Supplement to "Consistent Differences in Climate Feedbacks Between Atmosphere-Ocean GCMs and Atmospheric GCMs with Slab-Ocean Models"

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TABLE S1. We use model data from the World Climate Research Programme's (WCRP's) Coupled Model Intercomparison Project phase 3 (CMIP3) multi-model dataset. The model output must include the needed monthly average fields (upwelling and downwelling surface and TOA fluxes, surface and atmospheric temperature, surface air temperature, specific humidity, and surface pressure), and these fields must be available for both the AOGCM and the SOM-AGCM simulations, so not all archived simulations can be used. This table lists the models used and the data availability for each feedback. Multiple scenarios (i.e., the SRESa1b and the 1% per year CO_2 increase to doubling experiments) provide opportunities for comparing feedbacks related to different forcing conditions. However, not all scenarios were simulated for every model, so the possible comparisons vary from model to model. For the SRESa1b, 20C3M, and 1%to2x columns, the numbers indicate run numbers used. For the SRESa1b experiment, the 20C3M runs are used as the controls. For the 1%to2x experiment, the control and experiment state come from the same run. Some models have fewer ensemble members available for the "cloud" feedbacks. All models have only one experiment run and one control run for the SOM versions.

Abbreviation	Modeling Center	SRESa1b run(s)	20C3M run(s)	1%to2x run(s)
cccma_cgcm3_a	Canadian Centre for Climate Modelling and Analysis	1-5	1-5	1
cccma_cgcm3_1_t63	Canadian Centre for Climate Modelling and Analysis	1	1	none
csiro_mk3_0	CSIRO Atmospheric Research	1	2	1
gfdl_cm2_0	Geophysical Fluid Dynamics Laboratory	1	1	1
giss_model_e_r	Goddard Institute for Space Studies	2-5	6-9	none
inmcm3_0	Institute for Numerical Mathematics	1	1	1
miroc3_2_hires	Center for Climate System Research	1	1	1
miroc3_2_medres	Center for Climate System Research	1-3	1-3	1-3
mpi_echam5	Max Planck Institute for Meteorology	1-4 (cloud 1-3 only)	1-4	1-3
mri_cgcm2_3_2a	Meteorological Research Institute	1-5 (cloud 1 only)	1-5	1 (no cloud)
ncar_ccsm3_0	National Center for Atmospheric Research	1,2,3,5,6,7,9	1,2,3,4,5,6,7,9	1
ukmo_hadgem1	Met Office's Hadley Centre for Climate Prediction	1	1	none

1. Clear-sky test

The clear-sky test of the kernel technique with the CMIP3 models is shown in Figure S1. Global-average fluxes calculated using the kernel technique are compared with fluxes from the model output. Units are Wm^{-2}. Circles correspond to SRESa1b AOGCM simulations; stars indicate 1%to2x simulations; asterisks indicate SOM-AGCM simulations. When multiple ensemble members are available for an AOGCM experiment, additional circles or stars are plotted. The shortwave (SW) sums include the effects of changes in water vapor and surface albedo, plus clouds for the all-sky fluxes. The longwave (LW) sums include the effects of changes in water vapor, surface temperature, atmospheric temperature, CO_2, and clouds (for the all-sky fluxes). Ideally, the kernel technique should reproduce the actual TOA flux changes from the model. Since the kernel-derived all-sky fluxes use the modeled TOA fluxes in the cloud feedback calculation, the clear-sky values represent a better test of the technique. In the case of the SW fluxes, the kernel-based TOA flux change estimates agree with the modeled fluxes, except for the SRESa1b experiments (circles). This is expected, since the kernel-derived flux calculations do not include the effects of aerosols, which decrease with time in the SRESa1b scenario, resulting in more positive modeled SW fluxes. Since the effects of aerosols differ from model to model, the differences between kernel-derived and modeled SW fluxes depend on the particular model. The LW fluxes show less agreement, even for the cases when only CO_2 is changing (i.e., 1%to2x and 2xco2). Since we see these differences in the clear-sky case, they are likely caused by differences in the radiative forcing of CO_2. We use the same value for the forcing for all models, yet forcing does vary among models (Forster and Taylor 2006). The sums of all net fluxes indicate how close to equilibrium the simulations are. The SOM-AGCMs are very close to equilibrium; their model fluxes are near to zero, while the AOGCMs all show a further warming. Again we see a difference in kernel-derived and modeled flux due to differences in forcing. Note that, for our purposes, we are more interested in differences between different experiments for a given model. If all experiments for a model cluster together (especially the stars and squares), then *differences* in feedbacks among scenarios probably do not have a bias due to non-linearity of feedbacks, though some models show obvious differences.

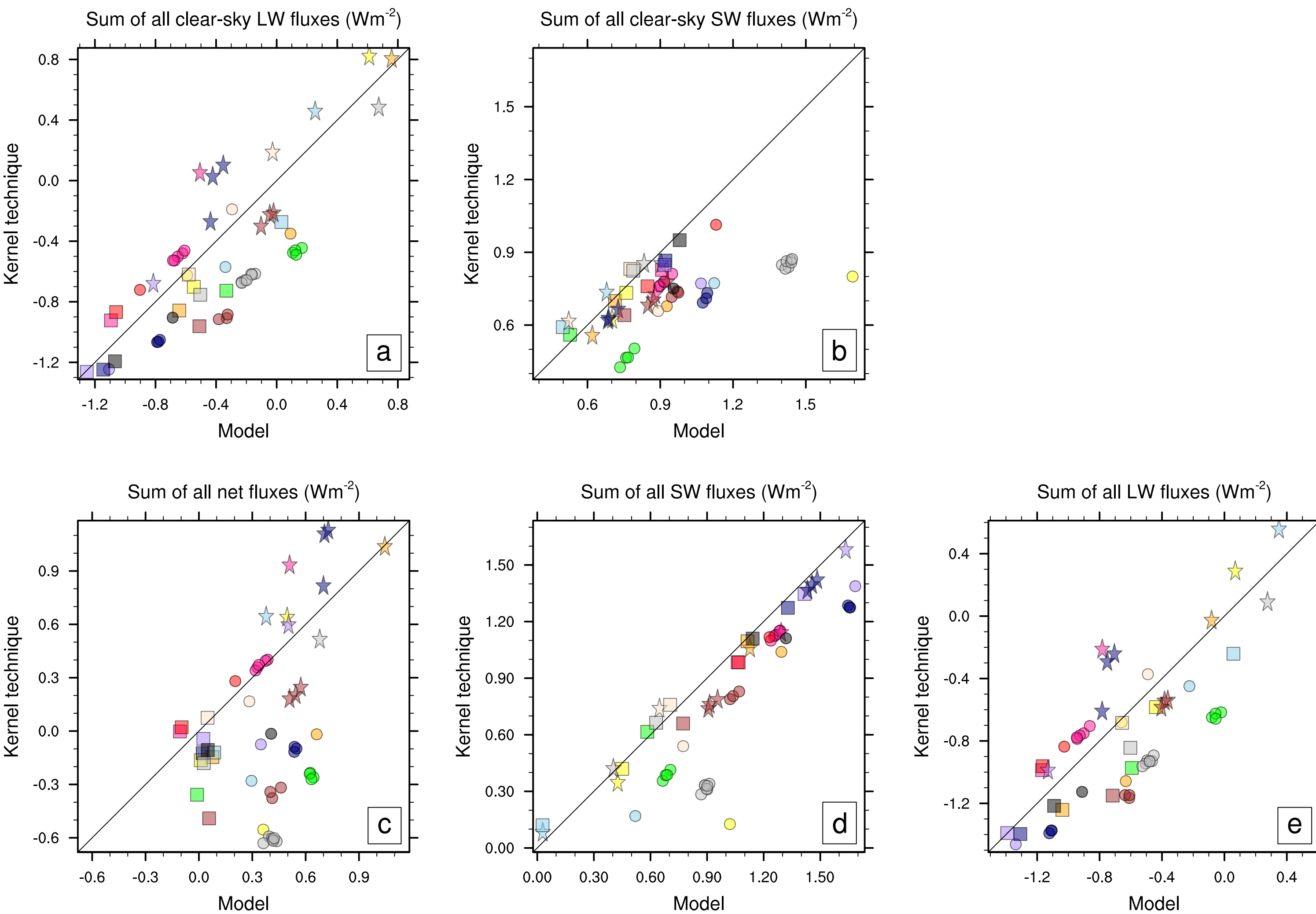

FIG. S1. The clear-sky test of the kernel technique for SRESa1b AOGCM (circles), 1%to2x AOGCM (stars), and doubled CO_2 SOM-AGCM (squares) experiments. Colors are as in Fig. 1.

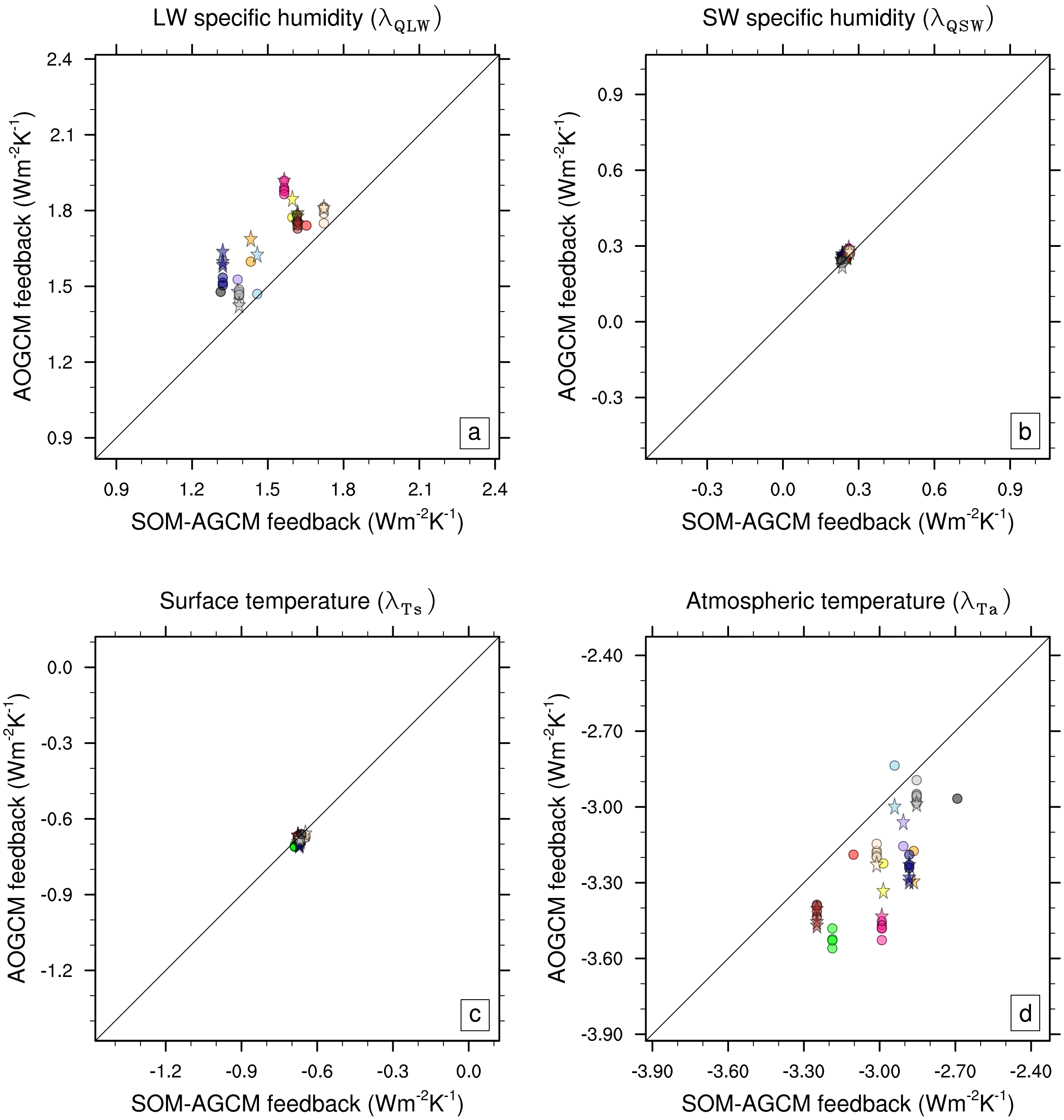

FIG. S2. Additional comparison of global-average feedbacks from atmosphere-ocean GCM experiments and slab ocean AGCM experiment. Surface and atmospheric temperature feedbacks are from Eq. 2 in the main text. Units are $Wm^{-2}K^{-1}$. Circles correspond to SRESa1b AOGCM experiments; squares indicate 1%to2x experiments. When multiple ensemble members are available for an AOGCM experiment, additional circles or stars are plotted. If feedbacks from AOGCMs were the same as those from SOM-AGCMs, all of the points would lie along the line.

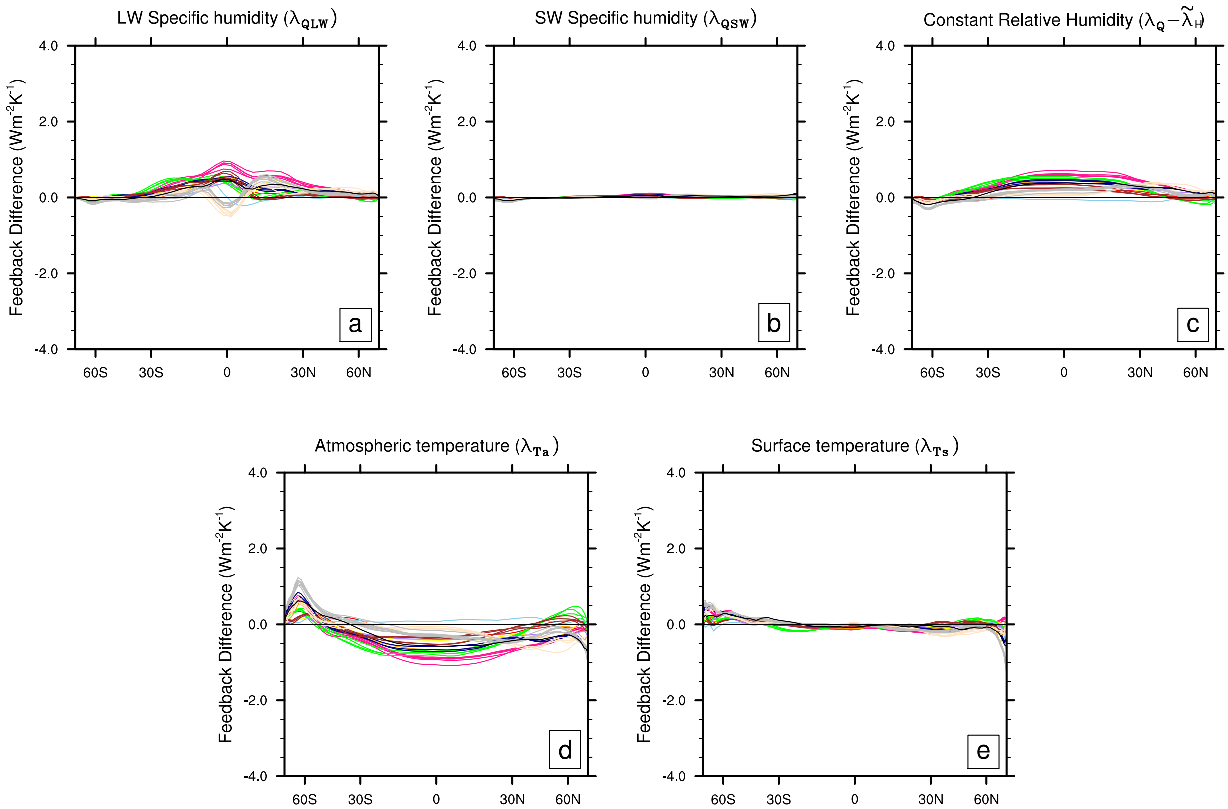

FIG. S3. Zonal-average (a) longwave water vapor, (b) shortwave water vapor, (c) net water vapor assuming relative humidity remains constant (but not incorporating the radiative effects of the changed temperature), (d) atmospheric temperature, and (e) surface temperature feedbacks in slab ocean AGCM experiments subtracted from feedbacks in SRESa1b AOGCM experiments, as in Figure 3 of the main manuscript. Part (c) is calculated following the procedure of Colman (2004). This quantity isolates the radiative effects of the specific humidity change corresponding to a constant relative humidity. In parts (d) and (e), roughly speaking, since increases in temperature lead to negative feedback values, positive temperature feedback differences between the AOGCM and SOM-AOGCM experiments indicate that the SOM-AOGCM is warmer at that latitude. Thus, the Arctic surface temperature change is larger in AOGCMs than in SOM-AOGCMs, in agreement with the zonal feedback differences seen in the surface albedo, lapse rate, and Planck temperature feedbacks. Overall, the atmospheric temperature feedback is more negative in AOGCMs, mostly due to the lapse rate feedback increase outside of the high latitudes. The inter-hemispheric gradient discussed in Section 4 of the main paper is also seen in the temperature feedbacks.

Table S2: Global- and annual-average feedbacks for AOGCMs and their corresponding SOM-AGCMs, in $Wm^{-2}K^{-1}$, and the global average surface air temperature change (K), for all of the available ensemble members. Dark shaded rows correspond to the SOM experiments, light shaded to 1%to2x.

Model	scen.	λ_T	λ_L	λ_Q	$\tilde{\lambda}_T$	$\tilde{\lambda}_L$	$\tilde{\lambda}_H$	λ_α	λ_{CSW}	λ_{CLW}	Non-C	All	$\Delta\overline{T_{as}}$
cccma_cgcm3_1	A1B	-3.13	-1.04	2.17	-1.75	-0.30	0.06	0.29	0.57	0.47	-1.70	-0.66	2.36
cccma_cgcm3_1	A1B	-3.14	-1.08	2.21	-1.75	-0.31	0.05	0.27	0.56	0.48	-1.74	-0.69	2.39
cccma_cgcm3_1	A1B	-3.14	-1.04	2.16	-1.75	-0.30	0.04	0.27	0.58	0.47	-1.74	-0.70	2.41
cccma_cgcm3_1	A1B	-3.13	-1.04	2.18	-1.75	-0.30	0.06	0.27	0.54	0.50	-1.72	-0.68	2.34
cccma_cgcm3_1	A1B	-3.12	-1.02	2.15	-1.75	-0.29	0.05	0.28	0.59	0.47	-1.72	-0.66	2.44
cccma_cgcm3_1	1%	-3.12	-0.99	2.21	-1.75	-0.27	0.12	0.22	0.63	0.56	-1.68	-0.49	1.76
cccma_cgcm3_1	2xCO_2	-3.04	-0.62	1.83	-1.76	-0.12	0.05	0.27	0.45	0.39	-1.56	-0.71	3.52
cccma_cgcm3_1_t63	A1B	-3.07	-0.79	2.01	-1.75	-0.19	0.09	0.36	0.49	0.44	-1.49	-0.56	2.99
cccma_cgcm3_1_t63	2xCO_2	-3.05	-0.72	1.92	-1.75	-0.17	0.07	0.24	0.47	0.41	-1.61	-0.72	3.38
csiro_mk3_0	A1B	-3.12	-0.73	1.84	-1.74	-0.20	-0.08	0.23	0.56	-0.06	-1.78	-1.28	2.00
csiro_mk3_0	1%	-3.15	-0.83	1.95	-1.74	-0.25	-0.06	0.18	0.62	0.12	-1.85	-1.11	1.17
csiro_mk3_0	2xCO_2	-3.08	-0.45	1.67	-1.75	-0.10	-0.02	0.25	0.61	0.04	-1.61	-0.96	3.07
gfdl_cm2_0	A1B	-3.11	-0.80	2.05	-1.74	-0.21	0.08	0.29	-0.44	0.56	-1.57	-1.45	2.81
gfdl_cm2_0	1%	-3.14	-0.88	2.13	-1.74	-0.25	0.08	0.18	-0.11	0.44	-1.71	-1.38	1.24
gfdl_cm2_0	2xCO_2	-3.07	-0.60	1.85	-1.75	-0.14	0.05	0.27	-0.10	0.63	-1.55	-1.02	2.93
giss_model_e_r	A1B	-3.16	-1.02	2.01	-1.74	-0.32	-0.14	0.14	0.01	0.60	-2.03	-1.42	2.13
giss_model_e_r	A1B	-3.17	-1.10	2.04	-1.74	-0.35	-0.17	0.11	-0.01	0.64	-2.12	-1.49	2.04
giss_model_e_r	A1B	-3.18	-1.06	2.04	-1.74	-0.33	-0.15	0.12	0.00	0.63	-2.07	-1.43	2.10
giss_model_e_r	A1B	-3.17	-1.06	2.00	-1.75	-0.33	-0.18	0.13	0.01	0.62	-2.10	-1.48	2.08
giss_model_e_r	2xCO_2	-3.10	-0.77	1.87	-1.74	-0.23	-0.07	0.17	0.19	0.36	-1.84	-1.28	2.72
inmcm3_0	A1B	-3.08	-0.43	1.70	-1.75	-0.05	-0.00	0.29	-0.36	0.60	-1.51	-1.27	2.54
inmcm3_0	1%	-3.12	-0.55	1.88	-1.75	-0.10	0.06	0.26	-0.42	0.84	-1.53	-1.11	1.43
inmcm3_0	2xCO_2	-3.09	-0.52	1.69	-1.75	-0.09	-0.07	0.21	-0.33	0.60	-1.70	-1.43	1.92
miroc3_2_hires	A1B	-3.10	-0.74	1.78	-1.74	-0.21	-0.11	0.30	0.84	0.25	-1.76	-0.68	4.15
miroc3_2_hires	1%	-3.10	-0.65	1.73	-1.75	-0.16	-0.11	0.32	1.01	0.23	-1.69	-0.45	2.39
miroc3_2_hires	2xCO_2	-3.06	-0.52	1.61	-1.75	-0.11	-0.11	0.30	0.81	0.22	-1.66	-0.63	4.29
miroc3_2_medres	A1B	-3.11	-0.76	1.76	-1.75	-0.21	-0.15	0.26	0.77	0.21	-1.86	-0.88	3.18
miroc3_2_medres	A1B	-3.13	-0.79	1.77	-1.76	-0.22	-0.17	0.24	0.78	0.20	-1.91	-0.92	3.11
miroc3_2_medres	A1B	-3.12	-0.80	1.79	-1.75	-0.23	-0.16	0.24	0.77	0.21	-1.89	-0.91	3.11
miroc3_2_medres	1%	-3.15	-0.77	1.85	-1.75	-0.22	-0.10	0.23	0.94	0.37	-1.85	-0.55	1.83
miroc3_2_medres	1%	-3.16	-0.83	1.87	-1.76	-0.24	-0.13	0.20	0.90	0.47	-1.93	-0.55	1.49
miroc3_2_medres	1%	-3.17	-0.81	1.91	-1.75	-0.24	-0.08	0.21	0.92	0.48	-1.86	-0.46	1.60
miroc3_2_medres	2xCO_2	-3.05	-0.50	1.56	-1.76	-0.10	-0.14	0.32	0.71	0.20	-1.67	-0.76	3.95
mpi_echam5	A1B	-3.12	-0.98	2.01	-1.74	-0.26	-0.09	0.26	0.27	0.39	-1.83	-1.17	3.18
mpi_echam5	A1B	-3.13	-0.95	2.01	-1.74	-0.26	-0.08	0.25	0.30	0.42	-1.82	-1.10	3.30
mpi_echam5	A1B	-3.12	-0.94	1.99	-1.74	-0.25	-0.08	0.26	0.31	0.39	-1.81	-1.11	3.16
mpi_echam5	A1B	-3.12	-0.94	2.01	-1.74	-0.25	-0.07	0.27			-1.79		3.09
mpi_echam5	1%	-3.13	-1.00	2.05	-1.74	-0.27	-0.07	0.23	0.25	0.49	-1.85	-1.11	1.91
mpi_echam5	1%	-3.13	-0.99	2.04	-1.74	-0.27	-0.08	0.24	0.30	0.49	-1.84	-1.06	1.92
mpi_echam5	1%	-3.13	-0.94	2.01	-1.74	-0.25	-0.07	0.27	0.24	0.49	-1.79	-1.06	2.01

Table S2: Global- and annual-average feedbacks for AOGCMs and their corresponding SOM-AGCMs, in $Wm^{-2}K^{-1}$, and the global average surface air temperature change (K), for all of the available ensemble members. Dark shaded rows correspond to the SOM experiments, light shaded to 1%to2x.

Model	scen.	λ_T	λ_L	λ_Q	$\tilde{\lambda}_T$	$\tilde{\lambda}_L$	$\tilde{\lambda}_H$	λ_α	λ_{CSW}	λ_{CLW}	Non-C	All	$\Delta\overline{T_{as}}$
mpi_echam5	$2xCO_2$	-3.10	-0.83	1.87	-1.75	-0.22	-0.09	0.21	0.19	0.40	-1.84	-1.25	3.31
mri_cgcm2_3_2a	A1B	-3.13	-0.71	2.07	-1.76	-0.17	0.16	0.22	0.03	0.52	-1.55	-1.00	2.16
mri_cgcm2_3_2a	A1B	-3.14	-0.71	2.10	-1.76	-0.18	0.18	0.21			-1.55		2.24
mri_cgcm2_3_2a	A1B	-3.12	-0.69	2.02	-1.76	-0.17	0.13	0.22			-1.58		2.13
mri_cgcm2_3_2a	A1B	-3.15	-0.72	2.10	-1.76	-0.18	0.17	0.21			-1.56		2.23
mri_cgcm2_3_2a	A1B	-3.14	-0.73	2.09	-1.76	-0.18	0.17	0.21			-1.57		2.23
mri_cgcm2_3_2a	1%	-3.14	-0.74	2.09	-1.76	-0.18	0.15	0.20	0.26		-1.59		1.72
mri_cgcm2_3_2a	$2xCO_2$	-3.10	-0.55	1.99	-1.75	-0.11	0.19	0.30	0.20	0.46	-1.37	-0.72	3.15
ncar_ccsm3_0	A1B	-3.07	-0.51	1.67	-1.76	-0.09	-0.06	0.30	-0.20	0.26	-1.60	-1.55	2.63
ncar_ccsm3_0	A1B	-3.08	-0.59	1.71	-1.75	-0.12	-0.08	0.30	-0.23	0.25	-1.65	-1.63	2.48
ncar_ccsm3_0	A1B	-3.07	-0.56	1.70	-1.75	-0.11	-0.07	0.31	-0.21	0.25	-1.63	-1.58	2.57
ncar_ccsm3_0	A1B	-3.08	-0.57	1.72	-1.76	-0.11	-0.06	0.29	-0.25	0.28	-1.63	-1.61	2.52
ncar_ccsm3_0	A1B	-3.08	-0.55	1.70	-1.76	-0.11	-0.07	0.31	-0.21	0.24	-1.62	-1.59	2.61
ncar_ccsm3_0	A1B	-3.09	-0.58	1.73	-1.76	-0.12	-0.07	0.30	-0.23	0.25	-1.64	-1.62	2.51
ncar_ccsm3_0	A1B	-3.07	-0.56	1.70	-1.76	-0.11	-0.07	0.31	-0.22	0.26	-1.62	-1.58	2.57
ncar_ccsm3_0	1%	-3.06	-0.60	1.65	-1.76	-0.12	-0.14	0.31	-0.11	0.39	-1.71	-1.42	1.29
ncar_ccsm3_0	$2xCO_2$	-3.05	-0.48	1.62	-1.75	-0.09	-0.06	0.32	0.10	0.36	-1.58	-1.11	2.69
ukmo_hadgem1	A1B	-3.04	-0.58	1.72	-1.74	-0.11	-0.05	0.25	0.62	0.24	-1.66	-0.80	3.20
ukmo_hadgem1	$2xCO_2$	-3.03	-0.33	1.54	-1.75	-0.03	-0.03	0.33	0.55	0.27	-1.48	-0.66	4.53

Table S3: Global- and annual-average feedback and surface air temperature change differences between AOGCMs and their corresponding SOM-AGCMs (AOGCM minus SOM-AGCM), in $Wm^{-2}K^{-1}$ and K, for all of the available ensemble members. Shaded rows correspond to the 1%to2x experiments.

Model	scen.	λ_T	λ_L	λ_Q	$\tilde{\lambda}_T$	$\tilde{\lambda}_L$	$\tilde{\lambda}_H$	λ_α	λ_{CSW}	λ_{CLW}	Non-C	All	$\Delta\overline{T_{as}}$
cccma_cgcm3_1	A1B	-0.09	-0.42	0.34	0.00	-0.17	0.01	0.02	0.12	0.07	-0.15	0.05	-1.17
cccma_cgcm3_1	A1B	-0.10	-0.46	0.38	0.00	-0.18	0.00	-0.01	0.12	0.09	-0.18	0.02	-1.13
cccma_cgcm3_1	A1B	-0.10	-0.42	0.34	0.00	-0.17	-0.01	-0.01	0.13	0.08	-0.19	0.01	-1.11
cccma_cgcm3_1	A1B	-0.09	-0.42	0.35	0.00	-0.17	0.01	-0.00	0.09	0.11	-0.16	0.04	-1.18
cccma_cgcm3_1	A1B	-0.08	-0.40	0.32	0.00	-0.16	-0.00	0.00	0.14	0.08	-0.16	0.06	-1.09
cccma_cgcm3_1	1%	-0.08	-0.38	0.39	0.01	-0.15	0.07	-0.05	0.18	0.17	-0.12	0.23	-1.76
cccma_cgcm3_1_t63	A1B	-0.02	-0.07	0.09	0.00	-0.02	0.02	0.11	0.02	0.03	0.12	0.16	-0.39
csiro_mk3_0	A1B	-0.04	-0.28	0.18	0.01	-0.11	-0.05	-0.02	-0.05	-0.10	-0.16	-0.31	-1.07
csiro_mk3_0	1%	-0.06	-0.38	0.28	0.01	-0.15	-0.03	-0.07	0.01	0.08	-0.24	-0.14	-1.90
gfdl_cm2_0	A1B	-0.04	-0.20	0.20	0.00	-0.08	0.03	0.02	-0.34	-0.07	-0.02	-0.43	-0.12
gfdl_cm2_0	1%	-0.07	-0.29	0.28	0.00	-0.11	0.03	-0.08	-0.01	-0.18	-0.16	-0.36	-1.69
giss_model_e_r	A1B	-0.06	-0.25	0.14	-0.00	-0.09	-0.08	-0.03	-0.18	0.23	-0.19	-0.14	-0.60
giss_model_e_r	A1B	-0.07	-0.32	0.17	-0.00	-0.12	-0.11	-0.06	-0.20	0.28	-0.29	-0.21	-0.68
giss_model_e_r	A1B	-0.07	-0.28	0.17	-0.00	-0.10	-0.08	-0.05	-0.19	0.27	-0.23	-0.15	-0.62
giss_model_e_r	A1B	-0.07	-0.29	0.13	-0.01	-0.10	-0.12	-0.04	-0.18	0.26	-0.27	-0.20	-0.64
inmcm3_0	A1B	0.01	0.09	0.01	0.00	0.04	0.07	0.08	-0.03	0.00	0.19	0.16	0.62
inmcm3_0	1%	-0.03	-0.03	0.19	0.00	-0.01	0.13	0.05	-0.10	0.25	0.17	0.32	-0.50
miroc3_2_hires	A1B	-0.04	-0.23	0.16	0.01	-0.10	-0.01	-0.00	0.02	0.03	-0.10	-0.05	-0.15
miroc3_2_hires	1%	-0.03	-0.13	0.11	0.01	-0.06	0.00	0.02	0.20	0.01	-0.03	0.18	-1.90
miroc3_2_medres	A1B	-0.06	-0.26	0.20	0.01	-0.11	-0.01	-0.07	0.06	0.01	-0.18	-0.12	-0.77
miroc3_2_medres	A1B	-0.08	-0.29	0.22	0.00	-0.12	-0.03	-0.09	0.07	0.00	-0.23	-0.16	-0.84
miroc3_2_medres	A1B	-0.07	-0.30	0.24	0.01	-0.13	-0.02	-0.08	0.06	0.01	-0.21	-0.15	-0.84
miroc3_2_medres	1%	-0.10	-0.27	0.29	0.00	-0.12	0.04	-0.10	0.23	0.17	-0.18	0.21	-2.12
miroc3_2_medres	1%	-0.11	-0.33	0.31	0.00	-0.14	0.01	-0.12	0.19	0.27	-0.25	0.21	-2.46
miroc3_2_medres	1%	-0.11	-0.31	0.35	0.01	-0.14	0.06	-0.12	0.21	0.27	-0.18	0.30	-2.35
mpi_echam5	A1B	-0.02	-0.15	0.14	0.01	-0.04	-0.00	0.04	0.08	-0.01	0.01	0.08	-0.13
mpi_echam5	A1B	-0.03	-0.13	0.14	0.01	-0.04	0.01	0.04	0.11	0.02	0.02	0.15	-0.00
mpi_echam5	A1B	-0.02	-0.12	0.12	0.01	-0.03	0.00	0.05	0.12	-0.01	0.03	0.14	-0.15
mpi_echam5	A1B	-0.02	-0.11	0.13	0.00	-0.03	0.02	0.05			0.05		-0.22
mpi_echam5	1%	-0.03	-0.17	0.18	0.01	-0.04	0.01	0.01	0.06	0.09	-0.01	0.14	-1.40
mpi_echam5	1%	-0.03	-0.16	0.17	0.01	-0.05	0.01	0.03	0.10	0.09	-0.00	0.19	-1.39
mpi_echam5	1%	-0.03	-0.11	0.14	0.01	-0.02	0.02	0.06	0.04	0.09	0.05	0.19	-1.30
mri_cgcm2_3_2a	A1B	-0.03	-0.16	0.08	-0.01	-0.07	-0.03	-0.07	-0.16	0.07	-0.18	-0.27	-0.99
mri_cgcm2_3_2a	A1B	-0.04	-0.16	0.11	-0.01	-0.07	-0.01	-0.09			-0.17		-0.91
mri_cgcm2_3_2a	A1B	-0.02	-0.14	0.04	-0.00	-0.06	-0.06	-0.08			-0.20		-1.02
mri_cgcm2_3_2a	A1B	-0.04	-0.17	0.11	-0.01	-0.07	-0.02	-0.08			-0.18		-0.92
mri_cgcm2_3_2a	A1B	-0.03	-0.17	0.10	-0.01	-0.07	-0.02	-0.09			-0.19		-0.92
mri_cgcm2_3_2a	1%	-0.03	-0.19	0.10	-0.00	-0.08	-0.04	-0.09	0.06		-0.21		-1.42
ncar_ccsm3_0	A1B	-0.02	-0.03	0.05	-0.01	0.01	-0.00	-0.02	-0.31	-0.10	-0.02	-0.43	-0.06
ncar_ccsm3_0	A1B	-0.03	-0.11	0.09	-0.01	-0.02	-0.02	-0.02	-0.33	-0.11	-0.07	-0.52	-0.21

Table S3: Global- and annual-average feedback and surface air temperature change differences between AOGCMs and their corresponding SOM-AGCMs (AOGCM minus SOM-AGCM), in $Wm^{-2}K^{-1}$ and K, for all of the available ensemble members. Shaded rows correspond to the 1%to2x experiments.

Model	scen.	λ_T	λ_L	λ_Q	$\tilde{\lambda}_T$	$\tilde{\lambda}_L$	$\tilde{\lambda}_H$	λ_α	λ_{CSW}	λ_{CLW}	Non-C	All	$\Delta\overline{T_{as}}$
ncar_ccsm3_0	A1B	-0.03	-0.09	0.08	-0.01	-0.01	-0.01	-0.02	-0.31	-0.11	-0.05	-0.47	-0.12
ncar_ccsm3_0	A1B	-0.03	-0.09	0.10	-0.01	-0.01	-0.00	-0.03	-0.35	-0.08	-0.06	-0.49	-0.18
ncar_ccsm3_0	A1B	-0.03	-0.08	0.08	-0.01	-0.01	-0.01	-0.02	-0.32	-0.12	-0.05	-0.48	-0.08
ncar_ccsm3_0	A1B	-0.04	-0.11	0.11	-0.01	-0.02	-0.01	-0.02	-0.34	-0.11	-0.06	-0.51	-0.19
ncar_ccsm3_0	A1B	-0.03	-0.09	0.08	-0.01	-0.01	-0.01	-0.01	-0.32	-0.10	-0.05	-0.47	-0.13
ncar_ccsm3_0	1%	-0.02	-0.13	0.03	-0.01	-0.03	-0.08	-0.02	-0.21	0.03	-0.13	-0.31	-1.40
ukmo_hadgem1	A1B	-0.02	-0.26	0.18	0.01	-0.08	-0.02	-0.08	0.07	-0.03	-0.18	-0.14	-1.33

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