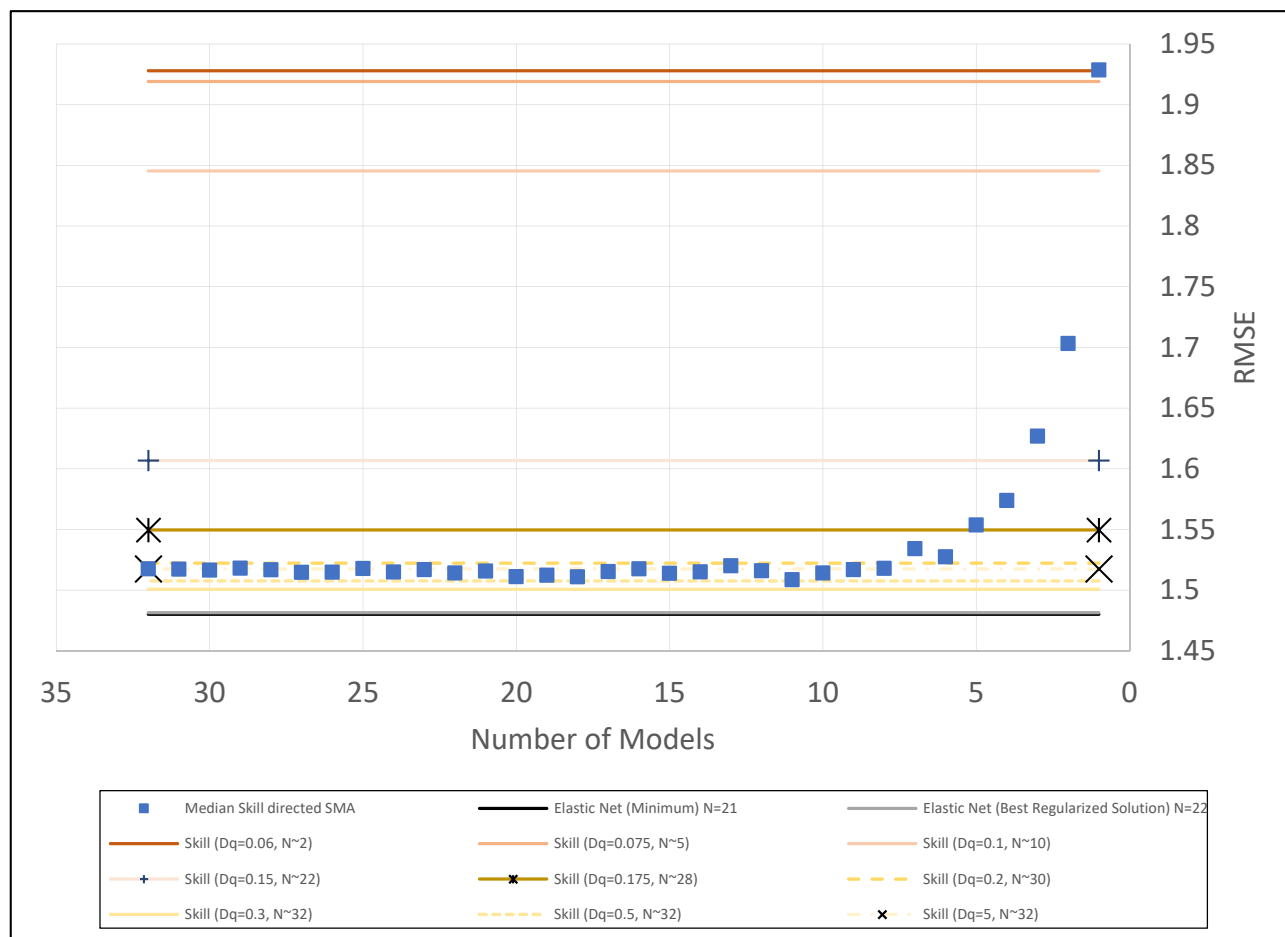
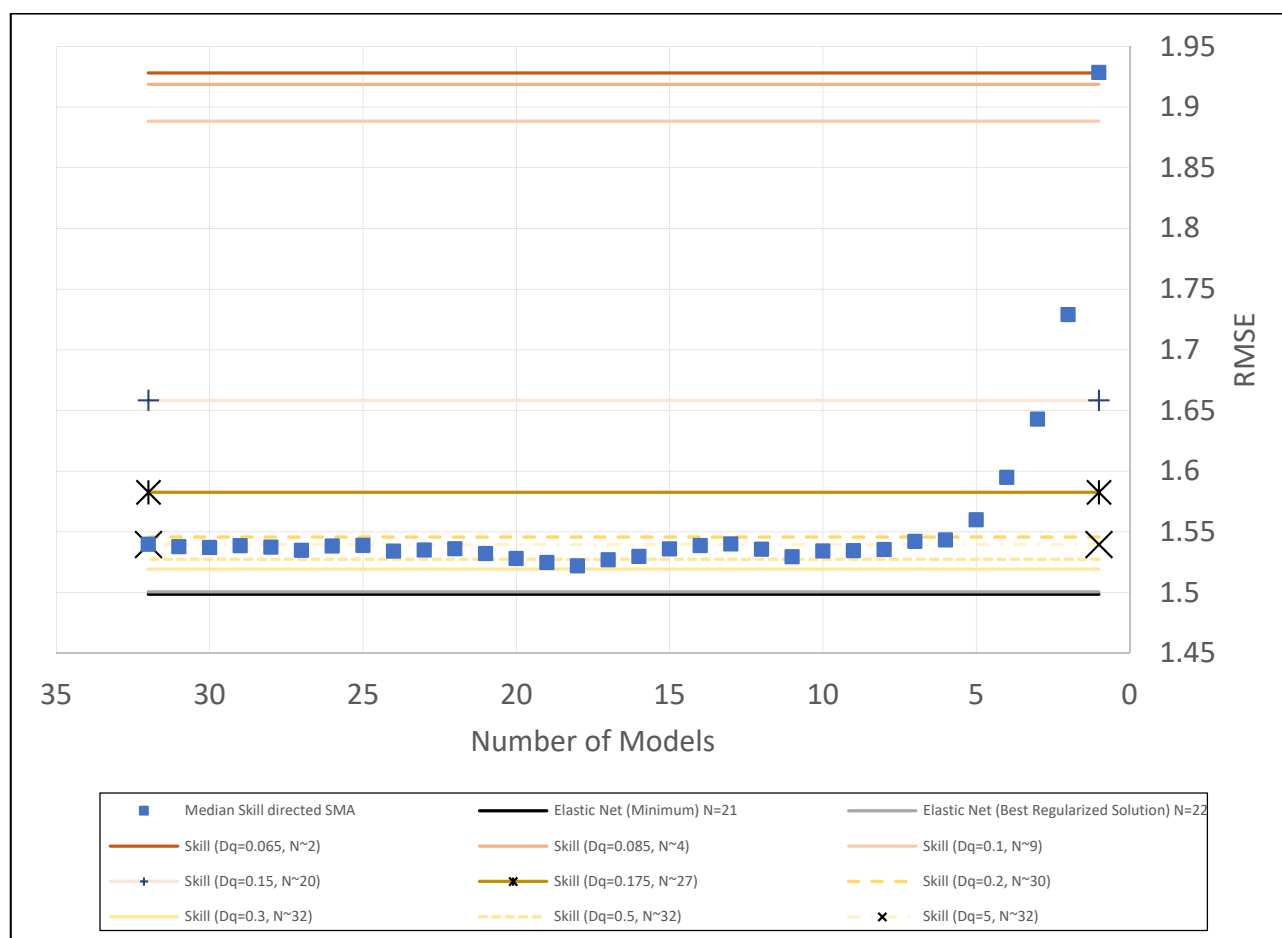


**Table S1.** The 32 models and modeling groups that provided Coupled Model Intercomparison Project phase 5 (CMIP5) data used in this study.

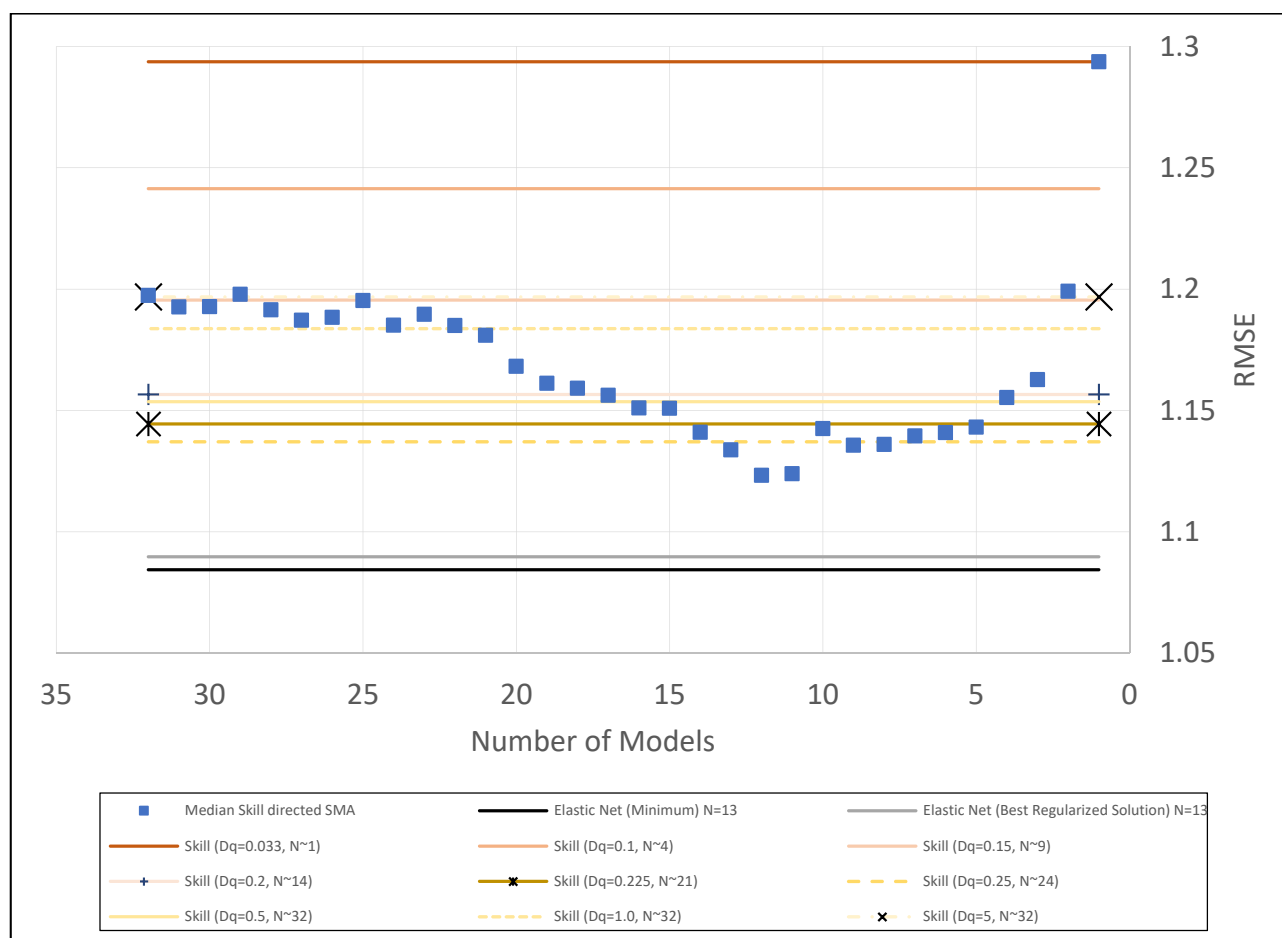
#	Model	Center
1	ACCESS1.0	Commonwealth Scientific and Industrial Research Organization (CSIRO) and Bureau of Meteorology (BOM), Australia
2	ACCESS1.3	Commonwealth Scientific and Industrial Research Organization (CSIRO) and Bureau of Meteorology (BOM), Australia
3	BCC-CSM1.1(m)	Beijing Climate Center, China Meteorological Administration
4	BCC-CSM1.1	Beijing Climate Center, China Meteorological Administration
5	CanESM2	Canadian Centre for Climate Modelling and Analysis
6	CCSM4	National Center for Atmospheric Research
7	CESM1(BGC)	Community Earth System Model Contributors
8	CESM1(CAM5)	Community Earth System Model Contributors
9	CMCC-CM	Centro Euro-Mediterraneo per I Cambiamenti Climatic
10	CMCC-CMS	Centro Euro-Mediterraneo per I Cambiamenti Climatic
11	CNRM-CM5	Centre National de Recherches Météorologiques / Centre Européen de Recherche et Formation Avancée en Calcul Scientifique
12	CSIRO-Mk3.6.0	Commonwealth Scientific and Industrial Research Organization in collaboration with Queensland Climate Change Centre of Excellence
13	EC-EARTH	EC-EARTH consortium
14	FGOALS-g2	LASG, Institute of Atmospheric Physics, Chinese Academy of Sciences and CESS, Tsinghua University
15	GFDL-CM3	NOAA Geophysical Fluid Dynamics Laboratory
16	GFDL-ESM2G	NOAA Geophysical Fluid Dynamics Laboratory
17	GFDL-ESM2M	NOAA Geophysical Fluid Dynamics Laboratory
18	GISS-E2-H	NASA Goddard Institute for Space Studies
19	GISS-E2-R	NASA Goddard Institute for Space Studies
20	HadGEM2-AO	National Institute of Meteorological Research/Korea Meteorological Administration
21	HadGEM2-CC	Met Office Hadley Centre (additional HadGEM2-ES realizations contributed by Instituto Nacional de Pesquisas Espaciais)
22	HadGEM2-ES	Met Office Hadley Centre (additional HadGEM2-ES realizations contributed by Instituto Nacional de Pesquisas Espaciais)
23	INM-CM4	Institute for Numerical Mathematics
24	IPSL-CM5A-LR	Institut Pierre-Simon Laplace
25	IPSL-CM5A-MR	Institut Pierre-Simon Laplace
26	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
27	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
28	MIROC5	Atmosphere and Ocean Research Institute (The University of Tokyo), National Institute for Environmental Studies, and Japan Agency for Marine-Earth Science and Technology
29	MPI-ESM-LR	Max-Planck-Institut für Meteorologie (Max Planck Institute for Meteorology)
30	MPI-ESM-MR	Max-Planck-Institut für Meteorologie (Max Planck Institute for Meteorology)
31	MRI-CGCM3	Meteorological Research Institute



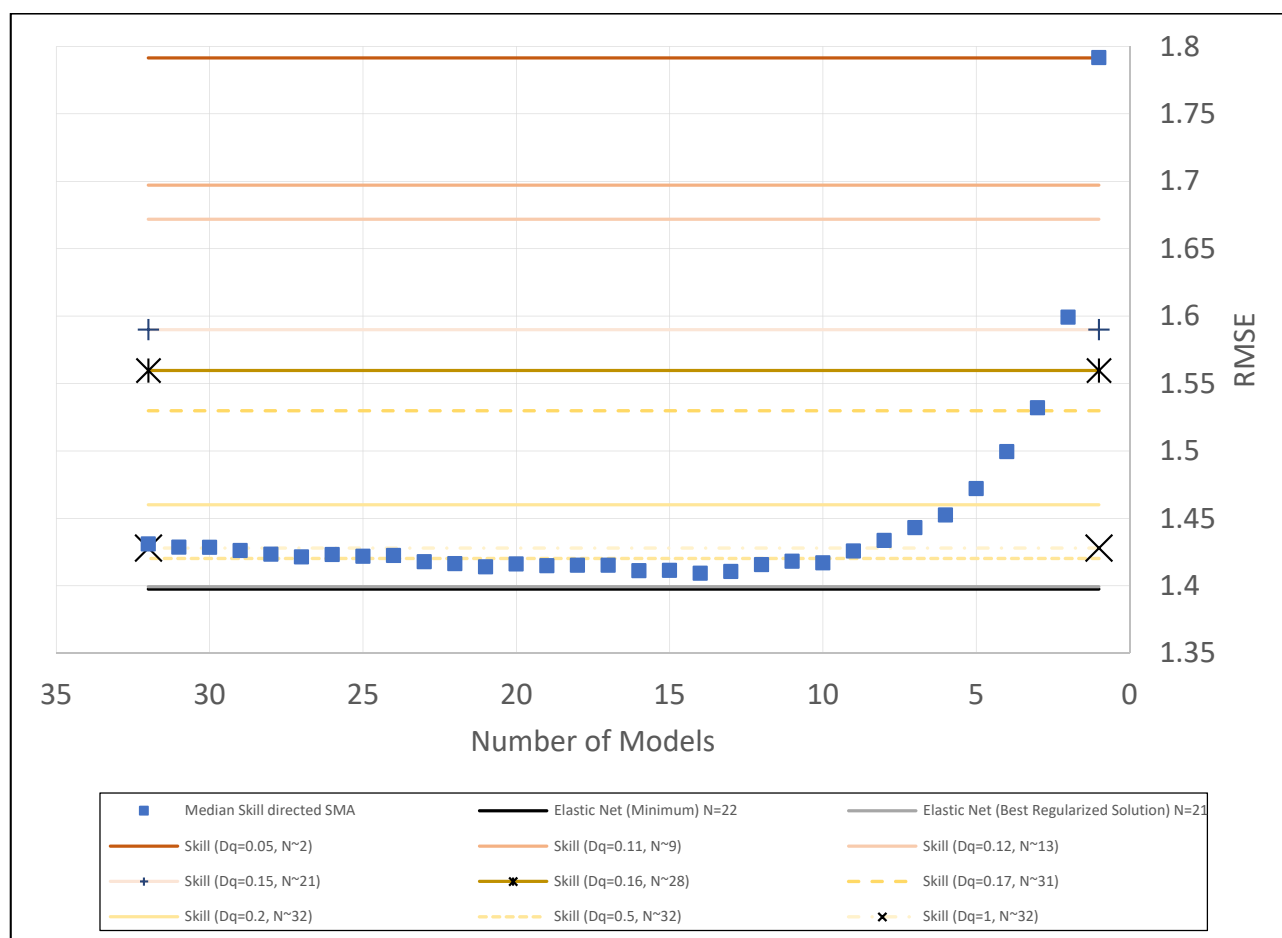
**Figure S1.** For the Willamette Valley American Viticultural Area (AVA) and growing degree days (GDD), computed root mean squared error (RMSE) values obtained by comparing GDD specific processed daily Localized Constructed Analogs (LOCA) Coupled Model Intercomparison Project phase 5 (CMIP5) model historic datasets [40,41] with their equivalently processed observed data counterparts [18,42] using skill weighting, with various values for its radius of model equality,  $D_q$  [17,23], model median skill directed simple model averaging (SMA), and elastic-net regularization [33]. N denotes the number of LOCA CMIP5 models defining the ensemble.



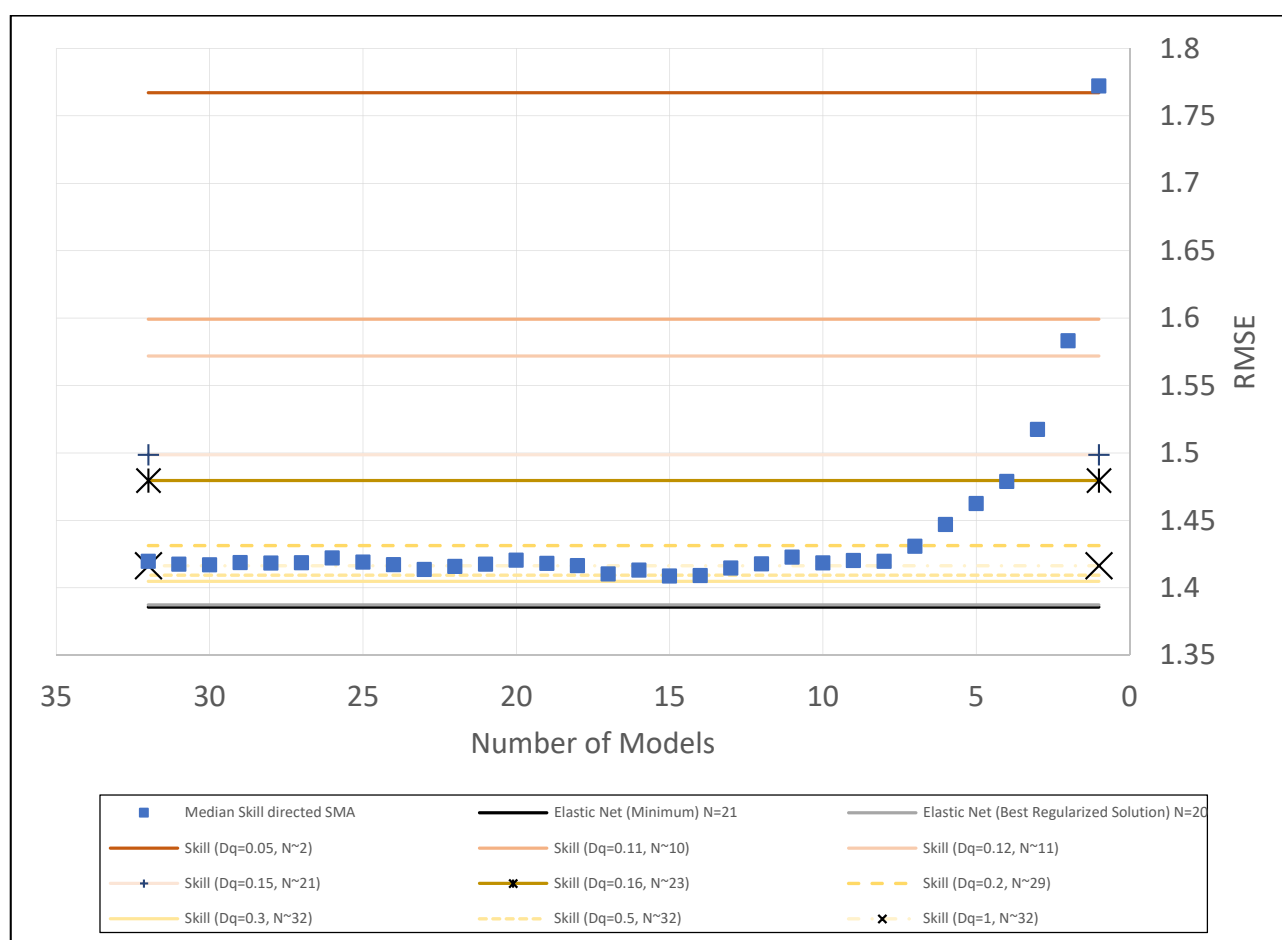
**Figure S2.** For the Willamette Valley American Viticultural Area (AVA) and Huglin index (HI), computed root mean squared error (RMSE) values obtained by comparing HI specific processed daily Localized Constructed Analogs (LOCA) Coupled Model Intercomparison Project phase 5 (CMIP5) model historic datasets [40,41] with their equivalently processed observed data counterparts [18,42] using skill weighting, with various values for its radius of model equality,  $D_q$  [17,23], model median skill directed simple model averaging (SMA), and elastic-net regularization [33]. N denotes the number of LOCA CMIP5 models defining the ensemble.



**Figure S3.** For the Willamette Valley American Viticultural Area (AVA) and cool night index (CI), computed root mean squared error (RMSE) values obtained by comparing CI specific processed daily Localized Constructed Analogs (LOCA) Coupled Model Intercomparison Project phase 5 (CMIP5) model historic datasets [40,41] with their equivalently processed observed data counterparts [18,42] using skill weighting, with various values for its radius of model equality,  $D_q$  [17,23], model median skill directed simple model averaging (SMA), and elastic-net regularization [33]. N denotes the number of LOCA CMIP5 models defining the ensemble.



**Figure S4.** For the Willamette Valley American Viticultural Area (AVA) and dryness index (DI), computed root mean squared error (RMSE) values obtained by comparing DI specific processed daily Localized Constructed Analogs (LOCA) Coupled Model Intercomparison Project phase 5 (CMIP5) model historic datasets [40,41] with their equivalently processed observed data counterparts [18,42] using skill weighting, with various values for its radius of model equality,  $D_q$  [17,23], model median skill directed simple model averaging (SMA), and elastic-net regularization [33]. N denotes the number of LOCA CMIP5 models defining the ensemble.



**Figure S5.** For the Willamette Valley American Viticultural Area (AVA) and Géoviticulture multicriteria climate classification (GMCC), computed root mean squared error (RMSE) values obtained by comparing GMCC specific processed daily Localized Constructed Analogs (LOCA) Coupled Model Intercomparison Project phase 5 (CMIP5) model historic datasets [40,41] with their equivalently processed observed data counterparts [18,42] using skill weighting, with various values for its radius of model equality,  $D_q$  [17,23], model median skill directed simple model averaging (SMA), and elastic-net regularization [33]. N denotes the number of LOCA CMIP5 models defining the ensemble.