



Supplement of

Intercomparison of bias correction methods for precipitation of multiple GCMs across six continents

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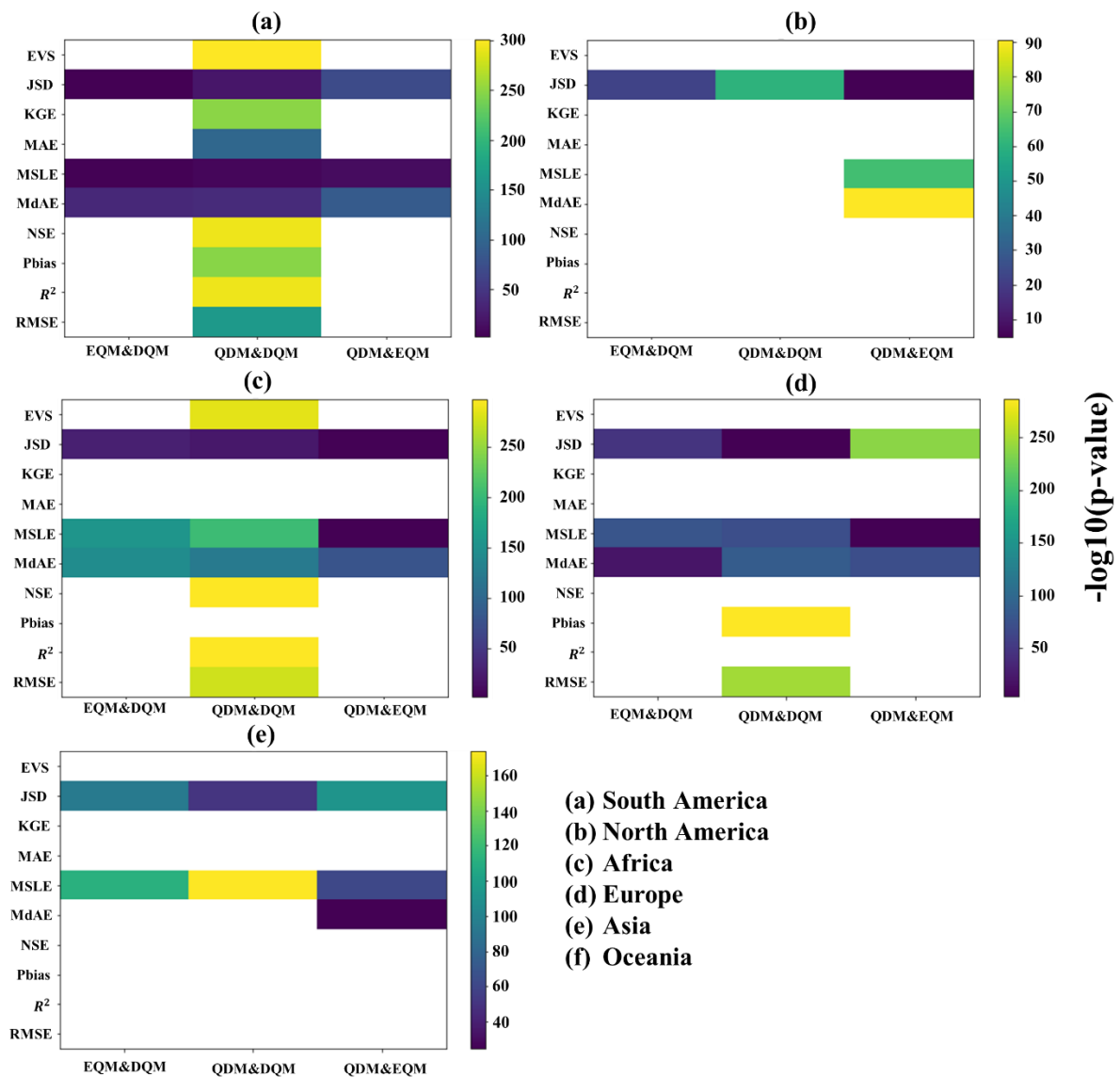


Figure S1. Statistical significance comparison of ten evaluation metrics based on Wilcoxon tests over six continents

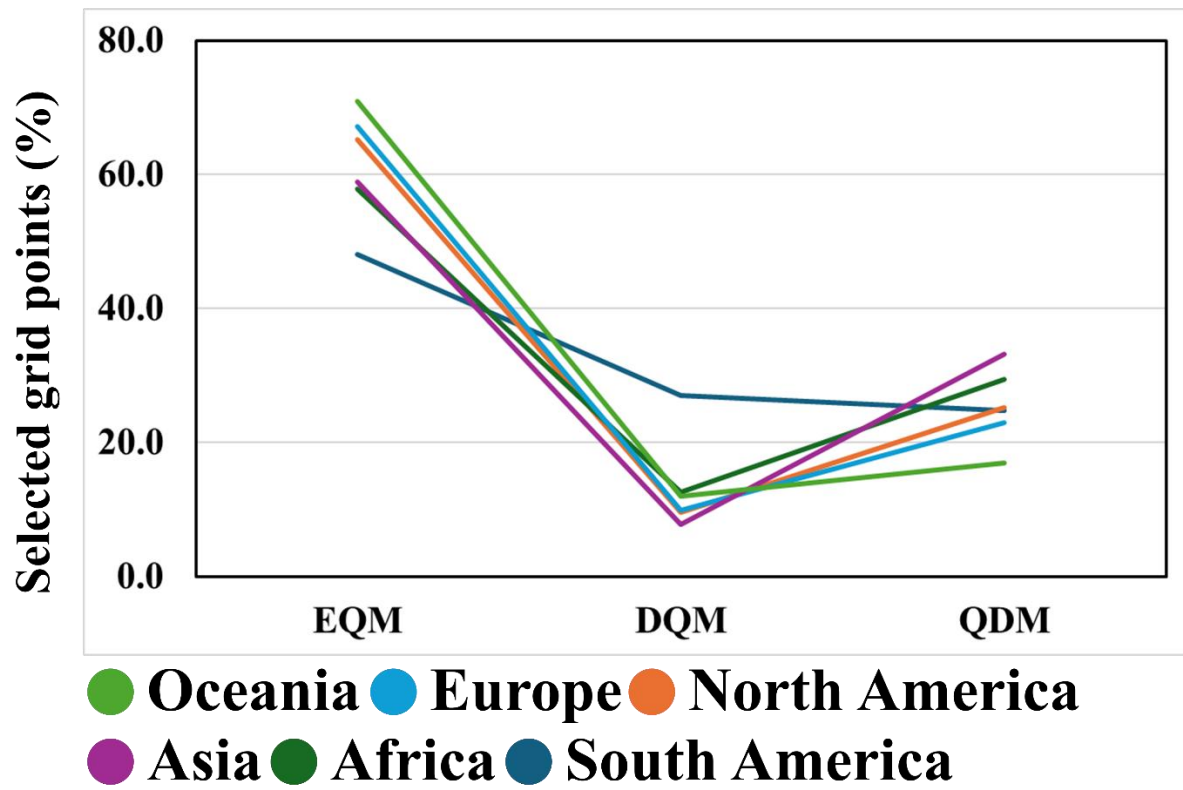


Figure S2. Percentage of selected grid points for best bias correction methods across continents

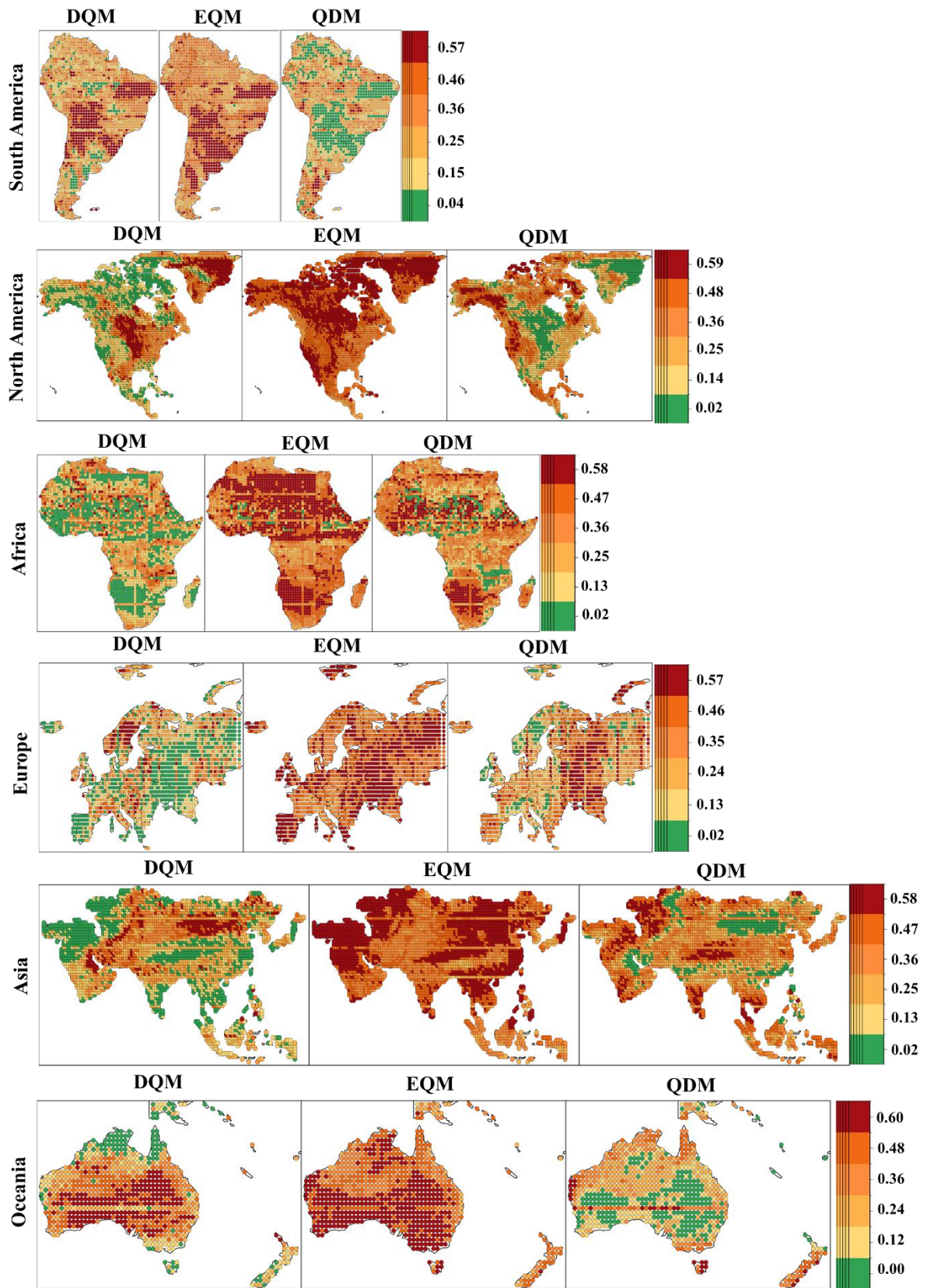


Figure S3. Spatial distribution of comprehensive indices for bias correction methods with the emphasized performance weight ($\alpha: 0.7$, $\beta: 0.3$) across continents

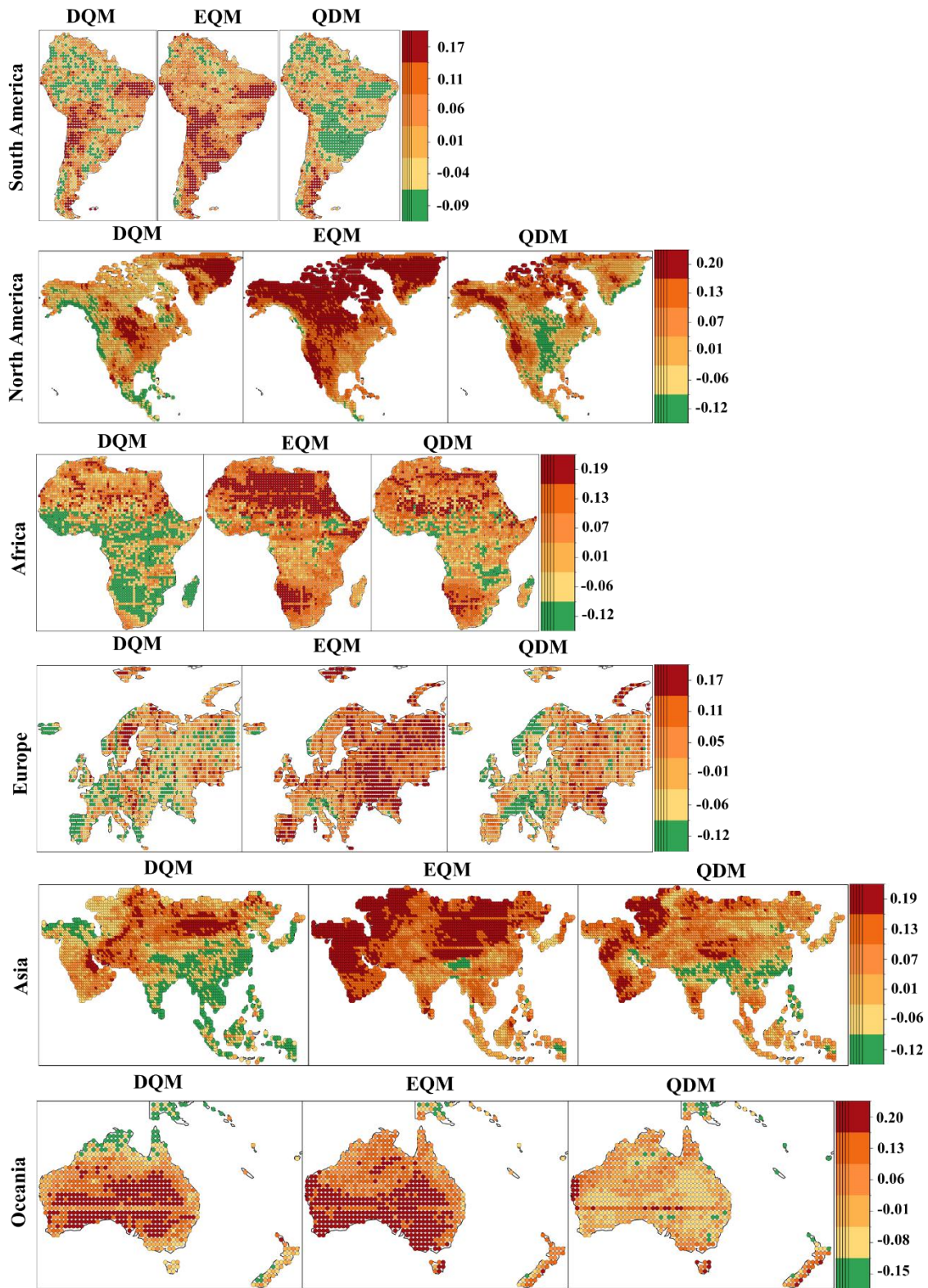


Figure S4. Spatial distribution of comprehensive indices for bias correction methods with emphasized uncertainty weight ($\alpha: 0.3$, $\beta: 0.7$) across continents

Table S1. Statistical significance comparison of ten evaluation metrics based on Friedman tests over six continents

Metrics	South America	North America	Africa	Europe	Asia	Oceania
RMSE	0.000	0.000	0.000	0.000	0.000	0.000
MAE	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.000	0.000	0.000	0.000	0.000	0.000
NSE	0.000	0.000	0.000	0.000	0.000	0.000
KGE	0.000	0.000	0.000	0.000	0.000	0.000
Pbias	0.000	0.000	0.000	0.000	0.000	0.000
MdAE	3.39E-22	0.000	0.000	1.80E-106	0.000	4.28E-172
MSLE	2.21E-09	0.000	1.51E-260	5.14E-109	0.000	7.78E-89
EVS	0.000	0.000	0.000	0.000	0.000	0.000
JSD	5.57E-101	3.19E-50	5.27E-10	1.20E-116	6.29E-79	2.09E-52

Table S2. Friedman test and Wilcoxon paired comparison Test (p-values) by continent for precipitation exceeding the 95th percentile based on the GEV distribution

Continent	Friedman	Wilcoxon		
		DQM & EQM	DQM & QDM	EQM & QDM
South America	4.5399×10^{-5}	0.00195	0.00195	0.00195
North America				
Africa				
Europe				
Asia				
Oceania				

Table S3. P-values of Friedman and Pairwise Wilcoxon tests for DQM, EQM, and QDM across continents under different α/β weightings

$\alpha: 0.5, \beta: 0.5$				
Continents	Friedman	Wilcoxon		
		DQM & EQM	DQM & QDM	EQM & QDM
South America	1.01E-160	1.99E-135	4.53E-16	2.07E-191
North America	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Africa	0.00E+00	0.00E+00	1.75E-234	3.20E-211
Europe	0.00E+00	0.00E+00	1.07E-106	0.00E+00
Asia	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Oceania	0.00E+00	1.76E-266+	3.93E-01	6.93E-287
$\alpha: 0.7, \beta: 0.3$				
South America	2.33E-150	2.69E-120	2.17E-18	4.40E-189
North America	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Africa	0.00E+00	0.00E+00	6.40E-226	3.76E-200
Europe	0.00E+00	0.00E+00	6.42E-129	0.00E+00
Asia	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Oceania	0.00E+00	1.78E-295	1.63E-02	6.49E-285
$\alpha: 0.3, \beta: 0.7$				
South America	3.73E-175	2.50E-160	1.01E-11	8.12E-189
North America	0.00E+00	0.00E+00	1.28E-277	0.00E+00
Africa	0.00E+00	0.00E+00	2.47E-249	2.90E-232
Europe	0.00E+00	0.00E+00	2.08E-59	0.00E+00
Asia	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Oceania	6.63E-250	4.75E-193	3.39E-02	6.27E-285