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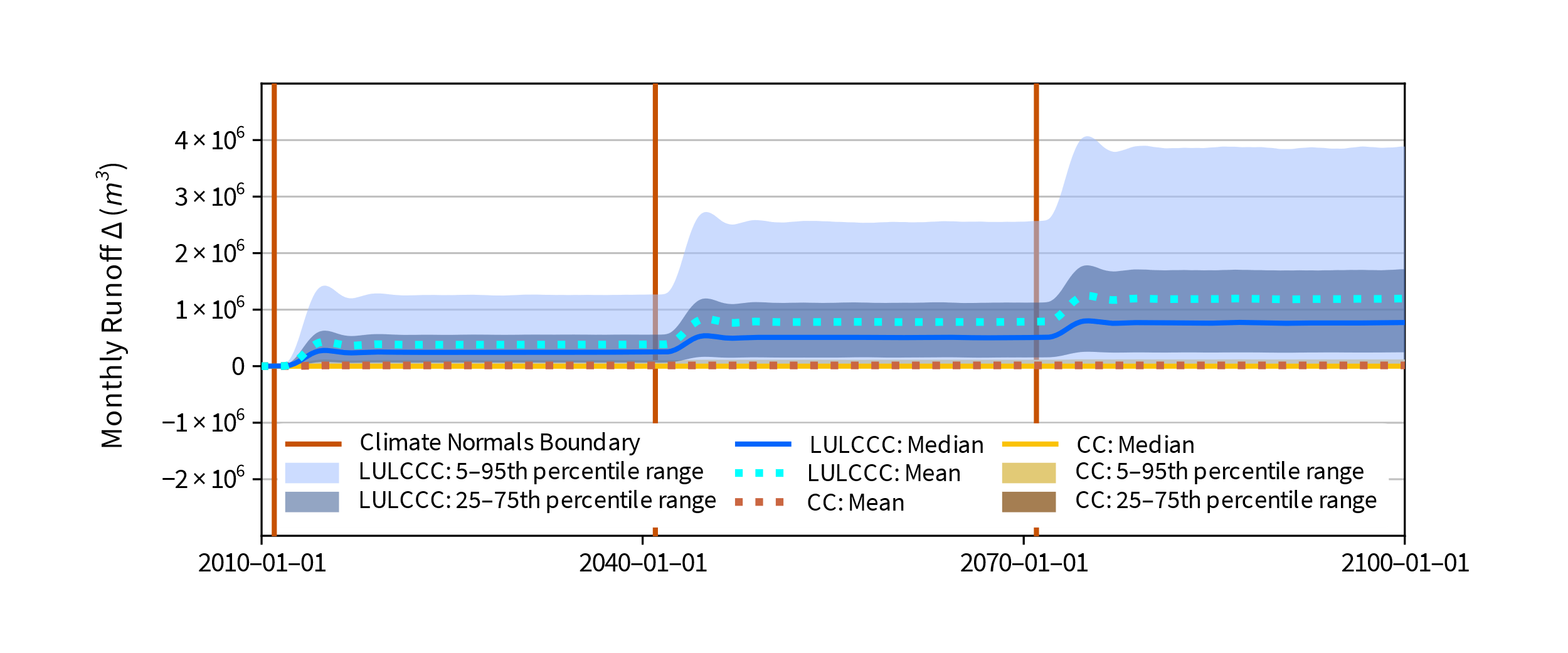
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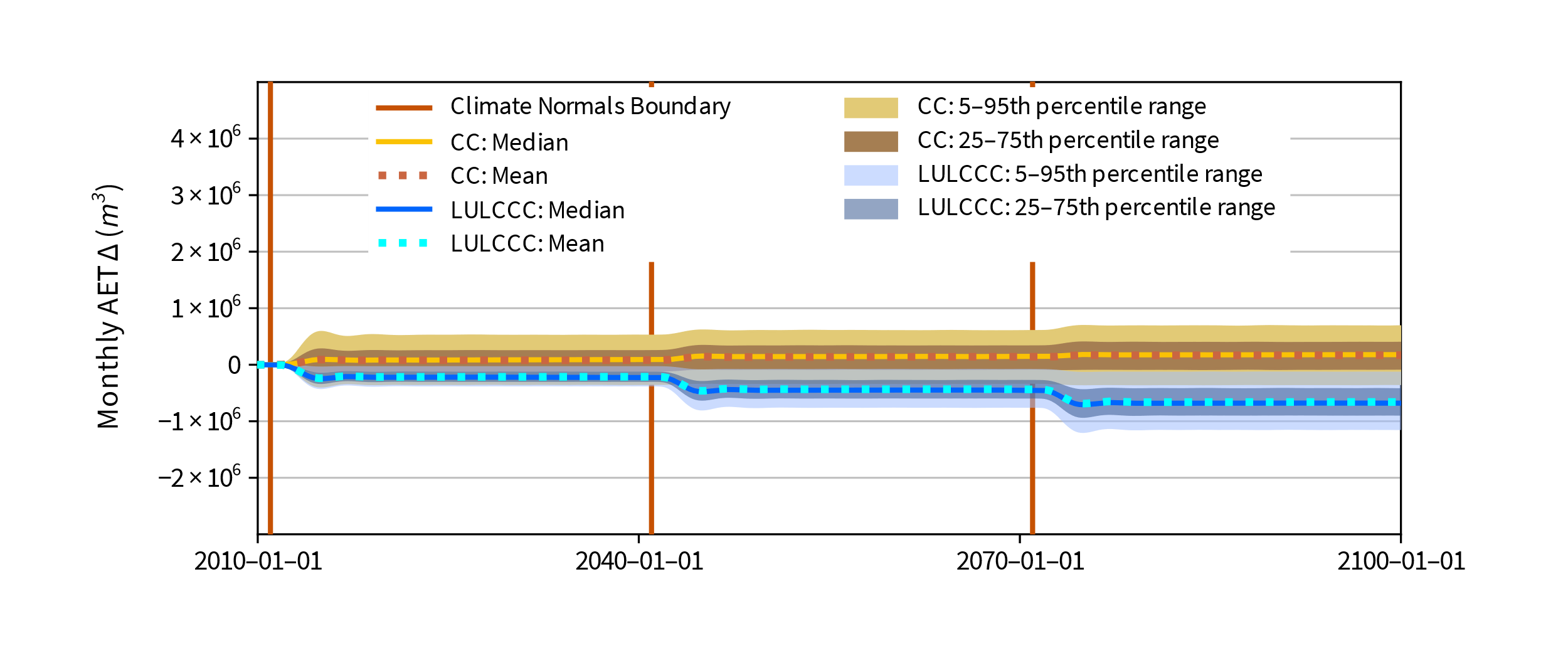
**Table S 1**. Listing of the 32 GCMs and Emission Scenarios available in CMIP5, LOCA Archive

| **Model Short Name** | **Organization** | **Emissions Scenarios** |
| --- | --- | --- |
| access1-0 | Commonwealth Scientific and Industrial Research Organization and Bureau of Meteorology, Australia | RCP4.5, RCP8.5 |
| access1-3 | Commonwealth Scientific and Industrial Research Organization and Bureau of Meteorology, Australia | RCP4.5, RCP8.5 |
| bcc-csm1-1 | Beijing Climate Center, China Meteorological Administration | RCP4.5, RCP8.5 |
| bcc-csm1-1-m | Beijing Climate Center, China Meteorological Administration | RCP4.5, RCP8.5 |
| canesm2 | Canadian Centre for Climate Modelling and Analysis | RCP4.5, RCP8.5 |
| ccsm4 | National Center for Atmospheric Research | RCP4.5, RCP8.5 |
| cesm1-bgc | Community Earth System Model Contributors | RCP4.5, RCP8.5 |
| cesm1-cam5 | Community Earth System Model Contributors | RCP4.5, RCP8.5 |
| cmcc-cm | Centro Euro-Mediterraneo per I Cambiamenti Climatici | RCP4.5, RCP8.5 |
| cnrm-cm5 | Centre National de Recherches Météorologiques/ Centre Européen de Recherche et Formation Avancée en Calcul Scientifique | RCP4.5, RCP8.5 |
| csiro-mk3-6-0 | Commonwealth Scientific and Industrial Research Organization, Queensland Climate Change Centre of Excellence | RCP4.5, RCP8.5 |
| ec-earth | EC-Earth consortium, representing 22 academic institutions and meteorological services from 10 countries in Europe | RCP4.5, RCP8.5 |
| fgoals-g2 | Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Institute of Atmospheric Physics, Chinese Academy of Sciences, and Center for Earth System Science, Tsinghua University | RCP4.5, RCP8.5 |
| gfdl-cm3 | NOAA Geophysical Fluid Dynamics Laboratory | RCP4.5, RCP8.5 |
| gfdl-esm2g | NOAA Geophysical Fluid Dynamics Laboratory | RCP4.5, RCP8.5 |
| gfdl-esm2m | NOAA Geophysical Fluid Dynamics Laboratory | RCP4.5, RCP8.5 |
| giss-e2-r | NASA Goddard Institute for Space Studies | RCP4.5, RCP8.5 |
| hadgem2-ao | Met Office Hadley Centre (additional HadGEM2ES realizations contributed by Instituto Nacional de Pesquisas Espaciais) | RCP4.5, RCP8.5 |
| hadgem2-cc | Met Office Hadley Centre (additional HadGEM2ES realizations contributed by Instituto Nacional de Pesquisas Espaciais) | RCP4.5, RCP8.5 |
| hadgem2-es | Met Office Hadley Centre (additional HadGEM2ES realizations contributed by Instituto Nacional de Pesquisas Espaciais) | RCP4.5, RCP8.5 |
| inmcm4 | Institute for Numerical Mathematics | RCP4.5, RCP8.5 |
| ipsl-cm5a-lr | Institut Pierre-Simon Laplace | RCP4.5, RCP8.5 |
| ipsl-cm5a-mr | Institut Pierre-Simon Laplace | RCP4.5, RCP8.5 |
| miroc-esm | Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies | RCP4.5, RCP8.5 |
| miroc-esm-chem | Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute (The University of Tokyo), and National Institute for Environmental Studies | RCP4.5, RCP8.5 |
| miroc5 | Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology | RCP4.5, RCP8.5 |
| mpi-esm-lr | Max-Planck-Institut für Meteorologie (Max Planck Institute for Meteorology) | RCP4.5, RCP8.5 |
| mpi-esm-mr | Max-Planck-Institut für Meteorologie (Max Planck Institute for Meteorology) | RCP4.5, RCP8.5 |
| mri-cgcm3 | Meteorological Research Institute | RCP4.5, RCP8.5 |
| noresm1-m | Norwegian Climate Centre | RCP4.5, RCP8.5 |
| cmcc-cms | Centro Euro-Mediterraneo per I Cambiamenti Climatici | RCP4.5, RCP8.5 |
| giss-e2-h | NASA Goddard Institute for Space Studies | RCP4.5, RCP8.5 |



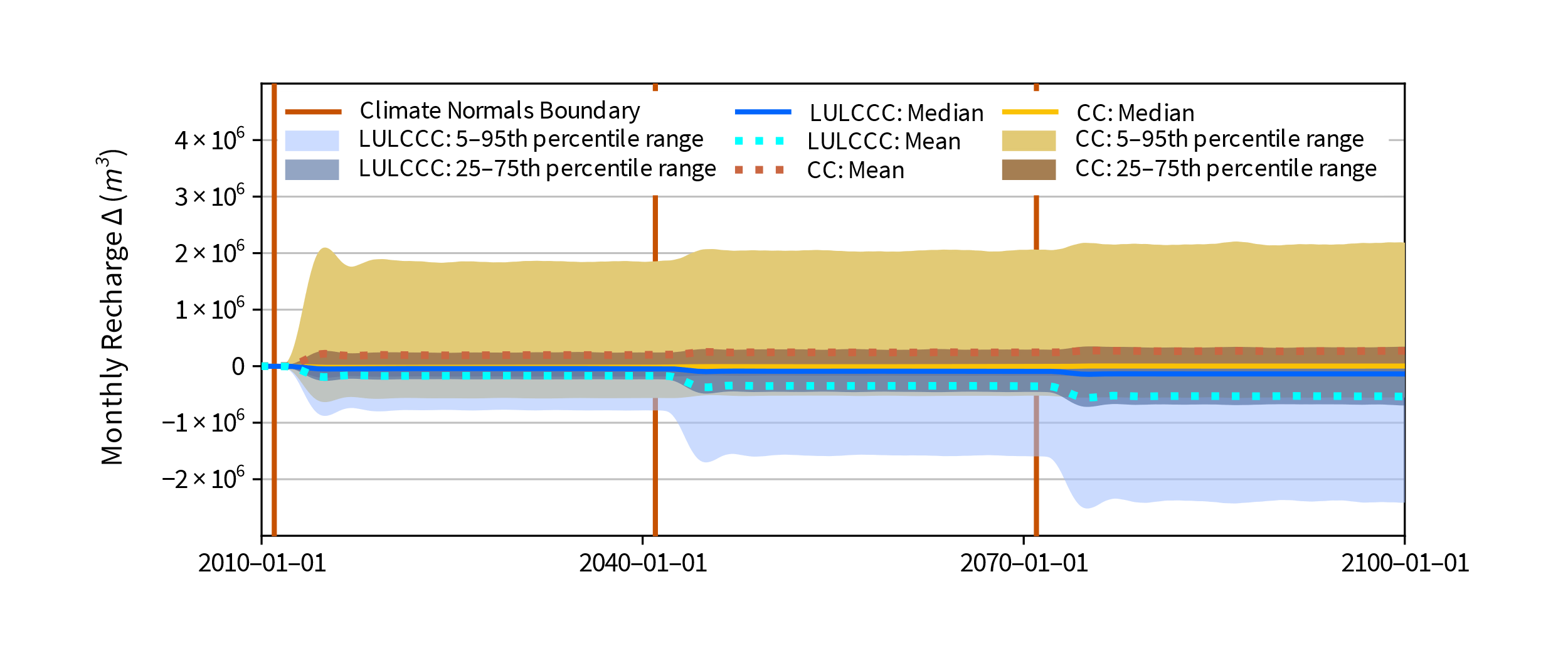
**Figure S 1**. HRU 1 magnitude of change in runoff and associated likelihoods for both scenarios

**.** Increase in impervious area in an HRU generates a corresponding increase in runoff.



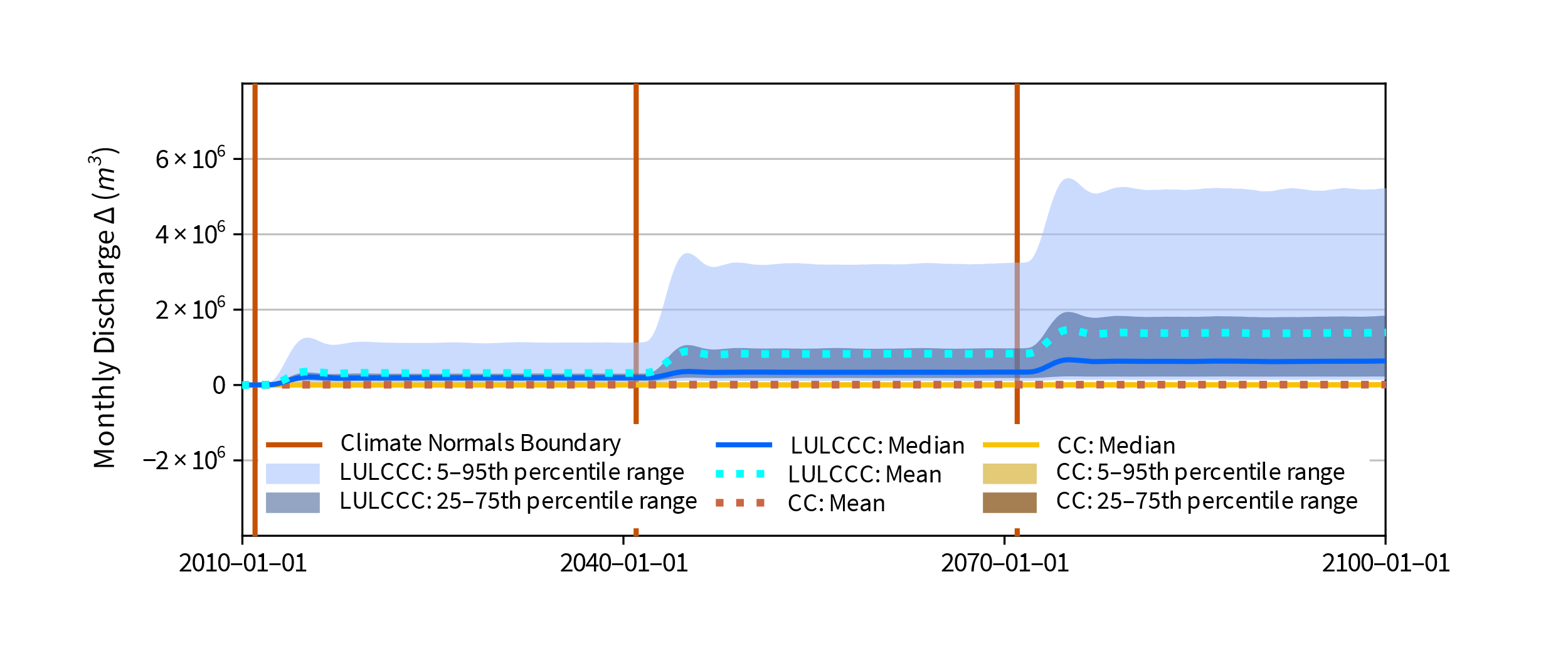
**Figure S 2**. HRU 1 magnitude of change in AET and associated likelihoods for both scenarios

**.** Increase in impervious area in an HRU increases runoff at the expense of AET and recharge. The LULCCC scenario shows a consistent relative decrease in AET with the increase in impervious area.



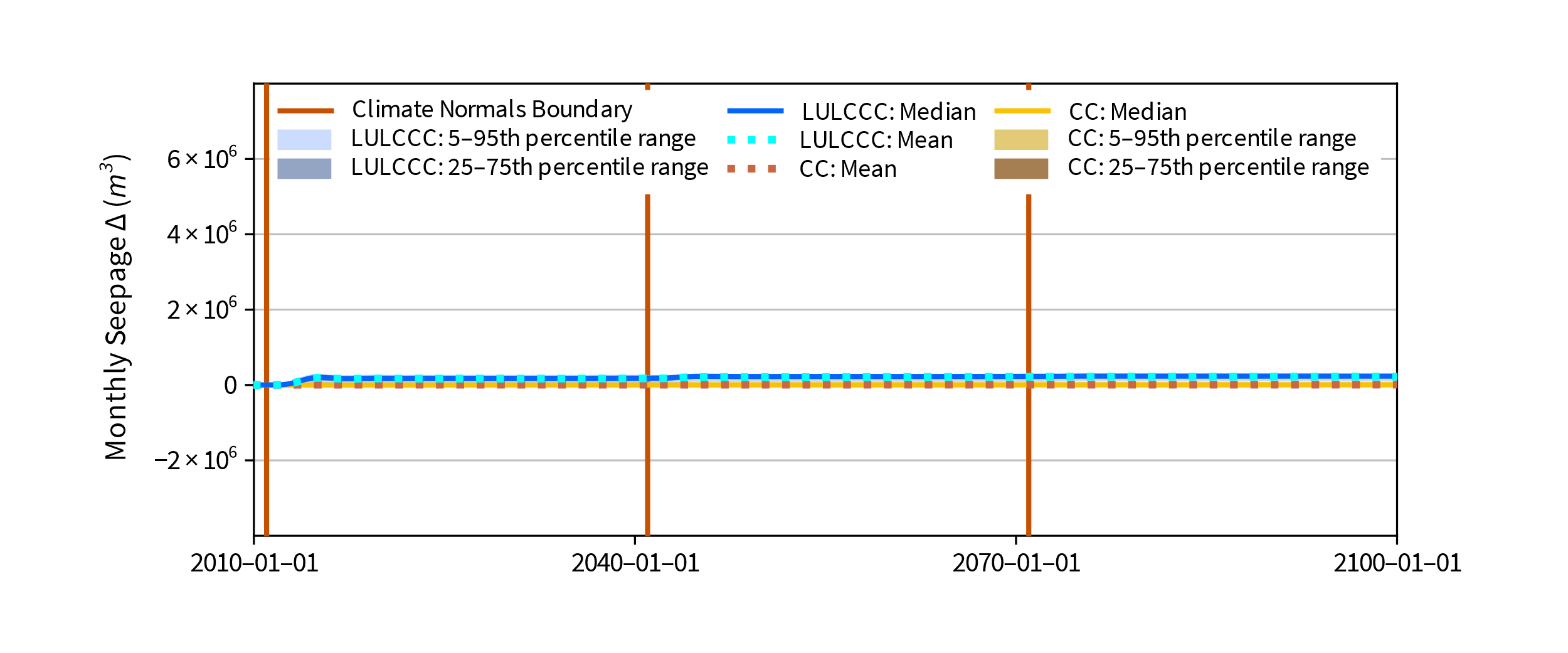
**Figure S 3**. HRU 1 magnitude of change in recharge and associated likelihoods for both scenarios

**.** Increase in impervious area in an HRU increases runoff at the expense of AET and recharge. The LULCCC scenario shows a consistent relative decrease in recharge with the increase in impervious area.



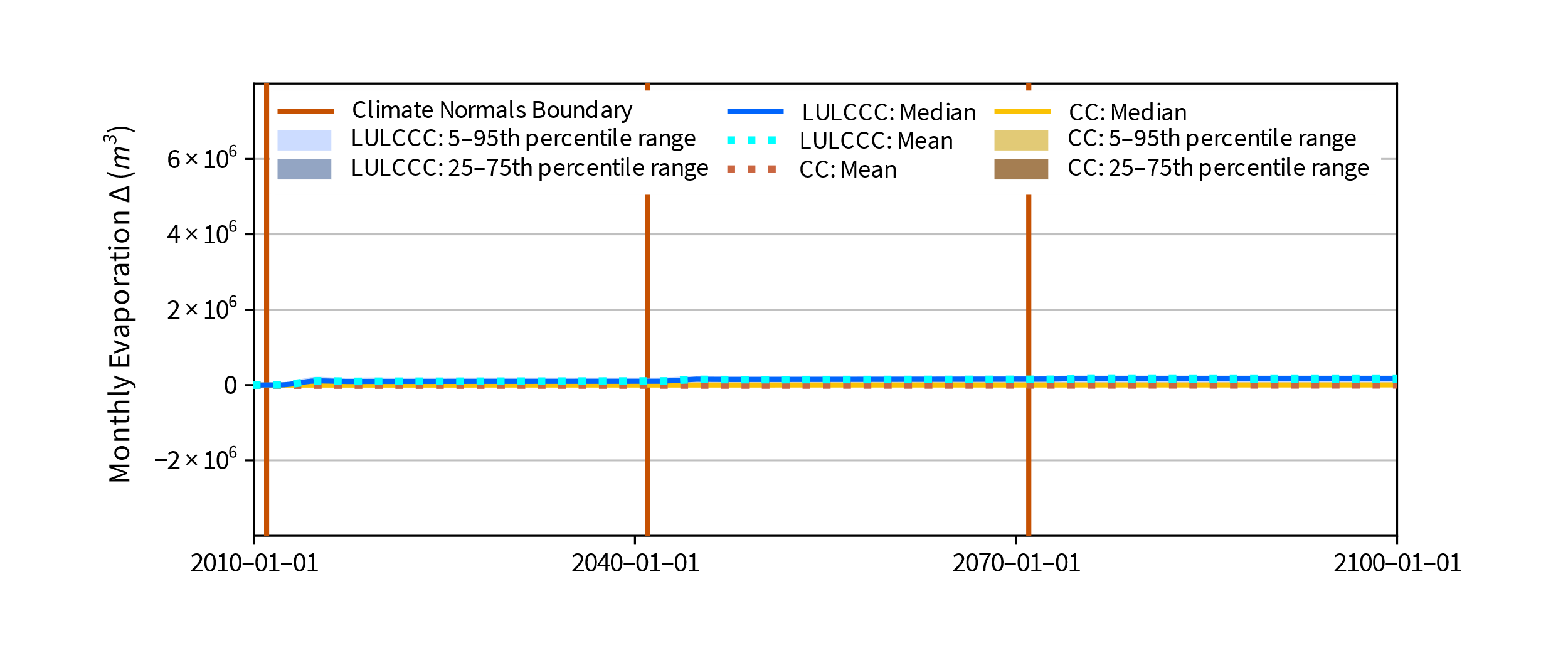
**Figure S 4**. Reach 1 magnitude of change in discharge to Reach 2 and associated likelihoods for both scenarios

**.** Inflows to Reach 1 are runoff from HRU 1 and 2. The increase in runoff from increases in imper-vious area are routed from these HRUs to Reach 1 and then routed downstream to Reach 2.



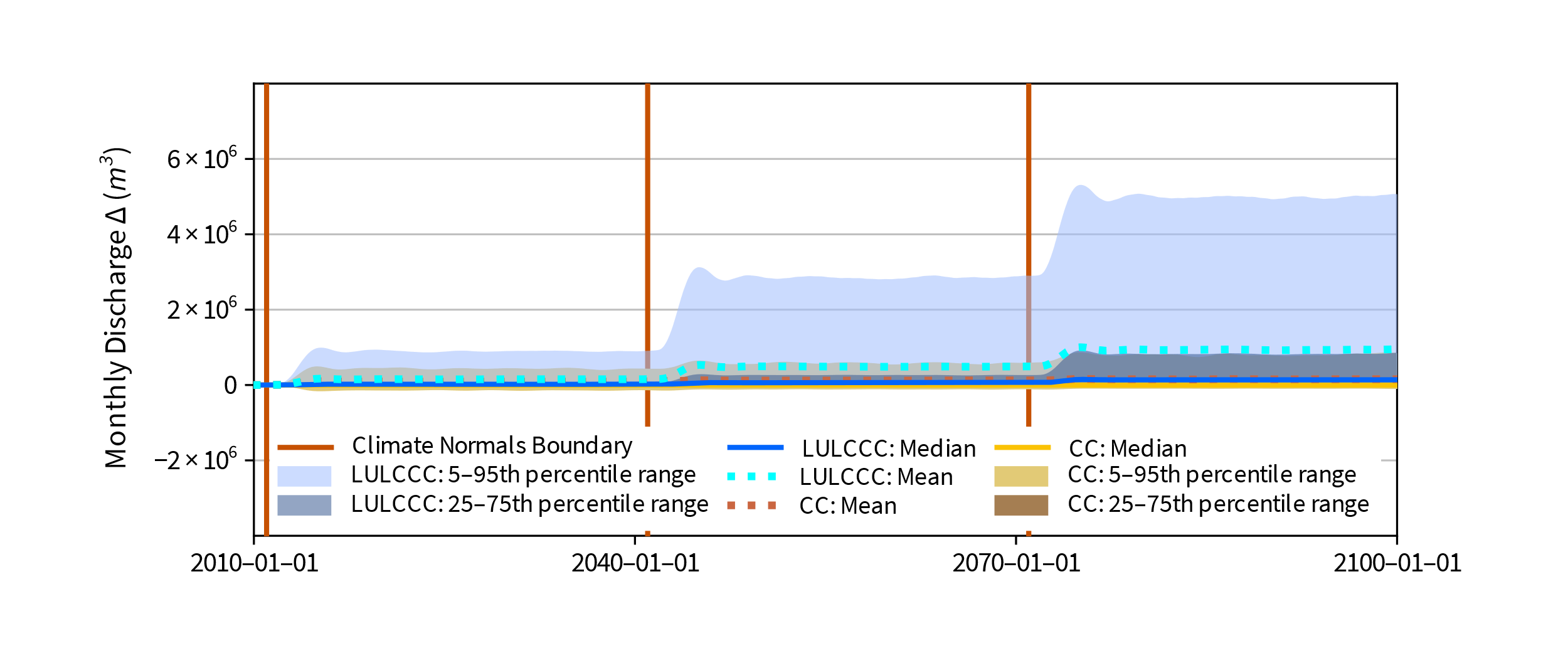
**Figure S 5**. Reach 1 change in seepage and associated likelihoods for both scenarios

**.** Seepage increases slightly on average in the LULCCC scenario because relatively more water is routed through Reach 1 in this scenario and additional water is available to be lost as seepage.



**Figure S 6**. Reach 1 change in evaporation for both scenarios

**.** Reach 1 is generally a losing reach and is frequently dry. Evaporation increases in the LULCCC scenario because evaporation is supply limited in Reach 1, and increased runoff from HRU 1 and 2 increases the supply of water to the extent that there is a higher frequency of flowing water in the reach for evaporation.



**Figure S 7**. Reach 5 magnitude of change in discharge downstream and out of the model and associated likelihoods for both scenarios

**.** Change in discharge from Reach 5 is like change in discharge from Reach 1 in **Figure S 4**. The additional runoff from HRU 1 and 2 in the LULCCC scenario is routed downstream from Reach 1 through Reaches 2, 3, and 4 to Reach 5 and then out of the model.