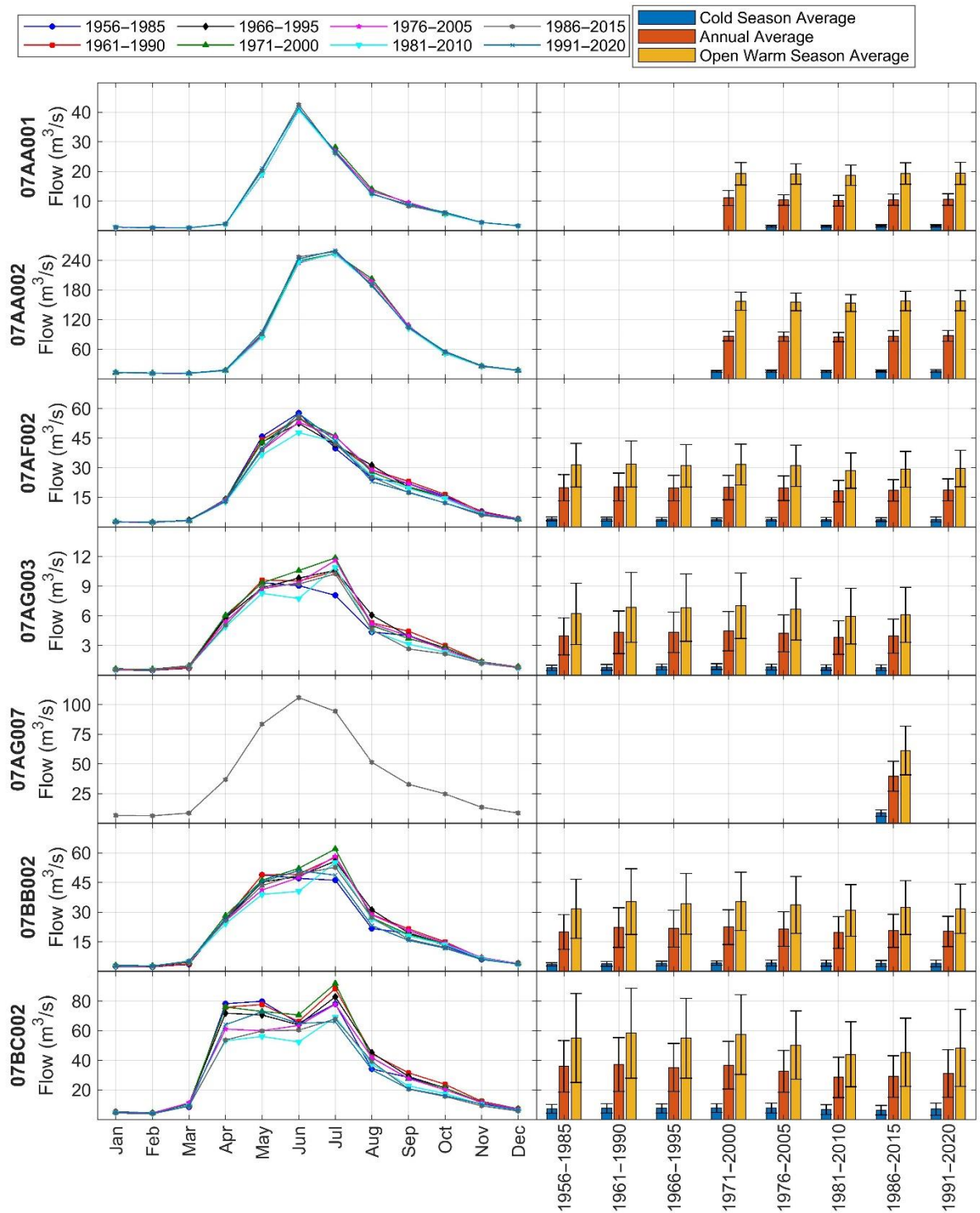
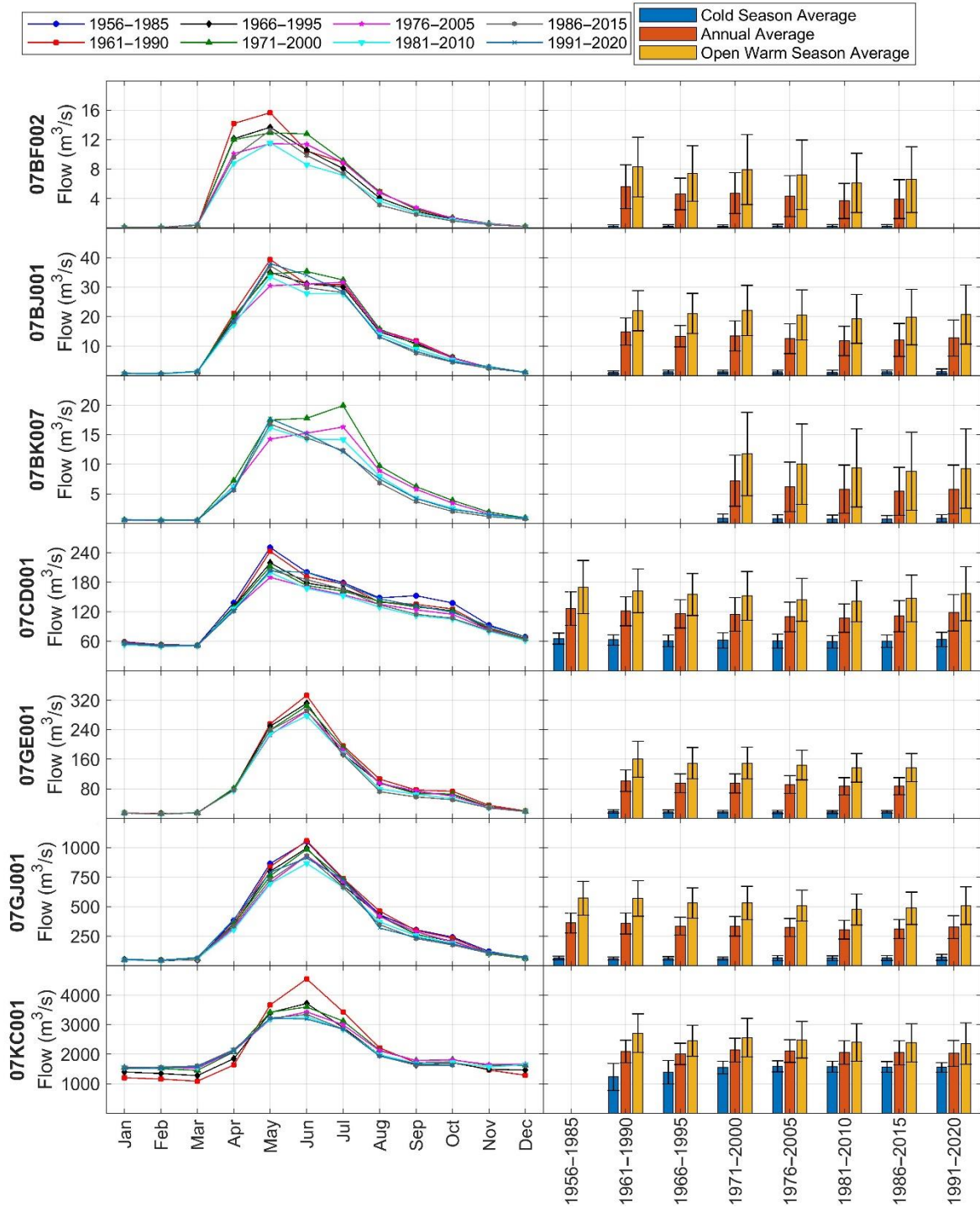


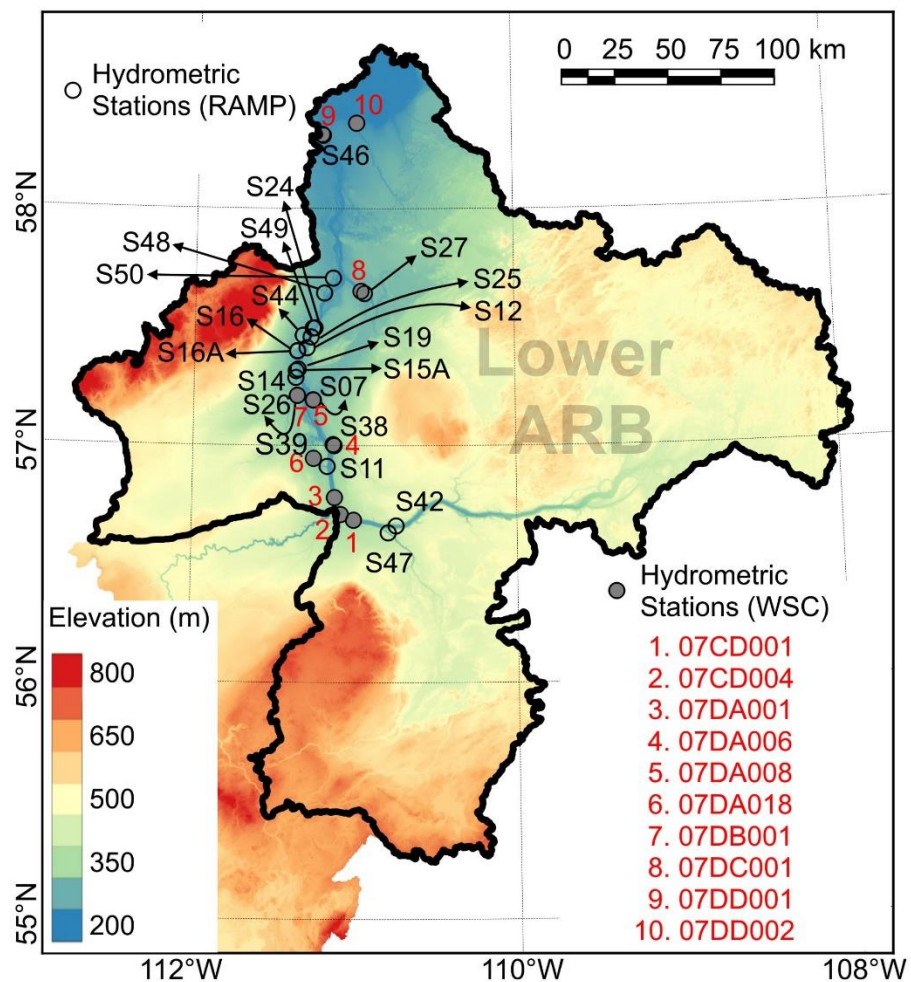
## Supplementary Information



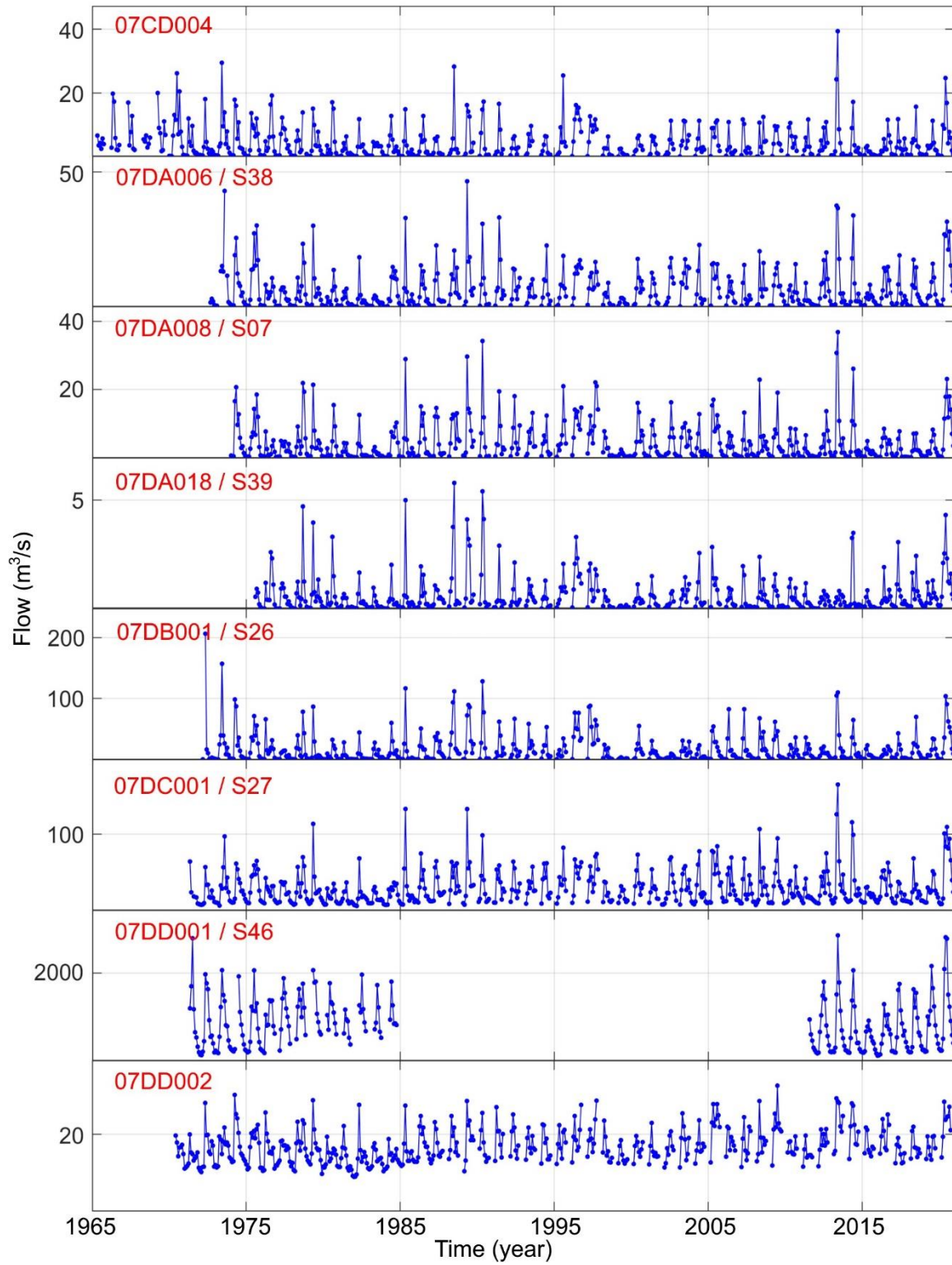
**Figure S1:** Hydrographs (left panels) and seasonal averages with standard deviation (right panels) of ARB stations.



**Figure S2:** Hydrographs (left panels) and seasonal averages with standard deviation (right panels) of ARB stations (continued).

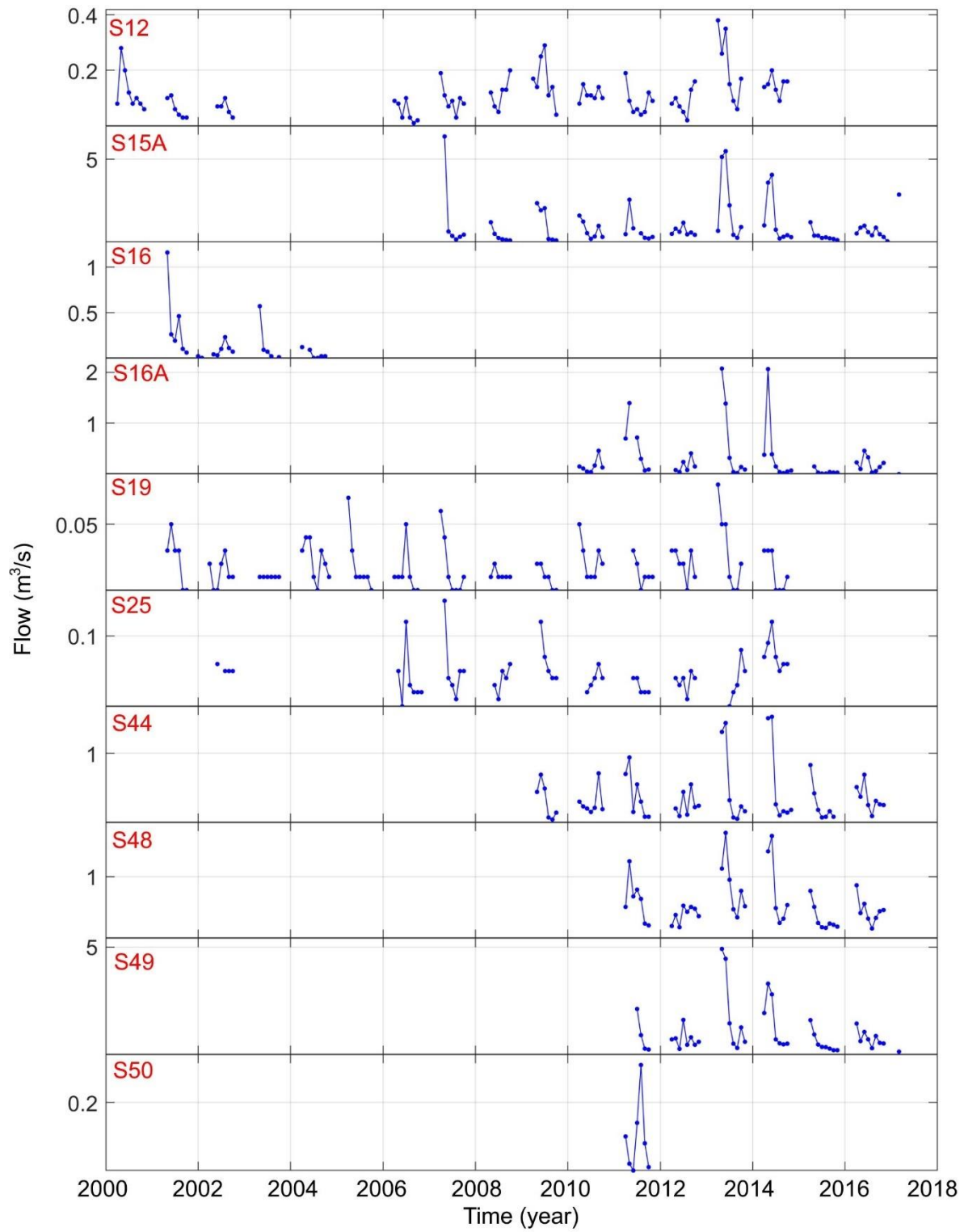


**Figure S3:** Map of the RAMP and WSC gauging stations in the lower ARB. Some stations were replicated in the RAMP and WSC data under different IDs: 07DA006-S38, 07DA008-S07, 07DA018-S39, 07DB001-S26, 07DC001-S27, and 07DD001-S46.

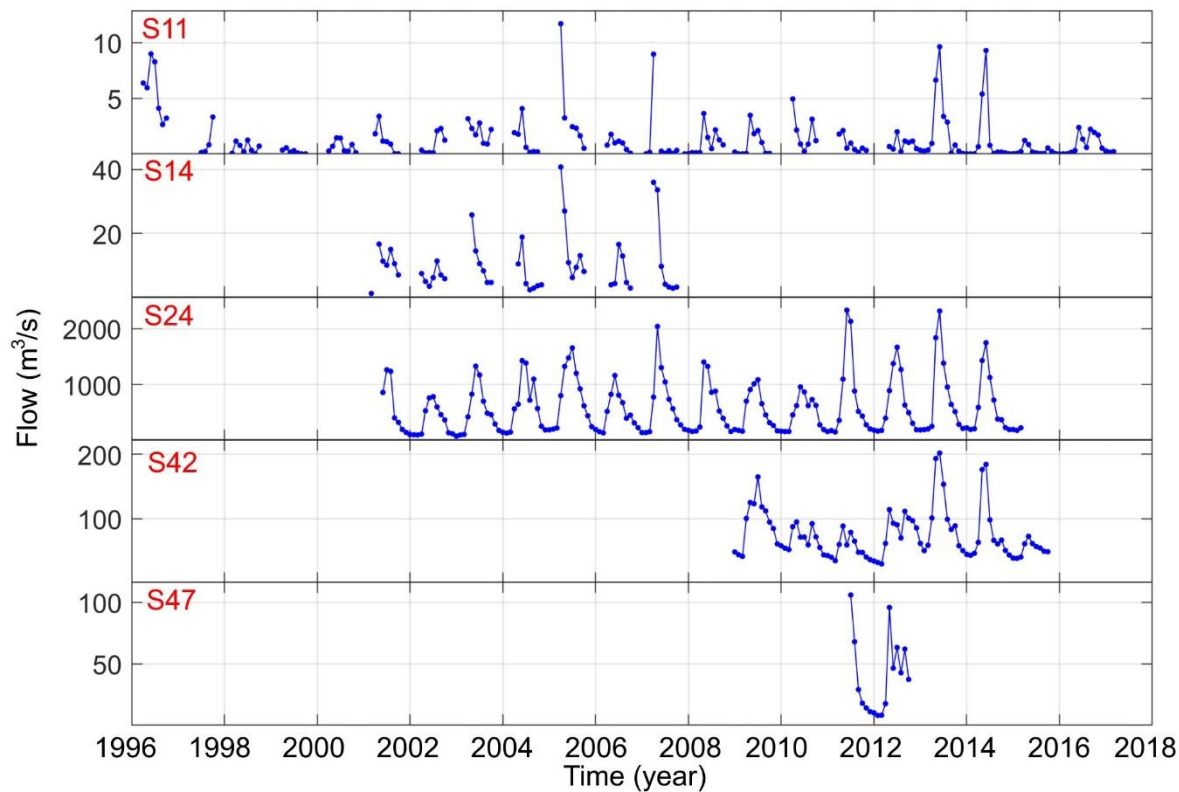


**Figure S4:** Hydrographs of the WSC stations between 1965 and 2020.

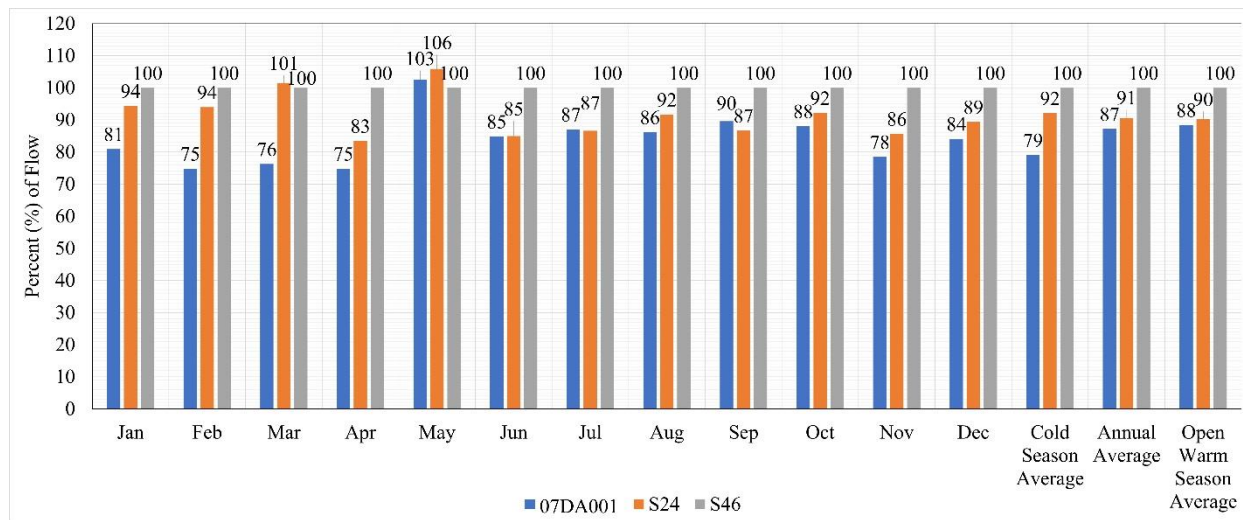




**Figure S5:** Hydrographs of the RAMP stations between 1996 and 2017.



**Figure S6:** Hydrographs of the RAMP stations between 1996 and 2017.



**Figure S7:** Average flow percentages of hydrometric stations at Fort McMurray, Athabasca River below Eymundson Creek, and Embarras Airport for the years 2012, 2013, 2014).

**Table S1:** Mann-Kendall streamflow slope and significance for a period of 30 years (1991-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AA001</b>	0.004	0.002	-0.002	-0.02	0.111	-0.1	-0.163	-0.095	0.058	0.046	0.014	0	-0.003	-0.01	-0.012
<b>07AA002</b>	0.032	0.024	0.002	0.009	0.949	0.625	-0.487	0.124	0.372	0.212	0.298**	0.023	0.069	0.178	0.262
<b>07AD002</b>	0.118	0.227**	0.353***	0.333	1.775	3.139	0.439	-0.405	1.084	0.775	0.659**	0.164	0.304**	0.911	1.48
<b>07AF002</b>	0.018	0	-0.001	-0.174	0.312	0.329	-0.055	-0.059	0.174	0.112	0.061	0.025	0.014	0.055	0.069
<b>07AG003</b>	-0.001	-0.001	-0.012*	-0.07	0.207	0.17	0.001	-0.011	0.013	0.009	0.004	0.005	-0.006	0.021	0.034
<b>07AG007</b>	0.014	0.005	-0.08	-0.733	0.835	2.425	1	-0.178	0.214	0.214	0.087	0.073	-0.025	0.208	0.393
<b>07BB002</b>	0.03	0.013	-0.069	0.188	0.959	0.788	-0.1	-0.067	0.154	0.033	-0.002	0.043	-0.008	0.103	0.092
<b>07BC002</b>	0.04	0.051	-0.007	1.333	1.6*	1.106	-0.3	0.15	0.215	0.29	0.117	0.118	0.079	0.559	0.832
<b>07BE001</b>	0.733	1.022*	0.733	3.167	10.333*	8.063	-0.913	-2.235	2.833	2.643	1.333	1.256*	1.353**	2.847	4.738
<b>07BF002</b>	0.003	0.001	-0.01	0.218	0.388*	0.125	0.13	-0.007	0.002	0.002	0.006	0.005	0.002	0.094	0.146
<b>07BJ001</b>	0.024*	0.018	0.016	0.125	0.779*	0.135	0.142	-0.005	-0.027	-0.006	0.004	0.017	0.028	0.186	0.324
<b>07BK007</b>	0.014*	0.012*	0.009	0.016	0.358	0.023	0.027	0.047	-0.006	0.017	0.023	0.021	0.02**	0.069	0.101
<b>07CD001</b>	0.75***	0.525**	0.436**	0.2	3.2	2.391	2.75	1.731	2.538**	1.906**	1.374**	1.011**	0.857***	1.53***	2.054**
<b>07DA001</b>	1.308	1.25	1	-1.282	10.056	15	0.417	-2.261	1.813	5.067*	2.111	1.8	1.743**	4.286	5.588
<b>07GE001</b>	0.152	0.075	0.039	-0.375	2.235	0.625	0.54	0.364	0.211	0.093	0.11	0.153*	0.12	1.053	1.42
<b>07GJ001</b>	0.7***	0.521*	0.363	6.5	15.09*	7.821	4.964	0.143	0.622	1.237	0.823	0.655*	0.801**	4.192**	7.411*
<b>07KC001</b>	-9.231*	-4	-5	-22.778	-6.667	2	-5	10	5.778	-4	-1.667	-7.071	-4.741	-1.6	-3.571

**Table S2:** Mann-Kendall streamflow slope and significance for a period of 35 years (1986-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
07AA001	0.007	0.005	0.001	-0.019	0.014	-0.202	-0.054	-0.096	0.066	0.06	0.008	0.001	-0.001	-0.008	-0.015
07AA002	0.067	0.061**	0.01	0	0.421	-0.091	0.111	-0.333	0.293	0.193	0.18	0.031	0.057	0.086	0.107
07AD002	0.111	0.261***	0.361***	0.307	0.542	1	1.108	-1.042	0.714	0.627	0.415*	0.139	0.269***	0.55	0.787
07AF002	0.002	-0.003	-0.012	-0.067	0.34	0.731	-0.05	-0.247	0.015	0.022	0.024	-0.003	-0.002	-0.002	-0.008
07AG003	-0.005	-0.003	-0.011**	-0.024	0.17	0.144	-0.071	-0.053	-0.003	-0.004	0.002	0	-0.008	0.01	0.006
07AG007	-0.02	-0.02	-0.108**	-0.394	0.926	2.255*	0.304	-0.42	-0.025	0.014	0.029	0.012	-0.07	0.04	0.059
07BB002	0.008	0.001	-0.066*	0.204	0.764	0.805*	-0.59	-0.366	-0.012	-0.077	-0.041	0.006	-0.036	-0.037	0
07BC002	0	0.016	-0.048	0.833	1.291*	1	-0.94	-0.309	-0.018	0.03	0.025	0.05	0.005	0.192	0.326
07BE001	0.333	0.657	0.25	2.556	9.667**	4.793	-4.231	-4.565	0.565	1.571	0.6	0.742	0.705	1.121	1.964
07BF002	0.001	0	-0.009	0.132	0.227	0.088	0.08	-0.007	-0.003	-0.005	0	0.002	-0.002	0.041	0.069
07BJ001	0.009	0.011	-0.004	0.074	0.483	0.158	-0.056	-0.057	-0.032	-0.014	-0.002	0.006	0.012	0.092	0.153
07BK007	0.012	0.01*	0.007	-0.009	0.318	-0.023	0.01	0.043	0.018	0.018*	0.023**	0.021**	0.019***	0.052	0.076
07CD001	0.586**	0.371**	0.3*	0.087	1.462	1.75	1.952	1.658	2.229***	1.683**	1.218**	0.742**	0.62***	1.034***	1.325***
07DA001	0.75	0.7	0.474	-1.783	7.6	7.778	-3.929	-6	-0.5	2.889	1	0.667	0.817	0.264	1.451
07GE001	0.1	0.068	-0.013	0.387	2	-0.5	0.55	0.095	0.245	0.252	0.11	0.126*	0.054	0.422	0.571
07GJ001	0.6**	0.422*	0.245	6.906	10.688*	2.747	4.05	-0.841	0.674	1.321	0.804	0.619*	0.609**	2.63	3.461
07KC001	-10**	-7.143*	-5	-16.25	-6.133	-18.889	-16.25	3.03	2.5	-5.161	-2	-5.5	-6.5**	-7.233	-8.571



**Table S3:** Mann-Kendall streamflow slope and significance for a period of 40 years (1981-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AA001</b>	0.006	0.005*	0.002	-0.002	0.144	-0.006	-0.056	-0.049	0.013	0.058*	0.014	0.006	0.005	0.011	0.02
<b>07AA002</b>	0.03	0.057**	0.024	0.057	0.6	0.308	0.1	-0.462	0.196	0.247	0.127	0.05	0.059	0.108	0.177
<b>07AD002</b>	0.023	0.286***	0.30***	0.33**	1.167	2.231	1.087	-0.875	0.2	0.583	0.342*	0.148	0.26***	0.614*	0.909
<b>07AF002</b>	-0.003	0.007	-0.009	0	0.294	0.595	0.038	-0.179	-0.052	-0.074	-0.035	-0.003	-0.009	0.021	0.035
<b>07AG003</b>	-0.002	-0.002	-0.008*	-0.015	0.137	0.113*	-0.02	-0.023	-0.005	-0.005	-0.004	0.002	-0.005	0.013	0.021
<b>07BB002</b>	0.007	0.003	-0.043	0.191	0.619*	0.677*	-0.268	-0.16	-0.03	-0.079	-0.056	0.016	-0.024	0.032	0.063
<b>07BC002</b>	-0.025	-0.011	-0.068	0.414	0.886	0.798	-0.659	-0.144	-0.053	-0.022	-0.024	0.013	-0.038	0.123	0.192
<b>07BE001</b>	-0.053	0.404	0	2.087	8.44**	4.897	-2.281	-3.286	-0.636	0.581	-0.202	0.267	0.053	0.753	1.143
<b>07BF002</b>	0.002	0.001	-0.008	0.164	0.152	0.056	0.074	-0.007	-0.01	-0.005	0	0.002	-0.002	0.019	0.035
<b>07BJ001</b>	0.013	0.011*	0.001	0.123	0.416	0.057	-0.018	-0.032	-0.041	-0.018	-0.001	0.012	0.014	0.065	0.095
<b>07BK007</b>	0.01*	0.009*	0.007	-0.026	0.185	0.037	-0.085	0.008	-0.005	0.009	0.013	0.012	0.013**	0.005	-0.003
<b>07CD001</b>	0.453***	0.26**	0.212	0.127	0.887	1.427	1.884*	1.629**	1.918***	1.472***	1.001***	0.717***	0.539***	0.945***	1.254***
<b>07DA001</b>	0.209	0.167	0.179	-0.889	5.036	8.266	-3.415	-3.045	-1.458	0.685	-0.382	0.167	-0.024	0.034	0.996
<b>07GE001</b>	0.071	0.039	-0.008	0.68	1.5	0.093	-0.027	-0.189	-0.064	0.09	0.069	0.132**	0.06	0.231	0.32
<b>07GJ001</b>	0.41*	0.253	0.114	6.167*	7.281*	2.111	1.636	-1.722	-0.077	0.727	0.522	0.527**	0.425*	1.636	2.132
<b>07KC001</b>	-4.248	-2.929	1.852	-4.444	-10	-7.636	-12.714	-2.5	-3.043	-7.842**	-4.226	-6.25	-2.947	-4.459	-7.345

**Table S4:** Mann-Kendall streamflow slope and significance for a period of 45 years (1976-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\*) = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AA001</b>	0.007*	0.007**	0.005*	-0.005	0.147	0.018	-0.087	-0.064	-0.032	0.033	0.013	0.003	0.004	-0.002	-0.012
<b>07AA002</b>	0.007	0.033*	0.028*	0.022	0.532	0.493	0.082	-0.412	0	0.134	0.124	0.023	0.037	0.09	0.143
<b>07AD002</b>	0.114	0.236***	0.253***	0.25**	1	2	0.857	-0.625	-0.056	0.395	0.445***	0.135	0.257***	0.473	0.738
<b>07AF002</b>	0.008	0.01	0.003	-0.028	0.111	0.294	-0.018	-0.243	-0.159	-0.079	-0.02	-0.01	-0.003	-0.035	-0.059
<b>07AG003</b>	-0.001	-0.002	-0.006*	-0.019	0.091	0.049	-0.014	-0.049*	-0.026	-0.012	-0.007	-0.001	-0.005	-0.005	-0.013
<b>07BB002</b>	0.007	0.009	-0.019	0.122	0.315	0.32	-0.038	-0.189	-0.1	-0.067	-0.037	-0.001	-0.008	-0.011	-0.022
<b>07BC002</b>	-0.029	-0.02	-0.072	0.007	0.419	0.221	-0.6	-0.257	-0.158	-0.096	-0.052	-0.02	-0.053	-0.082	-0.07
<b>07BE001</b>	-0.288	-0.014	-0.353	0.217	4.184	1.54	-3.588	-4**	-2.923*	-0.786	-0.667	-0.039	-0.258	-0.786	-1.282
<b>07BF002</b>	0	0	-0.004	0.01	0.04	-0.088	-0.001	-0.011	-0.034	-0.013	-0.003	0.001	-0.003	-0.027	-0.047
<b>07BJ001</b>	0.007	0.005	0.001	0.029	0.233	-0.103	-0.113	-0.061	-0.092	-0.046	-0.008	0.006	0.008	-0.006	-0.023
<b>07BK007</b>	0.009*	0.007*	0.003	-0.033	0.091	-0.023	-0.11	-0.047	-0.045	-0.008	0	0.007	0.004	-0.044	-0.077
<b>07CD001</b>	0.159	0.034	0.07	-0.147	0.705	0.833	1.304	0.661	0.582	0.573	0.405	0.375*	0.266*	0.493	0.584
<b>07DA001</b>	-0.869	-0.528	-0.559	-3.243	1.9	3.205	-4.424	-5.88	-5.729**	-2.158	-1.512	-0.509	-0.812	-1.823	-2.421
<b>07GE001</b>	0.046	0.021	0.003	0.293	0.615	-0.691	-0.685	-0.587	-0.471	-0.297	-0.036	0.077	0.012	-0.164	-0.266
<b>07GJ001</b>	0.285*	0.159	0.086	3.375	4.063	-2.263	-0.938	-2.214	-1.625	-0.333	0.364	0.357	0.302	0.21	-0.026
<b>07KC001</b>	-4	-2	2.795	0	-7.692	-13.583	-15.227	-3.859	-5	-8.714**	-4.777	-4.629	-2.2	-4.997*	-8.674*

**Table S5:** Mann-Kendall streamflow slope and significance for a period of 50 years (1971-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AA002</b>	0.016	0.006	0.026**	0.042	0.482	0.16	0.2	-0.556**	0.073	0.107	0.1	0.033	0.036	0.047	0.079
<b>07AD002</b>	0.141**	0.2***	0.209***	0.24***	0.805	1.07	0.427	-0.634	0.137	0.333	0.385***	0.106	0.222***	0.311	0.44
<b>07AF002</b>	0.008	0.01	0.008	-0.049	-0.08	0.051	-0.003	-0.037	-0.051	-0.062	-0.016	-0.01	0	-0.036	-0.061
<b>07AG003</b>	-0.003	-0.002	-0.006**	-0.044	0.017	0.028	-0.013	-0.028	-0.014	-0.018	-0.006	-0.003	-0.005*	-0.017	-0.034
<b>07BB002</b>	0.007	0.004	-0.003	-0.016	0.027	0.136	-0.094	-0.076	-0.019	-0.055	-0.036	0	-0.005	-0.072	-0.117
<b>07BC002</b>	-0.016	-0.01	-0.015	-0.35	-0.077	-0.028	-0.883*	-0.274	-0.147*	-0.116	-0.06	-0.024	-0.031	-0.191	-0.329
<b>07BE001</b>	-0.255	-0.093	-0.21	-0.75	0.727	-0.5	-5	-3.366**	-2.208*	-1.182	-0.9	-0.188	-0.286	-1.869	-2.73
<b>07BF002</b>	0	0	-0.002	-0.073	-0.008	-0.099	-0.021	-0.011	-0.022*	-0.014	-0.006	-0.001	-0.003	-0.034	-0.063
<b>07BJ001</b>	0.002	0.003	0	-0.055	0.007	-0.275	-0.191	-0.074	-0.075	-0.052*	-0.01	0.001	0.005	-0.062	-0.116
<b>07BK007</b>	0.005	0.006	0.003	-0.04	-0.039	-0.157	-0.23**	-0.079	-0.055*	-0.022	-0.011	0.002	0.001	-0.079**	-0.137**
<b>07CD001</b>	0.073	0.013	0.025	-0.378	-0.455	0.29	0.464	0.211	0.284	0.158	0.209	0.207	0.143	0.154	0.148
<b>07DA001</b>	-1*	-0.694	-0.556	-3.591	-3.036	-2.286	-8.611*	-6.32**	-5.09**	-3.25*	-2.027*	-0.8	-1.022**	-3.089***	-4.61**
<b>07GE001</b>	0.05	0.021	0.023	-0.057	0.105	-1.2	-0.828	-0.3	-0.289	-0.607	-0.088	0	-0.013	-0.247	-0.45
<b>07GJ001</b>	0.157	0.108	0.113	1.162	0.712	-4.414	-1.254	-1.557	-0.764	-1.056	-0.038	0.231	0.15	-0.692	-1.34
<b>07KC001</b>	-1.111	1.29	4.118*	2.373	-15	-18.889*	-23.333**	-6.036	-4.848	-8***	-2.973	-0.294	0.545	-5.365**	-10.667**

**Table S6:** Mann-Kendall streamflow slope and significance for a period of 55 years (1966-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AD002</b>	0.103*	0.124***	0.189***	0.21***	0.748	0.35	0.104	-1.075**	-0.013	0.276	0.318***	0.099	0.173***	0.138	0.145
<b>07AF002</b>	0.008	0.01	-0.003	-0.026	-0.1	0.104	0.008	-0.071	0	-0.011	-0.004	-0.002	-0.002	-0.027	-0.048
<b>07AG003</b>	-0.001	-0.001	-0.004*	-0.031	0.037	0.05	0.034	-0.043**	-0.009	-0.012	-0.003	-0.001	-0.003	-0.001	-0.004
<b>07BB002</b>	0.011	0.011	-0.003	0.095	0.077	0.195	0.076	-0.117	-0.01	-0.038	-0.013	0.001	0.003	-0.01	-0.016
<b>07BC002</b>	-0.009	-0.003	0.003	-0.194	0.036	0.148	-0.3	-0.285	-0.117	-0.063	-0.022	0.003	-0.012	-0.084	-0.125
<b>07BE001</b>	-0.143	0.016	0.056	0.111	1.091	0.241	-1.333	-3.132**	-1.778*	-0.583	-0.452	-0.083	-0.107	-0.751	-1.277
<b>07CD001</b>	0.06	0.036	0.063	-0.273	-0.5	0.143	0.474	0.205	0.154	-0.143	0.114	0.122	0.103	0.065	0.029
<b>07DA001</b>	-0.638	-0.45	-0.341	-1.841	-2.837	-0.789	-5	-5.263**	-4.459**	-2.75*	-1.4*	-0.471	-0.618	-2.344**	-3.265*
<b>07GE001</b>	0.008	-0.002	-0.007	-0.078	-0.5	-1.05	-0.289	-0.385	-0.324	-0.478*	-0.076	0.016	-0.014	-0.288	-0.519
<b>07GJ001</b>	0.118	0.052	0.05	0.792	-0.752	-3.88	0.588	-1.829*	-0.764	-0.5	0.126	0.277	0.156	-0.499	-0.951
<b>07KC001</b>	5	8.148**	10***	9.545*	-12.516	-17.941*	-18.81*	-0.571	0	-3.684	3.828	6.429*	4.444**	-2.348	-8.112*

**Table S7:** Mann-Kendall streamflow slope and significance for a period of 60 years (1961-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\*) = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AD002</b>	0.123**	0.125***	0.225***	0.14**	0.99*	-0.077	-0.25	-0.89**	-0.176	0.12	0.199*	0.061	0.14***	0.063	-0.01
<b>07AF002</b>	0.009	0.009	-0.003	-0.036	-0.143	0.091	0.011	-0.029	-0.033	-0.043	-0.02	-0.008	-0.009	-0.027	-0.048
<b>07AG003</b>	0.002	0.001	-0.001	-0.031	0.01	0.071*	0.048	-0.024	-0.007	-0.01	-0.001	0	0	0.003	0.001
<b>07BB002</b>	0.019**	0.017**	0.016	0.064	-0.037	0.218	0.127	-0.067	-0.021	-0.032	-0.013	0.006	0.009	-0.005	-0.008
<b>07BC002</b>	-0.007	0.009	0.017	-0.177	-0.149	0.193	-0.068	-0.2	-0.112	-0.054	-0.024	0.004	0.003	-0.053	-0.07
<b>07BE001</b>	-0.107	0.059	0.191	-0.212	-0.029	-0.264	-0.911	-2.9**	-1.783*	-0.882	-0.573	-0.157	-0.083	-0.746	-1.268
<b>07CD001</b>	0.034	0.035	0.058	0	-0.919	-0.186	0.436	0.209	0.183	-0.037	0.119	0.128	0.087	0	-0.005
<b>07DA001</b>	-0.636*	-0.429	-0.224	-1.2	-4.5	-1.731	-3.766	-4.14*	-3.9**	-2.64**	-1.36**	-0.486	-0.635*	-2.26**	-2.99**
<b>07GE001</b>	0.004	-0.024	0	-0.005	-0.818	-1.141	-0.432	-0.362	-0.365*	-0.606**	-0.176*	-0.018	-0.052	-0.334	-0.587
<b>07GJ001</b>	0.095	0.016	0.092	0.143	-1.895	-3.857	-0.455	-1.814*	-1.095	-1.047	-0.148	0.213	0.099	-0.923	-1.667
<b>07KC001</b>	11***	13.5***	15.9***	15***	-19.49**	-37.43***	-29.4***	-4.348	-1.429	-2.887	4.859	12.7***	9.6***	-4.574*	-15***

**Table S8:** Mann-Kendall streamflow slope and significance for a period of 65 years (1956-2020). The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\*) = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
<b>07AF002</b>	0.002	0.006	-0.003	-0.044	-0.132	0.042	0.045	0.009	-0.016	-0.021	-0.026	-0.009	-0.011	-0.016	-0.028
<b>07AG003</b>	0.002	0.002	0	-0.025	0.036	0.061*	0.061	-0.005	0.002	-0.005	0	0.001	0.001	0.012	0.018
<b>07BB002</b>	0.021***	0.014**	0.015	0.065	0.036	0.189	0.2	0.031	0.018	0.002	-0.002	0.01	0.01	0.049	0.08
<b>07BE001</b>	0	0.143	0.226	-0.286	0.095	0.031	0.119	-1.641	-1.282	-0.484	-0.157	-0.047	0.016	-0.292	-0.433
<b>07CD001</b>	0.014	0.029	0.048	-0.188	-1*	-0.3	0.453	0.208	0.051	-0.206	-0.015	0.02	0.017	-0.052	-0.069
<b>07DA001</b>	-0.571	-0.324	-0.095	-1.667	-3.778	-1.29	-2.926	-2.5	-3.75**	-2.19**	-1.209**	-0.466	-0.536	-1.927**	-2.614*
<b>07GJ001</b>	0.111	0.096	0.143	0	-1.694	-3.034	0.2	-1.407*	-0.806	-1	-0.21	0.11	0.005	-0.603	-1.091

**Table S9:** Mann-Kendall Trend Analysis of the RAMP streamflow data for the period of 1996 – 2017. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
S11	-0.003	0	0.003	-0.032	0.011	0.024	-0.006	-0.01	0.002	-0.006	0.01	0.007	0.009	-0.012	0.019
S12	N/A	N/A	N/A	0.005	0.003	0.002	0.002	0	0.005*	0.01**	N/A	N/A	N/A	0.006	0.006
S14	N/A	N/A	N/A	5.71	2.59	-0.272	-0.414	-1.408	-1.172	-0.635	N/A	N/A	N/A	0.46	0.235
S15A	N/A	N/A	N/A	0.008	-0.17	0.039	0.005	0.017	0.02	0.028	-0.002	N/A	0.028	-0.001	-0.027
S16	N/A	N/A	N/A	N/A	-0.295	-0.028	-0.06*	-0.182*	-0.027	-0.019	N/A	N/A	N/A	-0.11	-0.11
S16A	N/A	N/A	N/A	-0.031	-0.002	0.035	-0.006	-0.03**	-0.025	-0.01	0.012	N/A	-0.021	-0.037	-0.023
S19	N/A	N/A	N/A	0.001	0.002	0.002	0	-0.001**	0	0	N/A	N/A	N/A	0	0
S24	6.9**	6.3***	8.1***	-10.66	54.55*	63.51*	14.47	5.923	6.563	4.93	2.89	3.57	3.29***	1.309	21.126
S25	N/A	N/A	N/A	N/A	0.002	0.004	-0.001	0	0	0.001	N/A	N/A	N/A	0	-0.001
S42	-1.573	-1.287	-0.173	-5.294	-3.623	0.55	-2.948	-2.653	-10.26	-5.602	-6.683	-2.6	-2.043	-2.9	-3.512
S44	N/A	N/A	N/A	0.034	0.031	0.019	-0.047	-0.005	0.02	0.01	0.011	N/A	0.011	0.007	0.009
S47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S48	N/A	N/A	N/A	0.08	-0.1	-0.024	-0.1	-0.09**	-0.003	0.003	0.003	N/A	0.003	-0.035	-0.035
S49	N/A	N/A	N/A	0.012	-0.825	-0.404	0.35**	-0.08	0.015	0.023	-0.023	N/A	-0.064	-0.125	-0.041
S50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



**Table S10:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1991 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Average	Open Warm Season Average
07CD004	-0.01	0.009	0.006	0.05	0.11	-0.041	-0.006	-0.003	-0.003	0.017	0.183	0.109	0.01**	-0.03	0.029
07DA006 /S38	-0.021	-0.016	-0.001	-0.01	0.096	-0.008	0.055	-0.014	0.069	0.055	-0.012	0.027	0.024***	-0.077	0.028
07DA008 /S7	-0.008	-0.007	-0.01**	-0.019	-0.057	-0.104	-0.054	-0.031	-0.023	-0.013	-0.011	-0.003	0.005	-0.092*	-0.081
07DA018 /S39	0.003	0.007**	0.001	0.014*	0.019	-0.018	0.005	0.002	-0.001	0.005	0.012	0.008	0.003***	-0.003	0.006
07DB001 /S26	-0.012	0.002	0.004	-0.104	0.206	0.037	0.039	0.082	0.003	0.153	0.112	0.05**	0.05**	-0.202	-0.007
07DC001 /S27	0.1	0.064	0.02	-0.33	0.27	-0.155	0.022	-0.001	0.38	0.132	-0.17	0.241*	0.182***	-0.184	0.156
07DD001 /S46	7.619	5.139	4.585	2.721	13.177	-46.608	116.915	61.269	61.392	43.12**	26.333	17.58**	9.272	37.977	61.651
07DD002	N/A	N/A	0.025	-0.08	0.03	0.01	0.04	0.08	0.093	0.05	N/A	N/A	0.025	0.017	0.017

**Table S11:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1986 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Avg	Open Warm Season Avg
07CD004	0	0.003	0.003	0.038	0.036	-0.059	-0.067	0.025	0.025	0.028	0.102	0.074	0.007	-0.024	0.006
07DA006 /S38	-0.001	0	-0.002	-0.04	-0.091	-0.027	0.008	0.013	0.084	0.055	0.022	0.02	0.016***	-0.063	-0.009
07DA008 /S7	-0.001	-0.001	-0.01**	-0.061	-0.21**	-0.167*	-0.092	-0.026	-0.002	-0.016	-0.008	0.001	0.006	-0.098***	-0.108*
07DA018 /S39	0.002	0.003**	0	0.009	-0.001	-0.02**	-0.003	0.001	0	0.003	0.01	0.007	0.002*	-0.007	-0.004
07DB001 /S26	0.007	0.005	-0.002	-0.262*	-0.312	-0.508	-0.081	0.01	0.084	0.121	0.111	0.039**	0.042***	-0.286**	-0.236
07DC001 /S27	0.03	-0.015	0.016	-0.332	-0.455	-0.231	-0.05	0.051	0.363	0.221	-0.07	0.195*	0.148***	-0.188	0.064
07DD001 /S46	7.619	5.139	4.585	2.721	13.177	-46.608	116.915	61.269	61.392	43.12**	26.333	17.58**	9.272	37.977	61.651
07DD002	N/A	N/A	0	-0.054	-0.027	-0.033	0.008	0.06	0.089	0.062	N/A	N/A	0.004	0.017	0.002

**Table S12:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1981 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Avg	Open Warm Season Avg
07CD004	0.004	0.003	0.003	0.009	0.002	-0.006	0.001	0.03	0.03	0.016	0.013	0.009	0.002	0.022	0.025
07DA006 /S38	0.004	0.002	0	-0.017	-0.012	0.071	0.096	0.058	0.099*	0.062	0.031	0.017**	0.01**	0.017	0.058
07DA008 /S7	0.002	0.002	-0.002	-0.026	-0.059	-0.031	0.019	-0.009	0.004	-0.006	0.001	0.006	0.006	-0.035	-0.024
07DA018 /S39	0.002*	0.002**	0	0.005	-0.001	-0.008	0.003	0.003	0.005	0.004	0.007**	0.003**	0.002***	0	0.002
07DB001 /S26	0.017**	0.005	0.001	-0.15	-0.227	-0.03	0.173	0.148	0.196*	0.168*	0.081**	0.032***	0.035***	-0.065	0.008
07DC001 /S27	0.081**	0.056	0.03	-0.143	-0.133	0.152	0.242	0.174	0.508**	0.361*	0.125	0.146***	0.123***	0.078	0.24
07DD001 /S46	7.619	5.139	4.585	2.721	10.479	6.56	6.933	4	6.207	6.105	26.333	17.581**	9.272	-3.48	5.971
07DD002	0.533*	0.567*	0.026	0.016	-0.012	0.027	0.07**	0.09**	0.14***	0.1**	0.75**	0.75**	0.04*	0.091**	0.064*

**Table S13:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1976 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Avg	Open Warm Season Avg
07CD004	0	0.002	0.002	-0.013	0.001	0.005	0.02	-0.002	-0.002	-0.009	0	0.005	-0.002	0.012	-0.003
07DA006 /S38	0.003	0.001	0.001	-0.013	0.055	0.111	0.15**	0.031	0.036	0.012	0.016	0.013***	0.005	0.037	0.057
07DA008 /S7	0.001	0	-0.001	-0.018	-0.017	0.028	0.06	-0.016	-0.027	-0.044	-0.018	0.003	0.001	-0.019	-0.02
07DA018 /S39	0.002**	0.002***	0.001*	-0.001	0.002	-0.002	0.004	-0.001	-0.002	0	0.003	0.003***	0.001***	-0.002	-0.003
07DB001 /S26	0.015***	0.003	0.003	-0.13	0.007	0.089	0.283*	0.121	0.088	0.053	0.057*	0.026***	0.027***	-0.007	0.006
07DC001 /S27	0.044**	0.047*	0.029	-0.116	0.096	0.219	0.317*	0.112	0.266	0.159	0.165	0.093***	0.1***	0.129	0.216*
07DD001 /S46	4.787	2.199	1.855**	-4.74	4.211	2.431	2.62	-3.039	-6.306	-2.304	4.457	17.581**	0.734	-8.16**	-2.281
07DD002	0.038	0.1	0.035*	0.004	0.011	0.025	0.053*	0.058	0.09**	0.058*	0.171	0.15	0.036**	0.087***	0.049

**Table S14:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1971 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Avg	Open Warm Season Avg
07CD004	-0.004*	0	0.001	-0.03	-0.043	-0.007	-0.004	-0.006	-0.006	-0.015	-0.007	-0.001	-0.006**	0.003	-0.024
07DA006 /S38	0.001	-0.001	0	-0.019	0.032	0.071	0.109	0.002	0.011	-0.002	0.012	0.007*	0.001	0.044	0.04
07DA008 /S7	0	-0.001	-0.001	-0.036	-0.037	0.011	0.027	-0.018	-0.025	-0.042	-0.015	0.002	0	-0.039	-0.043
07DA018 /S39	0.002**	0.002***	0.001*	-0.001	0.002	-0.002	0.004	-0.001	-0.002	-0.001	0.002	0.002***	0.001**	-0.001	-0.003
07DB001 /S26	0.015***	0.003	0.003	-0.182*	-0.119	-0.014	0.12	0.045	0.072	0.039	0.039	0.018**	0.016*	-0.052	-0.038
07DC001 /S27	0.041**	0.03*	0.028*	-0.085	0.122	0.125	0.135	0.017	0.188	0.068	0.093	0.072**	0.073***	0.159*	0.15
07DD001 /S46	0.435	0.318	0.274	-0.93	-0.292	-0.407	-6.291	-3.001	-2.256	-0.224	0.589	1.307	0.159	-2.893	-2.92
07DD002	0.026	0.075	0.04***	0.019	0.011	0.015	0.018	0.031	0.07**	0.041	-0.152	0.023	0.024**	0.073***	0.027

**Table S15:** Mann-Kendall Trend Analysis of the Lower ARB streamflow for the period of 1955 – 2020. Cells highlighted in red represent insufficient data for a robust analysis. The statistically significant slopes are marked by stars: (\* = 90%), (\*\* = 95%), (\*\*\* = 99%).

Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Cold Season Average	Annual Avg	Open Warm Season Avg
07CD004	-0.003	0	0.001	-0.04*	-0.074	-0.011	-0.008	-0.009	-0.009	-0.03*	-0.013	-0.003	-0.007**	-0.022	-0.034
07DA006 /S38	0.001	-0.001	0	-0.019	0.032	0.071	0.109	0.002	0.011	-0.002	0.012	0.007*	0.001	0.044	0.04
07DA008 /S7	0	-0.001	-0.001	-0.036	-0.037	0.011	0.027	-0.018	-0.025	-0.042	-0.015	0.002	0	-0.039	-0.043
07DA018 /S39	0.002**	0.002***	0.001*	-0.001	0.002	-0.002	0.004	-0.001	-0.002	-0.001	0.002	0.002***	0.001**	-0.001	-0.003
07DB001 /S26	0.015***	0.003	0.003	-0.182*	-0.119	-0.014	0.12	0.045	0.072	0.039	0.039	0.018**	0.016*	-0.052	-0.038
07DC001 /S27	0.041**	0.03*	0.028*	-0.085	0.122	0.125	0.135	0.017	0.188	0.068	0.093	0.072**	0.073***	0.159*	0.15
07DD001 /S46	0.435	0.318	0.274	-0.93	-0.292	-0.407	-6.291	-3.001	-2.256	-0.224	0.589	1.307	0.159	-2.893	-2.92
07DD002	0.026	0.075	0.036***	0.019	0.011	0.01	0.015	0.033	0.07**	0.038	-0.22*	-0.04	0.02	0.066***	0.028