	0.81	-6.29	0.705	
		April	0.95	-4.43	0.718	
		May	0.99	-3.57	0.761	
		June	0.95	-1.89	0.501	
		July	0.91	-0.32	0.492	
		August	0.97	-0.70	0.633	
		September	0.88	-0.72	0.628	
		October	0.84	-2.48	0.740	
		November	0.75	-4.90	0.723	
		December	0.80	-4.56	0.686	
Inuvik A	Aklavik A	January	0.94	-1.87	0.844	1957–63
		February	0.95	-1.43	0.858	
		March	1.02	-0.78	0.853	
		April	1.03	-0.34	0.926	
		May	1.08	0.13	0.906	
		June	0.97	1.12	0.866	
		July	0.91	1.46	0.798	
		August	1.04	-0.46	0.876	
		September	1.04	-0.46	0.867	
		October	0.96	-0.83	0.841	
		November	0.88	-3.37	0.818	
		December	0.92	-3.41	0.799	
Inuvik A	Fort McPherson	January	0.87	-3.92	0.878	1957–77
		March	0.96	-3.05	0.806	
		August	0.94	-0.60	0.818	
		September	0.95	-0.62	0.813	
		November	0.868	-2.95	0.845	
Dawson	Mayo A	July	0.69	5.38	0.549	1925–79
		August	0.82	2.80	0.715	
Dawson A	Mayo A	October	1.00	-2.08	0.836	1976–2013
		November	0.87	-4.15	0.832	
Fort Simpson	Hay River	January	0.82	-6.24	0.698	1895–1943
		February	0.79	-5.43	0.722	
		March	0.72	-3.91	0.679	
		April	0.75	0.55	0.767	
		May	0.62	4.65	0.510	
		June	0.55	8.16	0.413	
		July	0.51	8.94	0.317	
		August	0.69	4.54	0.472	
		September	0.85	1.12	0.672	
		October	0.88	-1.64	0.720	
		November	0.88	-4.43	0.780	
		December	0.73	-8.83	0.651	
Fort Simpson	Hay River A	October	0.92	-2.19	0.781	1943–63
Fort Simpson A	Hay River A	October	0.99	-2.36	0.774	1963–2020
		November	0.88	-5.26	0.813	

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TABLE A2. Kendall- τ coefficients and n for mean annual temperature records for the four representative stations with other stations in Yukon and Mackenzie Valley. Values in the left column under a representative station are for our adjusted ECCC historical records (E τ), while the right column presents values from homogenized records (H τ). $p < 0.05$ in all cases. Results of the paired Student's t -test for equal means (excluding Beaver Creek) are presented at the end of the table. The two-tailed critical t value is 2.145.

Station	Whitehorse				Dawson				Inuvik				Fort Simpson			
	E τ	n	H τ	n	E τ	n	H τ	n	E τ	n	H τ	n	E τ	n	H τ	n
Beaver Creek	0.824	30	–	–	0.772	30	–	–	0.460	30	–	–	0.582	30	–	–
Burwash	0.809	53	0.813	43	0.805	53	0.829	43	0.430	53	0.442	43	0.531	53	0.565	43
Dawson	0.736	83	0.772	72	–	–	–	–	0.457	106	0.525	59	0.564	117	0.603	89
Fort Good Hope	0.431	57	0.540	47	0.505	83	0.636	46	0.739	83	0.827	36	0.734	85	0.739	47
Fort Simpson	0.570	83	0.553	72	0.564	117	0.603	89	0.644	108	0.689	58	–	–	–	–
Fort Smith	0.444	76	0.450	69	0.479	95	0.515	85	0.532	95	0.557	57	0.769	95	0.783	78
Haines Junction	0.778	44	0.802	53	0.718	44	0.803	50	0.501	44	0.493	40	0.610	44	0.607	52
Hay River	0.496	79	0.477	70	0.493	108	0.493	100	0.486	100	0.557	59	0.735	111	0.786	89
Inuvik	0.418	80	0.439	60	0.457	106	0.525	59	–	–	–	–	0.644	108	0.689	58
Komakuk Beach	0.425	31	0.288	30	0.412	31	0.362	29	0.781	31	0.562	29	0.547	31	0.319	30
Mayo	0.763	80	0.775	72	0.803	97	0.847	83	0.464	96	0.503	59	0.637	97	0.677	80
Norman Wells	0.503	77	0.532	70	0.600	77	0.631	69	0.708	77	0.787	57	0.775	77	0.760	69
Old Crow	0.494	40	0.517	36	0.541	40	0.653	35	0.707	40	0.706	34	0.538	40	0.560	36
Shingle Point	0.468	29	0.458	29	0.402	29	0.534	28	0.897	29	0.875	30	0.557	29	0.584	28
Tuktoyaktuk	0.398	62	0.470	45	0.469	62	0.590	45	0.859	62	0.878	46	0.632	62	0.676	45
Watson Lake	0.730	76	0.727	72	0.622	78	0.636	76	0.398	77	0.463	57	0.578	78	0.580	75
Whitehorse	–	–	–	–	0.736	83	0.772	72	0.418	80	0.439	60	0.570	83	0.553	72
Mean	0.564		0.574		0.574		0.629		0.601		0.620		0.628		0.632	
Variance	0.023		0.026		0.018		0.019		0.029		0.025		0.007		0.014	
t Stat		–0.734				–4.039				–0.987				–0.228		
p		0.475				0.001				0.340				0.822		

TABLE A3. Kendall- τ correlation coefficients and n for total annual precipitation records of the four representative stations with other sites in Yukon and Mackenzie Valley. Values in each left column are for ECCC historical records (E τ), and in the right column for homogenized records (H τ). Values in bold indicate $p < 0.05$. All data records truncated at the end of 2012, 2013, 2007, and 2014 for Whitehorse, Mayo, Inuvik, and Fort Simpson, respectively corresponding to the ends of the homogenized records. Results of the paired Student's t -test for equal means (excluding Beaver Creek) are presented at end of the table. The two-tailed critical t value is 2.145.

Station	Whitehorse				Mayo				Inuvik				Fort Simpson			
	E τ	n	H τ	n	E τ	n	H τ	n	E τ	n	H τ	n	E τ	n	H τ	n
Beaver Creek	0.188	32	–	–	0.343	32	–	–	–0.088	31	–	–	0.149	32	–	–
Burwash	0.145	38	0.266	35	0.374	39	0.311	35	–0.099	35	–0.154	30	0.133	40	0.162	37
Dawson	0.019	63	0.131	57	0.293	77	0.371	69	0.062	45	0.164	38	0.036	86	0.113	80
Fort Good Hope	–0.040	45	0.045	34	–0.039	58	0.000	33	0.259	27	0.333	19	–0.061	68	–0.016	36
Fort Simpson	0.133	70	0.195	66	0.104	82	0.245	77	0.050	48	0.021	40	–	–	–	–
Fort Smith	0.083	69	0.161	64	0.212	82	0.236	76	0.082	48	0.005	40	0.159	84	0.240	81
Haines Junction	0.183	38	0.123	37	0.078	37	0.116	35	–0.231	26	–0.100	25	0.040	38	0.021	37
Hay River	0.152	68	0.175	63	0.111	82	0.177	77	0.062	48	0.074	39	0.255	90	0.321	87
Inuvik	–0.002	48	0.096	40	0.048	48	0.034	39	–	–	–	–	0.050	48	0.021	40
Komakuk Beach	–0.241	29	–0.170	28	–0.084	29	–0.055	26	0.049	29	–0.066	28	–0.030	29	–0.068	30
Mayo	0.073	69	0.101	62	–	–	–	–	0.048	48	0.034	39	0.104	82	0.245	77
Norman Wells	0.081	69	0.091	65	0.079	68	0.128	63	0.298	48	0.294	40	0.255	70	0.226	67
Old Crow	0.057	27	–0.165	22	0.060	27	0.100	22	0.000	21	–0.137	18	0.356	27	0.360	23
Shingle Point	–0.243	22	–0.072	24	–0.104	22	–0.043	23	0.043	22	0.014	24	0.035	22	0.067	23
Tuktoyaktuk	0.182	46	0.106	35	–0.024	46	0.131	33	0.068	40	0.132	34	0.057	46	–0.014	34
Watson Lake	0.288	67	0.289	61	0.154	70	0.140	64	0.111	45	0.165	37	0.091	71	0.138	67
Whitehorse	–	–	–	–	0.073	69	0.101	62	–0.002	48	0.096	40	0.133	70	0.195	66
Mean	0.058		0.091		0.089		0.133		0.053		0.058		0.108		0.134	
Variance	0.022		0.018		0.017		0.015		0.015		0.021		0.013		0.017	
t Stat		–1.337				–3.067				–0.239				–1.820		
p		0.202				0.008				0.815				0.090		