

Supplementary Table 1 – phase 2: Global and annual multi-model mean clear sky radiative fluxes.

Variables	Base	cfc12	cfc11	n2o1p	Indus	bcslt
fsst						
rsutcs	52.0795 (10)	-0.0639 (8)	-0.0530 (4)	-0.0793 (5)	-0.0371 (3)	-0.8087 (4)
rsdscs	249.677 (8)	-0.108 (7)	-0.079 (3)	-0.121 (4)	-0.020 (3)	-3.728 (3)
rsuscs	30.3708 (8)	-0.0714 (7)	-0.0175 (3)	-0.1050 (4)	-0.0657 (3)	-0.4660 (3)
rlutcs	262.669 (10)	-1.768 (8)	-1.487 (4)	-1.763 (5)	0.104 (3)	0.234 (4)
rldscs	315.497 (10)	1.836 (8)	1.582 (4)	1.405 (5)	0.145 (3)	0.687 (4)
coupled						
rsutcs	52.2177 (10)	-0.6080 (8)	-0.4236 (3)	-0.6597 (5)	-0.4436 (3)	-0.8374 (4)
rsdscs	249.176 (8)	-0.911 (7)	-0.879 (2)	-1.043 (4)	0.616 (3)	-3.580 (3)
rsuscs	30.4707 (8)	-0.7108 (7)	-0.5750 (2)	-0.8703 (4)	0.2042 (3)	-0.6474 (3)
rlutcs	263.482 (10)	-0.195 (8)	-0.176 (3)	-0.047 (5)	0.475 (3)	0.707 (4)
rldscs	317.919 (10)	7.401 (8)	6.114 (3)	7.191 (5)	0.823 (3)	2.193 (4)

Supplementary Table 2 – phase 2: Global and annual multi-model mean energy fluxes.

Variables	Base	cfc12	cfc11	n2o1p	Indus	bcslt
fsst						
rsdt	341.055 (10)	-0.034 (8)	-0.044 (4)	-0.036 (5)	0.000 (3)	0.000 (4)
rsut	101.805 (10)	-0.404 (8)	-0.396 (4)	-0.360 (5)	-0.084 (3)	-1.149 (4)
rsds	188.595 (10)	0.291 (8)	0.345 (4)	0.212 (5)	0.051 (3)	-3.210 (4)
rsus	24.0455 (10)	-0.0454 (8)	0.0090 (4)	-0.0722 (5)	-0.0470 (3)	-0.4300 (4)
rlut	237.512 (10)	-1.047 (8)	-0.882 (4)	-1.230 (5)	0.119 (3)	0.401 (4)
rlds	341.571 (10)	1.120 (8)	0.925 (4)	0.988 (5)	0.122 (3)	0.692 (4)
rlus	398.138 (10)	0.364 (8)	0.298 (4)	0.405 (5)	0.209 (3)	-0.058 (4)
hfis	86.7742 (10)	-0.3201 (8)	-0.2884 (4)	-0.5700 (5)	-0.0989 (3)	-1.5847 (4)
hfss	19.9755 (11)	-0.0044 (8)	0.0047 (4)	-0.1196 (5)	0.1516 (3)	-1.1916 (4)
coupled						
rsdt	341.047 (10)	0.000 (8)	-0.000 (3)	-0.000 (5)	-0.000 (3)	0.000 (4)
rsut	101.265 (10)	-0.905 (8)	-0.675 (3)	-0.739 (5)	-0.354 (3)	-0.896 (4)
rsds	189.067 (10)	-0.372 (8)	-0.444 (3)	-0.694 (5)	0.529 (3)	-3.337 (4)

rsus	24.0532 (10)	-0.5689 (8)	-0.4471 (3)	-0.6660 (5)	0.1613 (3)	-0.5106 (4)
rlut	238.5 (10)	0.6 (8)	0.5 (3)	0.5 (5)	0.3 (3)	0.8 (4)
rlds	343.361 (10)	6.263 (8)	5.057 (3)	6.329 (5)	0.798 (3)	2.126 (4)
rlus	400.326 (10)	4.640 (8)	3.749 (3)	4.939 (5)	0.843 (3)	1.166 (4)
hfis	87.4238 (10)	1.7686 (8)	1.3293 (3)	1.4768 (5)	0.1192 (3)	-0.8697 (4)
hfss	19.9263 (11)	-0.2223 (8)	-0.2048 (3)	-0.3495 (5)	0.2028 (3)	-1.0967 (4)

Supplementary Table 3 - phase 2: Global and annual multi-model mean meteorological variables.

Variables	Base	cfc12	cfc11	n2op1	Indus	bcslt
fsst						
tas	287.54 (11)	0.08 (8)	0.06 (4)	0.09 (5)	0.04 (3)	0.11 (4)
ts	288.166 (4)	0.077 (3)	0.031 (1)	0.046 (1)	0.000 (0)	0.018 (1)
pr	3.44914E-05 (11)	-0.01287E-05 (8)	-0.01156E-05 (4)	-0.02282E-05 (5)	-0.00407E-05 (3)	-0.06349E-05 (4)
prc	2.08825E-05 (11)	-0.00887E-05 (8)	-0.00864E-05 (4)	-0.01635E-05 (5)	-0.00391E-05 (3)	-0.04453E-05 (4)
huss	0.00954522 (9)	0.00002603 (8)	0.00002118 (4)	0.00003652 (5)	-0.00000123 (3)	0.00010265 (4)

hurs	76.2668 (9)	-0.0024 (8)	0.0594 (4)	0.0234 (5)	-0.0751 (3)	0.2628 (4)
prw	24.5249 (11)	0.0929 (7)	0.0831 (4)	0.1080 (5)	0.0041 (3)	0.2297 (4)
evspsbl	2.82009E-05 (11)	-0.00977E-05 (7)	-0.00345E-05 (4)	-0.01228E-05 (5)	-0.00394E-05 (3)	-0.03369E-05 (4)
uas	-0.467135 (11)	-0.016395 (8)	-0.017517 (4)	0.000312 (5)	0.010264 (3)	-0.007747 (4)
vas	0.144352 (11)	0.004849 (8)	0.007670 (4)	0.000607 (5)	0.005689 (3)	0.004580 (4)
clt	54.803 (10)	-0.320 (7)	-0.304 (4)	-0.173 (5)	-0.016 (3)	0.157 (4)
ps	98533.5 (11)	0.7 (8)	0.8 (4)	0.8 (5)	0.0 (3)	1.5 (4)
coupled						
tas	287.942 (11)	0.881 (8)	0.721 (3)	0.960 (5)	0.162 (3)	0.250 (4)
ts	289.541 (4)	1.168 (3)	0.000 (0)	1.085 (1)	0.000 (0)	0.242 (1)
pr	3.47443E-05 (11)	0.07087E-05 (8)	0.05321E-05 (3)	0.05913E-05 (5)	0.00490E-05 (3)	-0.03477E-05 (4)
prc	2.12036E-05 (11)	0.05689E-05 (8)	0.03954E-05 (3)	0.04862E-05 (5)	0.00557E-05 (3)	-0.02615E-05 (4)
huss	0.00973659 (9)	0.00045588 (8)	0.00026574 (3)	0.00042824 (5)	0.00006941 (3)	0.00023477 (4)
hurs	75.9993 (9)	-0.0935 (8)	-0.1588 (3)	-0.1677 (5)	-0.0900 (3)	0.3454 (4)

prw	24.8998 (11)	1.4705 (7)	1.2143 (3)	1.5640 (5)	0.2095 (3)	0.6613 (4)
evspsbl	2.84365E-05 (11)	0.04390E-05 (7)	0.01205E-05 (3)	0.03379E-05 (5)	0.00492E-05 (3)	-0.00010E-05 (4)
uas	-0.419113 (11)	0.009167 (8)	0.012157 (3)	0.014656 (5)	0.015142 (3)	-0.013110 (4)
vas	0.104222 (11)	-0.001375 (8)	0.005877 (3)	0.003042 (5)	0.006519 (2)	0.011604 (4)
clt	54.3323 (10)	-0.4282 (7)	-0.4556 (3)	-0.2446 (5)	0.0558 (3)	0.3040 (4)
ps	98536.7 (11)	12.3 (8)	8.1 (3)	12.5 (5)	2.3 (3)	4.1 (4)

Table 4 phase 2: Global and annual multi-model mean short wave radiation fluxes *(no data for CaneESM2, IPSL-CM5A or MPI-ESM available).

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
fsst:			rsdt			
ECHAM-HAM	340.419	340.419	340.419	340.419	NA	340.419
GISS-E2-R	341.571	341.571	NA	NA	NA	341.571
HadGEM2	341.40	341.40	341.40	341.40	341.40	NA
HadGEM3	341.40	341.308	NA	NA	NA	NA
MIROC-SPRINTARS	341.748	341.748	341.748	341.748	341.748	NA

Commented [MS1]: Den er kanskje litt uinteressant å bruke plass på?

NCAR- CESM1- CAM4	341.357	341.357	341.357	341.357	NA	341.357
NCAR- CESM1- CAM5	340.395	340.395	NA	NA	NA	NA
NorESM1	340.328	340.328	NA	340.328	340.328	340.328
			rsut			
ECHAM- HAM	102.017	101.711	101.742	101.983	NA	101.823
GISS-E2-R	100.644	100.561	NA	NA	NA	99.0555
HadGEM2	97.3517	96.5311	96.5627	96.3561	96.6961	NA
HadGEM3	100.841	100.278	NA	NA	NA	NA
MIROC- SPRINTARS	106.207	105.911	105.869	105.955	106.193	NA
NCAR- CESM1- CAM4	102.198	101.755	101.819	101.790	NA	100.935
NCAR- CESM1- CAM5	101.575	100.951	NA	NA	NA	NA
NorESM1	106.165	105.867	NA	105.854	106.039	104.617

rsds

ECHAM-HAM	186.649	186.850	186.903	186.531	NA	182.782
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GISS-E2-R	193.477	193.412	NA	NA	NA	190.860
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HadGEM2	196.408	198.081	198.170	198.273	198.054	NA
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HadGEM3	195.113	195.438	NA	NA	NA	NA
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MIROC-SPRINTARS	186.214	186.514	186.530	186.318	186.194	NA
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NCAR-CESM1-CAM4	185.157	185.609	185.563	185.523	NA	181.940
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NCAR-CESM1-CAM5	183.351	183.869	NA	NA	NA	NA
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NorESM1	181.629	181.908	NA	181.827	181.794	178.491
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rsus

ECHAM-HAM	24.7876	24.7547	24.7946	24.7587	NA	24.2945
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GISS-E2-R	22.6640	22.5511	NA	NA	NA	22.3092
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HadGEM2	24.2767	24.9558	25.0650	24.9541	24.9677	NA
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HadGEM3	25.1567	25.0911	NA	NA	NA	NA
MIROC-SPRINTARS	23.6934	23.7172	23.7018	23.5928	23.6536	NA
NCAR-CESM1-CAM4	22.7170	22.7052	22.7316	22.6784	NA	22.3056
NCAR-CESM1-CAM5	23.5753	23.5254	NA	NA	NA	NA
NorESM1	22.9879	22.9773	NA	22.9000	22.9935	22.5275
Coupled:			rsdt			
ECHAM-HAM	340.387	340.420	340.420	340.420	NA	340.387
GISS-E2-R	341.571	341.571	NA	NA	NA	341.571
HadGEM2	341.400	341.400	341.400	341.400	341.400	NA
HadGEM3	341.400	341.400	NA	NA	NA	NA
MIROC-SPRINTARS	341.747	341.747	341.747	341.747	341.747	NA
NCAR-CESM1-CAM4	341.357	341.357	NA	341.357	NA	341.357

Commented [MS2]: Samme med denne

NCAR- CESM1- CAM5	340.422	340.422	NA	NA	NA	NA
NorESM1	340.328	340.328	NA	340.328	340.328	340.328
rsut						
ECHAM- HAM	101.560	100.791	100.939	100.981	NA	101.755
GISS-E2-R	100.713	100.815	NA	NA	NA	99.2465
HadGEM2	97.8977	97.4637	97.2367	96.9107	97.1902	NA
HadGEM3	97.3389	95.1202	NA	NA	NA	NA
MIROC- SPRINTARS	107.367	106.862	106.876	106.923	107.356	NA
NCAR- CESM1- CAM4	101.227	99.9988	NA	100.373	NA	100.140
NCAR- CESM1- CAM5	99.3527	98.207	NA	NA	NA	NA
NorESM1	105.834	105.045	NA	105.255	105.513	104.610
rsds						
ECHAM- HAM	187.007	186.336	186.436	186.115	NA	182.730

GISS-E2-R	192.910	192.398	NA	NA	NA	189.921
HadGEM2	196.333	195.370	195.426	195.031	197.595	NA
HadGEM3	196.437	196.908	NA	NA	NA	NA
MIROC-SPRINTARS	187.417	187.063	187.142	186.874	187.339	NA
NCAR-CESM1-CAM4	184.046	183.502	NA	183.437	NA	180.309
NCAR-CESM1-CAM5	184.504	184.242	NA	NA	NA	NA
NorESM1	184.307	183.745	NA	183.762	184.641	181.963
rsus						
ECHAM-HAM	24.7829	24.1951	24.2991	24.2250	NA	24.3836
GISS-E2-R	22.3171	22.1324	NA	NA	NA	21.8688
HadGEM2	24.725	24.138	24.0212	23.6813	25.2856	NA
HadGEM3	24.6560	24.0824	NA	NA	NA	NA
MIROC-SPRINTARS	23.8061	23.5193	23.5493	23.3906	23.7482	NA

NCAR-CESM1-CAM4	22.1397	21.2156	NA	21.3819	NA	21.6459
NCAR-CESM1-CAM5	23.1401	22.4261	NA	NA	NA	NA
NorESM1	24.3544	23.5587	NA	23.6963	24.3117	23.6535

Table 5 phase 2: Global and annual multi-model mean long wave radiation fluxes *(no data for CanESM2, IPSL-CM5A or MPI-ESM available).

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
FSST:			rlut			
ECHAM-HAM	237.968	236.521	236.663	236.208	NA	237.997
GISS-E2-R	240.264	239.022	NA	NA	NA	240.752
HadGEM2	242.92	241.580	241.802	241.015	242.759	NA
HadGEM3	238.544	237.580	NA	NA	NA	NA
MIROC-SPRINTARS	235.625	234.722	234.811	234.452	235.686	NA
NCAR-CESM1-CAM4	233.148	232.052	232.237	232.139	NA	233.761

NCAR- CESM1- CAM5	233.648	232.742	NA	NA	NA	NA
NorESM1	234.134	233.036	NA	233.211	234.426	234.606
rls						
ECHAM- HAM	348.567	349.761	349.553	349.644	NA	349.133
GISS-E2-R	348.926	349.860	NA	NA	NA	349.437
HadGEM2	333.277	334.009	333.808	334.036	332.692	NA
HadGEM3	337.561	338.750	NA	NA	NA	NA
MIROC- SPRINTARS	345.46	346.395	346.292	346.235	345.542	NA
NCAR- CESM1- CAM4	338.989	340.12	339.816	339.786	NA	339.855
NCAR- CESM1- CAM5	343.665	344.596	NA	NA	NA	NA
NorESM1	342.273	343.663	NA	343.283	342.513	343.098
rlus						
ECHAM- HAM	400.179	400.564	400.577	400.539	NA	400.006

GISS-E2-R	405.454	405.641	NA	NA	NA	405.518
HadGEM2	395.679	395.028	394.981	395.18	394.667	NA
HadGEM3	397.220	397.682	NA	NA	NA	NA
MIROC-SPRINTARS	398.466	398.747	398.71	398.9	398.533	NA
NCAR-CESM1-CAM4	397.495	397.778	397.66	397.738	NA	397.571
NCAR-CESM1-CAM5	396.031	396.446	NA	NA	NA	NA
NorESM1	400.61	401.079	NA	401.017	401.136	400.410
Coupled:			rlut			
ECHAM-HAM	238.495	239.046	238.926	238.879	NA	238.335
GISS-E2-R	240.37	239.926	NA	NA	NA	241.631
HadGEM2	243.088	243.122	243.461	243.535	243.782	NA
HadGEM3	243.326	245.026	NA	NA	NA	NA
MIROC-SPRINTARS	233.321	233.467	233.510	233.298	233.367	NA

NCAR- CESM1- CAM4	238.004	239.23	NA	238.854	NA	239.094
NCAR- CESM1- CAM5	237.004	237.783	NA	NA	NA	NA
NorESM1	232.083	232.505	NA	232.353	232.350	233.085
rlds						
ECHAM- HAM	349.541	356.167	355.015	356.084	NA	349.631
GISS-E2-R	350.238	353.608	NA	NA	NA	352.990
HadGEM2	333.152	339.136	339.650	342.544	335.018	NA
HadGEM3	349.983	358.711	NA	NA	NA	NA
MIROC- SPRINTARS	337.31	341.376	340.976	341.298	337.491	NA
NCAR- CESM1- CAM4	352.649	361.927	NA	359.977	NA	355.289
NCAR- CESM1- CAM5	349.807	356.099	NA	NA	NA	NA
NorESM1	334.851	341.078	NA	339.715	335.234	337.872
rlus						

ECHAM-HAM	401.484	406.36	405.574	406.520	NA	400.654
GISS-E2-R	406.403	408.562	NA	NA	NA	408.223
HadGEM2	395.657	399.911	400.514	403.037	397.227	NA
HadGEM3	408.589	415.49	NA	NA	NA	NA
MIROC-SPRINTARS	393.963	396.634	396.433	397.002	394.058	NA
NCAR-CESM1-CAM4	409.534	416.68	NA	415.273	NA	410.887
NCAR-CESM1-CAM5	402.639	407.366	NA	NA	NA	NA
NorESM1	394.921	399.471	NA	398.591	395.763	397.239

Supplementary Table 6 phase 2: Global and annual multi-model mean radiation fluxes *(no data for CanESM2, IPSL-CM5A or MPI-SM available).

Model	Base	cfc12	cfc11	n2o1p	Indus	bslt
FSST:			hfss			
ECHAM-HAM	23.3937	23.3024	23.4000	23.2134	NA	22.0978
GISS-E2-R	19.2932	19.0997	NA	NA	NA	18.1358

HadGEM2	18.3718	17.6567	17.6943	17.5277	17.9538	NA
HadGEM3	18.6489	18.6434	NA	NA	NA	NA
MIROC-SPRINTARS	14.7657	14.8280	14.7708	14.6288	14.7442	NA
NCAR-CESM1-CAM4	17.5531	17.6081	17.5328	17.4773	NA	16.4344
NCAR-CESM1-CAM5	17.2587	17.3277	NA	NA	NA	NA
NorESM1	18.4595	18.5380	NA	18.3933	18.6918	17.2650
hfls						
ECHAM-HAM	86.3195	85.6557	85.5166	85.2646	NA	84.8367
GISS-E2-R	93.6866	93.3686	NA	NA	NA	91.9281
HadGEM2	89.3718	90.2967	90.3378	89.7639	90.3485	NA
HadGEM3	88.7126	88.3943	NA	NA	NA	NA
MIROC-SPRINTARS	94.4902	94.1521	94.2085	93.7607	94.6095	NA
NCAR-CESM1-CAM4	81.6866	81.4065	81.4574	81.2999	NA	80.1085

NCAR- CESM1- CAM5	87.4054	86.9100	NA	NA	NA	NA
NorESM1	83.1197	82.8532	NA	82.8542	82.9308	81.6003
Coupled:			hfss			
ECHAM- HAM	23.4666	23.1399	23.1666	23.0025	NA	22.2559
GISS-E2-R	18.8777	18.6685	NA	NA	NA	17.7794
HadGEM2	18.5235	18.2219	18.1895	17.9191	18.7360	NA
HadGEM3	18.1570	17.9248	NA	NA	NA	NA
MIROC- SPRINTARS	14.3582	14.2949	14.2967	14.0625	14.2965	NA
NCAR- CESM1- CAM4	17.4571	17.1621	NA	17.1518	NA	16.3003
NCAR- CESM1- CAM5	17.0846	16.7530	NA	NA	NA	NA
NorESM1	18.6920	18.5920	NA	18.5327	19.1122	17.7708
			hfis			
ECHAM- HAM	86.4752	88.1408	87.7669	87.8076	NA	84.7444

GISS-E2-R	94.4444	95.1981	NA	NA	NA	93.7277
HadGEM2	89.3158	90.6064	90.8494	91.2128	90.1094	NA
HadGEM3	93.4500	96.0868	NA	NA	NA	NA
MIROC-SPRINTARS	91.3790	92.4215	92.3361	92.0559	91.5503	NA
NCAR-CESM1-CAM4	86.8499	89.7148	NA	88.9476	NA	86.0543
NCAR-CESM1-CAM5	89.9840	92.0095	NA	NA	NA	NA
NorESM1	80.0746	81.7386	NA	81.2491	79.5119	79.8392

Supplementary Table 7 phase 2: Global and annual multi-model mean temperature, precipitation and evaporation (no data for CanESM2, IPSL-CM5A or MPI-ESM available and no evspsbl data for HadGEM3).

Commented [MS3]: Hit

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
FSST:			tas			
ECHAM-HAM	287.872	287.960	287.952	287.949	NA	288.186
GISS-E2-R	289.047	289.098	NA	NA	NA	289.083
HadGEM2	286.786	286.73	286.722	286.776	286.649	NA

HadGEM3	287.297	287.388	NA	NA	NA	NA
MIROC-SPRINTARS	288.086	288.137	288.133	288.191	288.112	NA
NCAR-CESM1-CAM4	287.287	287.347	287.326	287.344	NA	287.353
NCAR-CESM1-CAM5	286.887	286.972	NA	NA	NA	NA
NorESM1	287.754	287.85	NA	287.852	287.841	287.77
pr						
ECHAM-HAM	3.45861E-05	3.43101E-05	3.42611E-05	3.41637E-05	NA	3.39899E-05
GISS-E2-R	3.74728E-05	3.73465E-05	NA	NA	NA	3.677E-05
HadGEM2	3.57253E-05	3.6095E-05	3.61117E-05	3.58811E-05	3.61151E-05	NA
HadGEM3	3.55032E-05	3.53772E-05	NA	NA	NA	NA
MIROC-SPRINTARS	3.77968E-05	3.766E-05	3.76824E-05	3.7503E-05	3.78421E-05	NA
NCAR-CESM1-CAM4	3.26543E-05	3.2541E-05	3.2562E-05	3.24998E-05	NA	3.20242E-05
NCAR-CESM1-CAM5	3.49612E-05	3.47617E-05	NA	NA	NA	NA

NorESM1	3.32286E-05	3.3124E-05	NA	3.31194E-05	3.31523E-05	3.26183E-05
evspsbl						
ECHAM-HAM	-3.44997E-05	-3.42336E-05	-3.4178E-05	-3.4077E-05	NA	-3.3906E-05
GISS-E2-R	3.74746E-05	3.73474E-05	NA	NA	NA	3.6771E-05
HadGEM2	3.56996E-05	3.60712E-05	3.60877E-05	3.58579E-05	3.60908E-05	NA
MIROC-SPRINTARS	3.77961E-05	3.76608E-05	3.76834E-05	3.75043E-05	3.78438E-05	NA
NCAR-CESM1-CAM4	3.26547E-05	3.25423E-05	3.25627E-05	3.24998E-05	NA	3.20238E-05
NCAR-CESM1-CAM5	3.49622E-05	3.4764E-05	NA	NA	NA	NA
NorESM1	3.32268E-05	3.3121E-05	NA	3.31217E-05	3.31526E-05	3.26193E-05
Coupled:	tas					
ECHAM-HAM	288.148	289.104	288.950	289.137	NA	288.012
GISS-E2-R	289.227	289.627	NA	NA	NA	289.575
HadGEM2	286.745	287.565	287.691	288.183	287.075	NA
HadGEM3	289.413	290.681	NA	NA	NA	NA

MIROC-SPRINTARS	287.403	287.886	287.852	287.988	287.426	NA
NCAR-CESM1-CAM4	289.522	290.879	NA	290.618	NA	289.814
NCAR-CESM1-CAM5	288.179	289.087	NA	NA	NA	NA
NorESM1	286.689	287.578	NA	287.414	286.818	287.186
pr						
ECHAM-HAM	3.46344E-05	3.53089E-05	3.51591E-05	3.5177E-05	NA	3.39405E-05
GISS-E2-R	3.7776E-05	3.80785E-05	NA	NA	NA	3.74901E-05
HadGEM2	3.57037E-05	3.62196E-05	3.63178E-05	3.6462E-05	3.60234E-05	NA
HadGEM3	3.74147E-05	3.84775E-05	NA	NA	NA	NA
MIROC-SPRINTARS	3.65511E-05	3.69682E-05	3.69339E-05	3.68216E-05	3.66195E-05	NA
NCAR-CESM1-CAM4	3.4718E-05	3.58645E-05	NA	3.55575E-05	NA	3.44001E-05
NCAR-CESM1-CAM5	3.59932E-05	3.68022E-05	NA	NA	NA	NA
NorESM1	3.20053E-05	3.26718E-05	NA	3.24764E-05	3.17819E-05	3.19123E-05

evspsbl						
ECHAM-HAM	-3.45569E-05	-3.52255E-05	-3.50757E-05	-3.50924E-05	NA	-3.38636E-05
GISS-E2-R	3.77778E-05	3.80793E-05	NA	NA	NA	3.74911E-05
HadGEM2	3.56793E-05	3.61964E-05	3.62944E-05	3.64404E-05	3.59997E-05	NA
MIROC-SPRINTARS	3.65516E-05	3.69686E-05	3.69345E-05	3.68224E-05	3.66201E-05	NA
NCAR-CESM1-CAM4	3.47182E-05	3.58646E-05	NA	3.55577E-05	NA	3.44003E-05
NCAR-CESM1-CAM5	3.59936E-05	3.68038E-05	NA	NA	NA	NA
NorESM1	3.20058E-05	3.26729E-05	NA	3.24772E-05	3.17821E-05	3.19133E-05

Supplementary Table 8 phase 2: Global and annual multi-model mean humidity and pressure *(no data for CanESM2, IPSL-CM5A or MPI-ESM available. Data also missing for HadGEM3 for fsst huss and hurs).

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
FSST:						
huss						
ECHAM-HAM	0.00973237	0.000476906	0.000476045	0.00047781	NA	0.00978935

GISS-E2-R	0.0103356	0.0103784	NA	NA	NA	0.010444
HadGEM2	0.00942607	0.00956363	0.00956463	0.00958419	0.0095225	NA
HadGEM3	0.00968408	0.00972199	NA	NA	NA	NA
MIROC-SPRINTARS	0.0095515	0.00957235	0.00957317	0.00959727	0.00955264	NA
NCAR-CESM1-CAM4	0.0103413	0.0103578	0.0103612	0.0103712	NA	0.0104541
NCAR-CESM1-CAM5	0.0101312	0.0101517	NA	NA	NA	NA
NorESM1	0.010468	0.0104946	NA	0.0105104	0.0104657	0.0106002
hurs						
ECHAM-HAM	75.1505	53.0328	53.0522	52.8872	NA	74.8703
GISS-E2-R	73.8098	73.9043	NA	NA	NA	74.2114
HadGEM2	76.0549	76.9667	76.955	76.959	76.925	NA
HadGEM3	76.3749	76.3369	NA	NA	NA	NA
MIROC-SPRINTARS	77.6667	77.6418	77.6808	77.7064	77.6776	NA

NCAR- CESM1- CAM4	79.3237	79.2427	79.3073	79.3226	NA	79.7079
NCAR- CESM1- CAM5	78.8029	78.6842	NA	NA	NA	NA
NorESM1	78.2522	78.1691	NA	78.2519	78.0381	78.7980
ps						
ECHAM- HAM	98549.5	98549.5	98549.5	98549.5	NA	98549.5
GISS-E2-R	98400.0	98400.0	NA	NA	NA	98400.0
HadGEM2	98571.7	98573.7	98574.0	98573.5	98572	NA
HadGEM3	98521.7	98522.9	NA	NA	NA	NA
MIROC- SPRINTARS	98681.1	98681.8	98681.8	98681.9	98681.2	NA
NCAR- CESM1- CAM4	98540.7	98541.2	98541.1	98541.2	NA	98543.5
NCAR- CESM1- CAM5	98541.1	98541.7	NA	NA	NA	NA
NorESM1	98545.8	98546.6	NA	98546.8	98545.7	98548.9
Coupled:	huss					

ECHAM-HAM	0.00978844	0.000537115	0.000525775	0.00053786	NA	0.00980894
GISS-E2-R	0.0104758	0.0107635	NA	NA	NA	0.0108136
HadGEM2	0.00940126	0.00984328	0.00989349	0.0101498	0.00960478	NA
HadGEM3	0.0108608	0.0116421	NA	NA	NA	NA
MIROC-SPRINTARS	0.00885048	0.00913847	0.00911218	0.00917459	0.00886776	NA
NCAR-CESM1-CAM4	0.0116061	0.0124112	NA	0.012256	NA	0.01191
NCAR-CESM1-CAM5	0.0106531	0.0112003	NA	NA	NA	NA
NorESM1	0.00982093	0.010262	NA	0.0101837	0.00981274	0.0100973
hurs						
ECHAM-HAM	74.7892	52.2502	52.2833	52.0383	NA	75.2393
GISS-E2-R	74.0169	74.0903	NA	NA	NA	74.4556
HadGEM2	75.9867	75.9763	75.9526	75.9224	76.0984	NA
HadGEM3	75.8989	75.7988	NA	NA	NA	NA
MIROC-SPRINTARS	77.4895	77.5365	77.5155	77.5619	77.5298	NA

NCAR- CESM1- CAM4	78.6925	78.5768	NA	78.6506	NA	79.0948
NCAR- CESM1- CAM5	78.1502	78.1714	NA	NA	NA	NA
NorESM1	78.3035	78.1417	NA	78.2121	77.8984	78.3941
ps						
ECHAM- HAM	98549.5	98549.5	98549.5	98549.5	NA	98549.5
GISS-E2-R	98400.0	98400.0	NA	NA	NA	98400.0
HadGEM2	98571.5	98586.5	98588.0	98595.5	98578.3	NA
HadGEM3	98553.4	98575.0	NA	NA	NA	NA
MIROC- SPRINTARS	98654.8	98663.6	98662.7	98663.8	98655.2	NA
NCAR- CESM1- CAM4	98578.6	98602.7	NA	98597.7	NA	98587.8
NCAR- CESM1- CAM5	98554.0	98570.4	NA	NA	NA	NA
NorESM1	98525.0	98538.1	NA	98535.5	98524.9	98532.2

Table 9: Global and annual multi-model mean precipitation and cloud cover *(no data for CanESM2, IPSL-CM5A or MPI-ESM and no data available for clt for NCAR-CESM1-CAM5 or for prw for HadGEM3).

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
FSST:			prc			
ECHAM-HAM	2.31071E-05	2.30165E-05	2.29438E-05	2.28452E-05	NA	2.26409E-05
GISS-E2-R	1.54053E-05	1.53491E-05	NA	NA	NA	1.50645E-05
HadGEM2	2.659E-05	2.68609E-05	2.68773E-05	2.67013E-05	2.6926E-05	NA
HadGEM3	2.58621E-05	2.57382E-05	NA	NA	NA	NA
MIROC-SPRINTARS	1.91754E-05	1.9151E-05	1.91365E-05	1.9034E-05	1.92142E-05	NA
NCAR-CESM1-CAM4	2.00028E-05	1.99186E-05	1.99519E-05	1.99471E-05	NA	1.95086E-05
NCAR-CESM1-CAM5	2.47768E-05	2.46552E-05	NA	NA	NA	NA
NorESM1	2.0252E-05	2.01523E-05	NA	2.01624E-05	2.01576E-05	1.97722E-05
			prw			
ECHAM-HAM	26.4815	26.5682	26.5102	26.5773	NA	26.6081

GISS-E2-R	24.8819	24.9922	NA	NA	NA	25.0663
HadGEM2	22.1737	22.4342	22.4341	22.4384	22.3035	NA
MIROC-SPRINTARS	25.1178	25.185	25.1832	25.1921	25.1233	NA
NCAR-CESM1-CAM4	25.5186	25.5724	25.5597	25.5793	NA	25.8120
NCAR-CESM1-CAM5	25.5611	25.6142	NA	NA	NA	NA
NorESM1	26.0323	26.1145	NA	26.1399	26.0205	26.3468
clt						
ECHAM-HAM	68.114	67.9394	68.1151	68.2209	NA	68.2615
GISS-E2-R	61.1801	60.983	NA	NA	NA	60.9217
HadGEM2	53.4134	53.4137	53.3121	53.2486	53.5605	NA
HadGEM3	64.4578	64.1407	NA	NA	NA	NA
MIROC-SPRINTARS	67.9063	67.4432	67.5230	67.7919	67.9144	NA
NCAR-CESM1-CAM4	53.8737	53.4314	53.5506	53.6589	NA	54.2088

NorESM1	54.3828	54.1463	NA	54.3111	54.3649	54.7855
Coupled:			prc			
ECHAM-HAM	2.32743E-05	2.38955E-05	2.37684E-05	2.37765E-05	NA	2.25795E-05
GISS-E2-R	1.56487E-05	1.6001E-05	NA	NA	NA	1.56940E-05
HadGEM2	2.65747E-05	2.69546E-05	2.70643E-05	2.71974E-05	2.68513E-05	NA
HadGEM3	2.76167E-05	2.85426E-05	NA	NA	NA	NA
MIROC-SPRINTARS	1.86237E-05	1.88555E-05	1.88443E-05	1.88245E-05	1.86657E-05	NA
NCAR-CESM1-CAM4	2.15088E-05	2.25746E-05	NA	2.23193E-05	NA	2.12806E-05
NCAR-CESM1-CAM5	2.59768E-05	2.65449E-05	NA	NA	NA	NA
NorESM1	1.96188E-05	2.0043E-05	NA	1.99318E-05	1.94736E-05	1.94505E-05
			prw			
ECHAM-HAM	26.6229	28.3444	28.0289	28.3934	NA	26.6516
GISS-E2-R	25.2864	26.2045	NA	NA	NA	26.2327
HadGEM2	22.0892	23.4266	23.5624	24.2489	22.7022	NA

MIROC-SPRINTARS	22.4424	23.3443	23.2525	23.3605	22.4872	NA
NCAR-CESM1-CAM4	29.3831	31.8438	NA	31.3305	NA	30.3199
NCAR-CESM1-CAM5	26.8751	28.5409	NA	NA	NA	NA
NorESM1	23.9096	25.2439	NA	24.9805	23.9009	24.6431
clt						
ECHAM-HAM	67.708	67.1124	67.2054	67.1703	NA	68.2598
GISS-E2-R	61.2235	60.9571	NA	NA	NA	60.8800
HadGEM2	53.4756	53.2918	53.2085	53.0463	53.6353	NA
HadGEM3	62.8563	61.8053	NA	NA	NA	NA
MIROC-SPRINTARS	66.9475	66.5859	66.6188	66.8366	66.9762	NA
NCAR-CESM1-CAM4	53.5781	53.4048	NA	53.6266	NA	54.2605
NorESM1	53.4607	53.3634	NA	53.5355	53.4515	53.7860

Supplementary Table 10: Global and annual multi-model mean wind *(no data for CanESM2, IPSL-CM5A or MPI-ESM, HadGEM3 data only for coupled experiments).

Model	Base	cfc12	cfc11	n2o1p	Indus	bcslt
FSST:			uas			
ECHAM-HAM	-0.415027	-0.426143	-0.399068	-0.375361	NA	-0.428860
GISS-E2-R	-0.115321	-0.121167	NA	NA	NA	-0.131150
HadGEM2	-0.425581	-0.411703	-0.428703	-0.397318	-0.387718	NA
HadGEM3	-0.507254	-0.519696	NA	NA	NA	NA
MIROC-SPRINTARS	-0.422892	-0.447626	-0.422949	-0.431851	-0.431152	NA
NCAR-CESM1-CAM4	-0.774503	-0.770068	-0.779268	-0.774398	NA	-0.773364
NCAR-CESM1-CAM5	-0.716762	-0.734206	NA	NA	NA	NA
NorESM1	-0.795219	-0.795023	NA	-0.77465	-0.767849	-0.797687
			vas			
ECHAM-HAM	0.259792	0.253938	0.263699	0.23723	NA	0.232984
GISS-E2-R	0.101552	0.101636	NA	NA	NA	0.11095
HadGEM2	0.158784	0.159904	0.160251	0.151460	0.158666	NA

HadGEM3	0.139922	0.138752	NA	NA	NA	NA
MIROC-SPRINTARS	0.163417	0.170831	0.158871	0.161307	0.173595	NA
NCAR-CESM1-CAM4	0.150636	0.144472	0.13923	0.140243	NA	0.173684
NCAR-CESM1-CAM5	0.171376	0.180792	NA	NA	NA	NA
NorESM1	0.0837827	0.0764732	NA	0.0879505	0.0857571	0.096464
Coupled:			uas			
ECHAM-HAM	-0.387846	-0.359939	-0.357761	-0.359607	NA	-0.394126
GISS-E2-R	-0.121448	-0.124926	NA	NA	NA	-0.143289
HadGEM2	-0.402156	-0.399517	-0.381738	-0.368901	-0.352306	NA
HadGEM3	-0.437581	-0.43044	NA	NA	NA	NA
MIROC-SPRINTARS	-0.449403	-0.439171	-0.441468	-0.429746	-0.447647	NA
NCAR-CESM1-CAM4	-0.623458	-0.623132	NA	-0.622793	NA	-0.678414
NCAR-CESM1-CAM5	-0.501289	-0.465203	NA	NA	NA	NA

NorESM1	-0.730819	-0.716368	NA	-0.717386	-0.727207	-0.700182
vas						
ECHAM-HAM	0.251566	0.262215	0.25538	0.266241	NA	0.246363
GISS-E2-R	0.0999539	0.101113	NA	NA	NA	0.12079
HadGEM2	0.137630	0.145689	0.142574	0.135919	0.146556	NA
HadGEM3	0.0241895	0.0244702	NA	NA	NA	NA
MIROC-SPRINTARS	0.137257	0.137053	0.137803	0.132917	NA	NA
NCAR-CESM1-CAM4	0.00565497	-0.017541	NA	-0.00628492	NA	0.0343109
NCAR-CESM1-CAM5	0.046967	0.024539	NA	NA	NA	NA
NorESM1	0.0461957	0.05255	NA	0.0563919	0.0530919	0.0483234

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

Variables	Base	cfc12	cfc11	n2o1p	Indus	bcsIt
fsst						

rsutcs	52.0795 (10)	-0.2827 (6)	1.2508 (6)	0.4844 (5)	-0.6079 (2)	-0.2121 (1)
rsdscs	249.677 (8)	-1.064 (6)	-1.379 (6)	-0.499 (5)	0.600 (2)	0.194 (1)
rsuscs	30.3708 (8)	-0.1669 (6)	-0.1185 (6)	-0.0242 (5)	0.0196 (2)	0.0059 (1)
rlutcs	262.669 (10)	0.110 (6)	-0.193 (6)	-0.045 (5)	0.270 (2)	0.131 (1)
rlsdcscs	315.497 (10)	0.212 (6)	-0.047 (6)	-0.061 (5)	0.260 (2)	0.161 (1)
coupled						
rsutcs	52.2177 (10)	-0.4069 (5)	1.4763 (6)	0.5814 (6)	-1.1018 (2)	-0.2290 (1)
rsdscs	249.176 (8)	-1.191 (5)	-0.930 (6)	-0.284 (6)	-0.376 (2)	0.123 (1)
rsuscs	30.4707 (8)	-0.2952 (5)	0.1718 (6)	0.1159 (6)	-0.5325 (2)	-0.0162 (1)
rlutcs	263.482 (10)	0.350 (5)	-0.983 (6)	-0.408 (6)	1.779 (2)	0.228 (1)
rlsdcscs	317.919 (10)	1.097 (5)	-2.682 (6)	-1.305 (6)	6.231 (2)	0.535 (1)

Supplementary Table 2 – phase 2: Global and annual multi-model mean energy fluxes.

Variables	Base	cfc12	cfc11	n2o1p	Indus	bcslt
fsst						
rsdt	341.055 (10)	0.000 (6)	0.000 (6)	0.000 (5)	0.000 (2)	0.000 (1)
rsut	101.805 (10)	-0.484 (6)	1.085 (6)	0.395 (5)	-1.899 (2)	-0.498 (1)
rsds	188.595 (10)	-0.795 (6)	-1.182 (6)	-0.417 (5)	2.057 (2)	0.504 (1)
rsus	24.0455 (10)	-0.1395 (6)	-0.1016 (6)	-0.0247 (5)	0.1283 (2)	0.0315 (1)
rlut	237.512 (10)	0.292 (6)	-0.316 (6)	-0.034 (5)	0.460 (2)	0.207 (1)
rlds	341.571 (10)	0.174 (6)	-0.066 (6)	-0.047 (5)	-0.013 (2)	0.118 (1)
rlus	398.138 (10)	0.077 (6)	-0.224 (6)	-0.097 (5)	0.359 (2)	0.139 (1)
hfis	86.7742 (10)	-0.4657 (6)	0.0221 (6)	0.0415 (5)	-0.0451 (2)	0.1679 (1)
hfss	19.9755 (11)	-0.2832 (7)	-0.1733 (7)	-0.0317 (6)	0.1664 (2)	0.0017 (1)
coupled						
rsdt	341.047 (10)	0.000 (5)	-0.000 (6)	0.000 (6)	-0.000 (2)	-0.000 (1)
rsut	101.265 (10)	-0.586 (5)	1.361 (6)	0.530 (6)	-2.580 (2)	-0.382 (1)
rsds	189.067 (10)	-0.914 (5)	-0.886 (6)	-0.286 (6)	1.481 (2)	0.272 (1)

rsus	24.0532 (10)	-0.2377 (5)	0.1353 (6)	0.0950 (6)	-0.2917 (2)	-0.0055 (1)
rlut	238.5 (10)	0.5 (5)	-1.2 (6)	-0.4 (6)	2.2 (2)	0.3 (1)
rlds	343.361 (10)	1.003 (5)	-2.477 (6)	-1.180 (6)	5.510 (2)	0.507 (1)
rlus	400.326 (10)	0.771 (5)	-2.289 (6)	-1.077 (6)	4.869 (2)	0.451 (1)
hfis	87.4238 (10)	-0.2249 (5)	-0.9098 (6)	-0.4309 (6)	2.0846 (2)	0.1647 (1)
hfss	19.9263 (11)	-0.2845 (6)	-0.1276 (7)	0.0278 (7)	0.0041 (2)	0.0698 (1)

Supplementary Table 3 - phase 2: Global and annual multi-model mean meteorological variables.

Variables	Base	cfc12	cfc11	n2op1	Indus	bcslt
fsst						
tas	287.54 (11)	0.03 (7)	-0.04 (7)	-0.02 (7)	0.07 (2)	0.04 (1)
ts	288.166 (4)	0.013 (3)	-0.028 (3)	-0.017 (3)	0.108 (1)	0.000 (0)
pr	3.44914E-05 (11)	-0.01743E-05 (7)	0.00082E-05 (7)	0.00124E-05 (6)	-0.00157E-05 (2)	0.00656E-05 (1)
prc	2.08825E-05 (11)	-0.01450E-05 (7)	0.00252E-05 (7)	-0.00016E-05 (6)	-0.00636E-05 (2)	0.00040E-05 (1)
huss	0.00954522 (9)	0.00002057 (6)	-0.00000754 (6)	-0.00000938 (5)	0.00002314 (2)	0.00001132 (1)

hurs	76.2668 (9)	-11.3280 (6)	-11.3006 (6)	-13.6291 (5)	-0.0350 (2)	-0.0118 (1)
prw	24.5249 (11)	0.0666 (6)	-0.0216 (7)	-0.0277 (6)	0.0174 (2)	0.0376 (1)
evspsbl	2.82009E-05 (11)	-0.01738E-05 (7)	0.00096E-05 (7)	0.00136E-05 (6)	-0.00207E-05 (2)	0.00672E-05 (1)
uas	-0.467135 (11)	-0.001891 (6)	-0.003025 (7)	-0.012549 (6)	-0.016883 (2)	-0.000080 (1)
vas	0.144352 (11)	0.014528 (6)	-0.010210 (7)	0.001237 (6)	0.005088 (2)	-0.001845 (1)
clt	54.803 (10)	-0.091 (6)	0.031 (6)	0.002 (5)	-0.370 (2)	-0.079 (1)
ps	98533.5 (11)	0.5 (7)	-0.2 (7)	-0.3 (6)	0.2 (2)	0.4 (1)
coupled						
tas	287.942 (11)	0.145 (7)	-0.415 (7)	-0.208 (7)	0.882 (2)	0.080 (1)
ts	289.541 (4)	0.190 (3)	-0.509 (3)	-0.283 (3)	1.493 (1)	0.000 (0)
pr	3.47443E-05 (11)	-0.00854E-05 (6)	-0.03582E-05 (7)	-0.01866E-05 (7)	0.08396E-05 (2)	0.00658E-05 (1)
prc	2.12036E-05 (11)	-0.00913E-05 (6)	-0.02335E-05 (7)	-0.01563E-05 (7)	0.06328E-05 (2)	0.00098E-05 (1)
huss	0.00973659 (9)	0.00009203 (5)	-0.00021895 (6)	-0.00011093 (6)	0.00054255 (2)	0.00004164 (1)
hurs	75.9993 (9)	0.0159 (5)	0.1456 (6)	0.0129 (6)	-0.0525 (2)	-0.0385 (1)

prw	24.8998 (11)	0.2673 (6)	-0.6685 (7)	-0.3386 (7)	1.6192 (2)	0.1381 (1)
evspsbl	2.84365E-05 (11)	-0.00860E-05 (6)	-0.03564E-05 (7)	-0.01859E-05 (7)	0.08270E-05 (2)	0.00659E-05 (1)
uas	-0.419113 (11)	0.007278 (6)	0.001439 (7)	0.008882 (7)	0.002501 (2)	0.001721 (1)
vas	0.104222 (11)	0.015795 (6)	-0.041661 (7)	-0.015312 (7)	0.035011 (2)	0.005246 (1)
cft	54.3323 (10)	-0.0762 (5)	0.0870 (6)	0.0504 (6)	-0.6008 (2)	-0.0213 (1)
ps	98536.7 (11)	2.3 (7)	-5.0 (7)	-2.4 (7)	14.9 (2)	1.4 (1)