



Figure S1. Spatial distribution of mean surface temperature (tas) with ERA5 (first column) for the south-southeast zone and the four models (CNRM-ESM2-1, IPSL-CM6A-LR, MIROC6, MRI-ESM2-0) in the historical period 1980-2014 without (second column) and with correction (fourth column) and the bias of each one (third column).

Table S1. Trend slopes throughout the three future periods (2021-2040, 2041-2060, 2081-2100) with the four models (CNRM-ESM2-1, IPSL-CM6A-LR, MIROC6, MRI-ESM2-0) and under the three scenarios SSP2-4.5, SSP4-6.0 and SSP5-8.5 with the simple difference bias correction.

| SCENARIO | PERIOD | MODEL | M SOUTH (°C/year) (stdErr) | P-VALUE | M SOUTHEAST (°C/year) (stdErr) | P-VALUE |
|----------|-----------|--------------|----------------------------------|---------|-----------------------------------|---------|
| SSP2-4.5 | 2021-2040 | CNRM-ESM2-1 | 0.02 (0.011) | 0.94 | 0.02 (0.009) | 0.91 |
| SSP2-4.5 | 2021-2040 | IPSL-CM6A-LR | 0.03 (0.010) | 0.99 | 0.03 (0.010) | 0.99 |
| SSP2-4.5 | 2021-2040 | MIROC6 | 0.04 (0.018) | 0.99 | 0.07 (0.017) | 0.99 |
| SSP2-4.5 | 2021-2040 | MRI_ESM2_0 | 0.04 (0.015) | 0.99 | 0.05 (0.013) | 1 |
| SSP2-4.5 | 2041-2060 | CNRM-ESM2-1 | 0.04 (0.014) | 0.99 | 0.04 (0.013) | 0.99 |
| SSP2-4.5 | 2041-2060 | IPSL-CM6A-LR | 0.03 (0.013) | 0.97 | 0.04 (0.011) | 0.99 |
| SSP2-4.5 | 2041-2060 | MIROC6 | 0.03 (0.022) | 0.86 | 0.04 (0.017) | 0.93 |
| SSP2-4.5 | 2041-2060 | MRI_ESM2_0 | 0.03 (0.014) | 0.97 | 0.06 (0.011) | 1.00 |
| SSP2-4.5 | 2081-2100 | CNRM-ESM2-1 | 0.03 (0.012) | 0.97 | 0.02 (0.014) | 0.82 |
| SSP2-4.5 | 2081-2100 | IPSL-CM6A-LR | 0.00 (0.016) | 0.08 | 0.00 (0.012) | 0.18 |
| SSP2-4.5 | 2081-2100 | MIROC6 | 0.02 (0.016) | 0.77 | 0.00 (0.019) | 0.18 |
| SSP2-4.5 | 2081-2100 | MRI_ESM2_0 | 0.02 (0.016) | 0.79 | 0.02 (0.013) | 0.72 |
| SSP4-6.0 | 2021-2040 | CNRM-ESM2-1 | 0.05 (0.013) | 0.99 | 0.06 (0.012) | 1.00 |
| SSP4-6.0 | 2021-2040 | IPSL-CM6A-LR | 0.05 (0.014) | 0.99 | 0.05 (0.012) | 1.00 |
| SSP4-6.0 | 2021-2040 | MIROC6 | 0.03 (0.016) | 0.74 | 0.03 (0.017) | 0.97 |
| SSP4-6.0 | 2021-2040 | MRI_ESM2_0 | 0.03 (0.015) | 0.93 | 0.04 (0.011) | 0.99 |
| SSP4-6.0 | 2041-2060 | CNRM-ESM2-1 | 0.05 (0.011) | 1.00 | 0.04 (0.011) | 1.00 |
| SSP4-6.0 | 2041-2060 | IPSL-CM6A-LR | 0.04 (0.014) | 0.99 | 0.04 (0.013) | 1.00 |
| SSP4-6.0 | 2041-2060 | MIROC6 | 0.06 (0.020) | 0.94 | 0.04 (0.022) | 0.89 |
| SSP4-6.0 | 2041-2060 | MRI_ESM2_0 | 0.01 (0.013) | 0.58 | 0.02 (0.013) | 0.91 |
| SSP4-6.0 | 2081-2100 | CNRM-ESM2-1 | 0.06 (0.009) | 1.00 | 0.07(0.011) | 1.00 |
| SSP4-6.0 | 2081-2100 | IPSL-CM6A-LR | 0.02 (0.010) | 0.74 | 0.02 (0.008) | 0.94 |
| SSP4-6.0 | 2081-2100 | MIROC6 | 0.01 (0.020) | 0.50 | 0.01 (0.017) | 0.15 |
| SSP4-6.0 | 2081-2100 | MRI_ESM2_0 | 0.01 (0.014) | 0.37 | 0.02 (0.013) | 0.90 |
| SSP5-8.5 | 2021-2040 | CNRM-ESM2-1 | 0.04 (0.014) | 1.00 | 0.03 (0.014) | 0.97 |
| SSP5-8.5 | 2021-2040 | IPSL-CM6A-LR | 0.03 (0.010) | 0.95 | 0.03 (0.010) | 0.98 |
| SSP5-8.5 | 2021-2040 | MIROC6 | 0.05 (0.017) | 0.98 | 0.08 (0.019) | 1.00 |
| SSP5-8.5 | 2021-2040 | MRI_ESM2_0 | 0.06 (0.010) | 1.00 | 0.04 (0.011) | 1.00 |
| SSP5-8.5 | 2041-2060 | CNRM-ESM2-1 | 0.07 (0.012) | 1.00 | 0.05 (0.015) | 0.99 |
| SSP5-8.5 | 2041-2060 | IPSL-CM6A-LR | 0.06 (0.014) | 1.00 | 0.06 (0.011) | 1.00 |
| SSP5-8.5 | 2041-2060 | MIROC6 | 0.06 (0.016) | 1.00 | 0.04 (0.021) | 0.99 |
| SSP5-8.5 | 2041-2060 | MRI_ESM2_0 | 0.03 (0.014) | 0.95 | 0.04 (0.012) | 0.99 |
| SSP5-8.5 | 2081-2100 | CNRM-ESM2-1 | 0.10 (0.012) | 1.00 | 0.08 (0.012) | 1.00 |
| SSP5-8.5 | 2081-2100 | IPSL-CM6A-LR | 0.07 (0.016) | 1.00 | 0.07 (0.012) | 1.00 |
| SSP5-8.5 | 2081-2100 | MIROC6 | 0.06 (0.020) | 0.99 | 0.08 (0.023) | 1.00 |
| SSP5-8.5 | 2081-2100 | MRI_ESM2_0 | 0.06 (0.014) | 1.00 | 0.07 (0.011) | 1.00 |

Table S2. Historical trends (1980-2014) for the ERA 5 and four models with bias correction.

| PERIOD | MODEL | M SOUTH (stdErr) | P-VALUE | M SOUTHEAST (stdErr) | P-VALUE |
|-----------|--------------|------------------|---------|----------------------|---------|
| 1980-2014 | ERA-5 | 0.012 (0.004) | 1.00 | 0.039 (0.004) | 1.00 |
| 1980-2014 | CNRM-ESM2-1 | 0.032 (0.004) | 1.00 | 0.032 (0.004) | 1.00 |
| 1980-2014 | IPSL-CM6A-LR | 0.026 (0.005) | 1.00 | 0.026 (0.005) | 1.00 |
| 1980-2014 | MIROC6 | 0.032 (0.007) | 1.00 | 0.032 (0.007) | 1.00 |
| 1980-2014 | MRI ESM2 0 | 0.019 (0.004) | 1.00 | 0.019 (0.004) | 1.00 |

Table S3. Values of the $z\text{-eq}$ for the four models regarding the historical period (1980-2014) and future time of the models in each region (south and southeast).

| MODEL | SCENARIO | PERIOD | $z\text{-eq}$ MODELS (SOUTH) | $z\text{-eq}$ MODELS (SOUTHEAST) |
|--------------|----------|-----------|------------------------------------|--|
| CNRM-ESM2-1 | SSP2-4.5 | 2021-2040 | -1.02 | -1.05 |
| CNRM-ESM2-1 | SSP4-6.0 | 2021-2040 | 1.32 | 2.01 |
| CNRM-ESM2-1 | SSP5-8.5 | 2021-2040 | 0.55 | -0.13 |
| CNRM-ESM2-1 | SSP2-4.5 | 2041-2060 | 0.55 | 0.54 |
| CNRM-ESM2-1 | SSP4-6.0 | 2041-2060 | 1.54 | 0.61 |
| CNRM-ESM2-1 | SSP5-8.5 | 2041-2060 | 3.00 | 1.09 |
| CNRM-ESM2-1 | SSP2-4.5 | 2081-2100 | -0.16 | -0.77 |
| CNRM-ESM2-1 | SSP4-6.0 | 2081-2100 | 2.84 | 2.91 |
| CNRM-ESM2-1 | SSP5-8.5 | 2081-2100 | 5.38 | 3.45 |
| IPSL-CM6A-LR | SSP2-4.5 | 2021-2040 | 0.36 | 2.15 |
| IPSL-CM6A-LR | SSP4-6.0 | 2021-2040 | 1.61 | 1.08 |
| IPSL-CM6A-LR | SSP5-8.5 | 2021-2040 | 0.36 | 1.25 |
| IPSL-CM6A-LR | SSP2-4.5 | 2041-2060 | 0.29 | 2.81 |
| IPSL-CM6A-LR | SSP4-6.0 | 2041-2060 | 0.94 | -0.43 |
| IPSL-CM6A-LR | SSP5-8.5 | 2041-2060 | 2.29 | 1.16 |
| IPSL-CM6A-LR | SSP2-4.5 | 2081-2100 | -1.55 | -0.46 |
| IPSL-CM6A-LR | SSP4-6.0 | 2081-2100 | -0.54 | -0.64 |
| IPSL-CM6A-LR | SSP5-8.5 | 2081-2100 | 2.62 | 3.38 |
| MIROC6 | SSP2-4.5 | 2021-2040 | 0.41 | 2.07 |
| MIROC6 | SSP4-6.0 | 2021-2040 | -0.11 | -0.10 |
| MIROC6 | SSP5-8.5 | 2021-2040 | 0.98 | 2.37 |
| MIROC6 | SSP2-4.5 | 2041-2060 | -0.087 | 0.44 |
| MIROC6 | SSP4-6.0 | 2041-2060 | 1.32 | 0.35 |
| MIROC6 | SSP5-8.5 | 2041-2060 | 1.60 | 0.36 |
| MIROC6 | SSP2-4.5 | 2081-2100 | -0.69 | -1.58 |
| MIROC6 | SSP4-6.0 | 2081-2100 | -1.04 | -1.20 |
| MIROC6 | SSP5-8.5 | 2081-2100 | 1.32 | 1.99 |
| MRI ESM2 0 | SSP2-4.5 | 2021-2040 | 1.35 | 2.28 |
| MRI ESM2 0 | SSP4-6.0 | 2021-2040 | 0.71 | 1.79 |
| MRI ESM2 0 | SSP5-8.5 | 2021-2040 | 3.80 | 1.79 |
| MRI ESM2 0 | SSP2-4.5 | 2041-2060 | 0.76 | 3.50 |

| | | | | |
|------------|----------|-----------|-------|------|
| MRI ESM2 0 | SSP4-6.0 | 2041-2060 | -0.66 | 0.07 |
| MRI ESM2 0 | SSP5-8.5 | 2041-2060 | 0.75 | 1.66 |
| MRI ESM2 0 | SSP2-4.5 | 2081-2100 | 0.06 | 0.07 |
| MRI ESM2 0 | SSP4-6.0 | 2081-2100 | -0.62 | 0.07 |
| MRI ESM2 0 | SSP5-8.5 | 2081-2100 | 2.82 | 4.36 |