

Supplementary Tables

Table S1. Detail of scores for the changes in precipitation and temperature indices of selected GCMs in each corner before intermediate selection step (Step 2)

RCP 4.5										
Condition	Model	$\Delta r95p(\%)$	$\Delta cdd(\%)$	$\Delta wdsdi(\%)$	$\Delta csdi(\%)$	$\Delta T(^{\circ}C)$	$\Delta P(\%)$	Tindex rank	Pindex rank	Combined Score
Cold,dry p10_10	inmcm4_rcp45_r1i1p1	6.6	8.8	136.5	-21.3	0.7	-0.4	5	2	3.5
	FGOALS-g2_rcp45_r1i1p1	-8.1	-0.6	385.7	-89.9	1.4	-3.4	1	1	1
	bcc-csm1-1-m_rcp45_r1i1p1	6.4	21.1	226.5	-78.4	1.4	1.9	2	4	3
	HadGEM2-CC_rcp45_r1i1p1	0.8	44.7	564.6	-74.5	1.6	-2.5	3	5	4
	MPI-ESM-MR_rcp45_r2i1p1	-0.9	12.4	207.5	-69.2	1.5	-0.4	4	3	3.5
Cold,wet p10_90	MRI-CGCM3_rcp45_r1i1p1	53.0	-11.9	120.4	-90.0	1.2	13.9	1	5	3
	CSIRO-Mk3-6-0_rcp45_r3i1p1	34.6	-0.6	389.5	-55.9	1.2	14.8	3	3	3
	CSIRO-Mk3-6-0_rcp45_r8i1p1	16.7	3.8	223.0	-54.9	1.4	11.5	4	1	2.5
	CESM1-BGC_rcp45_r1i1p1	30.5	-8.8	218.1	-73.8	1.4	10.3	2	2	2
	GFDL-ESM2G_rcp45_r1i1p1	38.9	5.3	377.5	-78.1	1.4	7.2	5	4	4.5
Warm,wet p90_90	CanESM2_rcp45_r3i1p1	50.9	2.2	211.6	-87.0	2.3	12.7	3	4	3.5
	CanESM2_rcp45_r2i1p1	44.5	5.8	302.8	-78.8	2.3	13.3	5	3	4
	CanESM2_rcp45_r1i1p1	51.1	7.2	180.0	-79.7	2.1	16.0	2	5	3.5
	CanESM2_rcp45_r5i1p1	30.7	-8.4	149.8	-88.8	2.2	9.4	1	2	1.5
	IPSL-CM5A-LR_rcp45_r3i1p1	19.7	-0.6	279.8	-78.1	2.0	15.0	4	1	2.5
Warm,dry p90_10	CSIRO-Mk3-6-0_rcp45_r9i1p1	-4.7	28.5	683.2	-84.7	2.0	-0.8	5	5	5
	GFDL-CM3_rcp45_r1i1p1	0.3	4.5	646.5	-85.4	3.2	-3.8	4	2	3
	MPI-ESM-LR_rcp45_r2i1p1	-7.6	9.5	291.7	-81.9	2.0	-7.7	2	3	2.5
	MPI-ESM-LR_rcp45_r3i1p1	10.3	18.0	331.5	-76.2	2.1	0.8	3	4	3.5
	MIROC-ESM_rcp45_r1i1p1	8.0	-4.0	233.1	-98.2	1.9	-0.6	1	1	1
RCP 8.5										
Cold,dry p10_10	inmcm4_rcp85_r1i1p1	15.6	3.4	168.1	-37.5	1.0	3.4	5	1	3
	GFDL-ESM2G_rcp85_r1i1p1	25.8	7.2	362.5	-61.9	1.6	2.7	3	2	2.5
	HadGEM2-ES_rcp85_r4i1p1	10.0	30.0	383.8	-65.0	1.6	-1.2	2	4	3
	FGOALS-g2_rcp85_r1i1p1	6.3	9.2	281.8	-92.7	1.6	2.6	1	3	2
	HadGEM2-ES_rcp85_r1i1p1	7.4	42.3	352.8	-56.6	1.7	-3.4	4	5	4.5
Cold,wet p10_90	CSIRO-Mk3-6-0_rcp85_r8i1p1	21.6	-9.8	218.2	-57.5	1.3	14.4	3	2	2.5
	CSIRO-Mk3-6-0_rcp85_r3i1p1	30.2	-11.3	349.9	-55.4	1.4	16.1	5	3	4
	GFDL-ESM2M_rcp85_r1i1p1	44.1	-0.3	235.0	-56.7	1.4	12.8	4	4	4
	IPSL-CM5B-LR_rcp85_r1i1p1	12.8	-11.7	152.2	-69.4	1.2	10.6	2	1	1.5
	bcc-csm1-1_rcp85_r1i1p1	50.9	3.7	347.2	-82.3	1.6	8.8	1	5	3
Warm,wet p90_90	CanESM2_rcp85_r2i1p1	48.3	4.1	325.0	-90.1	2.4	15.4	4	2	3
	CanESM2_rcp85_r3i1p1	49.3	8.3	285.7	-74.2	2.7	13.2	3	4	3.5
	IPSL-CM5A-MR_rcp85_r1i1p1	43.7	1.1	347.0	-90.8	2.5	11.0	5	1	3
	CanESM2_rcp85_r5i1p1	48.8	-15.2	169.8	-91.2	2.3	15.9	1	3	2
	CanESM2_rcp85_r1i1p1	68.6	-2.8	208.9	-74.7	2.4	22.5	2	5	3.5
Warm,dry p90_10	MPI-ESM-LR_rcp85_r3i1p1	16.6	12.6	414.3	-92.6	2.6	-0.5	3	3	3
	CMCC-CMS_rcp85_r1i1p1	5.1	9.7	318.0	-89.7	2.6	-6.9	1	1	1
	GFDL-CM3_rcp85_r1i1p1	12.2	14.9	603.8	-76.7	3.0	-2.1	4	5	4.5
	MIROC-ESM-CHEM_rcp85_r1i1p1	10.0	12.8	729.1	-94.8	2.6	-0.3	5	4	4.5
	MPI-ESM-LR_rcp85_r2i1p1	-11.2	10.4	369.4	-85.2	2.4	-11.1	2	2	2

Table S2. Selected GCMs in intermediate selection step (Step 3) using Taylor score

RCP 4.5				
Condition	GCMs	Taylor Score		
		Precipitation	Temperature	Combined
Cold – dry (p10_10)	inmcm4_rcp45_r1i1p1	0.707	0.835	0.771
	HadGEM2-CC_rcp45_r1i1p1	0.792	0.928	0.86
	MPI-ESM-MR_rcp45_r2i1p1	0.658	0.901	0.779
Cold – wet (p10_90)	MRI-CGCM3_rcp45_r1i1p1	0.568	0.891	0.729
	CSIRO-Mk3-6-0_rcp45_r3i1p1	0.49	0.891	0.69
	GFDL-ESM2G_rcp45_r1i1p1	0.663	0.904	0.784
Warm – wet (p90_90)	CanESM2_rcp45_r3i1p1	0.578	0.829	0.703
	CanESM2_rcp45_r2i1p1	0.529	0.832	0.68
	CanESM2_rcp45_r1i1p1	0.571	0.818	0.694
Warm – dry (p90_10)	CSIRO-Mk3-6-0_rcp45_r9i1p1	0.473	0.881	0.677
	MPI-ESM-LR_rcp45_r3i1p1	0.637	0.886	0.761
RCP 8.5				
Condition	GCMs	Taylor Skill		
		Precipitation	Temperature	Combined
Cold – dry (p10_10)	inmcm4_rcp85_r1i1p1	0.707	0.835	0.771
	HadGEM2-ES_rcp85_r4i1p1	0.789	0.952	0.871
	HadGEM2-ES_rcp85_r1i1p1	0.802	0.947	0.874
Cold – wet (p10_90)	CSIRO-Mk3-6-0_rcp85_r3i1p1	0.49	0.891	0.69
	GFDL-ESM2M_rcp85_r1i1p1	0.66	0.891	0.775
Warm – wet (p90_90)	CanESM2_rcp85_r3i1p1	0.578	0.829	0.703
	CanESM2_rcp85_r1i1p1	0.571	0.818	0.694
Warm – dry (p90_10)	GFDL-CM3_rcp85_r1i1p1	0.47	0.838	0.654
	MIROC-ESM-CHEM_rcp85_r1i1p1	0.493	0.877	0.685

Notes: Bold GCMs are selected from step 3.

Table S3. The long-term monthly flow of three-time windows projected by four GCMs representing four climatic conditions of RCP 4.5 emission scenario

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Baseline Flow (m ³ /s)	73	70	83	113	173	355	582	600	436	193	101	81	240
Cold-wet (p _{10_90})	GFDL-ESM2G_rcp45_r1i1p1												
IF	81	79	114	138	178	375	688	793	497	219	123	90	283
MF	77	75	106	133	163	423	682	847	490	214	119	98	287
LF	87	80	104	132	170	414	711	879	541	211	121	93	297
Warm-wet (p _{90_90})	CanESM2_rcp45_r3i1p1												
IF	87	85	129	139	178	428	640	888	645	257	121	99	309
MF	85	87	124	138	162	467	699	873	639	237	113	92	311
LF	84	83	139	126	164	432	646	834	664	272	114	92	306
Cold-dry (p _{10_10})	HadGEM2-CC_rcp45_r1i1p1												
IF	79	74	95	110	168	334	659	665	559	208	108	84	263
MF	88	82	102	134	188	295	751	777	656	256	120	91	297
LF	83	82	102	140	204	346	836	798	726	225	114	91	314
Warm-dry (p _{90_10})	MPI-ESM-LR_rcp45_r3i1p1												
IF	86	83	111	123	244	536	710	730	527	218	127	96	301
MF	82	84	110	124	171	422	724	764	543	206	122	91	288
LF	81	88	110	109	191	421	658	717	550	219	118	89	281

Table S4. The long-term monthly flow of three-time windows projected by four GCMs representing four climatic conditions of RCP 8.5 emission scenario

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Baseline Flow (m ³ /s)	73	70	83	113	173	355	582	600	436	193	101	81	240
Cold-wet (p _{10_90})	GFDL-ESM2M_rcp85_r1i1p1												
IF	95	90	126	138	189	397	691	759	510	217	125	95	287
MF	91	98	136	125	176	440	887	943	627	235	122	104	334
LF	104	104	124	147	176	404	964	941	710	278	128	99	350
Warm-wet (p _{90_90})	CanESM2_rcp85_r3i1p1												
IF	97	91	140	139	183	503	647	840	589	270	120	102	311
MF	92	88	137	144	196	461	648	866	626	295	118	94	315
LF	100	100	154	158	186	471	803	1067	823	390	137	110	377
Cold-dry (p _{10_10})	HadGEM2-ES_rcp85_r1i1p1												
IF	88	77	106	147	199	449	792	778	525	240	128	104	304
MF	80	75	109	142	226	586	788	744	544	261	136	101	317
LF	88	85	131	150	213	538	940	911	694	274	135	111	358
Warm-dry (p _{90_10})	MIROC-ESM-CHEM_rcp85_r1i1p1												
IF	81	87	105	164	140	213	307	549	599	433	218	108	251
MF	90	101	118	169	138	194	270	534	658	561	300	125	272
LF	102	104	110	177	243	339	620	762	769	447	178	102	331