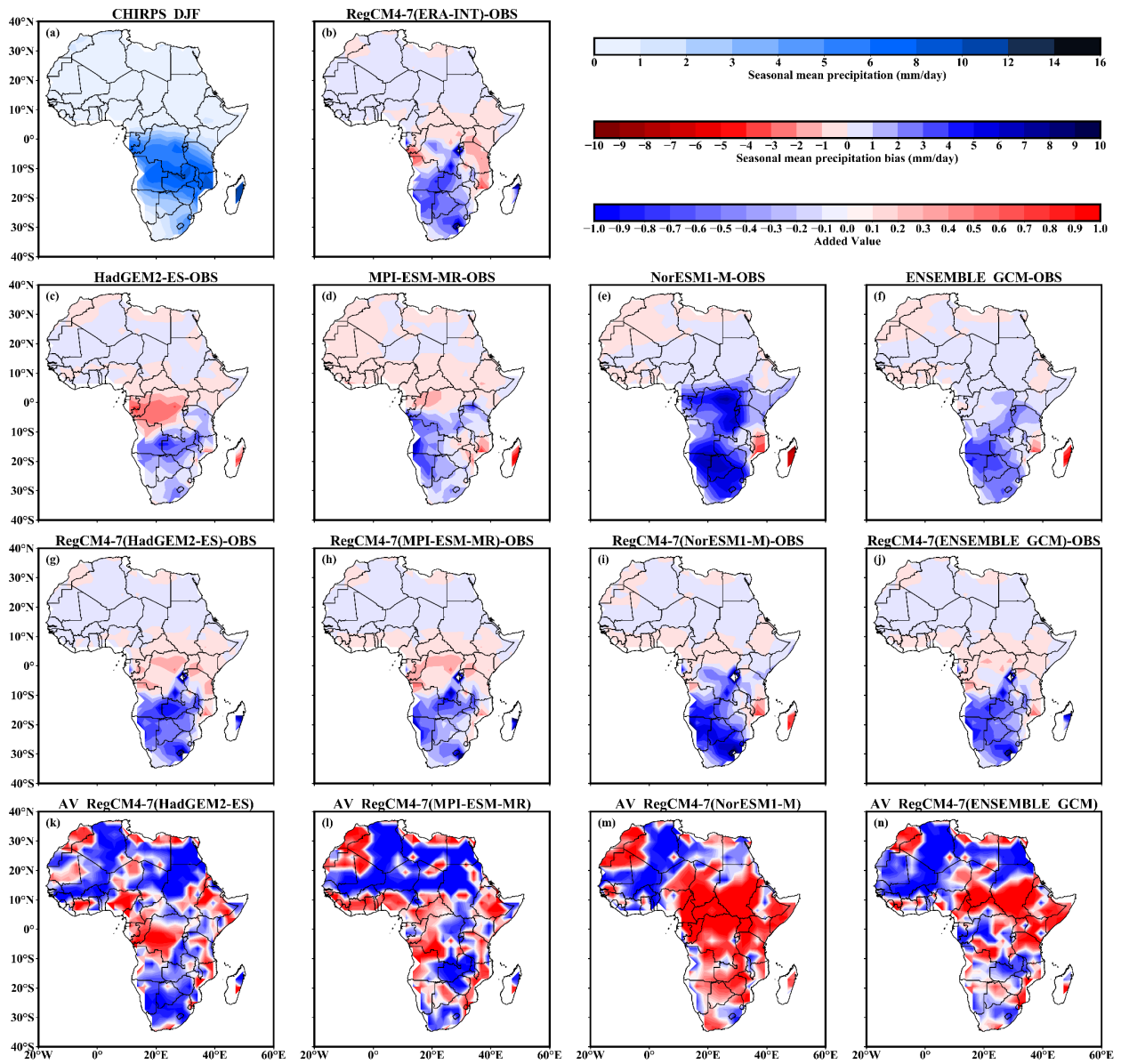
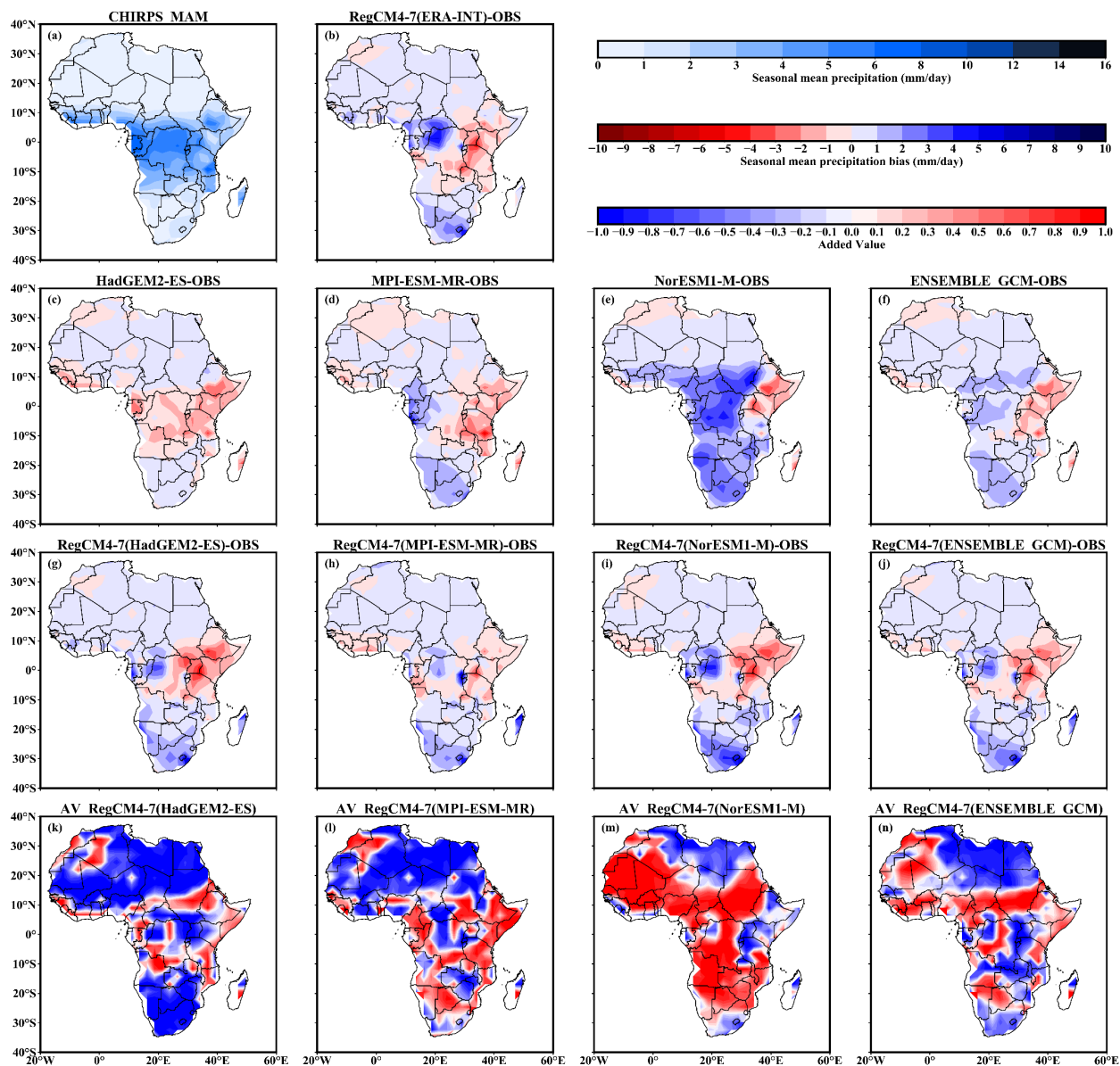


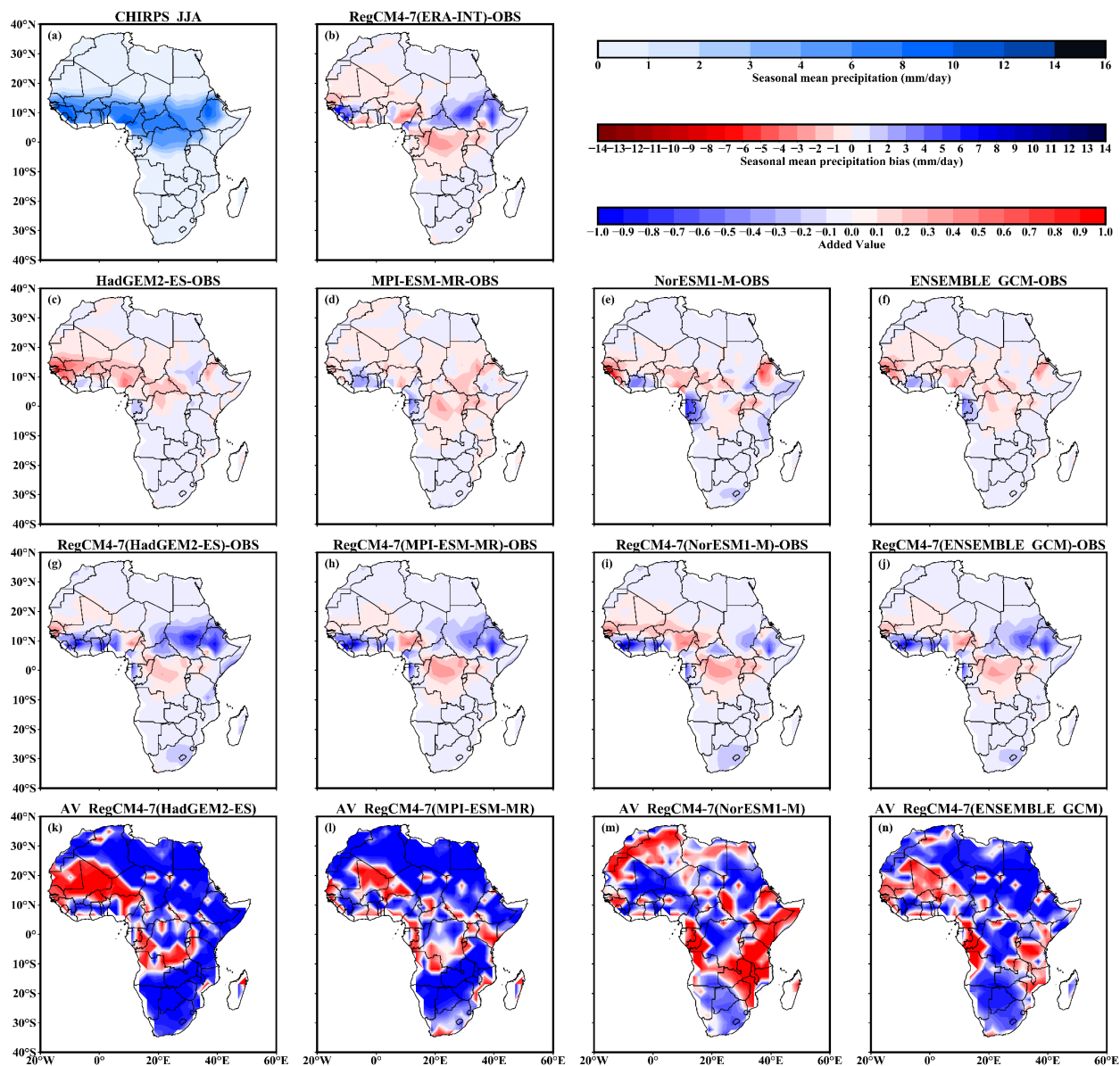
## Supplementary Materials



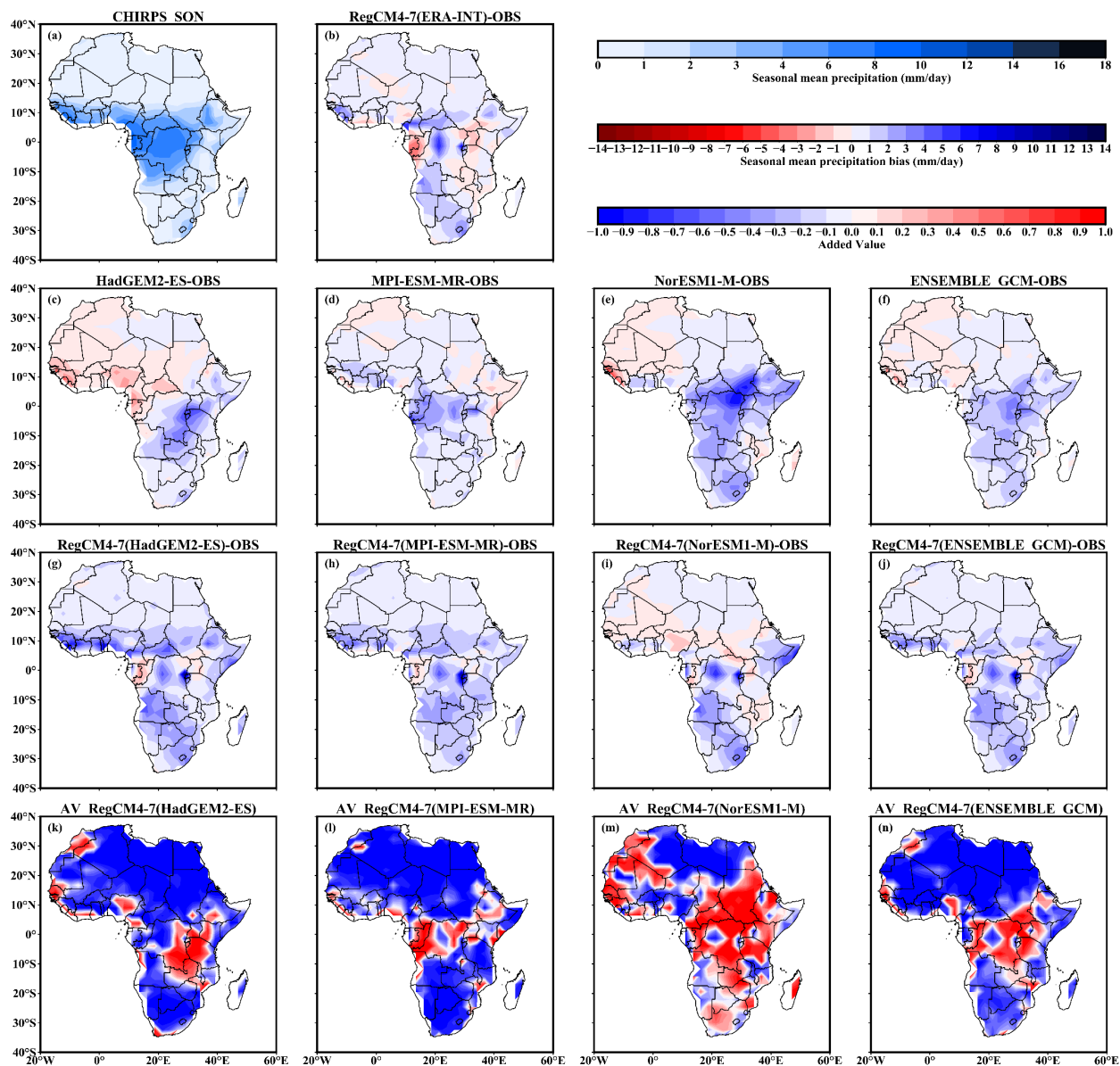
**Figure S1.** Performance of African precipitation in DJF season at low resolution compared to (a) CHIRPS, for (b) RegCM4-7 evaluation run driven by ERA-INT, (c) driving GCM HadGEM2-ES, (d) driving GCM MPI-ESM-MR, (e) driving GCM NorESM1-M, (f) ensemble mean of the driving GCMs, (g) RegCM4-7 historical run driven by HadGEM2-ES, (h) RegCM4-7 historical run driven by MPI-ESM-MR, (i) RegCM4-7 historical run driven by NorESM1-M, (j) RegCM4-7 historical runs' ensemble mean, (k) Added Value by RegCM4-7 to HadGEM2-ES, (l) Added Value by RegCM4-7 to MPI-ESM-MR, (m) Added Value by RegCM4-7 to NorESM1-M, (n) Added Value by RegCM4-7 to ensemble mean of the driving GCMs.



**Figure S2.** Performance of African precipitation in MAM season at low resolution compared to (a) CHIRPS, for (b) RegCM4-7 evaluation run driven by ERA-INT, (c) driving GCM HadGEM2-ES, (d) driving GCM MPI-ESM-MR, (e) driving GCM NorESM1-M, (f) ensemble mean of the driving GCMs, (g) RegCM4-7 historical run driven by HadGEM2-ES, (h) RegCM4-7 historical run driven by MPI-ESM-MR, (i) RegCM4-7 historical run driven by NorESM1-M, (j) RegCM4-7 historical runs' ensemble mean, (k) Added Value by RegCM4-7 to HadGEM2-ES, (l) Added Value by RegCM4-7 to MPI-ESM-MR, (m) Added Value by RegCM4-7 to NorESM1-M, (n) Added Value by RegCM4-7 to ensemble mean of the driving GCMs.



**Figure S3.** Performance of African precipitation in JJA season at low resolution compared to (a) CHIRPS, for (b) RegCM4-7 evaluation run driven by ERA-INT, (c) driving GCM HadGEM2-ES, (d) driving GCM MPI-ESM-MR, (e) driving GCM NorESM1-M, (f) ensemble mean of the driving GCMs, (g) RegCM4-7 historical run driven by HadGEM2-ES, (h) RegCM4-7 historical run driven by MPI-ESM-MR, (i) RegCM4-7 historical run driven by NorESM1-M, (j) RegCM4-7 historical runs' ensemble mean, (k) Added Value by RegCM4-7 to HadGEM2-ES, (l) Added Value by RegCM4-7 to MPI-ESM-MR, (m) Added Value by RegCM4-7 to NorESM1-M, (n) Added Value by RegCM4-7 to ensemble mean of the driving GCMs.



**Figure S4.** Performance of African precipitation in SON season at low resolution compared to (a) CHIRPS, for (b) RegCM4-7 evaluation run driven by ERA-INT, (c) driving GCM HadGEM2-ES, (d) driving GCM MPI-ESM-MR, (e) driving GCM NorESM1-M, (f) ensemble mean of the driving GCMs, (g) RegCM4-7 historical run driven by HadGEM2-ES, (h) RegCM4-7 historical run driven by MPI-ESM-MR, (i) RegCM4-7 historical run driven by NorESM1-M, (j) RegCM4-7 historical runs' ensemble mean, (k) Added Value by RegCM4-7 to HadGEM2-ES, (l) Added Value by RegCM4-7 to MPI-ESM-MR, (m) Added Value by RegCM4-7 to NorESM1-M, (n) Added Value by RegCM4-7 to ensemble mean of the driving GCMs.

**Table S1.** Added Value Coverage results of RegCM4-7 simulations over continental Africa at low resolution for CHIRPS data (LR\_C) and for GPCP data (LR\_G).

		Negative AVC		Non-significant AVC		Positive AVC	
		LR_C	LR_G	LR_C	LR_G	LR_C	LR_G
DJF	RegCM4(HadGEM2-ES)	52.08%	73.67%	26.36%	5.67%	21.56%	20.65%
	RegCM4(MPI-ESM-MR)	53.73%	30.66%	7.45%	8.9%	38.82%	60.44%
	RegCM4(NorESM1-M)	43.4%	37.91%	0%	7.55%	56.6%	54.53%
	RegCM4(ENSEMBLE_GCMS)	60.55%	42%	2.77%	7.55%	35.68%	50.45%
MAM	RegCM4(HadGEM2-ES)	75.43%	41.76%	0%	9.16%	24.57%	49.08%
	RegCM4(MPI-ESM-MR)	56.28%	43.7%	5%	8.85%	38.72%	47.44%
	RegCM4(NorESM1-M)	41.18%	51.92%	0.37%	8.47%	58.45%	39.6%
	RegCM4(ENSEMBLE_GCMS)	51.6%	67.31%	1.23%	8.31%	47.17%	24.39%
JJA	RegCM4(HadGEM2-ES)	53.52%	49.21%	1.16%	6.51%	45.32%	44.28%
	RegCM4(MPI-ESM-MR)	32.3%	43.15%	0%	6.96%	67.7%	49.89%
	RegCM4(NorESM1-M)	26.66%	26.37%	14.25%	10.87%	59.09%	62.76%
	RegCM4(ENSEMBLE_GCMS)	41.04%	39.7%	0.42%	6.17%	58.53%	54.13%
SON	RegCM4(HadGEM2-ES)	49.14%	57.08%	4.3%	6.96%	46.56%	35.96%
	RegCM4(MPI-ESM-MR)	77.47%	75.8%	0%	5.7%	22.53%	18.5%
	RegCM4(NorESM1-M)	37.2%	43.64%	0.13%	7.15%	62.67%	49.21%
	RegCM4(ENSEMBLE_GCMS)	55.54%	57.22%	0.09%	6.48%	44.37%	36.3%