

Supplementary Table 1 : Global and annual multi-model mean clear sky radiative fluxes.

| Variables | Base | cfc12 | cfc11 | n2o1p | Indus | bcslt |
|------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| fsst | | | | | | |
| rsutcs | 52.0795 (10) | -0.1493 (10) | -0.1154 (9) | 0.9407 (9) | -1.4009 (9) | 3.4822 (9) |
| rsdscs | 249.677 (8) | -0.617 (8) | -0.382 (8) | 4.693 (8) | -4.632 (8) | -3.890 (8) |
| rsuscs | 30.3708 (8) | -0.2918 (8) | -0.1183 (8) | 0.4179 (8) | -0.7646 (8) | -0.3413 (8) |
| rlutcs | 262.669 (10) | -3.745 (10) | -1.216 (9) | 0.468 (9) | 0.290 (9) | -0.391 (9) |
| rldscs | 315.497 (10) | 3.340 (10) | 1.093 (9) | 1.039 (9) | 1.248 (9) | -0.341 (9) |
| coupled | | | | | | |
| rsutcs | 52.2177 (10) | -1.6848 (10) | -0.5122 (10) | -0.4573 (9) | -1.7721 (9) | 5.4165 (8) |
| rsdscs | 249.176 (8) | -2.733 (8) | -0.890 (8) | 2.114 (8) | -5.790 (8) | -1.609 (8) |
| rsuscs | 30.4707 (8) | -1.9290 (8) | -0.5917 (8) | -1.2358 (8) | -1.2555 (8) | 1.6795 (8) |
| rlutcs | 263.482 (10) | 0.523 (10) | 0.064 (10) | 4.952 (9) | 1.434 (9) | -4.917 (8) |
| rldscs | 317.919 (10) | 18.671 (10) | 4.995 (10) | 17.127 (9) | 5.264 (9) | -14.702 (8) |

Table 3: Global and annual multi-model mean top of the atmosphere and surface fluxes for core PDRMIP simulations (variable names described in Tables 5-7).

| Variables | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|----------------|--------------|--------------|--------------|-------------|--------------|--------------|
| fsst | | | | | | |
| rsdt | 341.055 (10) | -0.000 (10) | 0.000 (9) | 6.814 (9) | 0.000 (9) | 0.000 (9) |
| rsut | 101.805 (10) | -0.726 (10) | -0.296 (9) | 1.997 (9) | -1.994 (9) | 4.132 (9) |
| rsds | 188.595 (10) | 0.221 (10) | -0.125 (9) | 3.390 (9) | -4.423 (9) | -4.397 (9) |
| rsus | 24.0455 (10) | -0.1868 (10) | -0.0918 (9) | 0.2761 (9) | -0.7070 (9) | -0.3302 (9) |
| rlut | 237.512 (10) | -3.096 (10) | -0.835 (9) | 0.621 (9) | 0.978 (9) | -0.646 (9) |
| rlsds | 341.571 (10) | 2.339 (10) | 0.798 (9) | 1.011 (9) | 1.279 (9) | -0.222 (9) |
| rlus | 398.138 (10) | 1.164 (10) | 0.279 (9) | 0.623 (9) | 0.209 (9) | -0.536 (9) |
| hfls | 86.7742 (10) | -2.1689 (10) | -0.4763 (9) | -0.6745 (9) | -2.3951 (9) | -0.0772 (9) |
| hfss | 19.9755 (11) | -0.0571 (11) | -0.1516 (10) | 0.0167 (10) | -1.2561 (10) | -0.2193 (10) |
| coupled | | | | | | |
| rsdt | 341.047 (10) | 0.003 (10) | 0.000 (10) | 6.814 (9) | 0.000 (9) | -0.000 (8) |
| rsut | 101.265 (10) | -2.051 (10) | -0.613 (10) | 0.757 (9) | -2.304 (9) | 6.238 (8) |

| | | | | | | |
|------|--------------|--------------|--------------|--------------|--------------|-------------|
| rsds | 189.067 (10) | -1.632 (10) | -0.582 (10) | 1.299 (9) | -5.452 (9) | -3.099 (8) |
| rsus | 24.0532 (10) | -1.5260 (10) | -0.4483 (10) | -1.0378 (9) | -1.0720 (9) | 1.3567 (8) |
| rlut | 238.5 (10) | 1.2 (10) | 0.4 (10) | 5.1 (9) | 2.2 (9) | -5.3 (8) |
| rlds | 343.361 (10) | 16.550 (10) | 4.490 (10) | 15.844 (9) | 5.087 (9) | -13.305 (8) |
| rlus | 400.326 (10) | 13.114 (10) | 3.425 (10) | 12.947 (9) | 3.330 (9) | -11.926 (8) |
| hfls | 87.4238 (10) | 3.0924 (10) | 1.0147 (10) | 4.9348 (9) | -1.4130 (9) | -5.3573 (8) |
| hfss | 19.9263 (11) | -0.5725 (11) | -0.2729 (11) | -0.5133 (10) | -1.3166 (10) | 0.3224 (9) |

Table 4: Global and annual multi-model mean meteorological variables for core PDRMIP simulations (variable names described in Table 8-11).

| Variables | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-------------|------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| fsst | | | | | | |
| tas | 287.54 (11) | 0.27 (11) | 0.07 (10) | 0.13 (10) | 0.08 (10) | -0.10 (10) |
| ts | 288.166 (4) | 0.264 (4) | 0.052 (4) | 0.113 (4) | 0.051 (3) | -0.078 (3) |
| pr | 3.44914E-05 (11) | -0.08736E-05 (11) | -0.01762E-05 (10) | -0.02537E-05 (10) | -0.09186E-05 (10) | -0.00336E-05 (10) |
| prc | 2.08825E-05 (11) | -0.06511E-05 (11) | -0.01147E-05 (10) | -0.02795E-05 (10) | -0.07711E-05 (10) | 0.00169E-05 (10) |
| huss | 0.00954522 (9) | -0.00094672 (9) | 0.00003938 (8) | 0.00008641 (8) | 0.00012258 (9) | - 0.00107458 (9) |
| hurs | 76.2668 (9) | -2.6591 (9) | -8.4844 (8) | -8.4241 (8) | -7.2152 (9) | -9.9994 (9) |
| prw | 24.5249 (11) | 0.2055 (11) | 0.0895 (10) | 0.2888 (10) | 0.4323 (10) | -0.1181 (10) |
| evspsbl | 2.82009E-05 (11) | -0.07110E-05 (11) | -0.01765E-05 (10) | -0.02542E-05 (10) | -0.05946E-05 (10) | -0.00033E-05 (10) |
| uas | -0.467135 (11) | -0.001142 (11) | -0.013455 (10) | -0.015807 (10) | -0.005246 (10) | 0.014340 (10) |
| vas | 0.144352 (11) | -0.000438 (11) | -0.001657 (10) | 0.004555 (10) | 0.018139 (10) | -0.013067 (10) |
| clt | 54.803 (10) | -0.237 (10) | -0.133 (9) | -0.018 (9) | -0.137 (9) | 0.188 (9) |

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|----------------|------------------|------------------|------------------|------------------|-------------------|---------------------|
| ps | 98533.5 (11) | -1.2 (11) | 0.4 (10) | 1.9 (10) | 2.1 (10) | -0.6 (10) |
| coupled | | | | | | |
| tas | 287.942 (11) | 2.511 (11) | 0.692 (11) | 2.460 (10) | 0.671 (10) | -2.260 (9) |
| ts | 289.541 (4) | 2.851 (4) | 0.812 (4) | 2.804 (4) | 0.409 (3) | -3.062 (3) |
| pr | 3.47443E-05 (11) | 0.12655E-05 (11) | 0.04619E-05 (11) | 0.20698E-05 (10) | -0.05073E-05 (10) | -0.21488E-05 (9) |
| prc | 2.12036E-05 (11) | 0.08095E-05 (11) | 0.03125E-05 (11) | 0.11593E-05 (10) | -0.05582E-05 (10) | -0.14696E-05 (9) |
| huss | 0.00973659 (9) | 0.00027517 (9) | 0.00036842 (9) | 0.00155800 (8) | 0.00047317 (9) | - 0.00118848 (8) |
| hurs | 75.9993 (9) | -2.8860 (9) | -0.0385 (9) | 0.0034 (8) | 0.3712 (9) | 0.1386 (8) |
| prw | 24.8998 (11) | 4.4557 (11) | 1.2319 (11) | 4.9351 (10) | 1.5500 (10) | -3.3829 (9) |
| evspsbl | 2.84365E-05 (11) | 0.09808E-05 (11) | 0.04194E-05 (11) | 0.20626E-05 (10) | -0.02473E-05 (10) | -0.21406E-05 (9) |
| uas | -0.419113 (11) | 0.027759 (11) | 0.006887 (11) | 0.016164 (10) | 0.009095 (10) | -0.006817 (9) |
| vas | 0.104222 (11) | 0.006013 (11) | -0.001136 (11) | -0.002640 (10) | 0.047582 (10) | -0.062206 (9) |
| clt | 54.3323 (10) | -0.4712 (10) | -0.1894 (10) | -0.2585 (9) | -0.1122 (9) | 0.6490 (8) |
| ps | 98536.7 (11) | 21.9 (11) | 6.9 (11) | 29.6 (10) | 8.5 (10) | -23.2 (9) |

Table 5: Global and annual mean short wave (SW) radiative fluxes (rsdt – downward SW radiative fluxes at top of the atmosphere , rsut - upward SW radiative fluxes at top of the atmosphere, rsds – downward SW radiative fluxes at surface, rsus - upward SW radiative fluxes at surface) *(no separate upward and downward fluxes for IPSL-CM5A-LR available).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|
| FSST: | | | rsdt | | | |
| CanESM2 | 341.279 | 341.279 | 341.279 | 348.105 | 341.279 | 341.279 |
| ECHAM-HAM | 340.419 | 340.419 | NA | NA | 340.419 | 340.419 |
| GISS-E2-R | 341.571 | 341.571 | 341.571 | 348.403 | 341.571 | 341.571 |
| HadGEM2 | 341.4 | 341.4 | 341.4 | 348.228 | 341.4 | 341.4 |
| HadGEM3 | 341.4 | 341.4 | 341.4 | 348.228 | 341.4 | 341.4 |
| MIROC-SPRINTARS | 341.748 | 341.748 | 341.748 | 348.583 | 341.748 | 341.748 |
| MPI-ESM | 340.563 | 340.563 | 340.563 | 347.375 | NA | NA |
| NCAR-CESM1-CAM4 | 341.357 | 341.357 | 341.357 | 348.109 | 341.357 | 341.357 |
| NCAR-CESM1-CAM5 | 340.395 | 340.395 | 340.395 | 347.203 | 340.395 | 340.395 |
| NorESM1 | 340.328 | 340.328 | 340.328 | 347.135 | 340.328 | 340.328 |
| | | | rsut | | | |

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|-----------------|---------|---------|---------|---------|---------|---------|
| CanESM2 | 100.397 | 99.6752 | 99.8788 | 102.484 | 96.791 | 104.22 |
| ECHAM-HAM | 102.017 | 101.262 | NA | NA | 99.5867 | 104.899 |
| GISS-E2-R | 100.644 | 100.184 | 100.419 | 102.488 | 98.7821 | 103.719 |
| HadGEM2 | 97.3517 | 97.0016 | 97.1594 | 99.4303 | 95.4207 | 101.879 |
| HadGEM3 | 100.841 | 99.6877 | 100.266 | 102.507 | 99.5409 | 110.282 |
| MIROC-SPRINTARS | 106.207 | 105.477 | 106.055 | 108.235 | 105.108 | 109.57 |
| MPI-ESM | 100.751 | 99.9332 | 100.578 | 102.973 | NA | NA |
| NCAR-CESM1-CAM4 | 102.198 | 101.326 | 101.863 | 104.228 | 100.343 | 104.487 |
| NCAR-CESM1-CAM5 | 101.575 | 100.704 | 101.392 | 103.457 | 100.296 | 105.389 |
| NorESM1 | 106.165 | 105.635 | 105.851 | 108.302 | 103.582 | 110.138 |
| rsds | | | | | | |
| CanESM2 | 191.921 | 191.947 | 190.871 | 195.071 | 183.574 | 188.079 |
| ECHAM-HAM | 186.649 | 186.916 | NA | NA | 178.732 | 183.759 |
| GISS-E2-R | 193.477 | 193.614 | 193.578 | 197.271 | 189.483 | 190.095 |

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|-----------------|---------|---------|---------|---------|---------|---------|
| HadGEM2 | 196.408 | 196.033 | 196.449 | 199.689 | 193.199 | 191.417 |
| HadGEM3 | 195.113 | 195.635 | 195.632 | 199.029 | 193.164 | 184.613 |
| MIROC-SPRINTARS | 186.214 | 186.506 | 185.785 | 189.776 | 183.276 | 182.843 |
| MPI-ESM | 185.354 | 185.808 | 184.936 | 188.426 | NA | NA |
| NCAR-CESM1-CAM4 | 185.157 | 185.723 | 185.488 | 188.433 | 180.651 | 182.893 |
| NCAR-CESM1-CAM5 | 183.351 | 183.533 | 182.941 | 186.635 | 180.649 | 178.965 |
| NorESM1 | 181.629 | 181.77 | 181.819 | 184.804 | 177.388 | 177.684 |
| rsus | | | | | | |
| CanESM2 | 27.2944 | 27.1301 | 27.054 | 27.5672 | 25.796 | 26.9064 |
| ECHAM-HAM | 24.7876 | 24.6782 | NA | NA | 23.7561 | 24.5798 |
| GISS-E2-R | 22.664 | 22.4388 | 22.5542 | 22.9525 | 22.0979 | 22.4093 |
| HadGEM2 | 24.2767 | 24.1047 | 24.2436 | 24.5691 | 23.7137 | 23.8298 |
| HadGEM3 | 25.1567 | 25.0128 | 25.1167 | 25.5193 | 24.7884 | 24.3023 |
| MIROC-SPRINTARS | 23.6934 | 23.531 | 23.6212 | 24.0699 | 23.3365 | 23.5034 |

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|-------------------------|---------|---------|-------------|---------|---------|---------|
| MPI-ESM | 22.9107 | 22.8277 | 22.8141 | 23.1684 | NA | NA |
| NCAR- CESM1- CAM4 | 22.717 | 22.504 | 22.7164 | 22.9532 | 22.1347 | 22.574 |
| NCAR- CESM1- CAM5 | 23.5753 | 23.2339 | 23.4393 | 23.7662 | 22.8744 | 23.2734 |
| NorESM1 | 22.9879 | 22.7347 | 22.891 | 23.1952 | 22.2927 | 22.803 |
| Coupled: | | | rsdt | | | |
| CanESM2 | 341.279 | 341.279 | 341.279 | 348.105 | 341.279 | 341.279 |
| ECHAM- HAM | 340.387 | 340.42 | 340.42 | NA | 340.387 | NA |
| GISS-E2-R | 341.571 | 341.571 | 341.571 | 348.403 | 341.571 | 341.571 |
| HadGEM2 | 341.400 | 341.400 | 341.400 | 348.228 | 341.400 | 341.400 |
| HadGEM3 | 341.400 | 341.400 | 341.400 | 348.228 | 341.400 | 341.400 |
| MIROC- SPRINTARS | 341.747 | 341.747 | 341.747 | 348.582 | 341.747 | 341.747 |
| MPI-ESM | 340.564 | 340.564 | 340.564 | 347.375 | NA | NA |
| NCAR- CESM1- CAM4 | 341.357 | 341.357 | 341.357 | 348.109 | 341.357 | 341.357 |
| NCAR- CESM1- CAM5 | 340.422 | 340.422 | 340.422 | 347.23 | 340.422 | 340.422 |

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| NorESM1 | 340.328 | 340.328 | 340.328 | 347.135 | 340.328 | 340.328 |
| rsut | | | | | | |
| CanESM2 | 100.773 | 98.7659 | 100.144 | 101.391 | 96.6623 | 106.753 |
| ECHAM-HAM | 101.560 | 99.1295 | 101.392 | NA | 99.3234 | NA |
| GISS-E2-R | 100.713 | 101.117 | 100.665 | 103.551 | 99.0400 | 103.219 |
| HadGEM2 | 97.8977 | 95.5449 | 97.2198 | 98.9283 | 93.8448 | 104.384 |
| HadGEM3 | 97.3389 | 91.4093 | 95.2938 | 93.0231 | 95.1160 | 116.686 |
| MIROC-SPRINTARS | 107.367 | 106.378 | 107.062 | 109.233 | 106.417 | 111.043 |
| MPI-ESM | 100.465 | 99.8750 | 100.404 | 102.946 | NA | NA |
| NCAR-CESM1-CAM4 | 101.227 | 98.6404 | 100.319 | 101.863 | 99.3899 | 104.065 |
| NCAR-CESM1-CAM5 | 99.3527 | 96.8921 | 98.8093 | 99.6397 | 98.1819 | 104.081 |
| NorESM1 | 105.834 | 104.271 | 105.311 | 107.202 | 103.352 | 110.175 |
| rsds | | | | | | |
| CanESM2 | 191.929 | 189.421 | 191.077 | 192.200 | 182.916 | 189.923 |

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|-----------------|---------|---------|---------|---------|---------|---------|
| ECHAM-HAM | 187.007 | 185.109 | 185.887 | NA | 178.184 | NA |
| GISS-E2-R | 192.910 | 191.020 | 192.603 | 194.485 | 188.542 | 191.168 |
| HadGEM2 | 196.333 | 194.266 | 195.710 | 196.808 | 187.624 | 193.999 |
| HadGEM3 | 196.437 | 197.070 | 196.843 | 200.655 | 194.594 | 185.690 |
| MIROC-SPRINTARS | 187.417 | 185.827 | 186.649 | 188.794 | 184.162 | 185.729 |
| MPI-ESM | 185.994 | 183.441 | 184.802 | 186.133 | NA | NA |
| NCAR-CESM1-CAM4 | 184.046 | 182.589 | 183.535 | 185.061 | 179.081 | 183.126 |
| NCAR-CESM1-CAM5 | 184.504 | 183.098 | 183.793 | 186.043 | 181.587 | 180.910 |
| NorESM1 | 184.307 | 182.724 | 183.814 | 185.392 | 179.137 | 182.546 |
| rsus | | | | | | |
| CanESM2 | 27.6643 | 25.6649 | 27.0997 | 26.0028 | 25.5425 | 29.6400 |
| ECHAM-HAM | 24.7829 | 23.1342 | 24.4095 | NA | 23.6312 | NA |
| GISS-E2-R | 22.3171 | 21.6485 | 22.1576 | 22.1411 | 21.7346 | 22.5837 |
| HadGEM2 | 24.7250 | 22.8728 | 24.1850 | 23.5154 | 22.6742 | 26.7774 |

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|-----------------|---------|---------|---------|---------|---------|---------|
| HadGEM3 | 24.6560 | 23.0273 | 24.0693 | 23.3117 | 24.0232 | 27.9861 |
| MIROC-SPRINTARS | 23.8061 | 22.8578 | 23.5905 | 23.3246 | 23.2938 | 24.5506 |
| MPI-ESM | 22.9982 | 21.8968 | 22.6399 | 22.3300 | NA | NA |
| NCAR-CESM1-CAM4 | 22.1397 | 20.1232 | 21.3983 | 20.6997 | 21.3953 | 22.919 |
| NCAR-CESM1-CAM5 | 23.1401 | 21.5208 | 22.7246 | 22.0276 | 22.4320 | 23.5814 |
| NorESM1 | 24.3544 | 22.5772 | 23.7468 | 23.1075 | 23.2105 | 25.618 |

Table 6: Global and annual mean model long wave (LW) radiative fluxes (rlut – upward LW radiative fluxes at top of the atmosphere, rlds – downward LW radiative fluxes at surface, rlus - upward LW radiative fluxes at surface) *(no separate upward and downward fluxes for IPSL-CM5A-LR available).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|
| FSST: | | | rlut | | | |
| CanESM2 | 240.23 | 237.38 | 239.387 | 240.875 | 242.285 | 239.653 |
| ECHAM-HAM | 237.968 | 234.116 | NA | NA | 239.144 | 237.431 |
| GISS-E2-R | 240.264 | 236.659 | 239.147 | 240.767 | 240.891 | 239.983 |
| HadGEM2 | 242.92 | 239.903 | 242.132 | 243.472 | 243.661 | 242.409 |
| HadGEM3 | 238.544 | 236.053 | 237.724 | 239.349 | 239.149 | 237.367 |
| MIROC-SPRINTARS | 235.625 | 232.730 | 234.997 | 236.286 | 236.095 | 235.035 |
| MPI-ESM | 238.949 | 235.628 | 238.172 | 239.422 | NA | NA |
| NCAR-CESM1-CAM4 | 233.148 | 230.397 | 232.215 | 233.759 | 234.236 | 232.896 |
| NCAR-CESM1-CAM5 | 233.648 | 230.44 0 | 232.969 | 234.331 | 234.511 | 231.937 |
| NorESM1 | 234.134 | 231.169 | 233.205 | 234.793 | 235.313 | 233.954 |
| | | | rlds | | | |
| CanESM2 | 331.255 | 333.436 | 332.631 | 332.65 | 334.259 | 330.711 |

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|-----------------|---------|---------|---------|---------|---------|---------|
| ECHAM-HAM | 348.567 | 351.151 | NA | NA | 350.399 | 347.985 |
| GISS-E2-R | 348.926 | 351.098 | 349.594 | 349.686 | 349.889 | 348.724 |
| HadGEM2 | 333.277 | 335.435 | 333.900 | 334.330 | 334.258 | 332.945 |
| HadGEM3 | 337.561 | 339.560 | 338.241 | 338.436 | 338.199 | 338.241 |
| MIROC-SPRINTARS | 345.46 | 347.808 | 346.064 | 346.303 | 346.06 | 345.205 |
| MPI-ESM | 345.998 | 348.420 | 346.709 | 346.986 | NA | NA |
| NCAR-CESM1-CAM4 | 338.989 | 341.345 | 339.798 | 339.910 | 340.163 | 338.301 |
| NCAR-CESM1-CAM5 | 343.665 | 346.500 | 344.346 | 344.700 | 344.572 | 344.47 |
| NorESM1 | 342.273 | 344.607 | 343.301 | 343.501 | 343.682 | 341.393 |
| rlus | | | | | | |
| CanESM2 | 391.370 | 392.394 | 391.788 | 392.112 | 391.921 | 390.505 |
| ECHAM-HAM | 400.179 | 401.226 | NA | NA | 400.132 | 399.571 |
| GISS-E2-R | 405.454 | 406.552 | 405.794 | 405.900 | 405.657 | 405.069 |
| HadGEM2 | 395.679 | 396.79 | 395.812 | 396.326 | 395.886 | 395.028 |

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|-----------------|---------|---------|-------------|---------|---------|---------|
| HadGEM3 | 397.220 | 398.582 | 397.597 | 397.919 | 397.405 | 396.571 |
| MIROC-SPRINTARS | 398.466 | 399.552 | 398.640 | 398.978 | 398.452 | 398.036 |
| MPI-ESM | 399.422 | 400.539 | 399.634 | 399.934 | NA | NA |
| NCAR-CESM1-CAM4 | 397.495 | 398.741 | 397.759 | 398.035 | 397.601 | 396.921 |
| NCAR-CESM1-CAM5 | 396.031 | 397.577 | 396.241 | 396.711 | 396.476 | 395.996 |
| NorESM1 | 400.610 | 401.611 | 400.992 | 401.436 | 400.851 | 399.979 |
| Coupled: | | | rlut | | | |
| CanESM2 | 240.350 | 241.430 | 240.819 | 245.608 | 244.222 | 235.253 |
| ECHAM-HAM | 238.495 | 240.512 | 238.506 | NA | 240.75 | NA |
| GISS-E2-R | 240.370 | 238.915 | 239.945 | 243.412 | 241.819 | 238.483 |
| HadGEM2 | 243.088 | 244.369 | 243.530 | 247.961 | 246.811 | 237.728 |
| HadGEM3 | 243.326 | 247.848 | 244.935 | 252.886 | 245.389 | 226.602 |
| MIROC-SPRINTARS | 233.321 | 233.148 | 233.423 | 237.173 | 234.211 | 230.330 |
| MPI-ESM | 239.156 | 238.833 | 239.147 | 242.761 | NA | NA |

| | | | | | | |
|-------------------------|---------|---------|---------|---------|---------|---------|
| NCAR- CESM1- CAM4 | 238.004 | 240.669 | 238.908 | 244.099 | 239.845 | 235.141 |
| NCAR- CESM1- CAM5 | 237.004 | 238.448 | 237.350 | 242.579 | 238.053 | 232.725 |
| NorESM1 | 232.083 | 232.680 | 232.290 | 236.564 | 234.329 | 228.685 |
| rlds | | | | | | |
| CanESM2 | 331.319 | 348.782 | 335.325 | 350.167 | 340.97 | 316.261 |
| ECHAM- HAM | 349.541 | 368.349 | 353.184 | NA | 353.919 | NA |
| GISS-E2-R | 350.238 | 361.201 | 353.279 | 360.062 | 353.655 | 343.873 |
| HadGEM2 | 333.152 | 350.613 | 338.504 | 349.759 | 345.381 | 317.861 |
| HadGEM3 | 349.983 | 374.186 | 357.821 | 377.498 | 354.719 | 312.522 |
| MIROC- SPRINTARS | 337.310 | 348.163 | 339.774 | 347.287 | 338.893 | 330.339 |
| MPI-ESM | 344.526 | 359.536 | 348.189 | 357.829 | NA | NA |
| NCAR- CESM1- CAM4 | 352.649 | 373.388 | 359.863 | 371.250 | 356.253 | 343.372 |
| NCAR- CESM1- CAM5 | 349.807 | 366.348 | 353.400 | 364.752 | 351.197 | 344.016 |
| NorESM1 | 334.851 | 348.311 | 339.373 | 347.832 | 339.648 | 324.626 |

| | rlus | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| CanESM2 | 391.334 | 405.551 | 394.502 | 407.161 | 398.124 | 377.469 |
| ECHAM-HAM | 401.484 | 416.538 | 404.048 | NA | 403.488 | NA |
| GISS-E2-R | 406.403 | 414.363 | 408.597 | 413.831 | 408.509 | 401.306 |
| HadGEM2 | 395.657 | 409.564 | 399.786 | 409.187 | 404.196 | 381.949 |
| HadGEM3 | 408.589 | 428.938 | 415.020 | 431.883 | 412.293 | 374.003 |
| MIROC-SPRINTARS | 393.963 | 401.861 | 395.571 | 401.730 | 394.724 | 387.896 |
| MPI-ESM | 398.650 | 409.828 | 401.205 | 409.059 | NA | NA |
| NCAR-CESM1-CAM4 | 409.534 | 426.480 | 415.220 | 424.866 | 411.656 | 401.753 |
| NCAR-CESM1-CAM5 | 402.639 | 415.796 | 405.351 | 414.976 | 403.434 | 396.756 |
| NorESM1 | 394.921 | 405.397 | 398.313 | 405.519 | 398.068 | 386.500 |

Table 7: Global and annual mean surface fluxes of sensible heat (hfss) and latent heat (hfls) *(for IPSL-CM5A-LR data available only for hfss).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|--------------|---------|---------|-------------|---------|---------|---------|
| FSST: | | | hfss | | | |
| CanESM2 | 24.5302 | 24.0364 | 24.1017 | 24.2387 | 22.2035 | 24.4189 |

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| ECHAM-HAM | 23.3937 | 22.8944 | NA | NA | 21.1307 | 23.3985 |
| GISS-E2-R | 19.2932 | 19.6324 | 19.0871 | 19.3217 | 17.889 | 18.9304 |
| HadGEM2 | 18.3718 | 18.251 | 18.2405 | 18.3667 | 17.6989 | 18.2715 |
| HadGEM3 | 18.6489 | 18.8882 | 18.596 | 18.7832 | 18.1414 | 18.2214 |
| IPSL-CM5A-LR | 23.107 | 23.1467 | 23.059 | 23.2637 | 21.942 | 22.6869 |
| MIROC-SPRINTARS | 14.7657 | 14.7389 | 14.6435 | 14.8492 | 13.9654 | 14.586 |
| MPI-ESM | 24.7015 | 24.2622 | 24.4555 | 24.55 | NA | NA |
| NCAR-CESM1-CAM4 | 17.5531 | 17.7734 | 17.4900 | 17.6358 | 16.2234 | 17.2875 |
| NCAR-CESM1-CAM5 | 17.2587 | 17.5862 | 17.1149 | 17.2526 | 16.5866 | 17.1303 |
| NorESM1 | 18.4595 | 18.2454 | 18.3853 | 18.5952 | 17.0395 | 18.2575 |
| hfls | | | | | | |
| CanESM2 | 79.2433 | 77.5267 | 78.4585 | 78.9669 | 75.6298 | 79.4656 |
| ECHAM-HAM | 86.3195 | 84.0711 | NA | NA | 82.2927 | 85.9568 |
| GISS-E2-R | 93.6866 | 90.7557 | 93.1047 | 93.0157 | 91.1939 | 93.9021 |

| | | | | | | |
|-----------------|---------|---------|-------------|---------|---------|---------|
| HadGEM2 | 89.3718 | 86.9967 | 89.0947 | 88.5805 | 86.9941 | 89.2541 |
| HadGEM3 | 88.7126 | 86.1571 | 88.2342 | 87.9556 | 87.4185 | 89.0617 |
| MIROC-SPRINTARS | 94.4902 | 92.6133 | 93.8957 | 93.7644 | 92.6716 | 94.4217 |
| MPI-ESM | 83.3036 | 81.4531 | 82.7636 | 82.6018 | NA | NA |
| NCAR-CESM1-CAM4 | 81.6866 | 79.6927 | 81.3661 | 80.9562 | 79.3876 | 81.7494 |
| NCAR-CESM1-CAM5 | 87.4054 | 84.8591 | 86.9005 | 86.7048 | 86.1361 | 86.3956 |
| NorESM1 | 83.1197 | 81.5251 | 82.9154 | 82.4039 | 80.7555 | 83.1339 |
| Coupled: | | | hfss | | | |
| CanESM2 | 24.5571 | 23.1556 | 24.1591 | 23.3398 | 22.2206 | 25.4045 |
| ECHAM-HAM | 23.4666 | 22.7011 | 23.2072 | NA | 21.4049 | NA |
| GISS-E2-R | 18.8777 | 18.7263 | 18.5422 | 18.4749 | 17.5001 | 18.9194 |
| HadGEM2 | 18.5235 | 17.9027 | 18.2183 | 17.9025 | 16.9999 | 19.1407 |
| HadGEM3 | 18.1570 | 17.8099 | 17.8613 | 17.8572 | 17.5862 | 19.1682 |
| IPSL-CM5A-LR | 23.2497 | 22.6782 | 22.9350 | 22.7416 | 22.1539 | 23.3385 |

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| MIROC-SPRINTARS | 14.3582 | 14.0427 | 14.1753 | 14.2237 | 13.5839 | 14.4513 |
| MPI-ESM | 24.8059 | 23.8948 | 24.5291 | 24.2395 | NA | NA |
| NCAR-CESM1-CAM4 | 17.4571 | 17.0137 | 17.1519 | 16.9624 | 16.1309 | 17.5335 |
| NCAR-CESM1-CAM5 | 17.0846 | 16.6764 | 16.8743 | 16.4078 | 16.4013 | 17.1939 |
| NorESM1 | 18.692 | 18.3303 | 18.5301 | 18.4805 | 17.2754 | 18.7084 |
| hfls | | | | | | |
| CanESM2 | 79.4254 | 82.7272 | 80.2245 | 84.6968 | 77.5339 | 74.2227 |
| ECHAM-HAM | 86.4752 | 90.2696 | 86.7815 | NA | 83.2206 | NA |
| GISS-E2-R | 94.4444 | 95.3831 | 95.019 | 98.0726 | 93.1292 | 91.7209 |
| HadGEM2 | 89.3158 | 92.3595 | 90.5668 | 93.9023 | 87.6332 | 83.7318 |
| HadGEM3 | 93.4500 | 98.6532 | 95.7633 | 102.099 | 93.7147 | 77.8495 |
| MIROC-SPRINTARS | 91.3790 | 92.9131 | 91.6695 | 94.5117 | 90.1756 | 88.584 |
| MPI-ESM | 82.9423 | 85.3697 | 83.4426 | 86.5176 | NA | NA |
| NCAR-CESM1-CAM4 | 86.8499 | 91.8083 | 88.9700 | 93.2000 | 85.452 | 83.4929 |

| | | | | | | |
|-------------------------|---------|---------|---------|---------|---------|---------|
| NCAR- CESM1- CAM5 | 89.9840 | 93.1092 | 90.6157 | 95.1396 | 88.9415 | 86.3353 |
| NorESM1 | 80.0746 | 82.6724 | 81.1844 | 84.139 | 78.8808 | 76.1281 |

Table 8: Global and annual mean temperature (tas), precipitation (pr) and evaporation (evspsbl).

| Model | Base | co2x2 | ch4x3 | Solar | bcx10 | sulx5 |
|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|
| FSST: | | | tas | | | |
| CanESM2 | 286.831 | 287.063 | 286.921 | 286.977 | 286.991 | 286.669 |
| ECHAM-HAM | 287.872 | 288.123 | NA | NA | 287.904 | 287.734 |
| GISS-E2-R | 289.047 | 289.290 | 289.134 | 289.138 | 289.116 | 288.975 |
| HadGEM2 | 286.786 | 287.040 | 286.819 | 286.913 | 286.856 | 286.658 |
| HadGEM3 | 287.297 | 287.592 | 287.381 | 287.431 | 287.350 | 287.190 |
| IPSL-CM5A-LR | 287.180 | 287.455 | 287.280 | 287.332 | 287.243 | 287.066 |
| MIROC-SPRINTARS | 288.086 | 288.314 | 288.124 | 288.190 | 288.108 | 288.010 |
| MPI-ESM | 287.987 | 288.263 | 288.037 | 288.100 | NA | NA |
| NCAR-CESM1-CAM4 | 287.287 | 287.565 | 287.348 | 287.396 | 287.357 | 287.172 |
| NCAR-CESM1-CAM5 | 286.887 | 287.248 | 286.933 | 287.033 | 287.017 | 286.884 |
| NorESM1 | 287.754 | 287.990 | 287.845 | 287.922 | 287.876 | 287.634 |
| | | | pr | | | |

| | | | | | | |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CanESM2 | 3.16223E-05 | 3.09371E-05 | 3.13117E-05 | 3.15141E-05 | 3.01837E-05 | 3.17109E-05 |
| ECHAM-HAM | 3.45861E-05 | 3.36907E-05 | NA | NA | 3.29666E-05 | 3.44372E-05 |
| GISS-E2-R | 3.74728E-05 | 3.63025E-05 | 3.72425E-05 | 3.72042E-05 | 3.64768E-05 | 3.75605E-05 |
| HadGEM2 | 3.57253E-05 | 3.47728E-05 | 3.56122E-05 | 3.54076E-05 | 3.47763E-05 | 3.56769E-05 |
| HadGEM3 | 3.55032E-05 | 3.44809E-05 | 3.53129E-05 | 3.52031E-05 | 3.49798E-05 | 3.56462E-05 |
| IPSL-CM5A-LR | 3.23403E-05 | 3.13991E-05 | 3.22884E-05 | 3.22293E-05 | 3.17814E-05 | 3.2286E-05 |
| MIROC-SPRINTARS | 3.77968E-05 | 3.70448E-05 | 3.75593E-05 | 3.75057E-05 | 3.70697E-05 | 3.77699E-05 |
| MPI-ESM | 3.33563E-05 | 3.26192E-05 | 3.31428E-05 | 3.30773E-05 | NA | NA |
| NCAR-CESM1-CAM4 | 3.26543E-05 | 3.18571E-05 | 3.2525E-05 | 3.23622E-05 | 3.17346E-05 | 3.26797E-05 |
| NCAR-CESM1-CAM5 | 3.49612E-05 | 3.39425E-05 | 3.47596E-05 | 3.46811E-05 | 3.44535E-05 | 3.45569E-05 |
| NorESM1 | 3.32286E-05 | 3.25906E-05 | 3.31448E-05 | 3.29393E-05 | 3.22824E-05 | 3.3231E-05 |
| evspsbl | | | | | | |
| CanESM2 | 3.16221E-05 | 3.09388E-05 | 3.13118E-05 | 3.15149E-05 | 3.01851E-05 | 3.1712E-05 |

| | | | | | | |
|-----------------|--------------|--------------|-------------|-------------|--------------|--------------|
| ECHAM-HAM | -3.44997E-05 | -3.36001E-05 | 0 | 0 | -3.28898E-05 | -3.43531E-05 |
| GISS-E2-R | 3.74746E-05 | 3.63023E-05 | 3.72419E-05 | 3.72063E-05 | 3.64775E-05 | 3.75608E-05 |
| HadGEM2 | 3.56996E-05 | 3.47509E-05 | 3.55885E-05 | 3.53839E-05 | 3.47517E-05 | 3.5652E-05 |
| HadGEM3 | 3.53235E-05 | 3.42927E-05 | 3.51299E-05 | 3.50151E-05 | 3.48085E-05 | 3.5471E-05 |
| IPSL-CM5A-LR | 3.23349E-05 | 3.1394E-05 | 3.22833E-05 | 3.22228E-05 | 3.17748E-05 | 3.22797E-05 |
| MIROC-SPRINTARS | 3.77961E-05 | 3.70453E-05 | 3.75583E-05 | 3.75058E-05 | 3.70686E-05 | 3.77687E-05 |
| MPI-ESM | 3.32933E-05 | 3.25536E-05 | 3.30774E-05 | 3.30123E-05 | 0 | 0 |
| NCAR-CESM1-CAM4 | 3.26547E-05 | 3.1857E-05 | 3.25263E-05 | 3.23624E-05 | 3.17357E-05 | 3.26797E-05 |
| NCAR-CESM1-CAM5 | 3.49622E-05 | 3.39436E-05 | 3.47602E-05 | 3.46819E-05 | 3.44544E-05 | 3.45583E-05 |
| NorESM1 | 3.32268E-05 | 3.2589E-05 | 3.3145E-05 | 3.29405E-05 | 3.22819E-05 | 3.32327E-05 |
| Coupled: | | | tas | | | |
| CanESM2 | 286.815 | 289.514 | 287.415 | 289.760 | 288.121 | 284.101 |
| ECHAM-HAM | 288.148 | 291.068 | 288.651 | NA | 288.564 | NA |

| | | | | | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| GISS-E2-R | 289.227 | 290.713 | 289.643 | 290.574 | 289.624 | 288.297 |
| HadGEM2 | 286.745 | 289.479 | 287.542 | 289.299 | 288.408 | 284.021 |
| HadGEM3 | 289.413 | 293.144 | 290.608 | 293.617 | 290.11 | 282.793 |
| IPSL- CM5A-LR | 287.355 | 289.922 | 288.412 | 290.277 | 288.109 | 285.423 |
| MIROC- SPRINTARS | 287.403 | 288.865 | 287.700 | 288.815 | 287.562 | 286.233 |
| MPI-ESM | 287.847 | 290.055 | 288.348 | 289.840 | NA | NA |
| NCAR- CESM1- CAM4 | 289.522 | 292.734 | 290.608 | 292.393 | 289.963 | 288.046 |
| NCAR- CESM1- CAM5 | 288.179 | 290.717 | 288.702 | 290.508 | 288.379 | 287.057 |
| NorESM1 | 286.689 | 288.750 | 287.362 | 288.717 | 287.362 | 285.042 |
| pr | | | | | | |
| CanESM2 | 3.17034E-05 | 3.3013E-05 | 3.20217E-05 | 3.38032E-05 | 3.09441E-05 | 2.96299E-05 |
| ECHAM- HAM | 3.46344E-05 | 3.61768E-05 | 3.47661E-05 | NA | 3.33335E-05 | NA |
| GISS-E2-R | 3.7776E-05 | 3.81516E-05 | 3.80066E-05 | 3.92273E-05 | 3.72503E-05 | 3.66872E-05 |

| | | | | | | |
|-----------------|--------------|--------------|--------------|-------------|--------------|-------------|
| HadGEM2 | 3.57037E-05 | 3.69209E-05 | 3.62048E-05 | 3.75389E-05 | 3.5036E-05 | 3.34685E-05 |
| HadGEM3 | 3.74147E-05 | 3.95219E-05 | 3.83492E-05 | 4.09061E-05 | 3.7526E-05 | 3.11296E-05 |
| IPSL-CM5A-LR | 3.25155E-05 | 3.4007E-05 | 3.35243E-05 | 3.54076E-05 | 3.25205E-05 | 3.03604E-05 |
| MIROC-SPRINTARS | 3.65511E-05 | 3.71644E-05 | 3.66677E-05 | 3.7804E-05 | 3.60696E-05 | 3.54331E-05 |
| MPI-ESM | 3.32097E-05 | 3.41989E-05 | 3.34121E-05 | 3.46553E-05 | NA | NA |
| NCAR-CESM1-CAM4 | 3.4718E-05 | 3.67025E-05 | 3.55661E-05 | 3.72588E-05 | 3.41592E-05 | 3.33738E-05 |
| NCAR-CESM1-CAM5 | 3.59932E-05 | 3.72428E-05 | 3.62457E-05 | 3.80553E-05 | 3.55748E-05 | 3.45328E-05 |
| NorESM1 | 3.20053E-05 | 3.3045E-05 | 3.24495E-05 | 3.36322E-05 | 3.15288E-05 | 3.04267E-05 |
| evspsbl | | | | | | |
| CanESM2 | 3.17047E-05 | 3.30149E-05 | 3.20228E-05 | 3.38047E-05 | 3.09458E-05 | 2.96314E-05 |
| ECHAM-HAM1 | -3.45569E-05 | -3.60825E-05 | -3.46809E-05 | NA | -3.32566E-05 | NA |
| GISS-E2-R | 3.77778E-05 | 3.81532E-05 | 3.80076E-05 | 3.9229E-05 | 3.72517E-05 | 3.66884E-05 |
| HadGEM2 | 3.56793E-05 | 3.69022E-05 | 3.6181E-05 | 3.75193E-05 | 3.50142E-05 | 3.3441E-05 |

| | | | | | | |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| HadGEM3 | 3.72122E-05 | 3.92635E-05 | 3.81299E-05 | 4.06388E-05 | 3.73168E-05 | 3.10029E-05 |
| IPSL-CM5A-LR | 3.25095E-05 | 3.40017E-05 | 3.3518E-05 | 3.54017E-05 | 3.25151E-05 | 3.0354E-05 |
| MIROC-SPRINTARS | 3.65516E-05 | 3.71652E-05 | 3.66678E-05 | 3.78047E-05 | 3.60702E-05 | 3.54336E-05 |
| MPI-ESM | 3.31474E-05 | 3.41203E-05 | 3.33474E-05 | 3.45798E-05 | NA | NA |
| NCAR-CESM1-CAM4 | 3.47182E-05 | 3.67029E-05 | 3.55666E-05 | 3.72592E-05 | 3.41597E-05 | 3.33746E-05 |
| NCAR-CESM1-CAM5 | 3.59936E-05 | 3.72437E-05 | 3.62463E-05 | 3.80558E-05 | 3.55766E-05 | 3.45341E-05 |
| NorESM1 | 3.20058E-05 | 3.30463E-05 | 3.24501E-05 | 3.36328E-05 | 3.15293E-05 | 3.04273E-05 |

¹Sign convention downward and opposite to the other models.

Table 9: Global and annual mean surface specific humidity (huss), surface relative humidity (hurs) and surface pressure (ps) *(no data for HadGEM3, IPSL-CM5A-LR or MPI-ESM for huss and hurs or for GISS-E2-R for hurs available).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-----------------|------------|-------------|-------------|------------|------------|-------------|
| FSST: | | | huss | | | |
| CanESM2 | 0.0108174 | 0.0109222 | 0.0108862 | 0.0109264 | 0.0109977 | 0.0107351 |
| ECHAM-HAM | 0.00973237 | 0.000480334 | NA | NA | 0.00994605 | 0.000459508 |
| GISS-E2-R | 0.0103356 | 0.0104055 | 0.010386 | 0.0104347 | 0.0104573 | 0.010301 |
| HadGEM2 | 0.00942607 | 0.00950126 | 0.00944788 | 0.00950271 | 0.00950966 | 0.00935587 |
| HadGEM3 | 0.00968408 | 0.00975506 | 0.00971379 | 0.00975815 | 0.00974466 | 0.00961521 |
| MIROC-SPRINTARS | 0.0095515 | 0.00966087 | 0.00958157 | 0.00962288 | 0.0096225 | 0.00950136 |
| NCAR-CESM1-CAM4 | 0.0103413 | 0.0104265 | 0.0103739 | 0.0104230 | 0.0104741 | 0.0103025 |
| NCAR-CESM1-CAM5 | 0.0101312 | 0.0102439 | 0.0101700 | 0.0102256 | 0.0102117 | 0.0101222 |
| NorESM1 | 0.0104680 | 0.0105713 | 0.0105107 | 0.0105529 | 0.0106268 | 0.0104235 |
| | | | hurs | | | |
| CanESM2 | 81.6849 | 81.6436 | 81.8197 | 81.8531 | 82.1673 | 81.7371 |

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| ECHAM-HAM | 75.1505 | 52.9309 | NA | NA | 76.1054 | 53.151 |
| GISS-E2-R | 73.8098 | 73.3826 | 57.1948 | 57.2251 | 56.7608 | 57.2404 |
| HadGEM2 | 76.0549 | 75.7514 | 76.05 | 76.1426 | 76.2968 | 76.0292 |
| HadGEM3 | 76.3749 | 76.007 | 76.3386 | 76.4615 | 76.5727 | 76.2425 |
| MIROC-SPRINTARS | 77.6667 | 77.6560 | 77.7211 | 77.7725 | 77.9176 | 77.7079 |
| NCAR-CESM1-CAM4 | 79.3237 | 79.0583 | 79.3086 | 79.4305 | 79.7845 | 79.4373 |
| NCAR-CESM1-CAM5 | 78.8029 | 78.4697 | 78.8635 | 78.8974 | 78.9353 | 78.7192 |
| NorESM1 | 78.2522 | 78.2889 | 78.2737 | 78.2968 | 78.7279 | 78.3777 |
| ps | | | | | | |
| CanESM2 | 98459.5 | 98459.5 | 98459.5 | 98459.5 | 98459.5 | 98459.5 |
| ECHAM-HAM | 98549.5 | 98549.5 | NA | NA | 98549.5 | 98549.5 |
| GISS-E2-R | 98400.0 | 98400.0 | 98400.0 | 98400.0 | 98400.0 | 98400.0 |
| HadGEM2 | 98571.7 | 98547.7 | 98571.4 | 98577.4 | 98577.3 | 98569.9 |
| HadGEM3 | 98521.7 | 98522.8 | 98522.1 | 98523.6 | 98523.2 | 98521.1 |

| | | | | | | |
|-----------------|------------|-------------|-------------|------------|------------|------------|
| IPSL-CM5A-LR | 98507.9 | 98507.9 | 98507.9 | 98507.9 | 98507.9 | 98507.9 |
| MIROC-SPRINTARS | 98681.1 | 98683.7 | 98682.2 | 98683.5 | 98683.0 | 98679.5 |
| MPI-ESM | 98549.5 | 98549.5 | 98549.5 | 98549.5 | NA | NA |
| NCAR-CESM1-CAM4 | 98540.7 | 98542.8 | 98541.2 | 98543.4 | 98545 | 98539.1 |
| NCAR-CESM1-CAM5 | 98541.1 | 98543.8 | 98542.2 | 98544.2 | 98543.5 | 98542.6 |
| NorESM1 | 98545.8 | 98548.0 | 98546.7 | 98548.7 | 98550.8 | 98544.2 |
| Coupled: | | | huss | | | |
| CanESM2 | 0.0108253 | 0.012484 | 0.0111923 | 0.0127602 | 0.0117104 | 0.00941662 |
| ECHAM-HAM | 0.00978844 | 0.000660703 | 0.000508378 | NA | 0.010218 | NA |
| GISS-E2-R | 0.0104758 | 0.0113921 | 0.0107693 | 0.0114691 | 0.0108607 | 0.00986659 |
| HadGEM2 | 0.00940126 | 0.0108415 | 0.00983116 | 0.0108477 | 0.0104366 | 0.008123 |
| HadGEM3 | 0.0108608 | 0.0131689 | 0.0115872 | 0.0136404 | 0.0113207 | 0.00745885 |
| MIROC-SPRINTARS | 0.00885048 | 0.00969032 | 0.00903528 | 0.00971649 | 0.00899332 | 0.00828575 |
| NCAR-CESM1-CAM4 | 0.0116061 | 0.0135063 | 0.0122476 | 0.0134393 | 0.011976 | 0.010774 |

| | | | | | | |
|-------------------------|------------|-----------|-----------|-----------|-----------|------------|
| NCAR- CESM1- CAM5 | 0.0106531 | 0.0121362 | 0.0109614 | 0.0121408 | 0.0107819 | 0.0100384 |
| NorESM1 | 0.00982093 | 0.0108788 | 0.0101551 | 0.0109438 | 0.0102433 | 0.00902274 |
| hurs | | | | | | |
| CanESM2 | 81.6846 | 81.5408 | 81.7039 | 81.6680 | 81.9357 | 81.7209 |
| ECHAM- HAM | 74.7892 | 51.1607 | 52.3582 | NA | 75.6555 | NA |
| GISS-E2-R | 74.0169 | 73.6512 | 74.1027 | 74.2865 | 74.4345 | 73.9458 |
| HadGEM2 | 75.9867 | 75.6327 | 75.9835 | 75.9990 | 76.5551 | 76.1450 |
| HadGEM3 | 75.8989 | 75.3796 | 75.8563 | 75.701 | 76.0512 | 76.1801 |
| MIROC- SPRINTARS | 77.4895 | 77.5379 | 77.5634 | 77.6269 | 77.7085 | 77.6053 |
| NCAR- CESM1- CAM4 | 78.6925 | 78.3764 | 78.6453 | 78.655 | 79.0629 | 78.8309 |
| NCAR- CESM1- CAM5 | 78.1502 | 77.7451 | 78.1667 | 78.1681 | 78.3193 | 78.2995 |
| NorESM1 | 78.3035 | 78.014 | 78.2314 | 78.1451 | 78.6304 | 78.6043 |
| ps | | | | | | |
| CanESM2 | 98459.5 | 98459.5 | 98459.5 | 98459.5 | 98459.5 | 98459.5 |

| | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| ECHAM-HAM | 98549.5 | 98549.5 | 98549.5 | NA | 98549.5 | NA |
| GISS-E2-R | 98400.0 | 98400.0 | 98400.0 | 98400.0 | 98400.0 | 98400.0 |
| HadGEM2 | 98571.5 | 98592.4 | 98584.8 | 98623.4 | 98610.1 | 98530.8 |
| HadGEM3 | 98553.4 | 98616.8 | 98572.9 | 98632.8 | 98566.1 | 98468.8 |
| IPSL-CM5A-LR | 98507.9 | 98507.9 | 98507.9 | 98507.9 | 98507.9 | 98507.9 |
| MIROC-SPRINTARS | 98654.8 | 98679.9 | 98660.6 | 98682.4 | 98658.8 | 98637.8 |
| MPI-ESM | 98549.5 | 98549.5 | 98549.5 | 98549.5 | NA | NA |
| NCAR-CESM1-CAM4 | 98578.6 | 98634.6 | 98597.2 | 98635.3 | 98590.8 | 98553.2 |
| NCAR-CESM1-CAM5 | 98554.0 | 98598.4 | 98563.2 | 98600.1 | 98557.9 | 98537.3 |
| NorESM1 | 98525.0 | 98555.6 | 98534.3 | 98559.6 | 98537.9 | 98500.9 |

Table 10: Global and annual mean convective precipitation (prc), total water vapour path (prw) and total clouds fraction (clt) *(no data available for clt for NCAR-CESM1-CAM5).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| FSST: | | | prc | | | |
| CanESM2 | 1.71352E-05 | 1.64252E-05 | 1.68632E-05 | 1.67095E-05 | 1.55615E-05 | 1.71255E-05 |
| ECHAM-HAM | 2.31071E-05 | 2.25500E-05 | NA | NA | 2.17360E-05 | 2.31544E-05 |
| GISS-E2-R | 1.54053E-05 | 1.46421E-05 | 1.52638E-05 | 1.5338E-05 | 1.49784E-05 | 1.54573E-05 |
| HadGEM2 | 2.65900E-05 | 2.58253E-05 | 2.64839E-05 | 2.62637E-05 | 2.57411E-05 | 2.66595E-05 |
| HadGEM3 | 2.58621E-05 | 2.51099E-05 | 2.57297E-05 | 2.55645E-05 | 2.53924E-05 | 2.62621E-05 |
| IPSL-CM5A-LR | 1.577E-05 | 1.50753E-05 | 1.58122E-05 | 1.55162E-05 | 1.51423E-05 | 1.5711E-05 |
| MIROC-SPRINTARS | 1.91754E-05 | 1.85898E-05 | 1.90625E-05 | 1.8925E-05 | 1.86375E-05 | 1.92122E-05 |
| MPI-ESM | 2.14407E-05 | 2.10326E-05 | 2.12855E-05 | 2.11351E-05 | NA | NA |
| NCAR-CESM1-CAM4 | 2.00028E-05 | 1.94081E-05 | 1.99574E-05 | 1.97261E-05 | 1.92848E-05 | 2.00918E-05 |
| NCAR-CESM1-CAM5 | 2.47768E-05 | 2.38728E-05 | 2.45822E-05 | 2.44632E-05 | 2.43848E-05 | 2.42824E-05 |

| | | | | | | |
|-----------------|------------|-------------|-------------|-------------|-------------|-------------|
| NorESM1 | 2.0252E-05 | 1.98248E-05 | 2.02231E-05 | 1.99737E-05 | 1.95077E-05 | 2.02893E-05 |
| prw | | | | | | |
| CanESM2 | 22.0316 | 22.2118 | 22.2406 | 22.4226 | 22.9974 | 21.9291 |
| ECHAM-HAM | 26.4815 | 26.7192 | NA | NA | 27.1795 | 26.1699 |
| GISS-E2-R | 24.8819 | 24.9769 | 24.9247 | 25.1374 | 25.2092 | 24.8058 |
| HadGEM2 | 22.1737 | 22.3415 | 22.2199 | 22.4452 | 22.5781 | 21.9642 |
| HadGEM3 | 23.3195 | 23.4427 | 23.3570 | 23.5266 | 23.4863 | 23.2536 |
| IPSL-CM5A-LR | 23.8062 | 24.0922 | 23.8768 | 24.1036 | 24.1751 | 23.7173 |
| MIROC-SPRINTARS | 25.1178 | 25.3765 | 25.2287 | 25.3605 | 25.3126 | 24.9516 |
| MPI-ESM | 24.8185 | 25.0085 | 24.9318 | 25.1514 | NA | NA |
| NCAR-CESM1-CAM4 | 25.5186 | 25.7388 | 25.5776 | 25.7947 | 25.9599 | 25.3599 |
| NCAR-CESM1-CAM5 | 25.5611 | 25.8377 | 25.6739 | 25.8723 | 25.8052 | 25.7154 |
| NorESM1 | 26.0323 | 26.2570 | 26.1253 | 26.3353 | 26.5437 | 25.8762 |
| clt | | | | | | |

| | | | | | | |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CanESM2 | 61.3707 | 61.0170 | 61.3299 | 61.4366 | 61.2881 | 61.4543 |
| ECHAM-HAM | 68.1140 | 68.0835 | NA | NA | 67.9488 | 68.7870 |
| GISS-E2-R | 61.1801 | 60.9753 | 61.2025 | 60.9372 | 60.7897 | 61.3260 |
| HadGEM2 | 53.4134 | 52.9951 | 53.1411 | 53.3664 | 53.2067 | 53.7391 |
| HadGEM3 | 64.4578 | 63.8367 | 64.0835 | 64.1826 | 64.2537 | 65.4084 |
| IPSL-CM5A-LR ² | 0.563301 | 0.555459 | 0.557646 | 0.561081 | 0.548721 | 0.560251 |
| MIROC-SPRINTARS | 67.9063 | 67.4845 | 67.6543 | 67.8368 | 67.7027 | 68.0056 |
| MPI-ESM | 62.5639 | 62.1263 | 62.4602 | 62.5536 | NA | NA |
| NCAR-CESM1-CAM4 | 53.8737 | 53.8525 | 53.6997 | 53.9726 | 53.8599 | 53.6949 |
| NorESM1 | 54.3828 | 54.5275 | 54.3869 | 54.6990 | 54.4313 | 53.9803 |
| Coupled: | | | prc | | | |
| CanESM2 | 1.71441E-05 | 1.71099E-05 | 1.71637E-05 | 1.72672E-05 | 1.58047E-05 | 1.62659E-05 |
| ECHAM-HAM | 2.32743E-05 | 2.45658E-05 | 2.34369E-05 | NA | 2.19775E-05 | NA |
| GISS-E2-R | 1.56487E-05 | 1.60792E-05 | 1.59216E-05 | 1.68509E-05 | 1.56699E-05 | 1.49625E-05 |

| | | | | | | |
|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| HadGEM2 | 2.65747E-05 | 2.76819E-05 | 2.69862E-05 | 2.80504E-05 | 2.58206E-05 | 2.47559E-05 |
| HadGEM3 | 2.76167E-05 | 2.97472E-05 | 2.84788E-05 | 3.07554E-05 | 2.77035E-05 | 2.2552E-05 |
| IPSL-CM5A-LR | 1.58085E-05 | 1.54166E-05 | 1.60711E-05 | 1.57948E-05 | 1.53284E-05 | 1.48065E-05 |
| MIROC-SPRINTARS | 1.86237E-05 | 1.88791E-05 | 1.86717E-05 | 1.92116E-05 | 1.81892E-05 | 1.79701E-05 |
| MPI-ESM | 2.14353E-05 | 2.21804E-05 | 2.15659E-05 | 2.23196E-05 | NA | NA |
| NCAR-CESM1-CAM4 | 2.15088E-05 | 2.34320E-05 | 2.23380E-05 | 2.34728E-05 | 2.10562E-05 | 2.04903E-05 |
| NCAR-CESM1-CAM5 | 2.59768E-05 | 2.67069E-05 | 2.61320E-05 | 2.72453E-05 | 2.55668E-05 | 2.46933E-05 |
| NorESM1 | 1.96188E-05 | 2.03356E-05 | 1.99141E-05 | 2.05809E-05 | 1.90962E-05 | 1.87983E-05 |
| prw | | | | | | |
| CanESM2 | 22.0706 | 26.4337 | 23.0428 | 27.4239 | 24.7701 | 18.5632 |
| ECHAM-HAM | 26.6229 | 31.8791 | 27.5221 | NA | 28.0920 | NA |
| GISS-E2-R | 25.2864 | 28.1919 | 26.1468 | 28.5622 | 26.5121 | 23.3467 |
| HadGEM2 | 22.0892 | 26.3081 | 23.3441 | 26.4987 | 25.6813 | 18.4707 |
| HadGEM3 | 26.8290 | 33.7774 | 28.9681 | 35.5083 | 28.2153 | 17.3056 |

| | | | | | | |
|-------------------------------|----------|----------|----------|----------|----------|----------|
| IPSL- CM5A-LR | 23.9855 | 29.4026 | 26.1232 | 30.7613 | 25.7338 | 20.5977 |
| MIROC- SPRINTARS | 22.4424 | 25.0031 | 23.0373 | 25.2564 | 22.8565 | 20.7128 |
| MPI-ESM | 24.3810 | 28.3670 | 25.3090 | 28.4105 | NA | NA |
| NCAR- CESM1- CAM4 | 29.3831 | 35.0944 | 31.2810 | 35.1722 | 30.6293 | 26.7958 |
| NCAR- CESM1- CAM5 | 26.8751 | 31.3946 | 27.8150 | 31.5693 | 27.2740 | 25.1722 |
| NorESM1 | 23.9096 | 27.0351 | 24.8618 | 27.4400 | 25.2296 | 21.4597 |
| clt | | | | | | |
| CanESM2 | 61.3806 | 60.8798 | 61.2690 | 61.1212 | 61.2206 | 61.8058 |
| ECHAM- HAM | 67.7080 | 66.4365 | 67.5446 | NA | 67.7254 | NA |
| GISS-E2-R | 61.2235 | 60.9696 | 61.1473 | 60.7671 | 60.7301 | 61.4082 |
| HadGEM2 | 53.4756 | 53.0260 | 53.2751 | 53.3282 | 53.3036 | 54.2015 |
| HadGEM3 | 62.8563 | 60.3150 | 61.9300 | 60.0466 | 62.2705 | 67.9568 |
| IPSL- CM5A-LR ² | 0.562728 | 0.540701 | 0.551360 | 0.541396 | 0.545345 | 0.578806 |
| MIROC- SPRINTARS | 66.9475 | 66.8172 | 66.6980 | 67.0799 | 66.7764 | 66.9870 |

| | | | | | | |
|-------------------------|---------|---------|---------|---------|---------|---------|
| MPI-ESM | 61.9957 | 61.5089 | 61.9015 | 61.9008 | NA | NA |
| NCAR- CESM1- CAM4 | 53.5781 | 53.8993 | 53.6638 | 54.1168 | 53.8427 | 53.1310 |
| NorESM1 | 53.4607 | 54.0836 | 53.5708 | 54.2525 | 53.7689 | 52.6080 |

²Given as fraction and instead of percent for the other models.

Table 11: Global and annual mean surface wind (uas – eastward component of wind near surface, vas – northward component of wind near surface) *(no data for HadGEM3).

| Model | Base | co2x2 | ch4x3 | solar | bcx10 | sulx5 |
|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|
| FSST: | | | uas | | | |
| CanESM2 | -0.318887 | -0.325403 | -0.350715 | -0.362922 | -0.342252 | -0.295077 |
| ECHAM-HAM | -0.415027 | -0.411805 | NA | NA | -0.433618 | -0.341212 |
| GISS-E2-R | -0.115321 | -0.0977017 | -0.123128 | -0.131966 | -0.108856 | -0.111413 |
| HadGEM2 | -0.425581 | -0.447448 | -0.449691 | -0.44575 | -0.444959 | -0.416687 |
| HadGEM3 | -0.507254 | -0.527202 | -0.532581 | -0.514609 | -0.508329 | -0.486282 |
| IPSL-CM5A-LR | -0.38111 | -0.3716 | -0.402953 | -0.381525 | -0.384531 | -0.366221 |
| MIROC-SPRINTARS | -0.422892 | -0.417349 | -0.431603 | -0.445379 | -0.433842 | -0.427896 |
| MPI-ESM | -0.304967 | -0.319728 | -0.295238 | -0.334312 | NA | NA |
| NCAR-CESM1-CAM4 | -0.774503 | -0.769885 | -0.779289 | -0.766358 | -0.771007 | -0.766448 |
| NCAR-CESM1-CAM5 | -0.716762 | -0.734564 | -0.731939 | -0.737274 | -0.724175 | -0.736305 |
| NorESM1 | -0.795219 | -0.767405 | -0.799911 | -0.800474 | -0.773451 | -0.781614 |
| | | | vas | | | |

| | | | | | | |
|-----------------|-----------|-----------|------------|-----------|-----------|-----------|
| CanESM2 | 0.12938 | 0.139284 | 0.136915 | 0.140016 | 0.178394 | 0.11336 |
| ECHAM-HAM | 0.259792 | 0.242133 | NA | NA | 0.259151 | 0.228025 |
| GISS-E2-R | 0.101552 | 0.107905 | 0.10308 | 0.10655 | 0.107015 | 0.09167 |
| HadGEM2 | 0.158784 | 0.166602 | 0.153786 | 0.167900 | 0.187103 | 0.152217 |
| HadGEM3 | 0.139922 | 0.142524 | 0.134165 | 0.143738 | 0.139113 | 0.124674 |
| IPSL-CM5A-LR | 0.104631 | 0.106184 | 0.105991 | 0.112479 | 0.110485 | 0.0990391 |
| MIROC-SPRINTARS | 0.163417 | 0.156758 | 0.162596 | 0.160966 | 0.175376 | 0.156932 |
| MPI-ESM | 0.145224 | 0.144366 | 0.141461 | 0.153488 | NA | NA |
| NCAR-CESM1-CAM4 | 0.150636 | 0.139944 | 0.146296 | 0.147556 | 0.168122 | 0.131876 |
| NCAR-CESM1-CAM5 | 0.171376 | 0.18124 | 0.169463 | 0.174421 | 0.197491 | 0.162573 |
| NorESM1 | 0.0837827 | 0.0767375 | 0.0783795 | 0.0871408 | 0.122416 | 0.0722404 |
| Coupled: | | | uas | | | |
| CanESM2 | -0.311251 | -0.274510 | -0.307299 | -0.297622 | -0.292038 | -0.292543 |
| ECHAM-HAM | -0.387846 | -0.325903 | -0.368391 | NA | -0.394133 | NA |

| | | | | | | |
|-------------------------|-----------|------------|-----------|-----------|-----------|------------|
| GISS-E2-R | -0.121448 | -0.0830688 | -0.117303 | -0.116326 | -0.118782 | -0.122148 |
| HadGEM2 | -0.402156 | -0.360620 | -0.382777 | -0.359208 | -0.371869 | -0.365599 |
| HadGEM3 | -0.437581 | -0.417013 | -0.436726 | -0.431402 | -0.439871 | -0.560861 |
| IPSL- CM5A-LR | -0.394003 | -0.355178 | -0.381136 | -0.357037 | -0.372088 | -0.381248 |
| MIROC- SPRINTARS | -0.449403 | -0.411752 | -0.435069 | -0.421468 | -0.443611 | -0.439997 |
| MPI-ESM | -0.261968 | -0.262325 | -0.275034 | -0.263285 | NA | NA |
| NCAR- CESM1- CAM4 | -0.623458 | -0.611285 | -0.620882 | -0.606634 | -0.624729 | -0.647036 |
| NCAR- CESM1- CAM5 | -0.501289 | -0.495068 | -0.487274 | -0.491769 | -0.509293 | -0.496316 |
| NorESM1 | -0.730819 | -0.719149 | -0.721405 | -0.726981 | -0.701889 | -0.727008 |
| vas | | | | | | |
| CanESM2 | 0.129612 | 0.134125 | 0.133849 | 0.141698 | 0.184197 | 0.031632 |
| ECHAM- HAM | 0.251566 | 0.311382 | 0.255979 | NA | 0.325392 | NA |
| GISS-E2-R | 0.0999539 | 0.0930417 | 0.0938092 | 0.0963386 | 0.119065 | 0.0772974 |
| HadGEM2 | 0.137630 | 0.167482 | 0.132979 | 0.150599 | 0.263885 | -0.0308942 |

| | | | | | | |
|-------------------------|------------|------------|------------|------------|-----------|-----------------|
| HadGEM3 | 0.0241895 | 0.0405915 | 0.0277264 | 0.0385554 | 0.0509925 | -0.0181865 |
| IPSL- CM5A-LR | 0.113454 | 0.0897613 | 0.0981904 | 0.0872088 | 0.12326 | 0.080934 |
| MIROC- SPRINTARS | 0.137257 | 0.132460 | 0.135397 | 0.138947 | 0.146979 | 0.081413 |
| MPI-ESM | 0.158123 | 0.159815 | 0.159453 | 0.148133 | NA | NA |
| NCAR- CESM1- CAM4 | 0.00565497 | -0.0119216 | -0.0094979 | -0.0115981 | 0.0641135 | -0.0557006 |
| NCAR- CESM1- CAM5 | 0.046967 | 0.0379933 | 0.0520259 | 0.0207267 | 0.0933097 | - 0.00155856 |
| NorESM1 | 0.0461957 | 0.0620145 | 0.0470848 | 0.0620279 | 0.0971058 | 0.0161278 |

