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American Meteorological Society

Supplemental Material

Journal of Climate

A New Method for Assessing the Performance of General Circulation Models Based on Their Ability to Simulate the Response to Observed Forcing
<https://doi.org/10.1175/JCLI-D-20-0510.1>

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Table A. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to TRF and natural variability indices included in the final regression models in the first-stage of equation 6 in paper for each domain using the HadCRUT4 dataset.

Region/ Term	Gbl	Ama	Aus	Chi	EuN	EuW	Mex	SAf	USA
$\hat{\alpha}^m$	$\hat{\alpha}^m=-0.1290^{***}$ (0.0544)	$\hat{\alpha}^m=-0.0847^{**}$ (0.0717)	$\hat{\alpha}^m=-0.4106^{***}$ (0.1173)	$\hat{\alpha}^m=-0.1318^{***}$ (0.0876)	$\hat{\alpha}^m=-0.1998^{**}$ (0.1971)	$\hat{\alpha}^m=-0.1844^{***}$ (0.1066)	$\hat{\alpha}^m=-0.1134^{***}$ (0.0731)	$\hat{\alpha}^m=-0.3619^{***}$ (0.1416)	$\hat{\alpha}^m=-0.1367^{**}$ (0.1234)
TRF _t	$\hat{\beta}_1=0.2079^{***}$ (0.0728)	$\hat{\beta}_1=0.1087^{**}$ (0.0945)	$\hat{\beta}_1=0.4187^{***}$ (0.1298)	$\hat{\beta}_1=0.3314^{***}$ (0.1337)	$\hat{\beta}_1=0.4494^{***}$ (0.2422)	$\hat{\beta}_1=0.4028^{***}$ (0.1405)	$\hat{\beta}_1=0.2725^{***}$ (0.1031)	$\hat{\beta}_1=0.3975^{***}$ (0.1575)	$\hat{\beta}_1=0.3443^{***}$ (0.1576)
AMO _t	$\hat{\theta}_1=0.4437^{***}$ (0.1104)	$\hat{\theta}_1=0.9816^{***}$ (0.2916)	-	$\hat{\theta}_1=0.6538^{***}$ (0.3482)	-	$\hat{\theta}_1=0.9584^{***}$ (0.3259)	$\hat{\theta}_1=0.5739^{***}$ (0.2848)	-	$\hat{\theta}_1=0.8787^{***}$ (0.4019)
AMO _{t-1}	$\hat{\theta}_2=-0.2068^{***}$ (0.1336)	$\hat{\theta}_2=-0.7072^{***}$ (0.2956)	-	$\hat{\theta}_2=-0.3783^{**}$ (0.3718)	$\hat{\theta}_1=1.1644^{***}$ (0.6261)	-	-	-	-
AMO _{t-3}	-	-	-	-	-	-	$\hat{\theta}_2=0.3212^{**}$ (0.2563)	-	-
PDO _t	-	-	-	-	-	$\hat{\theta}_2=-0.0601$ (0.0826)	$\hat{\theta}_3=0.0610^*$ (0.0644)	-	-
PDO _{t-1}	$\hat{\theta}_3=-0.207^{**}$ (0.0181)	-	-	-	-	-	$\hat{\theta}_4=-0.0587^*$ (0.0596)	-	-
NPI _t	-	-	-	-	-	-	-	$\hat{\theta}_1=-0.0029$ (0.0256)	-
NAM _t	-	-	-	-	-	$\hat{\theta}_3=0.1294^{***}$ (0.0710)	$\hat{\theta}_5=0.0205$ (0.0482)	-	-
NAM _{t-2}	-	-	-	-	-	-	$\hat{\theta}_6=0.0059$ (0.0389)	-	-
NAO _t	-	-	-	-	$\hat{\theta}_2=0.8921^{***}$ (0.2535)	$\hat{\theta}_4=0.2563^{***}$ (0.1487)	$\hat{\theta}_7=0.1262^{**}$ (0.1019)	-	-
SOI _t	$\hat{\theta}_4=-0.0560^{***}$ (0.0216)	-	-	-	-	$\hat{\theta}_5=0.0601$ (0.0915)	$\hat{\theta}_8=-0.0519$ (0.0645)	$\hat{\theta}_2=-0.1943^{***}$ (0.0754)	-
SOI _{t-1}	-	-	-	-	$\hat{\theta}_3=0.1663^*$ (0.1691)	-	-	-	-
DOI _t	-	$\hat{\theta}_3=0.2400^{***}$ (0.1258)	-	$\hat{\theta}_3=0.1121$ (0.1572)	-	-	-	-	-
DOI _{t-1}	-	-	$\hat{\theta}_1=0.1833^{**}$ (0.1490)	-	-	-	-	$\hat{\theta}_3=0.1696^*$ (0.1730)	-
DOI _{t-2}	-	$\hat{\theta}_4=-0.1411^{**}$ (0.1324)	-	-	-	-	-	-	-
SAM _t	-	-	$\hat{\theta}_2=0.1071^*$ (0.1185)	$\hat{\theta}_4=0.1187^*$ (0.1299)	-	-	-	-	-
SAM _{t-1}	-	-	$\hat{\theta}_3=-0.0586$ (0.1217)	-	-	-	-	$\hat{\theta}_4=-0.0604$ (0.1326)	-
SAM _{t-2}	-	$\hat{\theta}_5=-0.0325$ (0.1031)	-	-	-	-	-	-	-
VOLC _t	$\hat{\theta}_5=0.0537^{***}$ (0.0354)	$\hat{\theta}_6=-0.0832^*$ (0.0901)	-	-	-	-	-	-	-
VOLC _{t-1}	-	-	-	$\hat{\theta}_5=0.2181^{***}$ (0.1499)	-	-	-	-	-
VOLC _{t-2}	-	-	-	$\hat{\theta}_6=-0.2310^{**}$ (0.1849)	-	-	$\hat{\theta}_9=-0.0758$ (0.0986)	$\hat{\theta}_5=0.0863$ (0.1217)	-
VOLC _{t-3}	-	-	-	$\hat{\theta}_7=0.2139^{***}$ (0.1481)	-	-	-	-	-
y_{t-1}^0	$\hat{\varphi}_1=0.3299^{***}$ (0.1741)	$\hat{\varphi}_1=0.5953^{***}$ (0.1676)	$\hat{\varphi}_1=-0.0055$ (0.2081)	$\hat{\varphi}_1=0.3378^{***}$ (0.1897)	$\hat{\varphi}_1=0.2210^{***}$ (0.1572)	$\hat{\varphi}_1=0.0296$ (0.1679)	$\hat{\varphi}_1=0.0646$ (0.1991)	$\hat{\varphi}_1=0.3579^{***}$ (0.1748)	$\hat{\varphi}_1=0.0890$ (0.1959)
y_{t-2}^0	$\hat{\varphi}_2=0.1085$ (0.1371)	-	-	-	-	-	-	-	-
R2	0.92	0.71	0.58	0.69	0.50	0.64	0.67	0.76	0.37
Statistical test	-	-	-	T4	-	-	T1	-	-

- Note: t – j denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i. Significance level: 10% (*), 5%(**), 1%(***) . ± 2 standard errors are given in parentheses. Abbreviations as Figure 1 in paper.

- Statistical tests: T1: Unknown break point (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test).

Table B. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to TRF and natural variability indices included in the final regression models in the first-stage of equation 6 in paper for each domain using the GISTEMP dataset.

Region/ Term	Gbl	Ama	Aus	Chi	EuN	EuW	Mex	SAf	USA
$\hat{\alpha}^m$	$\hat{\alpha}^m=-0.0927^{***}$ (0.0525)	$\hat{\alpha}^m=-0.2764^{***}$ (0.1002)	$\hat{\alpha}^m=-0.3373^{***}$ (0.1078)	$\hat{\alpha}^m=-0.0467$ (0.0878)	$\hat{\alpha}^m=-0.2041^{**}$ (0.1980)	$\hat{\alpha}^m=-0.1071^{**}$ (0.1064)	$\hat{\alpha}^m=-0.1137^{***}$ (0.0728)	$\hat{\alpha}^m=-0.0636$ (0.0802)	$\hat{\alpha}^m=-0.0697$ (0.1174)
TRF _t	$\hat{\beta}_1=0.1966^{***}$ (0.0831)	$\hat{\beta}_1=0.4479^{***}$ (0.1528)	$\hat{\beta}_1=0.5208^{***}$ (0.1487)	$\hat{\beta}_1=0.3195^{***}$ (0.1393)	$\hat{\beta}_1=0.5134^{***}$ (0.2461)	$\hat{\beta}_1=0.4273^{***}$ (0.1476)	$\hat{\beta}_1=0.2597^{***}$ (0.1040)	$\hat{\beta}_1=0.2149^{***}$ (0.1114)	$\hat{\beta}_1=0.3272^{***}$ (0.1522)
AMO _t	$\hat{\theta}_1=0.3722^{***}$ (0.1168)	$\hat{\theta}_1=1.0312^{***}$ (0.2585)	-	$\hat{\theta}_1=0.5039^{***}$ (0.3874)	-	$\hat{\theta}_1=0.9333^{***}$ (0.3400)	$\hat{\theta}_1=0.5749^{***}$ (0.2857)	-	$\hat{\theta}_1=0.9128^{***}$ (0.3925)
AMO _{t-1}	$\hat{\theta}_2=-0.2611^{***}$ (0.1341)	$\hat{\theta}_2=-0.5876^{***}$ (0.2663)	-	$\hat{\theta}_2=-0.2496$ (0.4045)	$\hat{\theta}_1=1.0809^{***}$ (0.6282)	-	-	-	-
AMO _{t-3}	-	-	-	-	-	-	$\hat{\theta}_2=0.2567^{**}$ (0.2509)	-	-
PDO _t	-	-	-	-	-	$\hat{\theta}_2=-0.0399$ (0.0855)	$\hat{\theta}_3=0.0927^{***}$ (0.0639)	-	-
PDO _{t-1}	$\hat{\theta}_3=-0.0134$ (0.0198)	-	-	-	-	-	$\hat{\theta}_4=-0.0480$ (0.0596)	-	-
NPI _t	-	-	-	-	-	-	-	$\hat{\theta}_1=-0.0093$ (0.0232)	-
NAM _t	-	-	-	-	-	$\hat{\theta}_3=0.1422^{***}$ (0.0741)	$\hat{\theta}_5=0.0199$ (0.0476)	-	-
NAM _{t-2}	-	-	-	-	-	-	$\hat{\theta}_6=0.0007$ (0.0387)	-	-
NAO _t	-	-	-	-	$\hat{\theta}_2=0.9205^{***}$ (0.2548)	$\hat{\theta}_4=0.2494^{***}$ (0.1554)	$\hat{\theta}_7=0.1156^{**}$ (0.1007)	-	-
SOI _t	$\hat{\theta}_4=-0.0474^{***}$ (0.0231)	-	-	-	-	$\hat{\theta}_5=0.0657$ (0.0950)	$\hat{\theta}_8=-0.0448$ (0.0638)	$\hat{\theta}_2=-0.1522^{***}$ (0.0674)	-
SOI _{t-1}	-	-	-	-	$\hat{\theta}_3=0.1640^*$ (0.1694)	-	-	-	-
DOI _t	-	$\hat{\theta}_3=0.2194^{***}$ (0.1111)	-	$\hat{\theta}_3=0.1854^{**}$ (0.1751)	-	-	-	-	-
DOI _{t-1}	-	-	$\hat{\theta}_1=0.1748^{**}$ (0.1485)	-	-	-	-	$\hat{\theta}_3=0.1132$ (0.1563)	-
DOI _{t-2}	-	$\hat{\theta}_4=-0.1004^*$ (0.1147)	-	-	-	-	-	-	-
SAM _t	-	-	$\hat{\theta}_2=0.0932$ (0.1175)	$\hat{\theta}_4=0.1657^{***}$ (0.1457)	-	-	-	-	-
SAM _{t-1}	-	-	$\hat{\theta}_3=-0.0787$ (0.1201)	-	-	-	-	$\hat{\theta}_4=0.0166$ (0.1216)	-
SAM _{t-2}	-	$\hat{\theta}_5=-0.0985^{**}$ (0.0908)	-	-	-	-	-	-	-
VOLC _t	$\hat{\theta}_5=0.0647^{***}$ (0.0381)	$\hat{\theta}_6=-0.0783^*$ (0.0794)	-	-	-	-	-	-	-
VOLC _{t-1}	-	-	-	$\hat{\theta}_5=0.2464^{***}$ (0.1668)	-	-	-	-	-
VOLC _{t-2}	-	-	-	$\hat{\theta}_6=-0.2090^{**}$ (0.2066)	-	-	$\hat{\theta}_9=-0.0848^*$ (0.0974)	$\hat{\theta}_5=0.0887$ (0.1091)	-
VOLC _{t-3}	-	-	-	$\hat{\theta}_7=0.1952^{**}$ (0.1648)	-	-	-	-	-
y_{t-1}^0	$\hat{\varphi}_1=0.4232^{***}$ (0.1812)	$\hat{\varphi}_1=0.3829^{***}$ (0.1805)	$\hat{\varphi}_1=0.0265$ (0.2088)	$\hat{\varphi}_1=0.2637^{***}$ (0.1926)	$\hat{\varphi}_1=0.2096^{***}$ (0.1567)	$\hat{\varphi}_1=0.0167$ (0.1718)	$\hat{\varphi}_1=0.1174$ (0.2035)	$\hat{\varphi}_1=0.2699^{***}$ (0.1853)	$\hat{\varphi}_1=0.0901$ (0.1940)
y_{t-2}^0	$\hat{\varphi}_1=0.1413^{***}$ (0.1505)	-	-	-	-	-	-	-	-
R2	0.93	0.90	0.68	0.62	0.51	0.63	0.69	0.55	0.38
Statistical test	T3	-	-	T6	-	-	-	-	-

- Note: t – j denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable *i*. Significance level: 10% (*), 5%(**), 1%(***) . ± 2 standard errors are given in parentheses. Abbreviations as Figure 1 in paper.

- Statistical tests: T1: Unknown break point (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test).

IPSL-CM5A-MR	0.0006 (0.0194)	0.6632*** (0.1406)	#N/A	0.3929*** (0.117)	-0.3116*** (0.1296)	-0.0192* (0.0194)	-0.0566*** (0.0232)	0.011 (0.045)	0.4363*** (0.176)	0.1211 (0.1526)	0.90		0	0	0	0	0	0	0	0
MIROC5	0.0034 (0.0268)	0.9646 (0.1688)	#N/A	0.378*** (0.1288)	-0.4002*** (0.1306)	-0.0151 (0.0212)	-0.059*** (0.0254)	0.0396 (0.0492)	0.6139*** (0.1608)	0.2408*** (0.1508)	0.89		0	0	0	0	0	0	0	0
MIROC-ESM	-0.0157 (0.0224)	1.0626*** (0.18)	#N/A	0.3772*** (0.1274)	-0.348*** (0.1328)	-0.0144 (0.0214)	-0.0493*** (0.0256)	-0.0028 (0.0478)	0.6279*** (0.159)	#N/A	0.89		0	1	0	0	0	0	0	0
MPI-ESM-LR	0.0563*** (0.02)	0.3946*** (0.106)	-0.2487*** (0.1282)	0.4153*** (0.1186)	-0.0616 (0.1174)	-0.0031 (0.02)	-0.0424*** (0.0236)	-0.0145 (0.0378)	#N/A	#N/A	0.91	38	0	0	0	0	0	0	0	0
MPI-ESM-MR	0.0123 (0.017)	0.6663*** (0.1258)	#N/A	0.4153*** (0.117)	-0.21*** (0.1348)	-0.0104 (0.0198)	-0.0535*** (0.023)	-0.0101 (0.0424)	0.4077*** (0.1818)	#N/A	0.91		0	0	0	0	0	0	0	0
NorESM1-M	0.0028 (0.0192)	1.0538*** (0.2022)	#N/A	0.4107*** (0.1178)	-0.3412*** (0.1258)	-0.0175* (0.0196)	-0.0526*** (0.0238)	0.0026 (0.0482)	0.4717*** (0.1686)	0.1413* (0.1498)	0.90		0	0	0	0	0	0	0	0
Multimodel	0.0007 (0.0226)	1.5039*** (0.3432)	-0.4847*** (0.2794)	0.3713*** (0.1122)	-0.2435*** (0.123)	-0.0055 (0.0196)	-0.0471*** (0.0224)	-0.0226 (0.0434)	0.2962*** (0.1896)	#N/A	0.92	61	0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0259*** (0.018)	0.8209*** (0.1492)	#N/A	0.337*** (0.1254)	-0.3555*** (0.13)	-0.0137 (0.021)	-0.0469*** (0.0246)	0.0319 (0.0472)	0.5413*** (0.177)	0.1674** (0.1638)	0.91		0	0	0	0	0	0	0	0	
MIROC5	0.0203* (0.0236)	1.0617 (0.1776)	#N/A	0.3574*** (0.135)	-0.4092*** (0.1326)	-0.0157 (0.0228)	-0.0486*** (0.0264)	0.0623** (0.051)	0.6742*** (0.167)	0.2713*** (0.1616)	0.90		0	0	0	0	0	0	0	0	
MIROC-ESM	0.0181* (0.0192)	1.2316** (0.2022)	#N/A	0.3399*** (0.1292)	-0.3844*** (0.1302)	-0.009 (0.0226)	-0.0453*** (0.0254)	0.0376 (0.05)	0.5907*** (0.1752)	0.2124** (0.162)	0.91		0	0	0	0	0	0	0	0	
MPI-ESM-LR	0.058*** (0.0234)	0.8138*** (0.1508)	#N/A	0.3661*** (0.1194)	-0.281*** (0.136)	-0.0105 (0.0204)	-0.0447*** (0.0238)	0.0325 (0.043)	0.4323*** (0.1904)	0.1795** (0.1496)	0.92		0	0	0	0	0	0	0	0	
MPI-ESM-MR	0.0424*** (0.0196)	0.8055*** (0.1534)	#N/A	0.3458*** (0.1212)	-0.3003*** (0.1344)	-0.004 (0.0214)	-0.0492*** (0.0238)	0.0247 (0.0458)	0.455*** (0.189)	0.1696** (0.154)	0.92		0	0	0	0	0	0	0	0	
NorESM1-M	0.0264*** (0.0182)	1.278*** (0.2138)	#N/A	0.3584*** (0.1258)	-0.3742*** (0.1298)	-0.0146 (0.0212)	-0.0448*** (0.0252)	0.0309 (0.0502)	0.5753*** (0.1738)	0.1931** (0.1628)	0.91		0	0	0	0	0	0	0	0	
Multimodel	0.0258** (0.0212)	1.6526*** (0.3234)	-0.3677*** (0.2478)	0.2923*** (0.1268)	-0.3503*** (0.128)	-0.0042 (0.0222)	-0.0406*** (0.0246)	-0.0006 (0.0478)	0.5285*** (0.1796)	#N/A	0.92	34	0	0	0	0	0	0	0	0	1

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	-0.0692** (0.0538)	-0.1715 (0.1906)	0.4444*** (0.2908)	0.9954*** (0.2862)	-0.7327*** (0.2812)	0.2286*** (0.1184)	-0.1636** (0.1278)	-0.0808 (0.1042)	-0.1474*** (0.0882)	0.571*** (0.1572)	0.71	64	0	0	0	0	0	0	0
MIROC5	-0.0536** (0.0438)	-0.3598** (0.1246)	0.6155*** (0.3018)	0.9998*** (0.277)	-0.7127*** (0.276)	0.2453*** (0.1184)	-0.1488** (0.1248)	-0.0612 (0.0982)	-0.1482*** (0.087)	0.5923*** (0.1484)	0.71	90	0	0	0	0	0	0	0
MIROC-ESM	-0.0631** (0.0542)	-0.1712 (0.1804)	0.4543*** (0.3268)	0.9902*** (0.2828)	-0.714*** (0.288)	0.2357*** (0.1242)	-0.1301** (0.1284)	-0.069 (0.1038)	-0.1173*** (0.0864)	0.5813*** (0.156)	0.69	85	0	0	0	0	0	0	0
MPI-ESM-LR	-0.0138 (0.0416)	0.3689*** (0.112)	#N/A	0.9073*** (0.299)	-0.6674*** (0.2972)	0.2464*** (0.1216)	-0.1335** (0.1302)	-0.0257 (0.1022)	-0.1067** (0.0874)	0.5888*** (0.1622)	0.69		0	0	0	0	0	0	0
MPI-ESM-MR	-0.0865*** (0.0612)	-0.328 (0.2238)	0.5372*** (0.3506)	0.9624*** (0.2806)	-0.7361*** (0.2804)	0.2314*** (0.124)	-0.1249* (0.1268)	-0.0734 (0.1022)	-0.1312*** (0.0864)	0.5402*** (0.1648)	0.7	79	0	0	0	0	0	0	0
NorESM1-M	-0.0559** (0.0466)	-0.2781 (0.2114)	0.5073*** (0.3156)	0.9853*** (0.284)	-0.7469*** (0.2828)	0.2522*** (0.1232)	-0.1422** (0.129)	-0.048 (0.1008)	-0.1498*** (0.0906)	0.6085*** (0.1618)	0.7	90	0	0	0	0	0	0	0
Multimodel	-0.1066*** (0.0652)	-0.7075* (0.4054)	0.918*** (0.5692)	0.9771*** (0.2792)	-0.6939*** (0.2776)	0.2179*** (0.1202)	-0.1322** (0.1248)	-0.0832 (0.1018)	-0.1454*** (0.086)	0.5042*** (0.1664)	0.71	74	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

Table F. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$ total (long run) effects, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to GCM and natural variability indices included in the final regression models and statistical tests (T1 to T9) applied to regressions for the Amazon domain using the GISTEMP dataset.

MCG	α^m	$\hat{\beta}_1 \overline{y_t^m}$	Dummy	$\hat{\theta}_1 AMO_t$	$\hat{\theta}_2 AMO_{t-1}$	$\hat{\theta}_3 DOI_t$	$\hat{\theta}_4 DOI_{t-2}$	$\hat{\theta}_5 SAM_{t-2}$	$\hat{\theta}_5 VOLC_t$	$\hat{\varphi}_1 y_{t-1}^o$	R2	T1	T2	T3	T4	T5	T6	T7	T8	T9
ACCESS1-0	-0.0301 (0.042)	1.1253*** (0.1886)	#N/A	0.9353*** (0.2864)	-0.7951*** (0.2766)	0.2683*** (0.121)	-0.0779 (0.1264)	-0.0543 (0.0984)	-0.1474*** (0.092)	0.7255*** (0.1102)	0.87		0	1	0	0	0	1	0	0
ACCESS1-3	-0.0289 (0.0432)	1.1469*** (0.1758)	#N/A	0.8354*** (0.2968)	-0.7581*** (0.282)	0.3015*** (0.1194)	-0.1058 (0.1296)	-0.0835 (0.1014)	-0.1086** (0.0882)	0.7938*** (0.0974)	0.87		0	1	0	0	1	1	0	0
CanESM2	-0.0055 (0.0412)	0.4873** (0.1154)	#N/A	0.9578*** (0.2956)	-0.7869*** (0.2836)	0.3118*** (0.1192)	-0.0831 (0.1296)	-0.0904* (0.1034)	-0.1182** (0.0904)	0.7085*** (0.1326)	0.86		0	1	0	0	0	0	0	0
CCSM4	0.0015 (0.0392)	0.9876*** (0.202)	#N/A	0.9*** (0.2776)	-0.6675*** (0.2736)	0.2736*** (0.1152)	-0.1046* (0.123)	-0.0817* (0.0958)	-0.1562*** (0.0888)	0.5834*** (0.1478)	0.88		0	1	0	0	0	0	0	0
CNRM-CM5	-0.0416* (0.0436)	1.3917*** (0.2956)	#N/A	0.8674*** (0.2842)	-0.6999*** (0.2772)	0.2753*** (0.1182)	-0.0566 (0.1262)	-0.0979* (0.0994)	-0.186*** (0.0998)	0.6229*** (0.145)	0.87		0	1	0	0	0	0	0	0
CSIRO-Mk3-6-0	-0.0513** (0.0492)	1.1375*** (0.2104)	#N/A	0.8992*** (0.2888)	-0.8601*** (0.2844)	0.3308*** (0.1168)	-0.0713 (0.128)	-0.0814 (0.1)	-0.132*** (0.0904)	0.7232*** (0.1148)	0.87		0	0	0	0	0	0	0	0
CSIRO-Mk3L-1	0.0209 (0.0398)	1.302*** (0.1858)	#N/A	0.8949*** (0.2694)	-0.7586*** (0.2604)	0.2726*** (0.1112)	-0.0582 (0.1196)	-0.0719 (0.0926)	-0.1326*** (0.0824)	0.6592*** (0.1112)	0.89		0	0	0	0	1	1	0	0
EC-EARTH	0.0418 (0.0508)	1.3051*** (0.2756)	0.2915 (0.4586)	0.8712*** (0.2674)	-0.8711*** (0.2598)	0.2541*** (0.1114)	-0.0313 (0.1214)	-0.0913* (0.0946)	-0.0901** (0.084)	0.4992*** (0.152)	0.89	96	0	1	0	0	0	0	0	0
FGOALS-g2	0.0172 (0.0416)	0.8841*** (0.1808)	#N/A	0.9872*** (0.2822)	-0.7185*** (0.2718)	0.2889*** (0.1146)	-0.0852 (0.1234)	-0.072 (0.0962)	-0.1206*** (0.085)	0.6016*** (0.1452)	0.88		0	1	0	0	0	0	0	0
GFDL-CM3	-0.0428 (0.0636)	-3.2033** (0.5842)	0.8979*** (0.6058)	0.9497*** (0.2926)	-0.8863*** (0.291)	0.2994*** (0.1188)	-0.0241 (0.1346)	-0.074 (0.0998)	-0.1306** (0.1032)	0.7671*** (0.1076)	0.87	28	0	0	0	0	0	0	0	0
GISS-E2-H	-0.0084 (0.0386)	1.1965*** (0.2432)	#N/A	0.9203*** (0.275)	-0.6836*** (0.2694)	0.2465*** (0.1174)	-0.0641 (0.122)	-0.0821* (0.095)	-0.2025*** (0.097)	0.5639*** (0.1498)	0.88		0	0	0	0	0	0	0	0
GISS-E2-R	-0.0117 (0.04)	1.0343*** (0.2314)	#N/A	0.9134*** (0.2856)	-0.7464*** (0.2768)	0.2835*** (0.1184)	-0.057 (0.1274)	-0.0736 (0.0984)	-0.1628*** (0.0956)	0.6306*** (0.1484)	0.87		0	1	0	0	0	0	0	0
HadCM3	-0.0596** (0.0486)	-0.0963 (0.2438)	0.4458*** (0.315)	0.9116*** (0.288)	-0.7438*** (0.2748)	0.2788*** (0.1178)	-0.0946 (0.1276)	-0.1045** (0.1034)	-0.1215*** (0.0878)	0.6706*** (0.138)	0.87	76	0	0	1	0	0	0	0	0
HadGEM2-ES	-0.0259 (0.0488)	-1.1371** (0.3304)	0.6906*** (0.3836)	0.9015*** (0.282)	-0.7001*** (0.2756)	0.3178*** (0.114)	-0.0835 (0.1256)	-0.0682 (0.0992)	-0.1349*** (0.09)	0.6986*** (0.1134)	0.87	56	0	0	1	0	0	0	0	0
IPSL-CM5A-LR	-0.0131 (0.0402)	0.8334*** (0.1952)	#N/A	0.8352*** (0.2894)	-0.7229*** (0.2782)	0.2582*** (0.1228)	-0.0767 (0.1264)	-0.0889* (0.0996)	-0.1289*** (0.0884)	0.6139*** (0.1566)	0.87		0	1	0	0	0	0	0	0

IPSL-CM5A-MR	-0.0005 (0.0378)	0.9091*** (0.1644)	#N/A	0.7947*** (0.2718)	-0.6319*** (0.2654)	0.3117*** (0.1084)	-0.085 (0.1182)	-0.059 (0.092)	-0.149*** (0.0834)	0.5555*** (0.139)	0.89		0	1	0	0	0	1	0	0
MIROC5	-0.036 (0.0444)	-0.0818 (0.1268)	0.4323*** (0.2978)	0.8906*** (0.2922)	-0.7502*** (0.2814)	0.2905*** (0.1208)	-0.1006 (0.1312)	-0.0856* (0.1012)	-0.1359*** (0.0926)	0.7586*** (0.1098)	0.87	90	0	0	0	0	0	0	0	0
MIROC-ESM	-0.0013 (0.0406)	0.7856*** (0.1538)	#N/A	0.9808*** (0.291)	-0.8158*** (0.279)	0.2674*** (0.1224)	-0.0679 (0.1276)	-0.0696 (0.099)	-0.1207*** (0.088)	0.6958*** (0.124)	0.87		0	0	0	0	0	0	0	0
MPI-ESM-LR	-0.0003 (0.0406)	0.6835*** (0.135)	#N/A	0.8413*** (0.2904)	-0.6707*** (0.2854)	0.2942*** (0.1178)	-0.0872 (0.1268)	-0.066 (0.0986)	-0.1162*** (0.0874)	0.6872*** (0.1264)	0.87		0	0	0	0	0	0	0	0
MPI-ESM-MR	-0.0058 (0.0414)	0.7254** (0.1848)	#N/A	0.9488*** (0.2956)	-0.7648*** (0.2844)	0.2734*** (0.1272)	-0.0828 (0.13)	-0.0779 (0.1018)	-0.1298*** (0.0936)	0.6981*** (0.1416)	0.86		0	0	0	0	0	0	0	0
NorESM1-M	-0.0152 (0.043)	0.5487 (0.1996)	#N/A	0.9033*** (0.3012)	-0.7784*** (0.2908)	0.3091*** (0.125)	-0.0724 (0.1348)	-0.0629 (0.1034)	-0.1146** (0.0966)	0.7728*** (0.1252)	0.86		0	1	0	0	0	0	0	0
Multimodel	-0.0262 (0.038)	1.3841*** (0.2766)	#N/A	0.8746*** (0.2678)	-0.7386*** (0.2588)	0.2433*** (0.1132)	-0.0584 (0.1186)	-0.0916* (0.0926)	-0.1885*** (0.089)	0.5065*** (0.1546)	0.89		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	-0.07** (0.0538)	0.6253*** (0.2064)	#N/A	0.2493*** (0.1472)	0.0981 (0.1204)	-0.0692 (0.1222)	0.0563 (0.1972)	0.2439*** (0.1776)	0.55		0	0	0	0	0	0	0	0
MIROC5	-0.0474* (0.0548)	0.698** (0.2628)	#N/A	0.2729*** (0.155)	0.1078* (0.1272)	-0.0662 (0.1294)	0.2038** (0.1854)	0.3017*** (0.1856)	0.49		0	0	0	0	0	0	0	0
MIROC-ESM	-0.0544* (0.0592)	0.4736* (0.2044)	#N/A	0.2803*** (0.158)	0.1161* (0.1294)	-0.0793 (0.1324)	0.2716*** (0.1792)	0.334*** (0.1866)	0.47		0	0	0	0	0	0	0	0
MPI-ESM-LR	-0.0541** (0.051)	0.786*** (0.2314)	#N/A	0.2174*** (0.1476)	0.0996* (0.1186)	-0.0945 (0.121)	0.0751 (0.1868)	0.2487*** (0.1726)	0.56		0	0	0	0	0	0	0	0
MPI-ESM-MR	-0.0544** (0.0518)	0.7278*** (0.232)	#N/A	0.2317*** (0.1488)	0.1116* (0.12)	-0.0538 (0.1226)	0.0951 (0.1882)	0.2304** (0.1802)	0.55		0	0	0	0	0	0	0	0
NorESM1-M	-0.0492* (0.0552)	0.7681** (0.2878)	#N/A	0.2736*** (0.1552)	0.1243* (0.127)	-0.0569 (0.1298)	0.2094** (0.1846)	0.3081*** (0.1846)	0.49		0	0	0	0	0	0	0	0
Multimodel	-0.102*** (0.0516)	1.0274*** (0.307)	#N/A	0.2278*** (0.1496)	0.0708 (0.1228)	-0.0961 (0.1246)	0.1135 (0.1924)	#N/A	0.54		0	1	0	0	0	1	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

Table H. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$ total (long run) effects, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to GCM and natural variability indices included in the final regression models and statistical tests (T1 to T9) applied to regressions for the Australian domain using the GISTEMP dataset.

MCG	α^m	$\hat{\beta}_1 \bar{y}_t^m$	Dummy	$\hat{\theta}_1 DOI_{t-1}$	$\hat{\theta}_2 SAM_t$	$\hat{\theta}_3 SAM_{t-1}$	$\hat{\varphi}_1 Y_{t-1}^o$	$\hat{\varphi}_2 Y_{t-2}^o$	R2	T1	T2	T3	T4	T5	T6	T7	T8	T9
ACCESS1-0	0.0133 (0.0524)	0.4683 (0.4682)	0.2554 (0.5248)	0.3081*** (0.154)	0.0698 (0.1296)	-0.0866 (0.1284)	0.2625*** (0.1784)	0.3873*** (0.1742)	0.62	49	0	0	0	0	0	0	0	0
ACCESS1-3	0.0114 (0.0486)	0.6971 (0.3188)	#N/A	0.2951*** (0.1598)	0.0856 (0.1326)	-0.0929 (0.1322)	0.3321*** (0.1756)	0.408*** (0.1802)	0.59		0	0	0	0	0	0	0	0
CanESM2	0.0255 (0.047)	0.7528*** (0.2186)	#N/A	0.2851*** (0.1526)	0.0693 (0.1268)	-0.1057 (0.1274)	0.2346** (0.1828)	0.3361*** (0.18)	0.62		0	0	1	0	0	0	0	0
CCSM4	0.0522** (0.052)	0.8089*** (0.2464)	#N/A	0.2555*** (0.1544)	0.0856 (0.1246)	-0.0804 (0.1262)	0.1784* (0.196)	0.3382*** (0.1768)	0.63		0	0	1	0	0	0	0	0
CNRM-CM5	-0.0102 (0.0596)	0.6433 (0.592)	0.3487 (0.7178)	0.2454*** (0.1562)	0.0561 (0.1274)	-0.1201* (0.1312)	0.2563*** (0.1776)	0.3225*** (0.1804)	0.63	71	0	0	0	0	0	0	0	0
CSIRO-Mk3-6-0	-0.0086 (0.0496)	-1.5479* (0.7048)	1.2468*** (0.808)	0.3114*** (0.1494)	0.0504 (0.1264)	-0.098 (0.1286)	0.2552*** (0.172)	0.359*** (0.1714)	0.64	57	0	0	0	0	0	0	0	0
CSIRO-Mk3L-1	0.0333 (0.0526)	1.1282** (0.331)	-0.1831 (0.416)	0.2768*** (0.1548)	0.1184* (0.131)	-0.101 (0.129)	0.2322** (0.188)	0.4014*** (0.1712)	0.62	50	0	0	0	0	0	0	0	0
EC-EARTH	0.0301 (0.0486)	1.0321** (0.301)	#N/A	0.2626*** (0.1576)	0.078 (0.1276)	-0.1105* (0.1294)	0.2539*** (0.183)	0.3722*** (0.176)	0.61		0	0	0	0	0	0	0	0
FGOALS-g2	0.036 (0.0516)	0.6419** (0.246)	#N/A	0.281*** (0.1572)	0.1004 (0.1278)	-0.0873 (0.1298)	0.2462** (0.193)	0.3405*** (0.1918)	0.61		0	0	1	0	0	0	0	0
GFDL-CM3	0.0058 (0.051)	0.4774 (0.2378)	#N/A	0.3067*** (0.1584)	0.0886 (0.1322)	-0.0959 (0.1328)	0.3326*** (0.176)	0.4138*** (0.179)	0.59		0	0	0	0	0	0	0	0
GISS-E2-H	-0.003 (0.0616)	0.7706* (0.378)	0.2044 (0.508)	0.2351*** (0.1516)	0.0362 (0.1248)	-0.1224* (0.124)	0.1901** (0.1786)	0.3363*** (0.1698)	0.65	77	0	0	1	0	0	0	0	0
GISS-E2-R	0.0117 (0.0466)	1.1028*** (0.3068)	#N/A	0.2882*** (0.1532)	0.0933 (0.1258)	-0.1129* (0.1284)	0.2526*** (0.18)	0.3551*** (0.177)	0.62		0	0	1	0	0	0	0	0
HadCM3	0.0233 (0.0462)	0.9599*** (0.2728)	#N/A	0.2688*** (0.1516)	0.0631 (0.1252)	-0.1041 (0.1254)	0.1886** (0.1888)	0.3317*** (0.1758)	0.63		0	0	0	0	0	0	0	0
HadGEM2-ES	0.0142 (0.0496)	-2.0719*** (0.5416)	1.2513*** (0.6422)	0.2726*** (0.1494)	0.071 (0.1248)	-0.1333** (0.1252)	0.2315*** (0.1738)	0.383*** (0.1682)	0.64	59	0	0	0	0	0	0	0	0
IPSL-CM5A-LR	0.0143 (0.049)	0.3118 (0.374)	0.2449 (0.3742)	0.2632*** (0.1538)	0.0597 (0.1268)	-0.1117* (0.1268)	0.2023** (0.1872)	0.2844*** (0.1918)	0.63	22	0	0	1	0	0	0	0	0

IPSL-CM5A-MR	0.0285 (0.0458)	0.7617*** (0.2122)	#N/A	0.2715*** (0.1488)	0.0811 (0.1218)	-0.09 (0.1234)	0.1442 (0.1932)	0.3255*** (0.1722)	0.64		0	0	1	0	0	0	0	0
MIROC5	0.0204 (0.0478)	0.8147** (0.2592)	#N/A	0.2918*** (0.156)	0.09 (0.1282)	-0.0901 (0.1298)	0.2863*** (0.1796)	0.3767*** (0.1794)	0.61		0	0	0	0	0	0	0	0
MIROC-ESM	0.0019 (0.0528)	0.4284 (0.1898)	#N/A	0.2992*** (0.1588)	0.0959 (0.1304)	-0.0995 (0.1332)	0.3459*** (0.175)	0.4041*** (0.182)	0.59		0	0	0	0	0	0	0	0
MPI-ESM-LR	0.0481** (0.0478)	1.2401*** (0.4128)	-0.154 (0.4142)	0.2263*** (0.1474)	0.0771 (0.1182)	-0.1173* (0.1202)	0.1522* (0.1776)	0.3303*** (0.1656)	0.67	26	0	0	0	0	0	0	0	0
MPI-ESM-MR	0.0465* (0.0514)	1.1346** (0.4286)	-0.179 (0.4118)	0.2537*** (0.1524)	0.0965 (0.1232)	-0.08 (0.1252)	0.1959** (0.184)	0.3069*** (0.179)	0.64	31	0	0	0	0	0	0	0	0
NorESM1-M	0.0178 (0.0478)	0.8251* (0.2736)	#N/A	0.2907*** (0.157)	0.1014 (0.1286)	-0.082 (0.1308)	0.2954*** (0.1788)	0.382*** (0.18)	0.60		0	0	0	0	1	0	0	0
Multimodel	0.0112 (0.0478)	0.5781 (0.6648)	0.4117 (0.664)	0.258*** (0.1504)	0.0638 (0.1226)	-0.1053* (0.1234)	0.1761* (0.184)	0.2883*** (0.179)	0.65	22	0	0	1	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

Table I. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$ total (long run) effects, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to GCM and natural variability indices included in the final regression models and statistical tests (T1 to T9) applied to regressions for the Chinan domain using the HadCRUT4 dataset.

MCG	α^m	$\hat{\beta}_1 \bar{y}_t^m$	Dummy	$\hat{\theta}_1 AMO_t$	$\hat{\theta}_2 AMO_{t-1}$	$\hat{\theta}_3 DOI_t$	$\hat{\theta}_4 SAM_t$	$\hat{\theta}_5 VOLC_{t-1}$	$\hat{\theta}_6 VOLC_{t-2}$	$\hat{\theta}_5 VOLC_{t-3}$	$\hat{\varphi}_1 y_{t-1}^0$	R2	T1	T2	T3	T4	T5	T6	T7	T8	T9
ACCESS1-0	0.0352 (0.0806)	-0.3608 (0.2632)	0.7984*** (0.391)	0.5273*** (0.3736)	-0.3745* (0.3896)	0.1211 (0.1636)	0.1442** (0.14)	0.1715** (0.1632)	-0.2974*** (0.1954)	0.2163*** (0.1574)	0.4046*** (0.1908)	0.63	86	0	0	0	0	0	0	0	0
ACCESS1-3	0.1055** (0.1002)	-0.7975** (0.332)	0.7596*** (0.438)	0.6537*** (0.3864)	-0.405** (0.3998)	0.1452* (0.167)	0.1304* (0.1386)	0.1285 (0.175)	-0.2384** (0.1974)	0.1996** (0.1582)	0.4852*** (0.1828)	0.61	62	0	0	1	0	0	0	0	0
CanESM2	-0.0153 (0.0648)	0.7068*** (0.2192)	#N/A	0.5721*** (0.3718)	-0.3993** (0.392)	0.1353 (0.1646)	0.1096 (0.1368)	0.0771 (0.1576)	-0.203** (0.1956)	0.1191 (0.1544)	0.4155*** (0.1944)	0.62		0	0	1	0	0	0	1	0
CCSM4	0.0521* (0.06)	0.677*** (0.2178)	#N/A	0.6625*** (0.3664)	-0.4739** (0.387)	0.11 (0.1666)	0.1028 (0.1372)	0.0525 (0.161)	-0.1696* (0.1982)	0.1595** (0.1536)	0.3949*** (0.202)	0.62		0	0	1	0	0	0	0	0
CNRM-CM5	-0.0113 (0.0686)	-0.0351 (0.4828)	0.8516*** (0.5836)	0.5669*** (0.3748)	-0.4092** (0.3918)	0.0999 (0.1676)	0.1005 (0.138)	0.088 (0.17)	-0.2085** (0.1998)	0.1519* (0.1542)	0.4077*** (0.195)	0.62	86	0	0	0	0	0	0	0	0
CSIRO-Mk3-6-0	-0.0404 (0.0956)	-0.9784* (0.5984)	1.2072*** (0.5808)	0.4934*** (0.3638)	-0.5573*** (0.3716)	0.1359* (0.1574)	0.1966*** (0.1402)	0.052 (0.1638)	-0.1907** (0.1884)	0.1112 (0.1504)	0.3997*** (0.1802)	0.65	37	0	0	1	0	0	0	0	0
CSIRO-Mk3L-1	0.0988*** (0.0628)	0.7951*** (0.1932)	#N/A	0.5502*** (0.3562)	-0.387** (0.3748)	0.1848** (0.157)	0.1378** (0.131)	0.1063 (0.1484)	-0.2205** (0.1866)	0.2108*** (0.1492)	0.4204*** (0.1722)	0.65		0	0	1	0	0	0	0	0
EC-EARTH	0.0889** (0.0736)	0.7526*** (0.2794)	#N/A	0.6637*** (0.3806)	-0.5939*** (0.4026)	0.1316 (0.172)	0.127* (0.1418)	0.1778** (0.1624)	-0.2426** (0.2018)	0.1967** (0.1628)	0.4998*** (0.1912)	0.59		0	0	1	0	0	0	1	0
FGOALS-g2	0.0573* (0.0652)	0.4812** (0.2028)	#N/A	0.6589*** (0.3854)	-0.4719** (0.4082)	0.1534* (0.1722)	0.1296* (0.1434)	0.1476* (0.162)	-0.2157** (0.2052)	0.1497* (0.161)	0.5169*** (0.1956)	0.59		0	0	1	0	0	0	0	0
GFDL-CM3	0.0342 (0.1072)	-0.2721 (0.2688)	0.7267*** (0.3294)	0.5843*** (0.3682)	-0.3682* (0.385)	0.1018 (0.1626)	0.1406** (0.1348)	0.1229 (0.1766)	-0.227** (0.1936)	0.1782** (0.1576)	0.3716*** (0.1954)	0.64	85	0	0	1	0	0	0	0	0
GISS-E2-H	-0.0303 (0.0696)	0.4603 (0.392)	0.9243*** (0.5922)	0.5734*** (0.3654)	-0.4563** (0.3818)	0.1314 (0.1632)	0.1084 (0.1348)	0.0585 (0.1702)	-0.2094** (0.193)	0.1117 (0.1522)	0.4079*** (0.1858)	0.63	96	0	0	0	0	0	0	1	0
GISS-E2-R	-0.0348 (0.077)	-1.7577** (0.8256)	1.6559*** (0.8698)	0.4949*** (0.3702)	-0.4377** (0.379)	0.1235 (0.1622)	0.1737** (0.1376)	0.0207 (0.1694)	-0.2072** (0.1906)	0.1097 (0.1516)	0.4395*** (0.1804)	0.64	37	0	0	1	0	0	0	0	0
HadCM3	-0.0272 (0.0694)	-0.8965 (0.809)	1.1497*** (0.8098)	0.662*** (0.3814)	-0.3845* (0.388)	0.1663** (0.1618)	0.1589** (0.1386)	0.0242 (0.1654)	-0.2011** (0.1942)	0.1197 (0.1524)	0.412*** (0.194)	0.63	45	0	0	0	0	0	0	0	0
HadGEM2-ES	0.0667 (0.0994)	-0.4448** (0.277)	1.0005*** (0.4294)	0.6461*** (0.3554)	-0.4197** (0.3764)	0.1631** (0.1584)	0.1419** (0.1328)	0.0756 (0.169)	-0.1341 (0.1952)	0.1283 (0.1552)	0.363*** (0.1914)	0.65	67	0	0	0	0	0	0	1	0
IPSL-CM5A-LR	0.055* (0.0586)	0.5794*** (0.1712)	#N/A	0.57*** (0.362)	-0.4209** (0.38)	0.1414* (0.1602)	0.1341** (0.1334)	0.1049 (0.1514)	-0.1797* (0.192)	0.1383* (0.15)	0.3568*** (0.1986)	0.64		0	0	1	0	0	0	0	0

IPSL-CM5A-MR	-0.0181 (0.0634)	0.0897 (0.1842)	0.5596*** (0.3048)	0.5839*** (0.3604)	-0.4516** (0.3784)	0.097 (0.1628)	0.0969 (0.134)	0.0899 (0.1518)	-0.1798* (0.1916)	0.0957 (0.1516)	0.3425*** (0.2024)	0.64	90	0	0	0	0	0	0	0	0
MIROC5	0.055 (0.0912)	-0.6393* (0.3352)	0.8295*** (0.464)	0.7075*** (0.3896)	-0.455** (0.3938)	0.1111 (0.1694)	0.1415** (0.1386)	0.0987 (0.1756)	-0.2267** (0.1982)	0.1644** (0.1596)	0.4868*** (0.1838)	0.61	82	0	0	1	0	0	0	0	0
MIROC-ESM	-0.0276 (0.061)	0.3049 (0.2784)	0.7456*** (0.4554)	0.5205*** (0.3526)	-0.4242** (0.3726)	0.0755 (0.1594)	0.1366** (0.133)	0.1375* (0.1456)	-0.2546*** (0.1836)	0.1347* (0.145)	0.3486*** (0.1846)	0.66	87	0	0	0	0	0	0	0	0
MPI-ESM-LR	0.0859*** (0.06)	0.6637*** (0.1734)	#N/A	0.6543*** (0.348)	-0.3817** (0.3712)	0.1299 (0.1562)	0.1284* (0.1298)	0.1335* (0.1464)	-0.2057** (0.1852)	0.1624** (0.1458)	0.3501*** (0.1862)	0.66		0	0	0	0	0	0	0	0
MPI-ESM-MR	0.0434 (0.0592)	0.5519*** (0.1714)	#N/A	0.6624*** (0.3648)	-0.4325** (0.3874)	0.0973 (0.167)	0.1428** (0.1362)	0.0859 (0.156)	-0.2155** (0.194)	0.1343* (0.153)	0.3978*** (0.1976)	0.63		0	0	1	0	0	0	0	0
NorESM1-M	-0.0134 (0.0658)	-0.0826 (0.3178)	0.7582*** (0.4456)	0.6395*** (0.3676)	-0.4676** (0.387)	0.0916 (0.17)	0.0895 (0.1404)	0.1171 (0.1576)	-0.226** (0.1956)	0.1396* (0.1542)	0.4124*** (0.192)	0.63	86	0	0	0	0	0	0	0	0
Multimodel	-0.031 (0.0662)	1.1739*** (0.3674)	#N/A	0.525*** (0.3696)	-0.4506** (0.3816)	0.1168 (0.163)	0.1049 (0.1348)	0.0213 (0.162)	-0.1784* (0.1938)	0.117 (0.1518)	0.3482*** (0.2066)	0.64		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

Table J. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$ total (long run) effects, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to GCM and natural variability indices included in the final regression models and statistical tests (T1 to T9) applied to regressions for the Chinan domain using the GISTEMP dataset.

MCG	α^m	$\hat{\beta}_1 \bar{y}_t^m$	Dummy	$\hat{\theta}_1 AMO_t$	$\hat{\theta}_2 AMO_{t-1}$	$\hat{\theta}_3 DOI_t$	$\hat{\theta}_4 SAM_t$	$\hat{\theta}_4 VOLC_{t-1}$	$\hat{\theta}_6 VOLC_{t-2}$	$\hat{\theta}_7 VOLC_{t-3}$	$\hat{\varphi}_1 y_{t-1}^o$	R2	T1	T2	T3	T4	T5	T6	T7	T8	T9
ACCESS1-0	0.1016** (0.0888)	-0.2538 (0.2674)	0.6591*** (0.38)	0.3777* (0.4166)	-0.2408 (0.4258)	0.2** (0.1834)	0.1879** (0.1588)	0.1916** (0.1824)	-0.2719** (0.2194)	0.1962** (0.1764)	0.3486*** (0.1922)	0.54	86	0	0	0	0	0	0	0	0
ACCESS1-3	0.1506*** (0.1086)	-0.5448* (0.3414)	0.6316*** (0.421)	0.4939** (0.428)	-0.2691 (0.4334)	0.2321** (0.1854)	0.1724** (0.1558)	0.1674* (0.193)	-0.2221** (0.2208)	0.1691* (0.1758)	0.4115*** (0.1872)	0.52	67	0	0	1	0	0	0	0	0
CanESM2	0.0497 (0.0714)	0.591*** (0.2202)	#N/A	0.4063* (0.4098)	-0.2443 (0.4228)	0.2076** (0.1816)	0.1479* (0.1522)	0.1012 (0.1734)	-0.1724 (0.2168)	0.0928 (0.1696)	0.3318*** (0.1946)	0.54		0	0	1	0	0	0	0	0
CCSM4	0.1288*** (0.0728)	0.5189*** (0.2074)	#N/A	0.5143** (0.406)	-0.3348 (0.4218)	0.1929** (0.1842)	0.1524** (0.153)	0.0887 (0.1764)	-0.1552 (0.2196)	0.1489* (0.1702)	0.316*** (0.204)	0.54		0	0	1	0	0	0	0	0
CNRM-CM5	0.0519 (0.077)	0.77** (0.3788)	#N/A	0.4458** (0.4266)	-0.3364 (0.4362)	0.2138** (0.1898)	0.1487* (0.1588)	0.0742 (0.1926)	-0.1565 (0.2302)	0.1101 (0.1758)	0.422*** (0.1904)	0.50		0	0	1	0	0	0	0	0
CSIRO-Mk3-6-0	0.0303 (0.0974)	-0.6162* (0.6534)	1.5317*** (0.586)	0.247 (0.4056)	-0.2822 (0.4064)	0.2389*** (0.1756)	0.2761*** (0.1546)	-0.0048 (0.173)	-0.0777 (0.2082)	0.0429 (0.1626)	#N/A	0.56	38	0	0	1	0	0	0	0	0
CSIRO-Mk3L-1	0.1578*** (0.0754)	0.633*** (0.1982)	#N/A	0.4008** (0.4012)	-0.253 (0.4138)	0.2536*** (0.1766)	0.1865** (0.1492)	0.1406* (0.167)	-0.2066* (0.2112)	0.1846** (0.1682)	0.3625*** (0.177)	0.56		0	0	0	0	0	0	0	0
EC-EARTH	0.1597*** (0.088)	0.6137*** (0.277)	#N/A	0.5127** (0.4156)	-0.4309* (0.4362)	0.2065** (0.188)	0.1701** (0.1562)	0.2068** (0.1774)	-0.2216** (0.2214)	0.1773** (0.178)	0.3844*** (0.1966)	0.52		0	0	0	0	0	0	0	0
FGOALS-g2	0.119*** (0.0774)	0.3714** (0.2024)	#N/A	0.4989** (0.4236)	-0.3057 (0.4402)	0.2354** (0.189)	0.1741** (0.159)	0.1745* (0.178)	-0.1927* (0.2266)	0.1265 (0.1766)	0.4218*** (0.1966)	0.50		0	0	0	0	0	0	0	0
GFDL-CM3	0.1267** (0.1234)	-0.2768 (0.3116)	0.5693*** (0.3328)	0.4723** (0.4142)	-0.2095 (0.431)	0.2354** (0.1812)	0.1915** (0.1544)	0.1094 (0.197)	-0.1424 (0.2226)	0.112 (0.1766)	0.3124*** (0.2036)	0.54	67	0	0	1	0	0	0	0	0
GISS-E2-H	0.0491 (0.088)	0.4157* (0.4396)	1.1979*** (0.6024)	0.315 (0.4358)	-0.118 (0.4308)	0.2498** (0.1924)	0.1982** (0.16)	0.0242 (0.1968)	-0.136 (0.2272)	0.074 (0.1782)	#N/A	0.49	95	0	1	0	0	0	0	0	0
GISS-E2-R	0.0609 (0.0904)	-1.0445*** (0.7434)	1.993*** (0.7394)	0.184 (0.4252)	-0.1342 (0.4148)	0.2209** (0.1864)	0.2792*** (0.1568)	-0.0332 (0.183)	-0.0929 (0.2178)	0.033 (0.1698)	#N/A	0.52	38	0	0	0	0	0	0	0	0
HadCM3	0.0527 (0.0754)	0.7336** (0.3522)	#N/A	0.4185* (0.4264)	-0.2801 (0.436)	0.2454*** (0.186)	0.157** (0.157)	0.0754 (0.1884)	-0.1826 (0.2242)	0.1146 (0.1744)	0.3757*** (0.204)	0.51		0	0	1	0	0	0	0	0
HadGEM2-ES	0.1012* (0.1102)	-0.182 (0.2852)	0.8279*** (0.4048)	0.4968** (0.3972)	-0.2836 (0.4122)	0.2403*** (0.1766)	0.1777** (0.149)	0.0719 (0.1878)	-0.1039 (0.219)	0.0927 (0.1718)	0.2977*** (0.1922)	0.56	67	0	0	0	0	1	1	0	0
IPSL-CM5A-LR	0.1367*** (0.0704)	0.4776*** (0.1644)	#N/A	0.431** (0.396)	-0.2868 (0.4092)	0.2174** (0.176)	0.1753** (0.148)	0.133 (0.166)	-0.1523 (0.212)	0.1207 (0.1642)	0.2702*** (0.1984)	0.57		0	0	1	0	0	0	0	0

IPSL-CM5A-MR	0.0511 (0.0728)	-0.0539 (0.2198)	0.5197*** (0.326)	0.4732** (0.4008)	-0.3094 (0.4186)	0.1813** (0.1816)	0.1484* (0.1512)	0.1244 (0.1694)	-0.1697 (0.2148)	0.0975 (0.1676)	0.3067*** (0.1982)	0.55	86	0	0	0	0	0	0	0	0
MIROC5	0.1175** (0.1066)	-0.4308 (0.3648)	0.7116*** (0.4732)	0.5424** (0.4354)	-0.3088 (0.4322)	0.189** (0.1894)	0.1832** (0.1564)	0.1317 (0.1946)	-0.2066* (0.2222)	0.146 (0.1784)	0.394*** (0.1936)	0.52	83	0	0	1	0	1	0	0	0
MIROC-ESM	0.0458 (0.0712)	0.7997*** (0.2514)	#N/A	0.3744* (0.4098)	-0.4022* (0.4178)	0.1509 (0.1866)	0.2078*** (0.1524)	0.1492* (0.1688)	-0.2219** (0.2138)	0.1024 (0.168)	0.4099*** (0.171)	0.55		0	0	0	0	1	1	0	0
MPI-ESM-LR	0.1638*** (0.0764)	0.522*** (0.1784)	#N/A	0.5232*** (0.3948)	-0.2962 (0.411)	0.2079** (0.1774)	0.1788** (0.1486)	0.1682** (0.1662)	-0.1832* (0.2114)	0.1508* (0.1656)	0.2943*** (0.194)	0.56		0	0	0	0	0	0	0	0
MPI-ESM-MR	0.1231*** (0.0698)	0.4664*** (0.1664)	#N/A	0.5203** (0.398)	-0.3072 (0.414)	0.1715* (0.182)	0.1982** (0.1506)	0.1175 (0.1692)	-0.1937* (0.2126)	0.1216 (0.1664)	0.2992*** (0.1968)	0.55		0	0	0	0	0	0	0	0
NorESM1-M	0.0576 (0.0708)	0.0552 (0.3146)	0.6125*** (0.4244)	0.4722** (0.4056)	-0.3328 (0.4206)	0.1562 (0.1882)	0.125 (0.1558)	0.1408 (0.1742)	-0.2028* (0.2172)	0.1242 (0.1698)	0.3286*** (0.1946)	0.54	86	0	0	0	0	0	0	0	0
Multimodel	0.0466 (0.0698)	0.9924*** (0.364)	#N/A	0.3745* (0.4034)	-0.3178 (0.4114)	0.1912** (0.1788)	0.1523** (0.149)	0.0473 (0.1762)	-0.1515 (0.2136)	0.0998 (0.1658)	0.252** (0.208)	0.56		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0724 (0.128)	0.3738*** (0.1764)	#N/A	1.0092*** (0.643)	0.8576*** (0.2582)	0.1329 (0.17)	0.2701*** (0.1564)	0.45		0	0	0	0	0	0	0	0
MIROC5	-0.0085 (0.1444)	-0.1377 (0.3674)	0.7314*** (0.4452)	0.9316*** (0.6572)	0.9224*** (0.2536)	0.1511* (0.1656)	0.1965** (0.1588)	0.48	88	0	0	0	0	0	0	0	0
MIROC-ESM	-0.0042 (0.1364)	-0.2958 (0.2668)	0.9775*** (0.428)	0.9564*** (0.6308)	0.9555*** (0.249)	0.1253 (0.1604)	0.2595*** (0.1554)	0.51	88	0	0	0	0	0	1	0	0
MPI-ESM-LR	0.1666** (0.146)	0.2929** (0.1738)	#N/A	1.1182*** (0.6494)	0.8458*** (0.2626)	0.1311 (0.1734)	0.2499*** (0.1618)	0.44		0	0	0	0	0	0	0	0
MPI-ESM-MR	-0.0576 (0.167)	-0.1793 (0.2202)	0.7895*** (0.4644)	0.8664*** (0.6472)	0.9183*** (0.257)	0.0593 (0.1688)	0.2136*** (0.1606)	0.47	89	0	0	0	0	0	0	0	0
NorESM1-M	0.0866 (0.136)	0.0636 (0.2294)	#N/A	1.108*** (0.675)	0.8647*** (0.2728)	0.0933 (0.1766)	0.2847*** (0.1676)	0.40		0	0	0	0	0	0	0	0
Multimodel	0.0738 (0.1282)	0.7013*** (0.36)	#N/A	0.8911*** (0.658)	0.8944*** (0.2598)	0.1213 (0.1694)	0.223*** (0.1626)	0.45		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0304 (0.1392)	0.1403 (0.2378)	0.5289** (0.4058)	0.8378*** (0.6324)	0.9401*** (0.2572)	0.1781** (0.1708)	0.2517*** (0.1516)	0.49	71	0	0	0	0	0	0	0	0
MIROC5	0.0096 (0.1462)	-0.1022 (0.3828)	0.8043*** (0.463)	0.7925** (0.6584)	0.9542*** (0.2552)	0.1456* (0.166)	0.1847** (0.1582)	0.49	88	0	0	0	0	0	0	0	0
MIROC-ESM	0.0241 (0.1386)	-0.3351* (0.2834)	1.0937*** (0.4444)	0.8583*** (0.6356)	0.9852*** (0.2504)	0.1222 (0.1612)	0.2513*** (0.1536)	0.51	88	0	0	0	0	0	0	0	0
MPI-ESM-LR	0.2131*** (0.1516)	0.3421*** (0.1822)	#N/A	1.0363*** (0.6576)	0.8726*** (0.2664)	0.1237 (0.1752)	0.2493*** (0.1618)	0.44		0	0	0	0	0	0	0	0
MPI-ESM-MR	-0.0261 (0.171)	-0.1636 (0.2294)	0.8436*** (0.481)	0.7579** (0.656)	0.9448*** (0.2604)	0.0493 (0.1708)	0.2081** (0.1614)	0.47	89	0	0	0	0	0	0	0	0
NorESM1-M	0.1451** (0.136)	0.1812 (0.2366)	#N/A	1.2026*** (0.662)	0.9509*** (0.2676)	0.1546* (0.1758)	0.2376*** (0.163)	0.45		0	0	0	0	0	0	0	0
Multimodel	0.1066 (0.131)	0.8098*** (0.373)	#N/A	0.7637** (0.6648)	0.9241*** (0.2624)	0.1133 (0.1704)	0.2159*** (0.1626)	0.46		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0239 (0.066)	0.4489*** (0.1792)	#N/A	0.6031*** (0.346)	-0.0437 (0.0868)	0.1539*** (0.074)	0.1581** (0.1518)	0.0012 (0.0956)	0.1397* (0.1648)	#N/A	0.56		0	0	1	0	0	0	0	0
MIROC5	0.0481 (0.0924)	-0.2691* (0.2684)	0.794*** (0.3196)	0.8529*** (0.3684)	-0.0389 (0.0838)	0.1225*** (0.075)	0.2908*** (0.1584)	0.0289 (0.0924)	0.0388 (0.1748)	#N/A	0.59	88	0	0	0	0	0	0	0	0
MIROC-ESM	0.0268 (0.0816)	-0.2053 (0.2878)	0.8443*** (0.3552)	0.7175*** (0.3686)	-0.0337 (0.0836)	0.1345*** (0.0732)	0.2516*** (0.1546)	0.0311 (0.093)	0.0889 (0.1658)	#N/A	0.59	88	0	0	1	0	0	0	0	0
MPI-ESM-LR	0.1182*** (0.0664)	0.4578*** (0.151)	#N/A	0.7852*** (0.3262)	-0.0052 (0.0828)	0.1545*** (0.071)	0.2208*** (0.149)	0.054 (0.0938)	0.0953 (0.1634)	0.2804*** (0.155)	0.60		0	0	0	0	1	0	0	0
MPI-ESM-MR	0.026 (0.0862)	0.0852 (0.2052)	0.6194*** (0.41)	0.7105*** (0.3364)	-0.0292 (0.0852)	0.1403*** (0.0744)	0.206*** (0.1522)	0.0323 (0.0944)	0.064 (0.175)	#N/A	0.57	88	0	0	0	0	0	0	0	0
NorESM1-M	0.019 (0.069)	0.1068 (0.2886)	0.6631*** (0.4304)	0.6309*** (0.347)	-0.0281 (0.0866)	0.1542*** (0.0746)	0.2243*** (0.1584)	0.0235 (0.0964)	0.0918 (0.1806)	#N/A	0.55	94	0	0	0	0	0	0	0	0
Multimodel	0.023 (0.0666)	0.7539*** (0.3618)	#N/A	0.5771*** (0.3476)	-0.031 (0.0874)	0.1491*** (0.0742)	0.2129*** (0.1522)	0.0485 (0.0958)	0.0429 (0.1776)	0.1957** (0.1712)	0.58		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0968*** (0.0708)	0.4975*** (0.1876)	#N/A	0.5529*** (0.3588)	-0.0233 (0.0894)	0.1616*** (0.077)	0.1443* (0.1574)	0.008 (0.0992)	0.1311 (0.1664)	#N/A	0.56		0	0	1	0	0	0	0	0
MIROC5	0.113** (0.098)	-0.1984 (0.283)	0.8115*** (0.338)	0.7772*** (0.3864)	-0.0167 (0.0876)	0.1307*** (0.0788)	0.2796*** (0.1668)	0.0371 (0.0972)	0.029 (0.1804)	#N/A	0.58	88	0	0	0	0	0	0	0	0
MIROC-ESM	0.0982** (0.0864)	-0.1597 (0.3052)	0.8749*** (0.377)	0.6537*** (0.3864)	-0.0108 (0.0872)	0.1453*** (0.077)	0.2377*** (0.1624)	0.0384 (0.0976)	0.0818 (0.1702)	#N/A	0.58	88	0	0	1	0	0	0	0	0
MPI-ESM-LR	0.178*** (0.0768)	0.4744*** (0.1612)	#N/A	0.7538*** (0.3446)	0.0153 (0.0868)	0.1638*** (0.0754)	0.2061** (0.1572)	0.0619 (0.0992)	0.1024 (0.1674)	0.2671*** (0.1596)	0.58		0	0	0	0	1	0	0	0
MPI-ESM-MR	0.1109** (0.0916)	0.1047 (0.2148)	0.6582*** (0.4278)	0.6785*** (0.3504)	-0.0053 (0.0884)	0.1497*** (0.0776)	0.196** (0.1588)	0.0425 (0.0984)	0.0536 (0.1782)	#N/A	0.57	88	0	0	0	0	0	0	0	0
NorESM1-M	0.0978** (0.0746)	0.1041 (0.3068)	0.7212*** (0.4512)	0.5938*** (0.3638)	-0.0046 (0.0904)	0.1647*** (0.0786)	0.2152** (0.1664)	0.0321 (0.101)	0.0852 (0.1872)	#N/A	0.54	94	0	0	1	0	0	0	0	0
Multimodel	0.0943*** (0.0708)	0.9009*** (0.3608)	#N/A	0.4821*** (0.3642)	-0.0316 (0.0896)	0.15*** (0.0778)	0.2032** (0.1602)	0.0348 (0.0986)	0.0542 (0.1806)	#N/A	0.56		0	0	1	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10%

(*), 5%(**), 1%(***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	-0.0839** (0.0743)	0.5941*** (0.1917)	#N/A	-0.006 (0.0276)	-0.2185*** (0.0801)	0.2107** (0.1848)	-0.0838 (0.1452)	0.0389 (0.1337)	0.4858*** (0.1774)	#N/A	0.70		0	0	0	0	0	0	0	0
MIROC5	-0.0552 (0.0735)	0.6495* (0.2742)	#N/A	-0.0076 (0.0287)	-0.2182*** (0.0835)	0.2353** (0.1905)	-0.0456 (0.1478)	0.0553 (0.1385)	0.6017*** (0.1573)	#N/A	0.67		0	0	0	0	0	0	0	0
MIROC-ESM	-0.0638 (0.0776)	0.534 (0.2553)	#N/A	-0.0073 (0.0289)	-0.2183*** (0.0846)	0.2072** (0.1973)	-0.0452 (0.149)	0.0464 (0.1443)	0.6426*** (0.1434)	#N/A	0.67		0	0	1	0	0	0	0	0
MPI-ESM-LR	-0.0718** (0.072)	0.4778** (0.1902)	#N/A	-0.0067 (0.0276)	-0.2286*** (0.0814)	0.2228** (0.1863)	-0.0944 (0.1477)	0.041 (0.1338)	0.5561*** (0.1521)	#N/A	0.70		0	0	1	0	0	0	1	0
MPI-ESM-MR	-0.0771** (0.0743)	0.4058* (0.206)	#N/A	-0.0083 (0.028)	-0.2362*** (0.0816)	0.2388** (0.187)	-0.1009 (0.15)	0.0527 (0.1342)	0.557*** (0.164)	#N/A	0.69		0	0	1	0	0	0	1	1
NorESM1-M	-0.0545 (0.0776)	0.3496 (0.2868)	#N/A	-0.0055 (0.029)	-0.2272*** (0.0842)	0.2307** (0.1953)	-0.0417 (0.1502)	0.0664 (0.1422)	0.6566*** (0.1473)	#N/A	0.66		0	0	1	0	0	0	0	0
Multimodel	-0.1042*** (0.0763)	1.157*** (0.3522)	#N/A	-0.0057 (0.0271)	-0.2067*** (0.0795)	0.2038** (0.182)	-0.0784 (0.1418)	-0.0107 (0.1383)	0.4445*** (0.1809)	#N/A	0.71		0	0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10% (*), 5% (**), 1% (***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0748*** (0.0531)	0.2797*** (0.1208)	#N/A	-0.0161 (0.0235)	-0.1745*** (0.0694)	0.1615** (0.1591)	-0.03 (0.1284)	-0.0009 (0.1068)	#N/A	0.49		0	0	0	0	0	0	0
MIROC5	0.0561** (0.0529)	0.2465 (0.2041)	#N/A	-0.0139 (0.0232)	-0.1773*** (0.0685)	0.1695** (0.1552)	-0.0339 (0.1262)	0.0442 (0.1095)	0.3502*** (0.1772)	0.51		0	0	1	0	0	0	1
MIROC-ESM	0.0417 (0.053)	0.2318 (0.1984)	#N/A	-0.0145 (0.0233)	-0.1768*** (0.0689)	0.152* (0.1594)	-0.0389 (0.1265)	0.032 (0.1131)	0.3728*** (0.1693)	0.51		0	0	1	0	0	0	1
MPI-ESM-LR	0.0616** (0.0522)	0.2588** (0.1431)	#N/A	-0.0121 (0.0228)	-0.1725*** (0.0674)	0.1475* (0.1542)	-0.0336 (0.1239)	0.0409 (0.1074)	0.3368*** (0.1701)	0.53		0	0	1	0	0	0	0
MPI-ESM-MR	0.0717** (0.0561)	0.2423*** (0.1502)	#N/A	-0.0208* (0.0247)	-0.1789*** (0.0732)	0.1888** (0.1671)	-0.0039 (0.1346)	-0.0062 (0.1127)	#N/A	0.43		0	0	0	0	0	0	0
NorESM1-M	0.0479* (0.0529)	0.0806 (0.23)	#N/A	-0.0132 (0.0235)	-0.1837*** (0.069)	0.1737** (0.1591)	-0.0332 (0.128)	0.0496 (0.1124)	0.3923*** (0.1734)	0.50		0	0	1	0	0	0	1
Multimodel	0.0654** (0.052)	0.5301*** (0.2129)	#N/A	-0.0151 (0.0232)	-0.1655*** (0.0686)	0.1565** (0.1568)	-0.0211 (0.1259)	-0.0324 (0.1049)	#N/A	0.51		0	0	0	0	0	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10% (*), 5% (**), 1% (***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

IPSL-CM5A-MR	0.0566 (0.0798)	0.3836*** (0.2022)	#N/A	0.6246*** (0.4306)	0.1644 (0.2042)	-0.0919 (0.197)	0.30		0	0	0	0	1	1	0	0
MIROC5	0.021 (0.0924)	0.4022** (0.2612)	#N/A	0.5482** (0.4664)	0.2097** (0.1956)	#N/A	0.27		0	0	0	0	0	0	0	0
MIROC-ESM	0.015 (0.0984)	0.4051** (0.3008)	#N/A	0.5451** (0.4786)	0.1842* (0.2064)	#N/A	0.26		0	0	0	0	1	1	0	0
MPI-ESM-LR	0.1276*** (0.0832)	0.3397*** (0.1726)	#N/A	0.8492*** (0.4218)	0.1453 (0.2064)	-0.0676 (0.1932)	0.31		0	0	0	0	0	0	0	0
MPI-ESM-MR	0.0968** (0.0822)	0.2392** (0.1664)	#N/A	0.7052*** (0.4318)	0.1977* (0.2002)	#N/A	0.26		0	0	1	0	1	1	0	0
NorESM1-M	0.1074** (0.0856)	0.3076** (0.2256)	#N/A	0.7448*** (0.43)	0.221** (0.1962)	#N/A	0.25		0	0	1	0	1	1	0	0
Multimodel	0.0547 (0.0752)	0.7742*** (0.333)	#N/A	0.561*** (0.4082)	0.09 (0.1984)	-0.1536 (0.19)	0.38		0	0	0	0	1	1	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10% (*), 5% (**), 1% (***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.

Table T. Regression coefficients $\hat{\alpha}^m$, $\hat{\beta}_1$ total (long run) effects, $\hat{\theta}_i$ and $\hat{\varphi}_i$ associated to GCM and natural variability indices included in the final regression models and statistical tests (T1 to T9) applied to regressions for the USA domain using the GISTEMP dataset.

MCG	α^m	$\hat{\beta}_1 \bar{y}_t^m$	Dummy	$\hat{\theta}_1 AMO_t$	$\hat{\varphi}_1 y_{t-1}^o$	$\hat{\varphi}_2 y_{t-2}^o$	R2	T1	T2	T3	T4	T5	T6	T7	T8	T9
ACCESS1-0	0.1029** (0.0856)	0.2526 (0.24)	#N/A	0.7284*** (0.4352)	0.225** (0.1968)	#N/A	0.26		0	0	0	1	1	1	0	0
ACCESS1-3	0.0904** (0.086)	-0.2352 (0.4068)	0.926*** (0.5166)	0.771*** (0.4054)	0.1034 (0.1946)	#N/A	0.35	80	0	0	0	0	1	1	0	1
CanESM2	0.0527 (0.0804)	0.6252*** (0.2394)	#N/A	0.6191*** (0.3924)	0.097 (0.1874)	#N/A	0.38		0	0	0	0	0	0	0	0
CCSM4	0.1768*** (0.0834)	0.6553** (0.4804)	-0.2759 (0.495)	0.7481*** (0.4126)	0.1068 (0.1978)	#N/A	0.34	21	0	0	1	0	0	1	0	0
CNRM-CM5	0.095** (0.0778)	0.7901*** (0.3478)	-0.2056 (0.4474)	0.547*** (0.4008)	0.1385 (0.1872)	#N/A	0.38	95	0	0	0	0	0	0	0	0
CSIRO-Mk3-6-0	0.1173** (0.0998)	-0.3519 (0.626)	0.8762*** (0.6038)	0.7921*** (0.487)	0.1468 (0.1896)	#N/A	0.34	63	0	0	0	0	1	1	0	0
CSIRO-Mk3L-1	0.1929*** (0.0804)	0.5841*** (0.2394)	#N/A	0.7289*** (0.3876)	0.1519 (0.1876)	-0.1916** (0.1894)	0.40		0	0	0	0	0	0	0	0
EC-EARTH	0.0877 (0.1136)	0.1284 (0.314)	1.0256*** (0.686)	0.7655*** (0.381)	0.0591 (0.1906)	#N/A	0.40	79	0	0	0	0	0	1	0	0
FGOALS-g2	0.1613*** (0.081)	0.4782*** (0.2242)	#N/A	0.8943*** (0.4042)	0.1687* (0.196)	-0.1213 (0.1914)	0.35		0	0	1	0	1	1	0	0
GFDL-CM3	0.1447** (0.1108)	-0.3408 (0.4146)	0.6789*** (0.4092)	0.7986*** (0.4492)	0.1523 (0.1916)	#N/A	0.34	63	0	0	0	0	1	1	0	0
GISS-E2-H	0.1229*** (0.0876)	0.4842* (0.419)	0.5377 (0.7844)	0.6966*** (0.4072)	0.142 (0.193)	#N/A	0.33	90	0	0	0	0	0	0	0	0
GISS-E2-R	0.1043** (0.0796)	0.6721*** (0.3756)	#N/A	0.6876*** (0.4124)	0.0877 (0.2128)	#N/A	0.31		0	0	0	0	1	1	0	0
HadCM3	0.1131*** (0.0786)	0.5837*** (0.2868)	#N/A	0.7048*** (0.4076)	0.1544 (0.1928)	#N/A	0.32		0	0	0	1	1	1	0	0
HadGEM2-ES	0.0808* (0.094)	-0.0624 (0.334)	0.6644*** (0.4374)	0.7478*** (0.4324)	0.1775* (0.1904)	#N/A	0.32	86	0	0	0	0	1	1	0	0
IPSL-CM5A-LR	0.198*** (0.0768)	0.4468*** (0.165)	#N/A	0.8345*** (0.3712)	0.0698 (0.1876)	-0.1636* (0.1772)	0.44		0	0	1	0	0	0	0	0

IPSL-CM5A-MR	0.1183*** (0.0806)	0.3772*** (0.1994)	#N/A	0.6785*** (0.4172)	0.1625 (0.2022)	-0.1107 (0.1946)	0.32		0	0	0	0	1	1	0	0
MIROC5	0.0709 (0.091)	0.4016** (0.2608)	#N/A	0.5874** (0.4538)	0.1991** (0.1946)	#N/A	0.28		0	0	0	0	0	0	0	0
MIROC-ESM	0.0672 (0.0968)	0.3897** (0.3016)	#N/A	0.5908** (0.469)	0.1824* (0.2044)	#N/A	0.27		0	0	0	0	1	1	0	0
MPI-ESM-LR	0.176*** (0.084)	0.3297*** (0.1648)	#N/A	0.8549*** (0.4026)	0.1329 (0.197)	#N/A	0.32		0	0	0	0	0	0	0	0
MPI-ESM-MR	0.1464*** (0.0836)	0.2317** (0.1646)	#N/A	0.7452*** (0.4208)	0.1931* (0.1984)	#N/A	0.28		0	0	1	0	1	1	0	0
NorESM1-M	0.1533*** (0.0868)	0.2903** (0.2254)	#N/A	0.782*** (0.4198)	0.2176** (0.1948)	#N/A	0.27		0	0	1	0	1	1	0	0
Multimodel	0.1231*** (0.0762)	0.7483*** (0.3258)	#N/A	0.6161*** (0.397)	0.0937 (0.1966)	-0.169* (0.188)	0.39		0	0	0	0	1	1	0	0

Note: $t - j$ denotes the j lag order applied to the variable. $\hat{\alpha}^m$ represents bias, $\hat{\beta}_1$ is the climate transient response, $\hat{\theta}_i$ is the coefficient associated to the independent variable i . Significance level: 10% (*), 5% (**), 1% (***). ± 2 standard errors are given in parentheses. #N/A: Does not apply.

Statistical tests: T1: Indicate the last two digits of the estimated break date (Andrews-Quandt test), T2: Autocorrelation (Breusch-Godfrey test), T3: Autocorrelation (Q test), T4: Misspecification (Ramsey RESET test), T5: Heteroskedasticity (White test), T6: Heteroskedasticity (ARCH test), T7: Heteroskedasticity (McLeod-Li), T8: Normality (Jarque-Bera test), T9: Normality (Anderson-Darling test). A value of 1 in columns T1 to T9 indicates that the corresponding statistical test is significant at the 5% significance level and 0 otherwise.