Methodological approach for climate simulations selection for climate change impact studies

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Supplementary Information

Online Resource 1. Euclidean distance between simulations and Dry-Cold, Dry-Warm, Wet-Cold and Wet-Warm corners (RCP4.5)

G'man lad'a ma	ΔΡ (%)	AT (0C)	Distance to corners			
Simulations		ΔT (°C)	Dry-Cold	Dry-Warm	Wet-Cold	Wet-Warm
CanESM2	-14.9	3.1	18.0	18.0	14.9	14.9
CCLM_CNRM	-26.3	2.0	6.6	6.7	26.3	26.3
CCLM_ICHEC	-2.2	2.2	30.6	30.7	2.2	2.4
CCLM_MPI	-22.4	2.2	10.5	10.6	22.3	22.4
CMCC.CM	-32.4	3.1	1.2	0.5	32.4	32.4
CMCC.CMS	0.0	2.7	32.9	32.9	0.8	0.5
CNRM.CM5	-16.4	2.1	16.5	16.6	16.3	16.4
CSIRO.MK3.6	-17.4	2.9	15.5	15.4	17.4	17.4
FGOALS.S2.0	-22.5	1.8	10.4	10.5	22.5	22.5
GFDL.ESM2G	1.0	1.8	33.8	33.9	1.0	1.8
GFDL.ESM2M	-23.0	2.1	9.9	10.0	22.9	23.0
HADGEM2.AO	-19.0	2.7	13.9	13.9	19.0	19.0
HADGEM2.CC	-37.7	2.8	4.9	4.8	37.7	37.7
HADGEM2.ES	-38.3	3.0	5.5	5.4	38.3	38.2
INMCM4	-32.6	1.3	0.7	1.9	32.5	32.6
IPSL.CM5A.LR	-52.5	2.6	19.7	19.6	52.5	52.5
IPSL.CM5A.MR	-33.6	2.8	1.1	0.9	33.6	33.6
IPSL.CM5B.LR	-16.8	2.0	16.1	16.2	16.7	16.8
RACMO22T_ICHEC	-1.8	2.1	31.1	31.1	1.7	2.0
RACMO22T_HADGEM2	-18.8	3.7	14.2	14.1	18.8	18.8
MIROC.ESM	9.0	3.2	41.9	41.9	9.1	9.0
MIROC.ESM.CHEM	9.0	3.2	41.9	41.9	9.1	9.0
MIROC5	-15.5	2.8	17.4	17.4	15.5	15.5
MPI.ESM.LR	-18.3	1.9	14.5	14.6	18.3	18.3
MPI.ESM.MR	-32.4	2.3	0.6	1.0	32.4	32.4
REMO2009_MPI	-18.2	2.2	14.7	14.7	18.2	18.2
MRI.CGCM3	0.0	2.0	32.8	32.9	0.0	1.3
NORESM1.M	-21.9	2.2	11.0	11.0	21.9	21.9
RCA4_CANESM2	-25.3	3.0	7.6	7.6	25.3	25.3
RCA4_CNRM	-13.9	1.9	18.9	19.0	13.9	14.0
RCA4_ICHEC	-17.1	2.2	15.8	15.8	17.1	17.1
RCA4_MPI	-11.0	2.3	21.9	21.9	11.0	11.0
RCA4_CSIRO	-1.6	3.3	31.3	31.3	2.1	1.6
RCA4_IPSL	-32.4	3.1	1.3	0.5	32.4	32.3
RCA4_MIROC	-19.3	2.7	13.6	13.6	19.3	19.3
RCA4_HADGEM2	-20.8	3.6	12.2	12.0	20.9	20.8
RCA4_NORESM1	-0.2	2.4	32.7	32.7	0.5	0.8
RCA4_GFDL	-10.9	2.4	22.0	22.0	10.9	10.9

Online Resource 2. Euclidean distance between simulations and Dry-Cold, Dry-Warm, Wet-Cold and Wet-Warm corners (RCP8.5)

G'1	AD (0/)	AT (0C)	Distance to corners			
Simulations	ΔP (%)	ΔT (°C)	Dry-Cold	Dry-Warm	Wet-Cold	Wet-Warm
CanESM2	-13.4	5.4	41.4	41.4	7.6	7.4
CCLM_CNRM	-36.1	3.7	18.7	18.8	30.1	30.1
CCLM_ICHEC	-33.4	3.7	21.4	21.5	27.3	27.4
CCLM_MPI	-54.1	4.2	0.9	1.7	48.1	48.1
CMCC.CM	-39.3	5.7	15.6	15.5	33.3	33.2
CMCC.CMS	-33.1	5.0	21.8	21.7	27.1	27.0
CNRM.CM5	-24.7	3.9	30.1	30.1	18.7	18.8
CSIRO.MK3.6	-24.4	4.6	30.4	30.4	18.4	18.4
FGOALS.S2.0	-45.1	4.8	9.7	9.7	39.1	39.1
GFDL.ESM2G	16.0	3.7	70.8	70.8	22.0	22.1
GFDL.ESM2M	-13.2	3.8	41.6	41.6	7.2	7.4
HADGEM2.AO	-42.6	4.2	12.2	12.3	36.6	36.6
HADGEM2.CC	-42.6	5.1	12.3	12.2	36.6	36.6
HADGEM2.ES	-46.5	5.1	8.4	8.3	40.5	40.5
INMCM4	-38.0	3.0	16.8	17.0	32.0	32.1
IPSL.CM5A.LR	-74.9	5.4	20.2	20.1	68.9	68.8
IPSL.CM5A.MR	-62.7	5.3	8.1	8.0	56.7	56.7
IPSL.CM5B.LR	-59.7	3.6	5.0	5.4	53.7	53.8
RACMO22T_ICHEC	-23.3	4.3	31.5	31.5	17.3	17.4
RACMO22T_HADGEM2	-23.5	5.9	31.4	31.3	17.6	17.5
MIROC.ESM	32.4	5.9	87.2	87.2	38.5	38.4
MIROC.ESM.CHEM	32.4	5.9	87.2	87.2	38.5	38.4
MIROC5	-16.0	4.7	38.8	38.8	10.0	10.0
MPI.ESM.LR	-52.2	3.7	2.6	3.3	46.1	46.2
MPI.ESM.MR	-48.9	4.5	5.9	6.0	42.9	42.9
REMO2009_MPI	-50.4	4.5	4.5	4.6	44.3	44.3
MRI.CGCM3	1.6	3.7	56.4	56.5	7.7	7.9
NORESM1.M	-41.5	4.0	13.3	13.4	35.4	35.5
RCA4_CANESM2	-38.0	5.2	16.9	16.8	32.0	31.9
RCA4_CNRM	-17.9	3.9	36.9	37.0	11.8	12.0
RCA4_ICHEC	-24.4	4.1	30.4	30.5	18.3	18.4
RCA4_MPI	-29.3	4.5	25.6	25.6	23.2	23.3
RCA4_CSIRO	-9.3	5.2	45.5	45.5	3.6	3.3
RCA4_IPSL	-56.4	5.7	2.6	1.6	50.4	50.4
RCA4_MIROC	-31.4	4.8	23.5	23.5	25.3	25.3
RCA4_HADGEM2	-29.9	5.8	25.0	24.9	23.9	23.8
RCA4 NORESM1	-16.8	4.1	38.0	38.1	10.7	10.9
RCA4_GFDL	-23.7	4.3	31.1	31.2	17.6	17.7

Online Resource 3. Simulations ranking based on the ability of the models to simulate the reference period climate (RCP4.5)

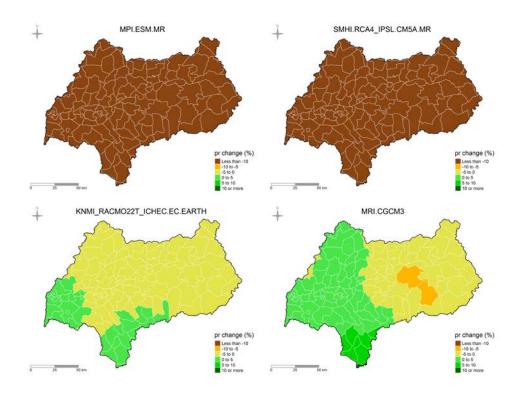
Models	ScP	ScT	Sc	Rank
SMHI-RCA4_NOAA-GFDL-ESM2M	1.000	0.936	0.968	1
SMHI_RCA4_MPI-ESM-LR	0.877	0.996	0.936	2
SMHI-RCA4_MIROC-MIROC5	0.771	0.951	0.861	3
SMHI-RCA4_MOHC-HADGEM2-ES	0.691	0.996	0.843	4
SMHI_RCA4_CNRM-CM5	0.701	0.955	0.828	5
SMHI-RCA4_CSIRO-QCCCE-CSIRO-MK3-6-0	0.686	0.959	0.823	6
SMHI_RCA4_ICHEC-EC-EARTH	0.591	0.992	0.791	7
SMHI-RCA4_NCC-NORESM1-M	0.430	0.944	0.687	8
KNMI-RACMO22T_MOHC-HADGEM2-ES	0.246	0.972	0.609	9
CNRM.CM5	0.213	0.998	0.605	10
SMHI_RCA4_CCCMA-CANESM2	0.231	0.973	0.602	11
CLMCOM_CCLM4-8-17_CNRM-CM5	0.192	0.997	0.594	12
CMCC.CM	0.179	0.998	0.589	13
SMHI-RCA4_IPSL-CM5A-MR	0.212	0.947	0.579	14
CLMCOM_CCLM4-8-17_MPI-ESM-LR	0.116	0.997	0.556	15
KNMI_RACMO22T_ICHEC-EC-EARTH	0.097	0.997	0.547	16
MPI.ESM.LR	0.134	0.950	0.542	17
IPSL.CM5B.LR	0.094	0.968	0.531	18
MIROC5	0.112	0.946	0.529	19
GFDL.ESM2M	0.092	0.956	0.524	20
HADGEM2.CC	0.052	0.995	0.523	21
MPI-CSC_REMO2009_MPI-ESM-LR	0.088	0.955	0.522	22
MRI.CGCM3	0.085	0.955	0.520	23
HADGEM2.ES	0.042	0.990	0.516	24
HADGEM2.AO	0.022	0.996	0.509	25
IPSL.CM5A.LR	0.029	0.988	0.509	26
CSIRO.MK3.6	0.018	0.995	0.507	27
MPI.ESM.MR	0.019	0.992	0.505	28
FGOALS.S2.0	0.011	0.998	0.505	29
CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH	0.016	0.991	0.503	30
IPSL.CM5A.MR	0.022	0.984	0.503	31
INMCM4	0.005	0.998	0.502	32
NORESM1.M	0.004	0.998	0.501	33
GFDL.ESM2G	0.025	0.950	0.488	34
CMCC.CMS	0.010	0.947	0.479	35
MIROC.ESM	0.004	0.949	0.476	36
CanESM2	0.002	0.950	0.476	37
MIROC.ESM.CHEM	0.004	0.938	0.471	38

Online Resource 4. Simulations ranking based on the ability of the models to simulate the reference period climate (RCP8.5)

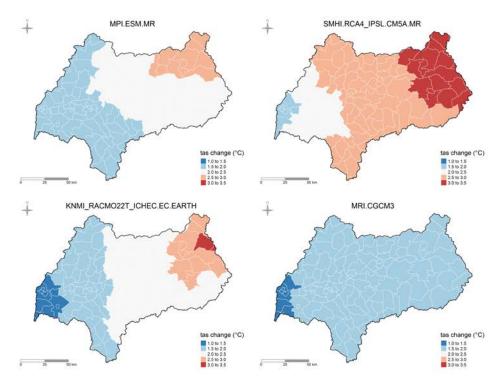
Models					
SMH1_RCA4_MPI-ESM-LR 0.877 0.996 0.936 2 SMH1-RCA4_MIROC-MIROCS 0.771 0.951 0.861 3 SMH1-RCA4_MOHC-HADGEM2-ES 0.691 0.996 0.843 4 SMH1_RCA4_CNRM-CM5 0.701 0.955 0.828 5 SMH1_RCA4_CNEM-CM5 0.701 0.955 0.828 5 SMH1_RCA4_CNCNCESIRO-MK3-6-0 0.686 0.959 0.823 6 SMH1_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMH1_RCA4_NCC-NORESM1-M 0.430 0.944 0.687 8 KRMI-RACM022T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CNRM.CM5 0.213 0.998 0.605 10 SMH1_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNR-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMH1_RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 <td>Models</td> <td>ScP</td> <td>ScT</td> <td>Sc</td> <td>Rank</td>	Models	ScP	ScT	Sc	Rank
SMH1-RCA4_MIROC-MIROCS 0.771 0.951 0.861 3 SMH1-RCA4_MOHC-HADGEM2-ES 0.691 0.996 0.843 4 SMH1_RCA4_CNRM-CMS 0.701 0.955 0.828 5 SMH1_RCA4_CSIRO-QCCCE-CSIRO-MK3-6-0 0.686 0.959 0.823 6 SMH1_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMH1_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMH1_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMH1_RCA4_ICHEC-EC-EARTH 0.430 0.944 0.687 8 KNMI-RACM022T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CRMC.M5 0.213 0.998 0.605 10 SMH1_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCCCM 0.179 0.998 0.589 13 SMH1-RCA4_IPSL-CM5A-MR 0.212 0.947 0.576 <t< td=""><td>SMHI-RCA4_NOAA-GFDL-ESM2M</td><td>1.000</td><td>0.936</td><td>0.968</td><td>1</td></t<>	SMHI-RCA4_NOAA-GFDL-ESM2M	1.000	0.936	0.968	1
SMHI-RCA4_MOHC-HADGEM2-ES 0.691 0.996 0.843 4 SMHI_RCA4_CNRM-CM5 0.701 0.955 0.828 5 SMHI_RCA4_CSIRO-QCCCE-CSIRO-MK3-6-0 0.686 0.959 0.823 6 SMHI_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMHI_RCA4_NCC-NORESMI-M 0.430 0.944 0.687 8 KNMI-RACM022T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CNRM.CM5 0.213 0.998 0.605 10 SMHI_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSI-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM48-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.016 0.997 0.547 16 MPI-ESM-LR 0.114 0.950 0.542 <	SMHI_RCA4_MPI-ESM-LR	0.877	0.996	0.936	2
SMH1_RCA4_CNRM-CM5 0.701 0.955 0.828 5 SMH1_RCA4_CSIRO_QCCCE_CSIRO-MK3-6-0 0.686 0.959 0.823 6 SMH1_RCA4_ICHEC_EC_EARTH 0.591 0.992 0.791 7 SMH1_RCA4_NCC_NORESM1-M 0.430 0.944 0.687 8 RNMI-RACM022T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CNRM.CM5 0.213 0.998 0.605 10 SMH1_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMH1-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESMLR 0.134 0.990 0.542 17 IPSL_CM5B.LR 0.094 0.968 0.531 18	SMHI-RCA4_MIROC-MIROC5	0.771	0.951	0.861	3
SMHI-RCA4_CSIRO-QCCE-CSIRO-MK3-6-0 0.686 0.959 0.823 6 SMHI_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMHI_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMHI_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMHI_RCA4_ICHEC-EC-EARTH 0.430 0.944 0.687 8 KNMI-RACM_OCT_MOHOL 0.213 0.998 0.605 10 SMHI_RCA4_CCCMA-CANESM2 0.213 0.998 0.605 10 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNML_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESMLR 0.134 0.950 0.542 17 IPSL_CM5B.LR 0.094 0.968 0.531	SMHI-RCA4_MOHC-HADGEM2-ES	0.691	0.996	0.843	4
SMHI_RCA4_ICHEC-EC-EARTH 0.591 0.992 0.791 7 SMHI-RCA4_NCC-NORESMI-M 0.430 0.944 0.687 8 KNNI-RACM022T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CNRM.CM5 0.213 0.998 0.605 10 SMHI_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.542 17 IPSL.CM5B.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROCS 0.112 0.946 0.529 19 GFDLESM2M 0.092 0.956 0.524 20 HADGE	SMHI_RCA4_CNRM-CM5	0.701	0.955	0.828	5
SMHI-RCA4_NCC-NORESMI-M 0.430 0.944 0.687 8 KNMI-RACMO22T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CRM.CM5 0.213 0.998 0.605 10 SMH_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMH-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPI-ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-E	SMHI-RCA4_CSIRO-QCCCE-CSIRO-MK3-6-0	0.686	0.959	0.823	6
KNMI-RACMO22T_MOHC-HADGEM2-ES 0.246 0.972 0.609 9 CNRM.CM5 0.213 0.998 0.605 10 SMHL_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROCS 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRLOGCM3	SMHI_RCA4_ICHEC-EC-EARTH	0.591	0.992	0.791	7
CNRM.CM5 0.213 0.998 0.605 10 SMHI_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMH-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROCS 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRLCGCM3 0.085 0.955 0.520 23 HADGEM2.AO 0.002 <td>SMHI-RCA4_NCC-NORESM1-M</td> <td>0.430</td> <td>0.944</td> <td>0.687</td> <td>8</td>	SMHI-RCA4_NCC-NORESM1-M	0.430	0.944	0.687	8
SMH1_RCA4_CCCMA-CANESM2 0.231 0.973 0.602 11 CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMH1_RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPI.ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRLCGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.02	KNMI-RACMO22T_MOHC-HADGEM2-ES	0.246	0.972	0.609	9
CLMCOM_CCLM4-8-17_CNRM-CM5 0.192 0.997 0.594 12 CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPI.ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 25 IPSL.CM5A.MR 0.019	CNRM.CM5	0.213	0.998	0.605	10
CMCC.CM 0.179 0.998 0.589 13 SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPI.ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 25 IPSL.CM5A.MR 0.019 0.992	SMHI_RCA4_CCCMA-CANESM2	0.231	0.973	0.602	11
SMHI-RCA4_IPSL-CM5A-MR 0.212 0.947 0.579 14 CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACM022T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRLCGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSLCM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPLESM.MR 0.019 0.992 </td <td>CLMCOM_CCLM4-8-17_CNRM-CM5</td> <td>0.192</td> <td>0.997</td> <td>0.594</td> <td>12</td>	CLMCOM_CCLM4-8-17_CNRM-CM5	0.192	0.997	0.594	12
CLMCOM_CCLM4-8-17_MPI-ESM-LR 0.116 0.997 0.556 15 KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPI.ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRLCGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPLESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998	CMCC.CM	0.179	0.998	0.589	13
KNMI_RACMO22T_ICHEC-EC-EARTH 0.097 0.997 0.547 16 MPLESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROCS 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPLESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991	SMHI-RCA4_IPSL-CM5A-MR	0.212	0.947	0.579	14
MPI.ESM.LR 0.134 0.950 0.542 17 IPSL.CM5B.LR 0.094 0.968 0.531 18 MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 31 INMCM4 0.005 0.998 0.502 <td>CLMCOM_CCLM4-8-17_MPI-ESM-LR</td> <td>0.116</td> <td>0.997</td> <td>0.556</td> <td>15</td>	CLMCOM_CCLM4-8-17_MPI-ESM-LR	0.116	0.997	0.556	15
PSL.CM5B.LR	KNMI_RACMO22T_ICHEC-EC-EARTH	0.097	0.997	0.547	16
MIROC5 0.112 0.946 0.529 19 GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488	MPI.ESM.LR	0.134	0.950	0.542	17
GFDL.ESM2M 0.092 0.956 0.524 20 HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 31 IPSL.CM5A.MR 0.002 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488<	IPSL.CM5B.LR	0.094	0.968	0.531	18
HADGEM2.CC 0.052 0.995 0.523 21 MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.002 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 <td>MIROC5</td> <td>0.112</td> <td>0.946</td> <td>0.529</td> <td>19</td>	MIROC5	0.112	0.946	0.529	19
MPI-CSC_REMO2009_MPI-ESM-LR 0.088 0.955 0.522 22 MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 31 INMCM4 0.002 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	GFDL.ESM2M	0.092	0.956	0.524	20
MRI.CGCM3 0.085 0.955 0.520 23 HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	HADGEM2.CC	0.052	0.995	0.523	21
HADGEM2.ES 0.042 0.990 0.516 24 HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	MPI-CSC_REMO2009_MPI-ESM-LR	0.088	0.955	0.522	22
HADGEM2.AO 0.022 0.996 0.509 25 IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	MRI.CGCM3	0.085	0.955	0.520	23
IPSL.CM5A.LR 0.029 0.988 0.509 26 CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	HADGEM2.ES	0.042	0.990	0.516	24
CSIRO.MK3.6 0.018 0.995 0.507 27 MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	HADGEM2.AO	0.022	0.996	0.509	25
MPI.ESM.MR 0.019 0.992 0.505 28 FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	IPSL.CM5A.LR	0.029	0.988	0.509	26
FGOALS.S2.0 0.011 0.998 0.505 29 CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	CSIRO.MK3.6	0.018	0.995	0.507	27
CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH 0.016 0.991 0.503 30 IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	MPI.ESM.MR	0.019	0.992	0.505	28
IPSL.CM5A.MR 0.022 0.984 0.503 31 INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	FGOALS.S2.0	0.011	0.998	0.505	29
INMCM4 0.005 0.998 0.502 32 NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	CLMCOM_CCLM4-8-17_ICHEC-EC-EARTH	0.016	0.991	0.503	30
NORESM1.M 0.004 0.998 0.501 33 GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	IPSL.CM5A.MR	0.022	0.984	0.503	31
GFDL.ESM2G 0.025 0.950 0.488 34 CMCC.CMS 0.010 0.947 0.479 35	INMCM4	0.005	0.998	0.502	
CMCC.CMS 0.010 0.947 0.479 35	NORESM1.M	0.004	0.998	0.501	33
	GFDL.ESM2G	0.025	0.950	0.488	34
MIROC.ESM 0.004 0.949 0.476 36	CMCC.CMS	0.010	0.947	0.479	35
	MIROC.ESM	0.004	0.949	0.476	36
CanESM2 0.002 0.950 0.476 37	CanESM2	0.002	0.950	0.476	37
MIROC.ESM.CHEM 0.004 0.938 0.471 38	A UD C C EGA A CHEA A	0.004	0.020	0.471	1 20

Online Resource 5. Selected simulations for each corner based on the change in the means after bias correction

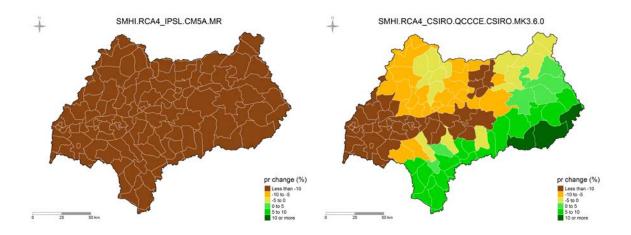
Projection	GCM/RCM runs	ΔΡ	ΔΤ
-	RCP4.5		
	HADGEM2.ES	-9.96	0.86
5 6 11	SMHI-RCA4_MIROC-MIROC5	-12.07	0.70
Dry-Cold	HADGEM2.CC	-8.98	0.76
	MPI-CSC_REMO2009_MPI-ESM-LR	-8.55	0.79
	CLMCOM_CCLM4-8-17_MPI-ESM-LR	-8.05	0.47
	HADGEM2.ES	-9.96	0.86
	SMHI-RCA4_MIROC-MIROC5	-12.07	0.70
Dry-Warm	HADGEM2.CC	-8.98	0.76
	MPI-CSC_REMO2009_MPI-ESM-LR	-8.55	0.79
	CLMCOM_CCLM4-8-17_MPI-ESM-LR	-8.05	0.47
	GFDL.ESM2G	-1.21	0.63
	KNMI-RACMO22T_MOHC-HADGEM2-ES	-1.94	0.37
Wet-Cold	SMHI_RCA4_CCCMA-CANESM2	-0.79	0.67
	SMHI-RCA4_MOHC-HADGEM2-ES	-2.38	0.33
	SMHI-RCA4_IPSL-CM5A-MR	-2.57	0.39
	GFDL.ESM2G	-1.21	0.63
	SMHI_RCA4_CCCMA-CANESM2	-0.79	0.67
Wet-Warm	KNMI-RACMO22T_MOHC-HADGEM2-ES	-1.94	0.37
	SMHI-RCA4_MOHC-HADGEM2-ES	-2.38	0.33
	MIROC.ESM	-1.41	2.44
	RCP8.5		
	HADGEM2.ES	-9.96	0.86
	SMHI-RCA4_MIROC-MIROC5	-12.07	0.70
Dry-Cold	HADGEM2.CC	-8.98	0.76
	MPI-CSC_REMO2009_MPI-ESM-LR	-8.55	0.79
	CLMCOM_CCLM4-8-17_MPI-ESM-LR	-8.05	0.47
	HADGEM2.ES	-9.96	0.86
	SMHI-RCA4_MIROC-MIROC5	-12.07	0.70
Dry-Warm	HADGEM2.CC	-8.98	0.76
	MPI-CSC_REMO2009_MPI-ESM-LR	-8.55	0.79
	CLMCOM_CCLM4-8-17_MPI-ESM-LR	-8.05	0.47
	GFDL.ESM2G	-1.21	0.63
Wet-Cold	KNMI-RACMO22T_MOHC-HADGEM2-ES	-1.94	0.37
	SMHI_RCA4_CCCMA-CANESM2	-0.79	0.67
	SMHI-RCA4_MOHC-HADGEM2-ES	-2.38	0.33
	SMHI-RCA4_IPSL-CM5A-MR	-2.57	0.39
Wet-Warm	GFDL.ESM2G	-1.21	0.63
	SMHI_RCA4_CCCMA-CANESM2	-0.79	0.67
	KNMI-RACMO22T_MOHC-HADGEM2-ES	-1.94	0.37
	SMHI-RCA4_MOHC-HADGEM2-ES	-2.38	0.33
	MIROC.ESM	-1.41	2.44



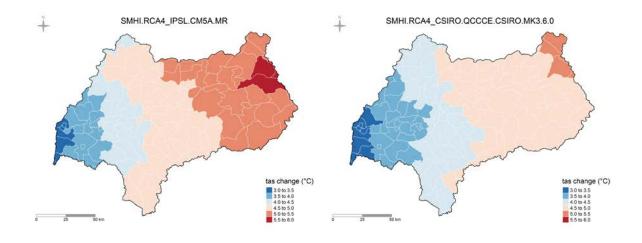
Online Resource 6. Future projections (2066-2095) of precipitation change for selected simulations following the first selection procedure for RCP4.5



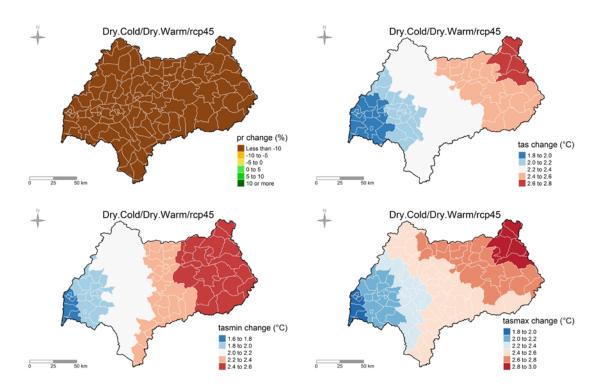
Online Resource 7. Future projections (2066-2095) of temperature change for selected simulations following the first selection procedure for RCP4.5



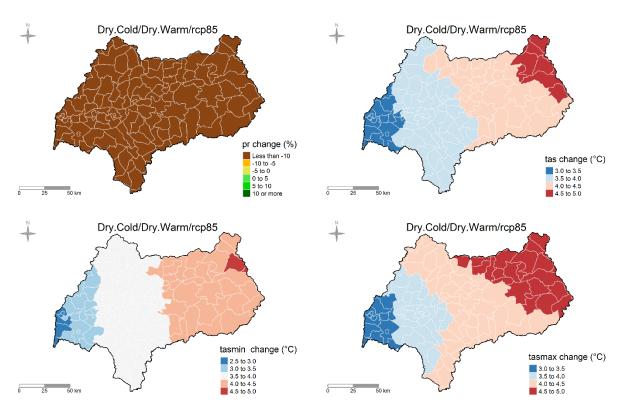
Online Resource 8. Future projections (2066-2095) of precipitation change for selected simulations following the first selection procedure for RCP8.5



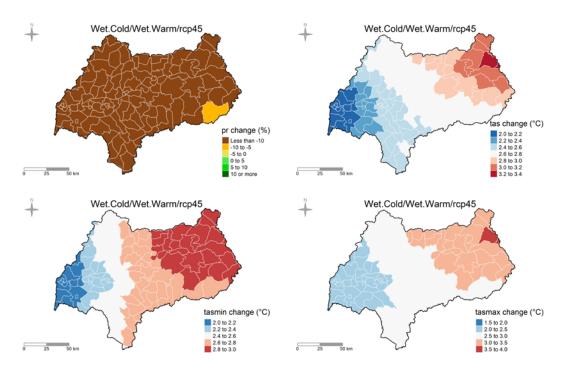
Online Resource 9. Future projections (2066-2095) of temperature change for selected simulations following the first selection procedure for RCP8.5



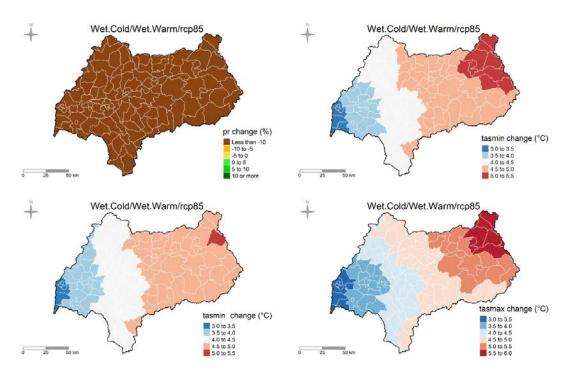
Online Resource 10. Dry-Cold/Dry-Warm projections (2066-2095) for selected simulations following the third selection procedure for RCP4.5



Online Resource 11. Dry-Cold/Dry-Warm projections (2066-2095) for selected simulations following the third selection procedure for RCP8.5



Online Resource 12. Wet-Cold/Wet-Warm projections (2066-2095) for selected simulations following the third selection procedure for RCP4.5



Online Resource 13. Warm-Cold/Wet-Warm projections (2066-2095) for selected simulations following the third selection procedure for RCP8.5