

Supplementary Information for Performance based sub-selection of CMIP6 models for impact assessments in Europe

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Table S1. Model realisations from CMIP6 ensemble that were assessed

Model and Realisation	Institution
ACCESS-CM2 r1i1p1f1	Commonwealth Scientific and Industrial Research Organization (Australia)
ACCESS-ESM1-5 r1i1p1f1	Commonwealth Scientific and Industrial Research Organization (Australia)
BCC-CSM2-MR r1i1p1f1	Beijing Climate Center (China)
CAMS-CSM1-0 r1i1p1f1	Chinese Academy of Meteorological Sciences (China)
CESM2 r1i1p1f1	National Center for Atmospheric Research (USA)
CESM2-WACCM r1i1p1f1	National Center for Atmospheric Research (USA)
CNRM-CM6-1 r1i1p1f2	Centre National de Recherches Meteorologiques, Centre Europeen de Recherche et de Formation Avancee en Calcul Scientifique (France)
CNRM-CM6-1-HR r1i1p1f2	Centre National de Recherches Meteorologiques, Centre Europeen de Recherche et de Formation Avancee en Calcul Scientifique (France)
CNRM-ESM2-1 r1i1p1f2	Centre National de Recherches Meteorologiques, Centre Europeen de Recherche et de Formation Avancee en Calcul Scientifique (France)
CanESM5 r1i1p1f1	Canadian Centre for Climate Modelling and Analysis (Canada)
EC-Earth3 r1i1p1f1	European Center Earth Consortium (Europe)
EC-Earth3-Veg r1i1p1f1	European Center Earth Consortium (Europe)
FGOALS-f3-L r1i1p1f1	Chinese Academy of Sciences (China)
FGOALS-g3 r1i1p1f1	Chinese Academy of Sciences (China)
GFDL-CM4 r1i1p1f1	Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration (USA)
GFDL-ESM4 r1i1p1f1	Geophysical Fluid Dynamics Laboratory, National Oceanic and Atmospheric Administration (USA)
GISS-E2-1-G r1i1p3f1	Goddard Institute for Space Studies, National Aeronautics and Space Administration (USA)
HadGEM3-GC31-LL r1i1p1f3	Met Office Hadley Centre
HadGEM3-GC31-MM r1i1p1f3	Met Office Hadley Centre
INM-CM4-8 r1i1p1f1	Institute for Numerical Mathematics, Russia Academy of Science (Russia)
INM-CM5-0 r1i1p1f1	Institute for Numerical Mathematics, Russia Academy of Science (Russia)
IPSL-CM6A-LR r1i1p1f1	Institut Pierre Simon Laplace, Paris 75252, France
KACE-1-0-G r1i1p1f1	National Institute of Meteorological Sciences/Korea Meteorological Administration (Korea)
MIROC-ES2L r1i1p1f2	Japan Agency for Marine-Earth Science and Technology (Japan)
MIROC6 r1i1p1f1	Japan Agency for Marine-Earth Science and Technology (Japan)
MPI-ESM1-2-HR r1i1p1f1	Max Planck Institute for Meteorology (Germany)
MRI-ESM2-0 r1i1p1f1	Meteorological Research Institute, Japan Meteorological Agency (Japan)
NESM3 r1i1p1f1	Nanjing University of Information Science and Technology (China)
NorESM2-LM r1i1p1f1	Norwegian Climate Center (Norway)
TaiESM1 r1i1p1f1	Research Center for Environmental Changes (Taiwan)
UKESM1-0-LL r1i1p1f2	Met Office Hadley Centre

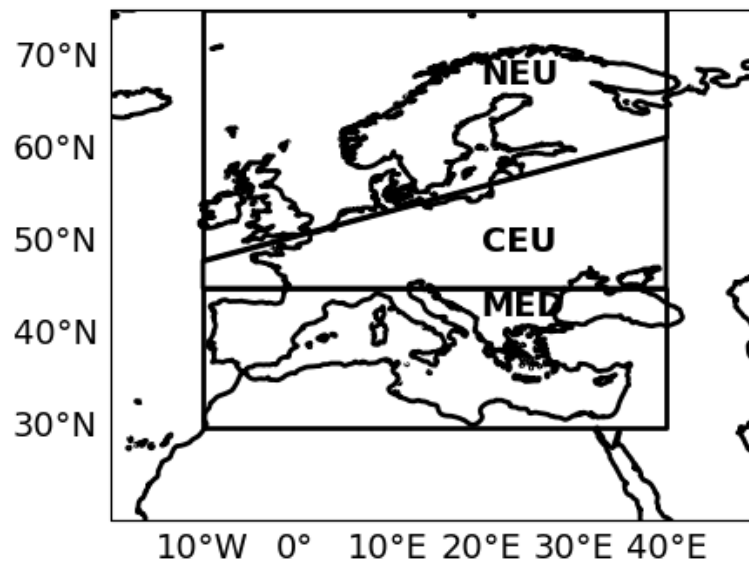


Figure S1. European regions used for regional assessment. NEU: Northern Europe, CEU: Central and Western Europe, MED: Mediterranean

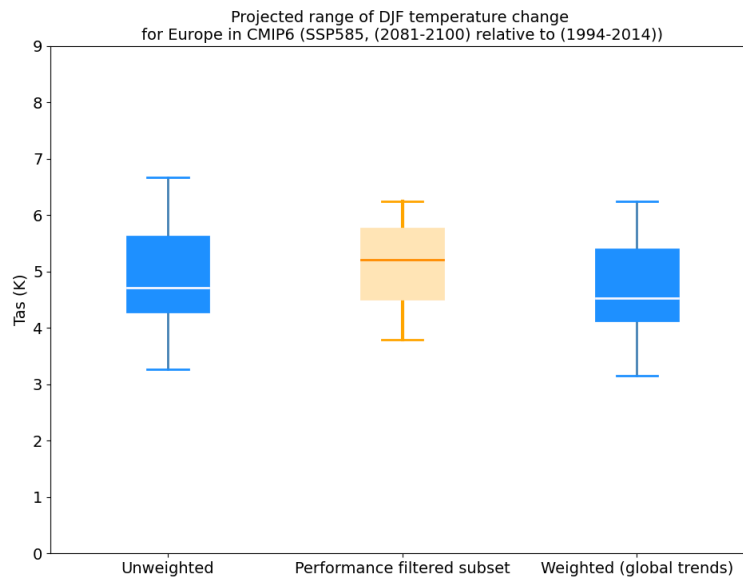


Figure S2. Projected range of JJA temperature change for Europe in CMIP6 (SSP585, (2081-2100) relative to (1994-2014)) for the raw unweighted multi-model ensemble, the performance filtered subset and the raw ensemble weighted for performance against global trends using the climWIP method . Boxes show 25th to 75th percentile. Whiskers show the 5th and 95th percentile

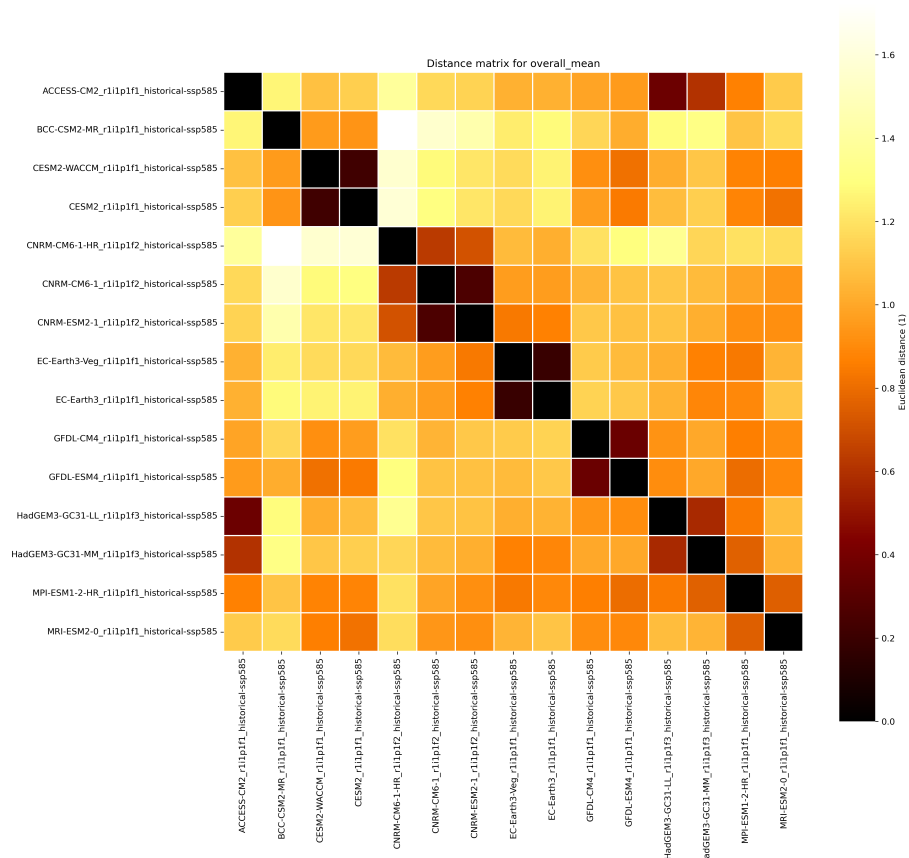


Figure S3. Euclidean distance for CMIP6 models using the ClimWIP method (Brunner et al., 2020)

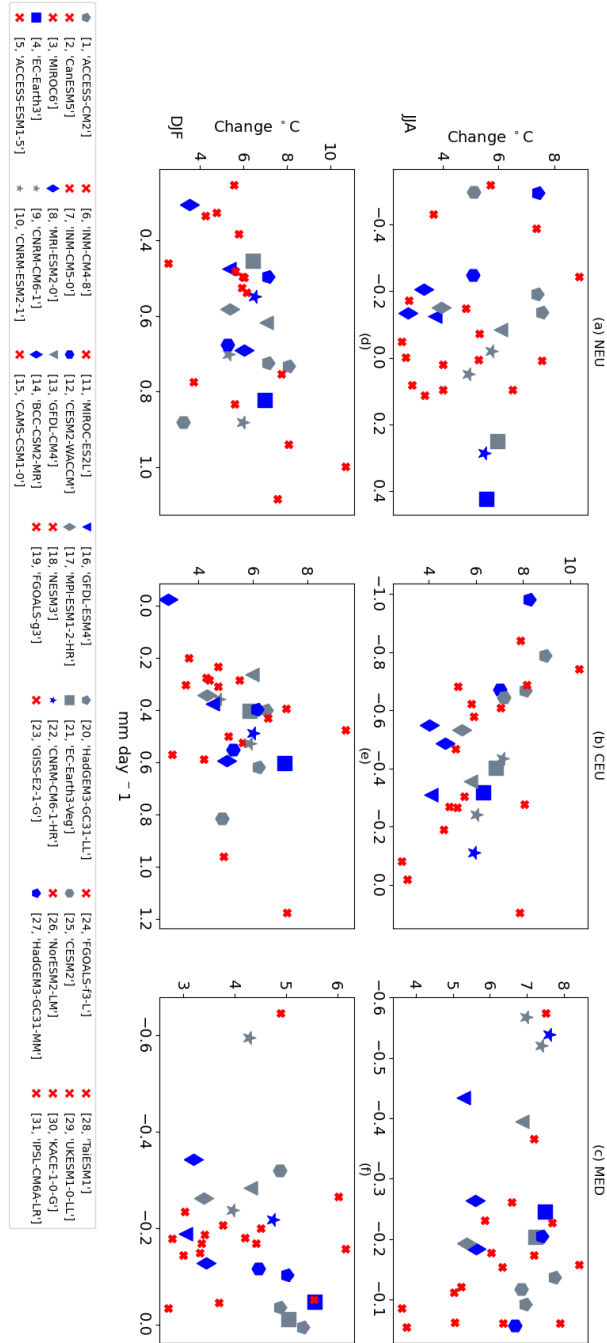


Figure S4. Temperature and precipitation projection range (SSP585, 2018-2100 relative to 1995-2014) for CMIP6 multi-model ensemble. Excluded models are shown as red. Models selected from each of the 7 clusters in table ?? shown as blue. Models from the process performance filtered subset not selected shown in grey. Models from the same cluster are indicated by symbol.