Supplementary Material

**Supplementary Table S1.** Availability of studied variables for CMIP5 simulations incorporated in present study. "x" denotes the variable is available for listed simulation for respective period and forcing scenario. The last row describes the number of simulation for individual variables, time periods and forcing scenarios.

|  |  |  |  |
| --- | --- | --- | --- |
|   | **1961-1990** | **2070-2099 RCP45** | **2070-2099 RCP85** |
|   | **TAS** | **TN** | **TX** | **PR** | **TAS** | **TN** | **TX** | **PR** | **TAS** | **TN** | **TX** | **PR** |
| ACCESS1-0 |   | x | x |   |   | x | x |   |   | x | x |   |
| ACCESS1-3 | x | x | x | x | x | x | x | x | x | x | x | x |
| bcc-csm1-1-m | x | x | x | x | x | x | x | x | x | x | x | x |
| bcc-csm1-1 | x | x | x | x | x | x | x | x | x | x | x | x |
| BNU-ESM |   | x | x |   |   | x | x |   |   | x | x |   |
| CanESM2 | x | x | x | x | x | x | x | x | x | x | x | x |
| CCSM4 | x | x | x | x | x | x | x | x | x | x | x | x |
| CESM1-BGC | x | x | x | x | x | x | x | x | x | x | x | x |
| CESM1-CAM5-1-FV2 | x |   |   | x | x |   |   | x | x |   |   | x |
| CESM1-CAM5 | x | x | x | x | x | x | x | x | x | x | x | x |
| CESM1-FASTCHEM | x | x | x | x |   |   |   |   |   |   |   |   |
| CESM1-WACCM | x | x | x | x |   |   |   |   |   |   |   |   |
| CMCC-CESM | x | x | x | x |   |   |   |   |   | x |   |   |
| CMCC-CM | x | x | x | x | x | x | x | x | x | x | x | x |
| CMCC-CMS |   | x | x |   |   | x | x |   |   | x | x |   |
| CNRM-CM5-2 | x | x | x | x |   |   |   |   |   |   |   |   |
| CNRM-CM5 | x | x | x | x | x | x | x | x | x | x | x | x |
| CSIRO-Mk3-6-0 | x | x | x | x | x | x | x | x | x | x | x | x |
| EC-EARTH | x | x | x | x | x | x | x |   | x | x | x | x |
| FGOALS-g2 | x | x | x | x | x | x | x | x | x | x | x | x |
| FIO-ESM |   | x | x |   |   | x | x |   |   | x | x |   |
| GFDL-CM2p1 | x |   |   | x |   |   |   |   |   |   |   |   |
| GFDL-CM3 | x | x | x | x | x | x | x | x | x | x | x | x |
| GFDL-ESM2G | x | x | x | x | x | x | x | x | x | x | x | x |
| GFDL-ESM2M | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-H-CC | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-H | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-R-CC | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-R | x | x | x | x | x | x | x | x | x | x | x | x |
| HadCM3 | x | x | x | x |   |   |   |   |   |   |   |   |
| HadGEM2-AO | x | x | x | x | x | x | x | x | x | x | x | x |
| HadGEM2-CC | x | x | x | x | x | x | x | x | x | x | x | x |
| inmcm4 | x | x | x | x | x | x | x | x | x | x | x | x |
| IPSL-CM5A-LR | x | x | x | x | x | x | x | x | x | x | x | x |
| IPSL-CM5A-MR | x | x | x | x | x | x | x | x | x | x | x | x |
| IPSL-CM5B-LR | x | x | x | x | x | x | x | x | x | x | x | x |
| MIROC-ESM-CHEM | x | x | x | x | x | x | x | x | x | x | x | x |
| MIROC-ESM | x | x | x | x | x | x | x | x | x | x | x | x |
| MIROC4h |   | x | x |   |   |   |   |   |   |   |   |   |
| MIROC5 | x | x | x | x | x | x | x | x | x | x | x | x |
| MPI-ESM-LR | x | x | x | x | x | x | x | x | x | x | x | x |
| MPI-ESM-MR | x | x | x | x | x | x | x | x | x | x | x | x |
| MPI-ESM-P | x | x | x | x |   |   |   |   |   |   |   |   |
| MRI-CGCM3 | x | x | x | x | x | x | x | x | x | x | x | x |
| MRI-ESM1 | x | x | x | x |   |   |   |   | x |   |   | x |
| NorESM1-M | x | x | x | x | x | x | x | x | x | x | x | x |
| NorESM1-ME | x |   |   | x | x |   |   | x | x |   |   | x |
| **Number of GCMs** | **42** | **44** | **44** | **42** | **34** | **36** | **36** | **33** | **35** | **37** | **36** | **35** |

**Supplementary Table S2.** The same as Table S1, but for CMIP6.

|  |  |  |  |
| --- | --- | --- | --- |
|   | **1961-1990** | **2070-2099 SSP245** | **2070-2099 SSP585** |
|   | **TAS**  | **TN** | **TX** | **PR** | **TAS** | **TN** | **TX** | **PR** | **TAS** | **TN** | **TX** | **PR** |
| ACCESS-CM2 | x | x | x | x | x | x | x | x | x | x | x | x |
| ACCESS-ESM1-5 | x | x | x | x | x | x | x | x | x | x | x | x |
| AWI-CM-1-1-MR | x | x | x | x |   |   |   |   |   |   |   |   |
| AWI-ESM-1-1-LR | x | x | x | x |   |   |   |   |   |   |   |   |
| BCC-CSM2-MR | x | x | x | x | x | x | x | x | x | x | x | x |
| BCC-ESM1 | x | x | x | x |   |   |   |   |   |   |   |   |
| CAMS-CSM1-0 | x |   |   | x | x |   |   | x | x |   |   | x |
| CanESM5 | x | x | x | x | x | x | x | x | x | x | x | x |
| CAS-ESM2-0 | x | x | x | x |   |   |   |   |   |   |   |   |
| CESM2-FV2 | x |   |   | x |   |   |   |   |   |   |   |   |
| CESM2-WACCM-FV2 | x |   |   | x |   |   |   |   |   |   |   |   |
| CESM2-WACCM | x |   |   | x | x |   |   | x | x |   |   | x |
| CESM2 | x |   |   | x |   |   |   |   |   |   |   |   |
| CMCC-CM2-HR4 | x |   |   | x |   |   |   |   |   |   |   |   |
| CMCC-CM2-SR5 | x |   |   | x | x |   |   | x | x |   |   | x |
| CMCC-ESM2 | x | x | x | x | x | x | x | x | x | x | x | x |
| CNRM-CM6-1-HR | x | x | x | x | x | x | x | x | x | x | x | x |
| CNRM-CM6-1 | x | x | x | x | x | x | x | x | x | x | x | x |
| CNRM-ESM2-1 | x | x | x | x | x | x | x | x | x | x | x | x |
| E3SM-1-0 | x |   |   | x |   |   |   |   | x |   |   | x |
| E3SM-1-1-ECA | x |   |   | x |   |   |   |   |   |   |   |   |
| E3SM-1-1 | x |   |   | x |   |   |   |   |   |   |   |   |
| EC-Earth3-AerChem | x | x | x | x |   |   |   |   |   |   |   |   |
| EC-Earth3-CC | x | x | x | x | x | x | x | x | x | x | x | x |
| EC-Earth3-Veg-LR | x | x | x | x | x | x | x | x | x | x | x | x |
| EC-Earth3-Veg | x | x | x | x | x | x | x | x | x | x | x | x |
| EC-Earth3 | x | x | x | x | x | x | x | x | x | x | x | x |
| FGOALS-f3-L | x |   |   | x | x |   |   | x | x |   |   | x |
| FGOALS-g3 | x | x | x | x | x | x | x | x | x | x | x | x |
| FIO-ESM-2-0 | x | x | x | x | x | x | x | x | x | x | x | x |
| GFDL-CM4 | x | x | x | x | x | x | x | x | x | x | x | x |
| GFDL-ESM4 | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-1-G-CC | x | x | x | x |   |   |   |   |   |   |   |   |
| GISS-E2-1-G | x | x | x | x | x | x | x | x | x | x | x | x |
| GISS-E2-1-H | x | x | x | x |   |   |   |   |   |   |   |   |
| HadGEM3-GC31-LL | x | x | x | x | x | x | x | x | x | x | x | x |
| HadGEM3-GC31-MM | x |   |   | x |   |   |   |   | x | x | x | x |
| IITM-ESM | x |   |   | x | x |   |   | x | x |   |   | x |
| INM-CM4-8 | x | x | x | x | x | x | x | x | x | x | x | x |
| INM-CM5-0 | x | x | x | x | x | x | x | x | x | x | x | x |
| IPSL-CM5A2-INCA | x |   |   | x | x | x | x | x |   |   |   |   |
| IPSL-CM6A-LR | x | x | x | x |   |   |   |   | x | x | x | x |
| KACE-1-0-G | x | x | x | x | x | x | x | x | x | x | x | x |
| MCM-UA-1-0 | x |   |   | x | x |   |   | x | x |   |   | x |
| MIROC-ES2L | x | x | x | x | x | x | x | x | x | x | x | x |
| MIROC6 | x | x | x | x | x | x | x | x | x | x | x | x |
| MPI-ESM-1-2-HAM | x | x | x | x |   |   |   |   |   |   |   |   |
| MPI-ESM1-2-HR | x | x | x | x | x | x | x | x | x | x | x | x |
| MPI-ESM1-2-LR | x | x | x | x | x | x | x | x | x | x | x | x |
| MRI-ESM2-0 | x | x | x | x | x | x | x | x | x | x | x | x |
| NESM3 | x | x | x | x | x | x | x | x | x | x | x | x |
| NorCPM1 | x |   |   | x |   |   |   |   |   |   |   |   |
| NorESM2-LM | x |   |   | x | x |   |   | x | x |   |   | x |
| NorESM2-MM | x |   |   | x | x |   |   | x | x |   |   | x |
| SAM0-UNICON | x | x | x | x |   |   |   |   |   |   |   |   |
| TaiESM1 | x |   |   | x | x |   |   | x | x |   |   | x |
| UKESM1-0-LL | x | x | x | x | x | x | x | x | x | x | x | x |
| **Number of GCMs** | **57** | **38** | **38** | **57** | **38** | **29** | **29** | **38** | **40** | **30** | **30** | **40** |