

Supporting Information for ”Estimating radiative forcing with a nonconstant feedback parameter and linear response”

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Introduction This document repeats Figures 1 and 3 for all models and available RCP scenarios. For a description of the figures, see the NorESM1-M figures in the main manuscript.

Table S1 in the end lists the piControl trend values used when subtracting linear trends from the variables of the abrupt4xCO₂ experiment.

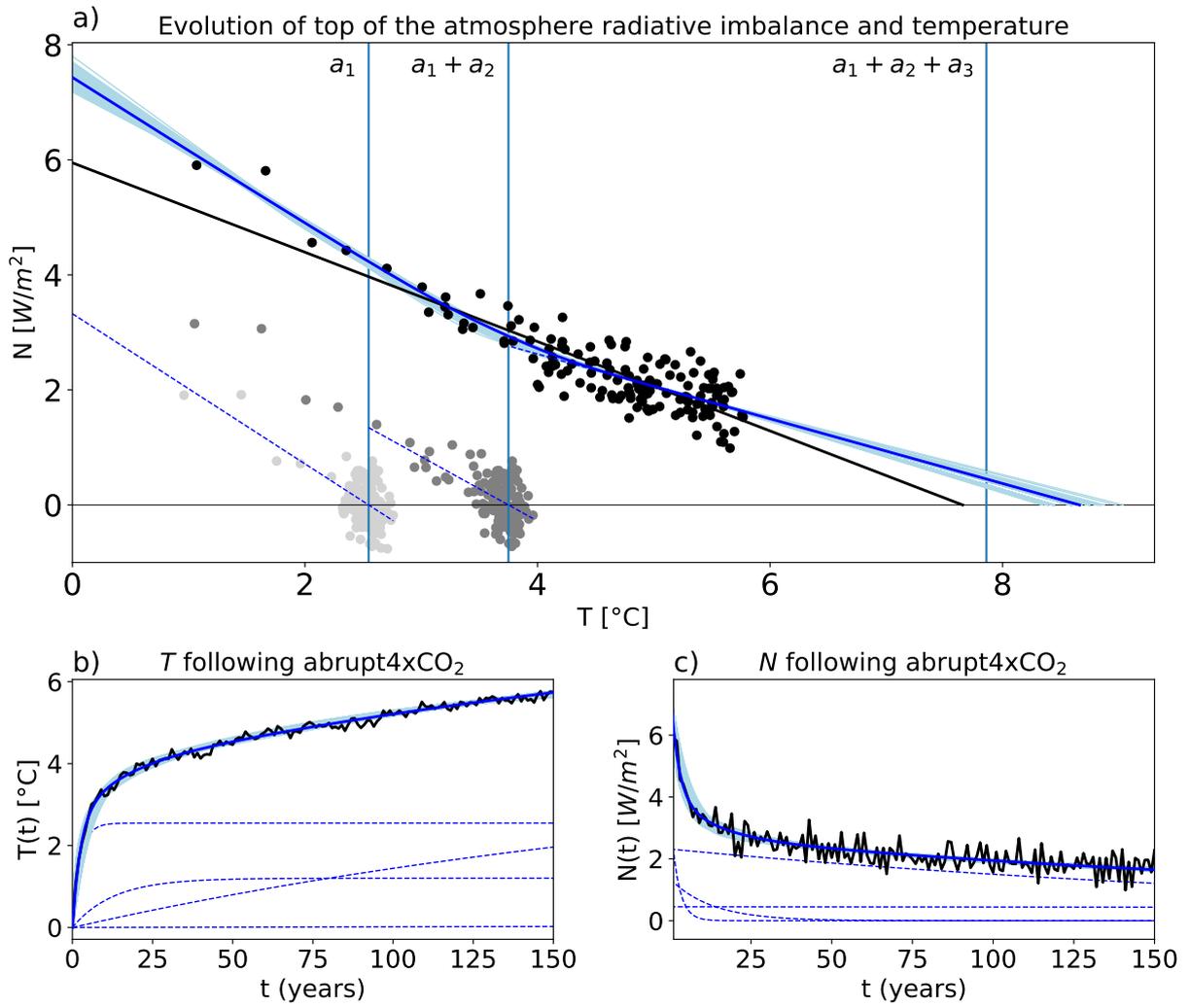


Figure S1. As Figure 1, but for the model ACCESS1-0.

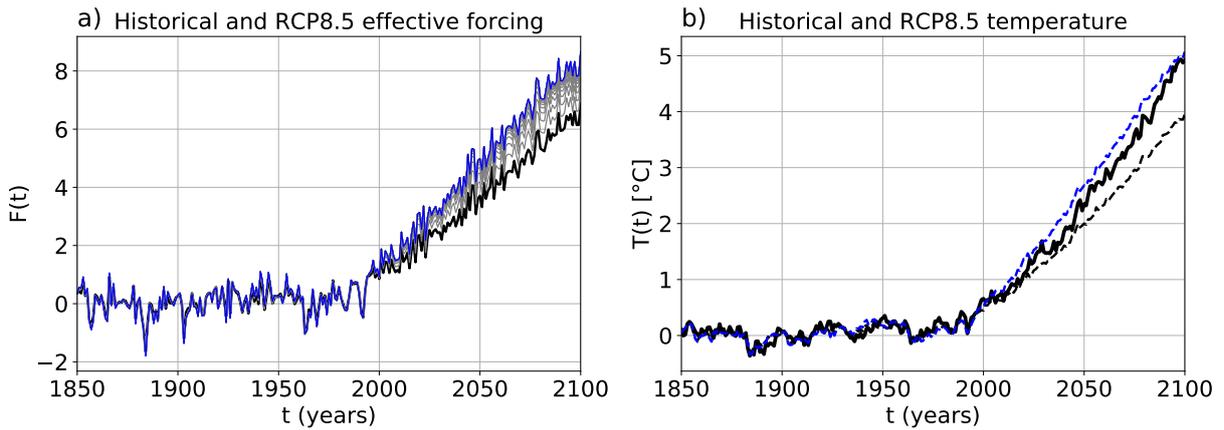


Figure S2. As Figure 3, but for the model ACCESS1-0.

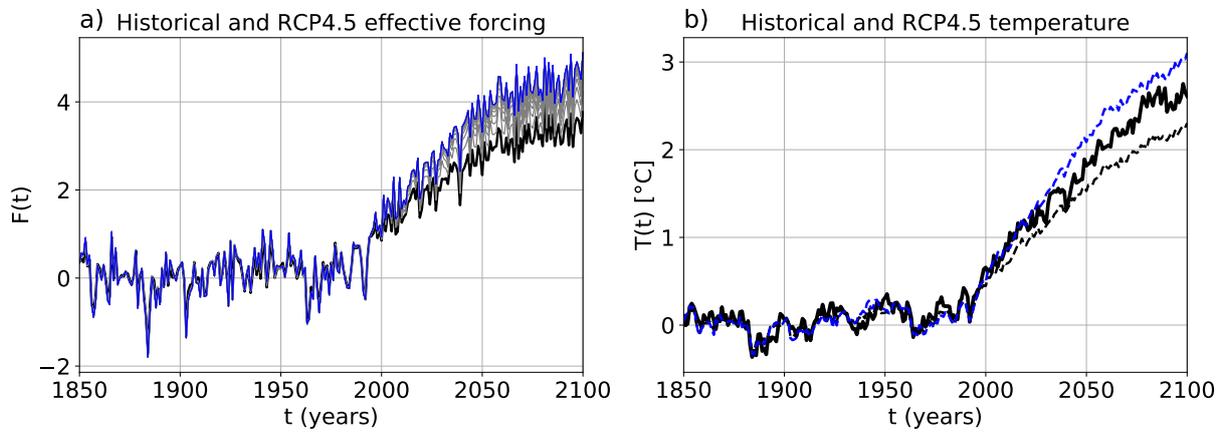


Figure S3. As Figure 3, but for the model ACCESS1-0 and experiment RCP4.5.

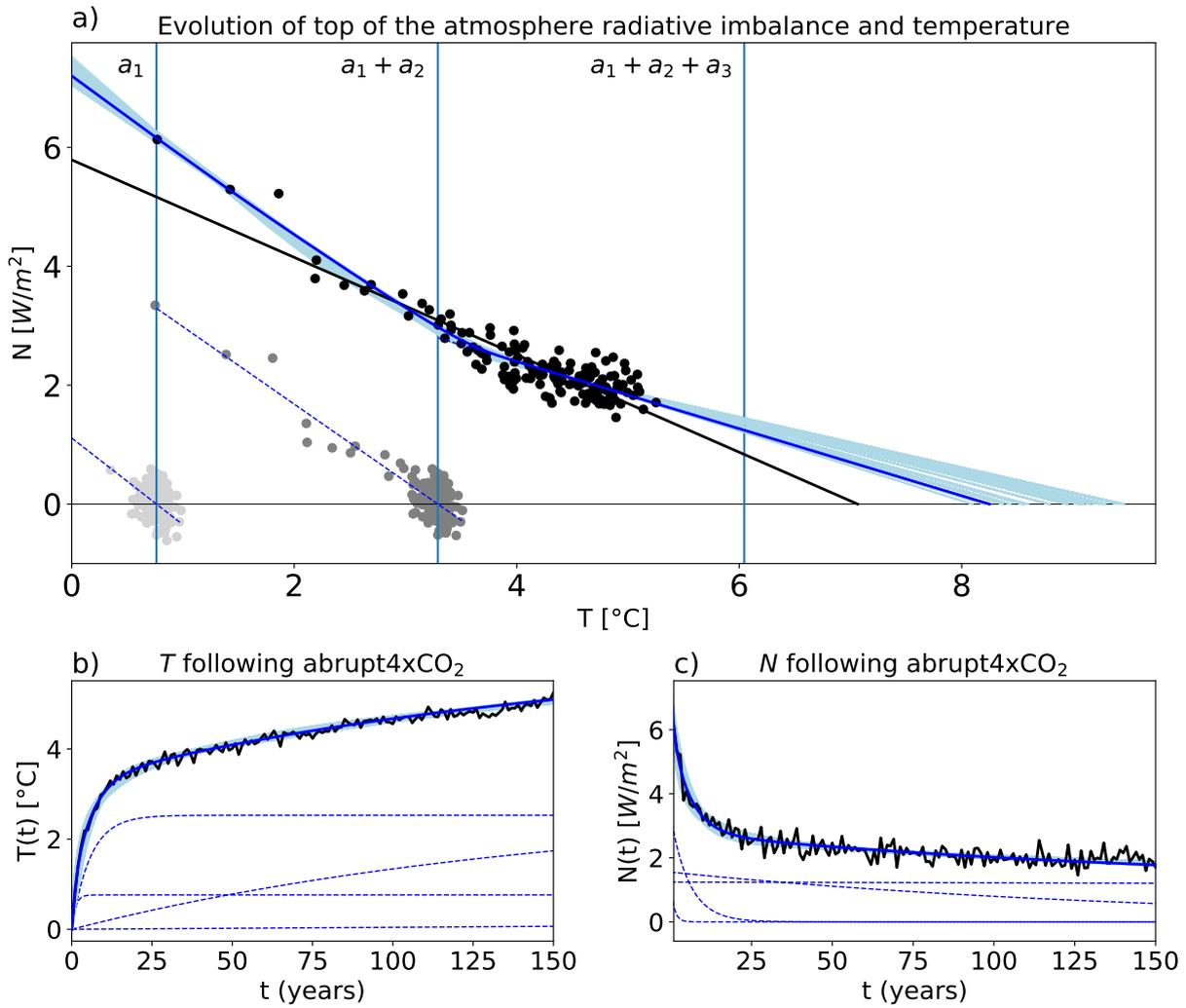


Figure S4. As Figure 1, but for the model ACCESS1-3.

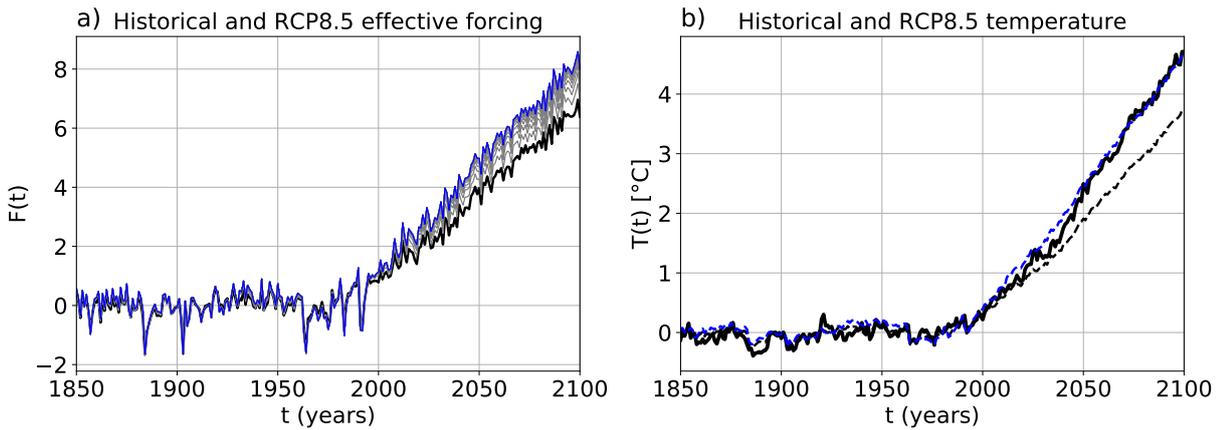


Figure S5. As Figure 3, but for the model ACCESS1-3.

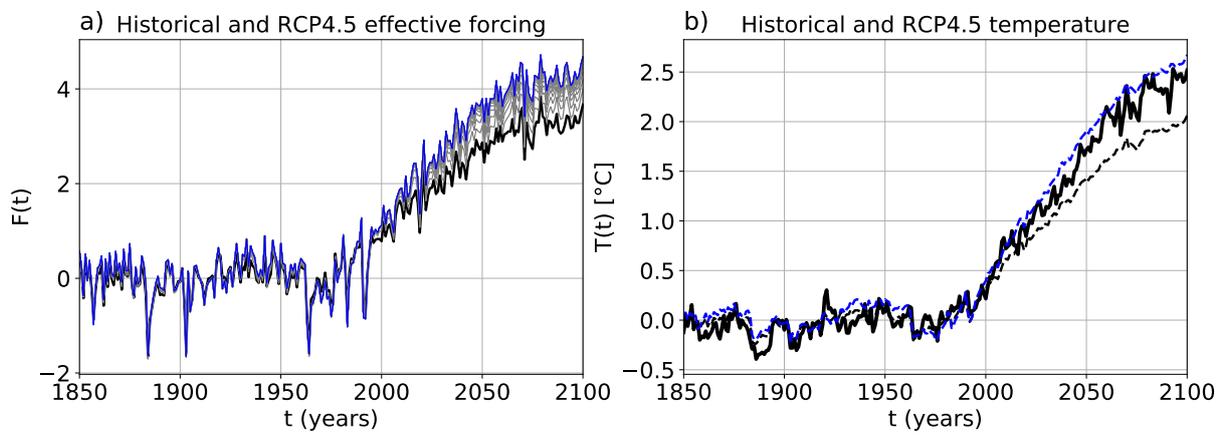


Figure S6. As Figure 3, but for the model ACCESS1-3 and experiment RCP4.5.

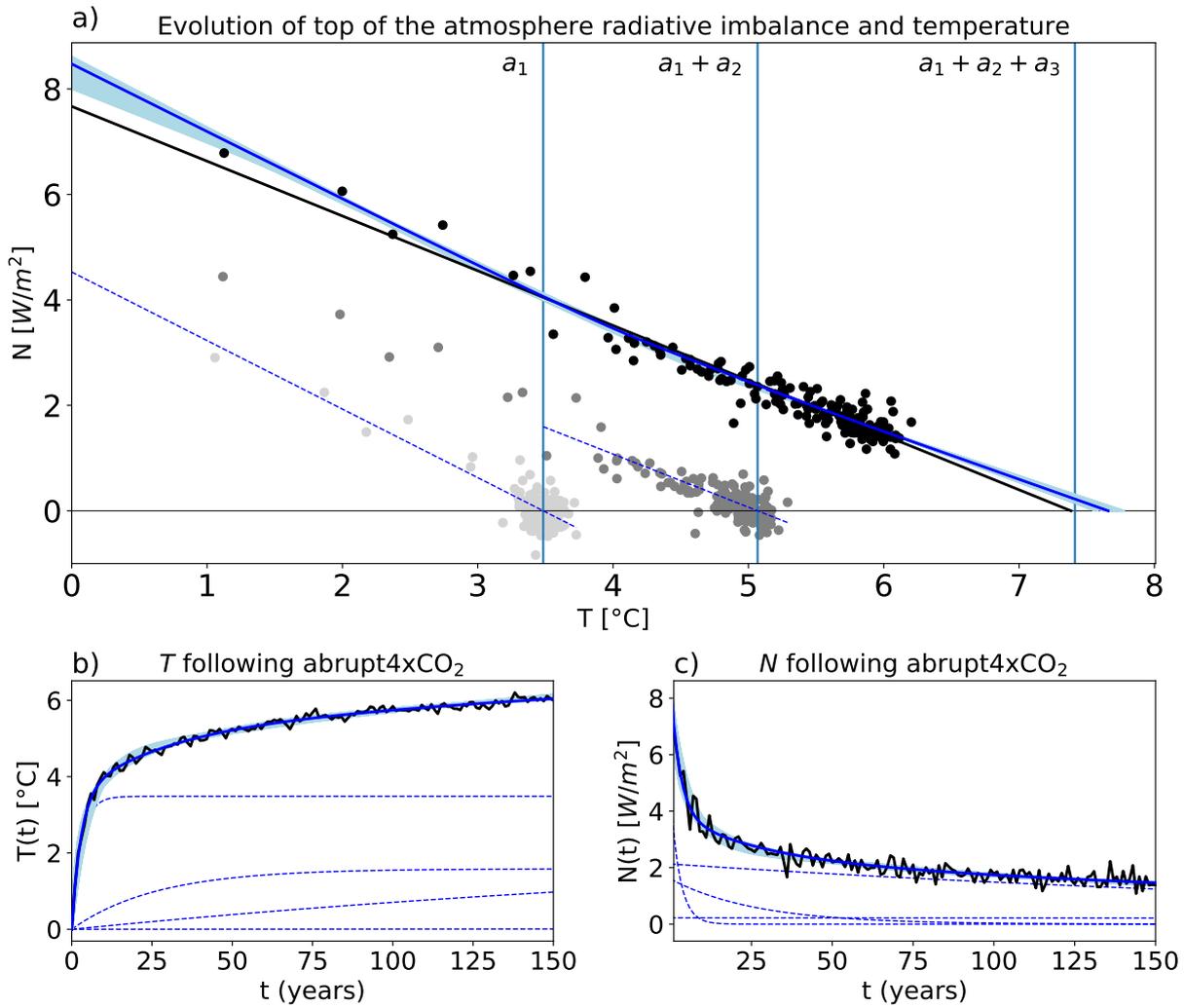


Figure S7. As Figure 1, but for the model CanESM2.

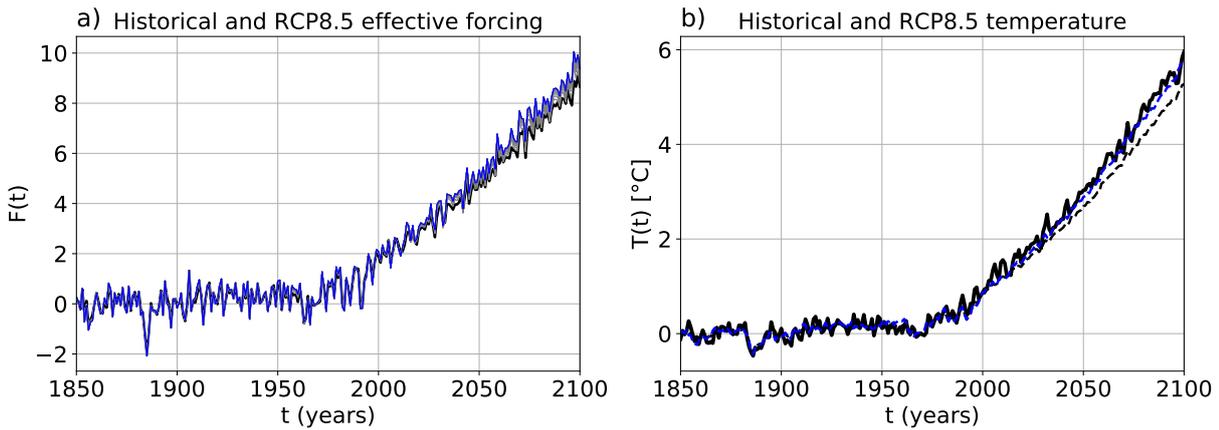


Figure S8. As Figure 3, but for the model CanESM2.

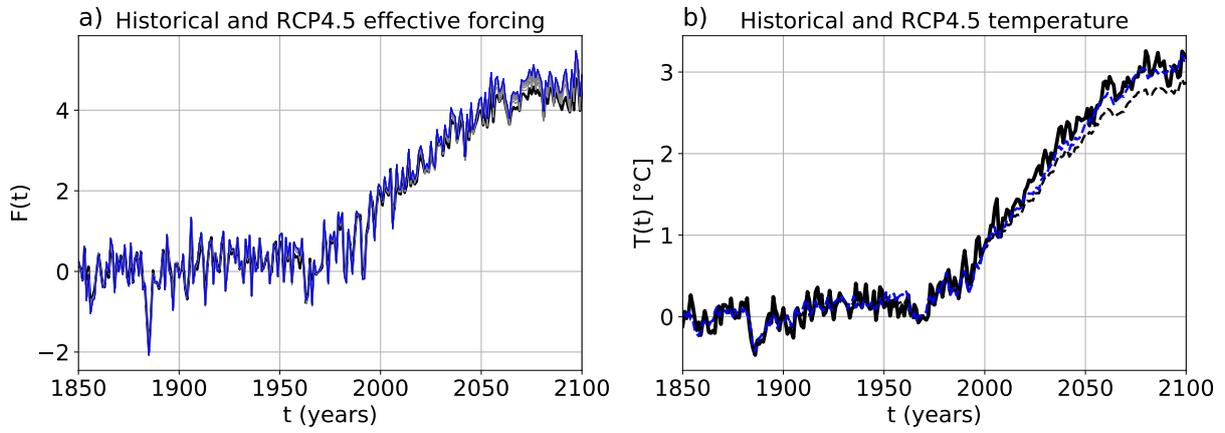


Figure S9. As Figure 3, but for the model CanESM2 and experiment RCP4.5.

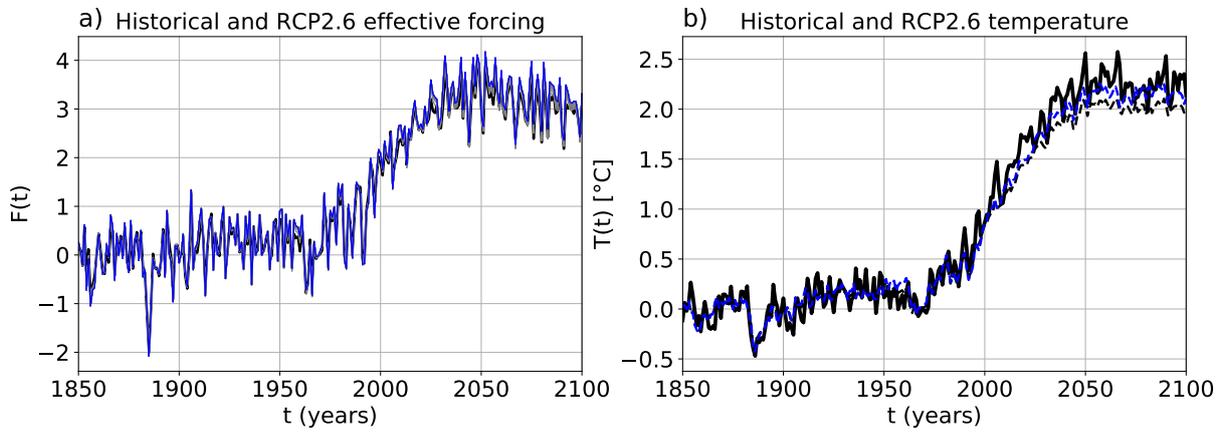


Figure S10. As Figure 3, but for the model CanESM2 and experiment RCP2.6.

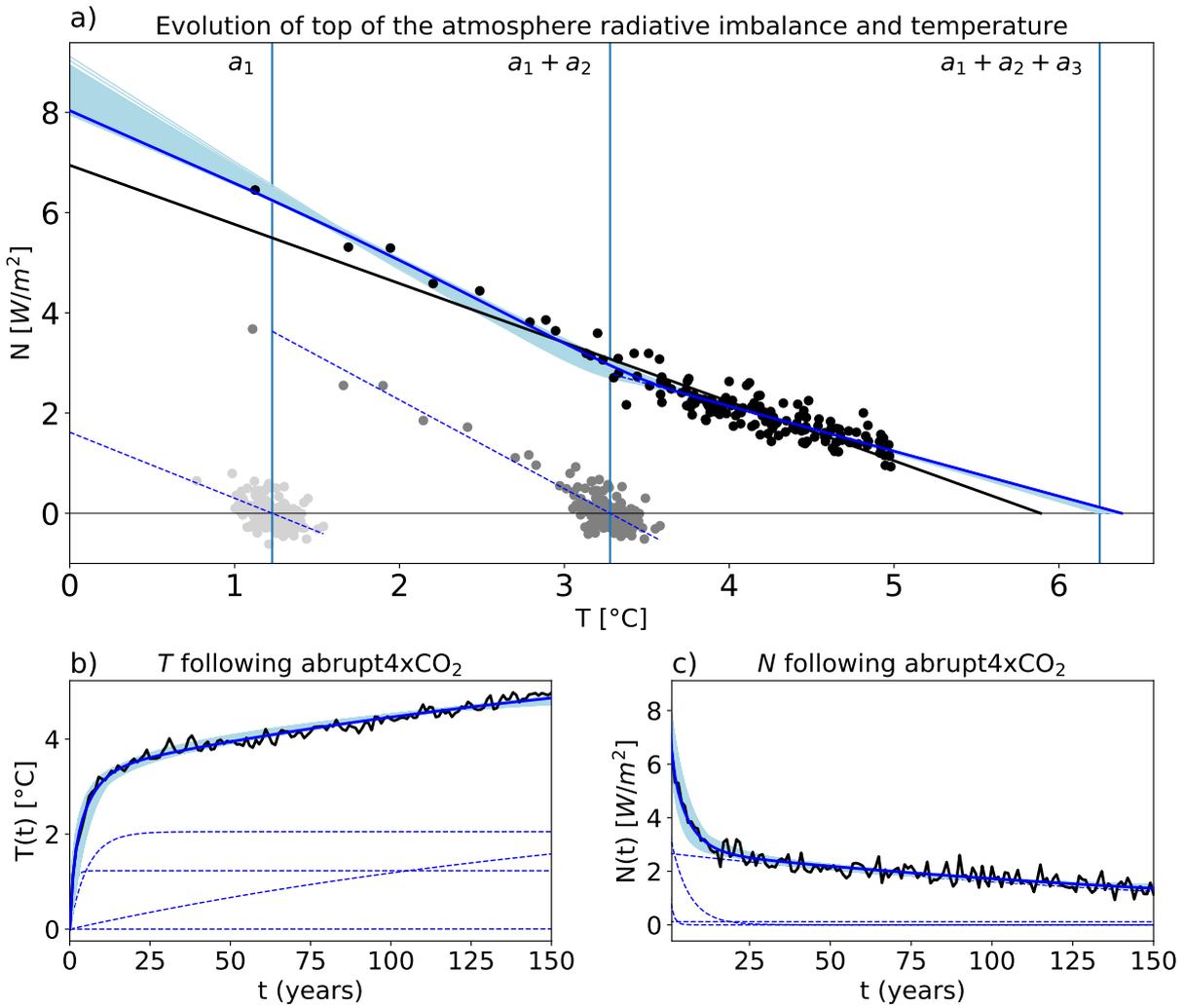


Figure S11. As Figure 1, but for the model CCSM4.

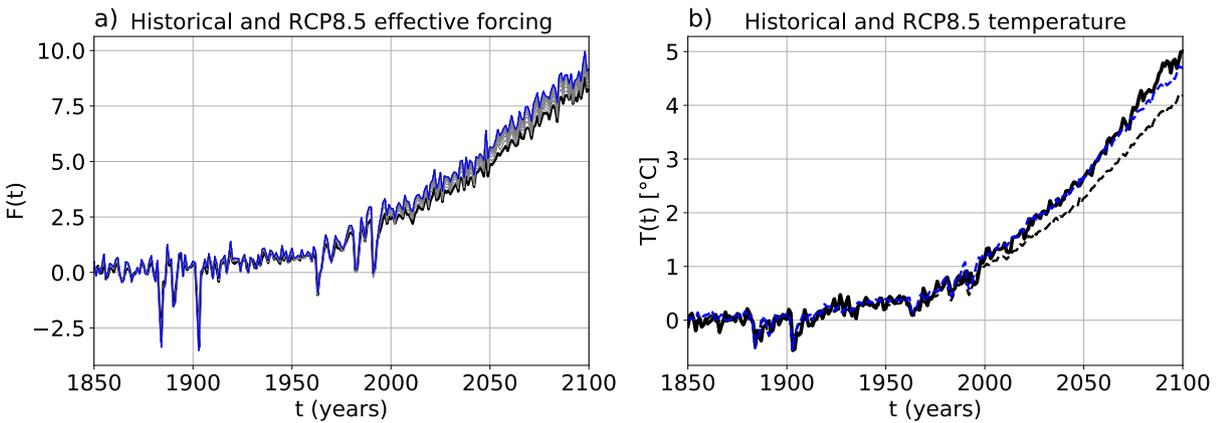


Figure S12. As Figure 3, but for the model CCSM4.

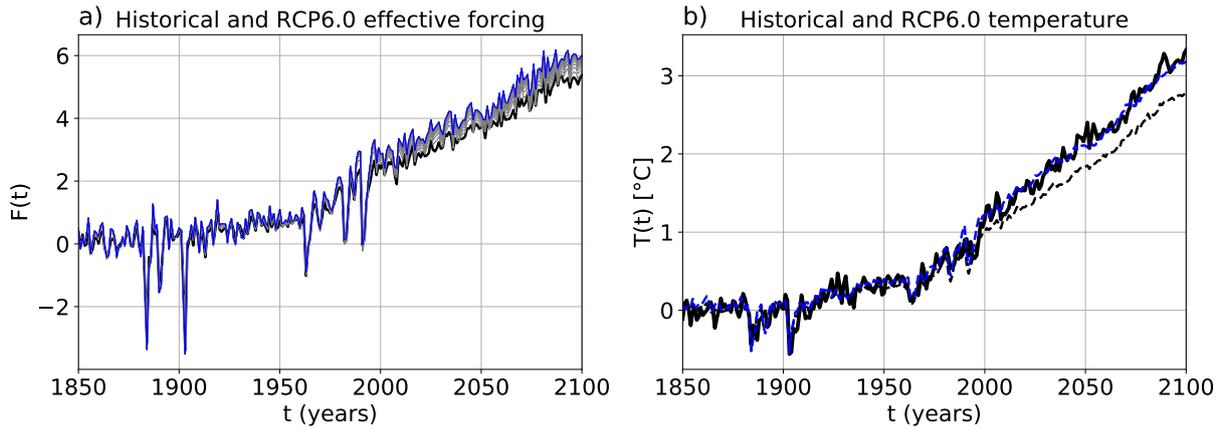


Figure S13. As Figure 3, but for the model CCSM4 and experiment RCP6.0.

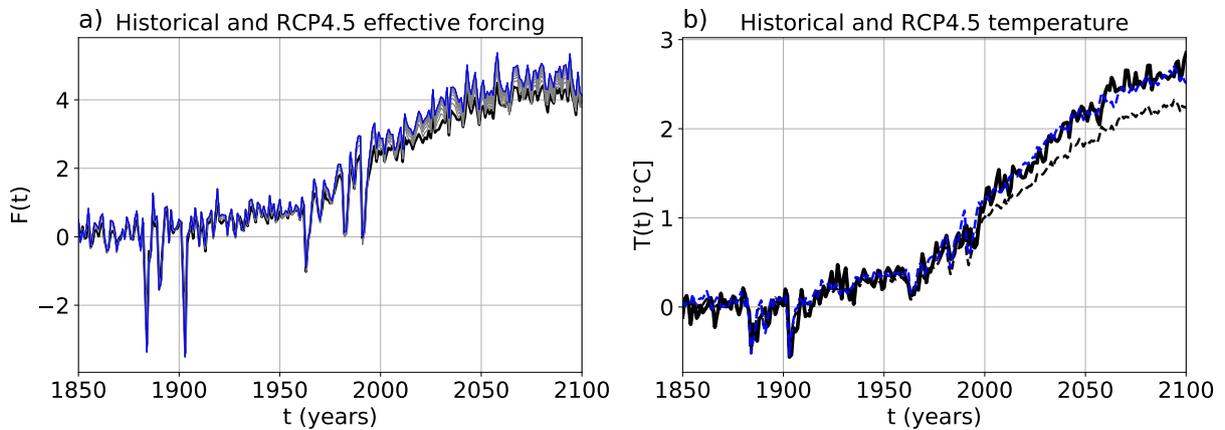


Figure S14. As Figure 3, but for the model CCSM4 and experiment RCP4.5.

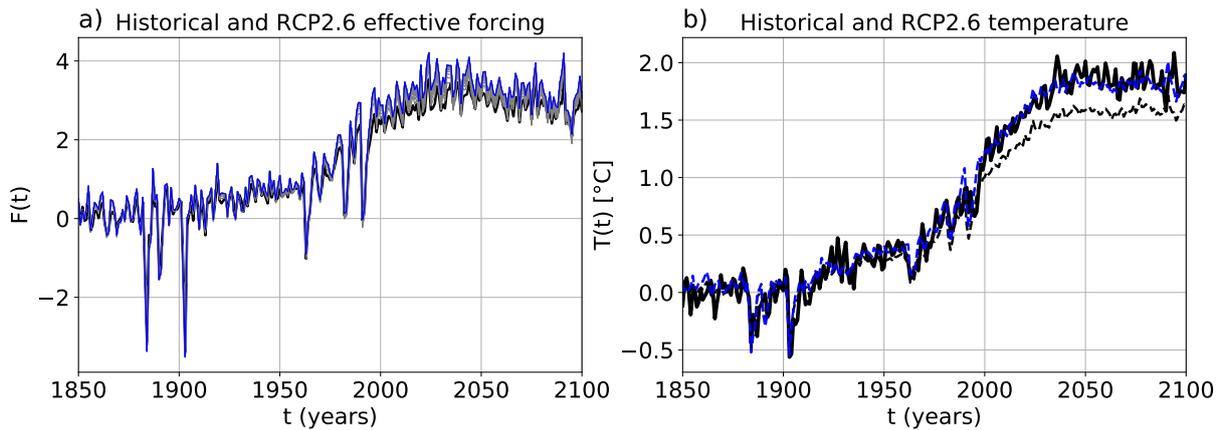


Figure S15. As Figure 3, but for the model CCSM4 and experiment RCP2.6.

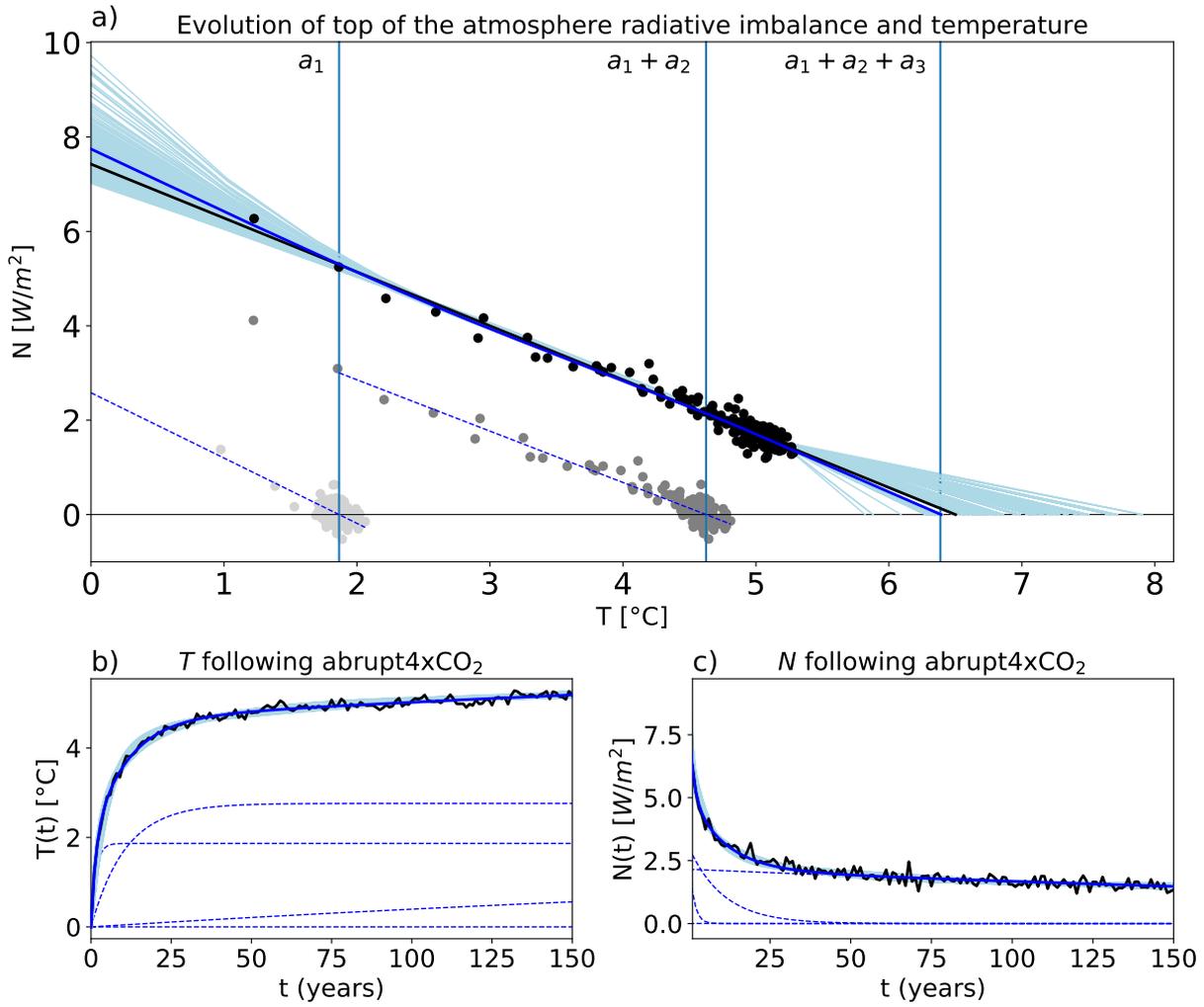


Figure S16. As Figure 1, but for the model CNRM-CM5.

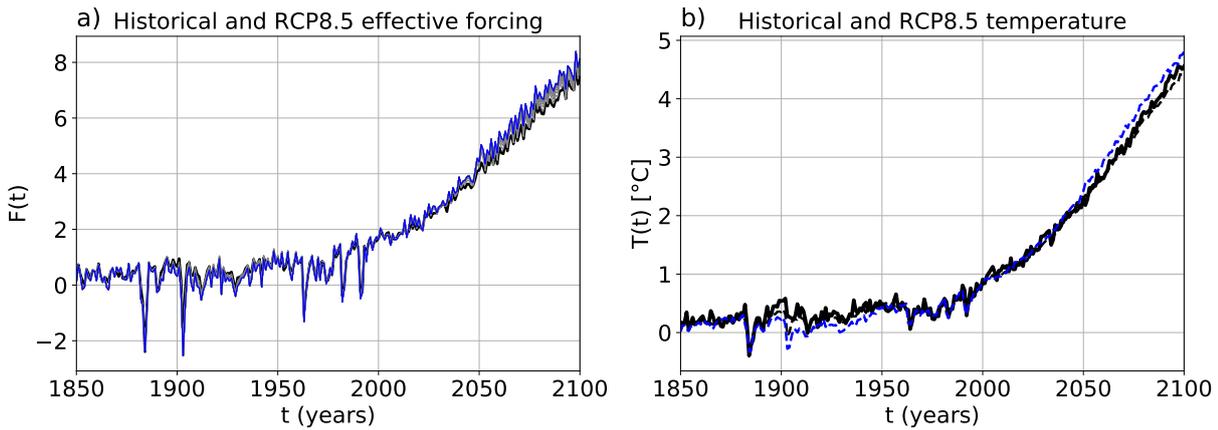


Figure S17. As Figure 3, but for the model CNRM-CM5.

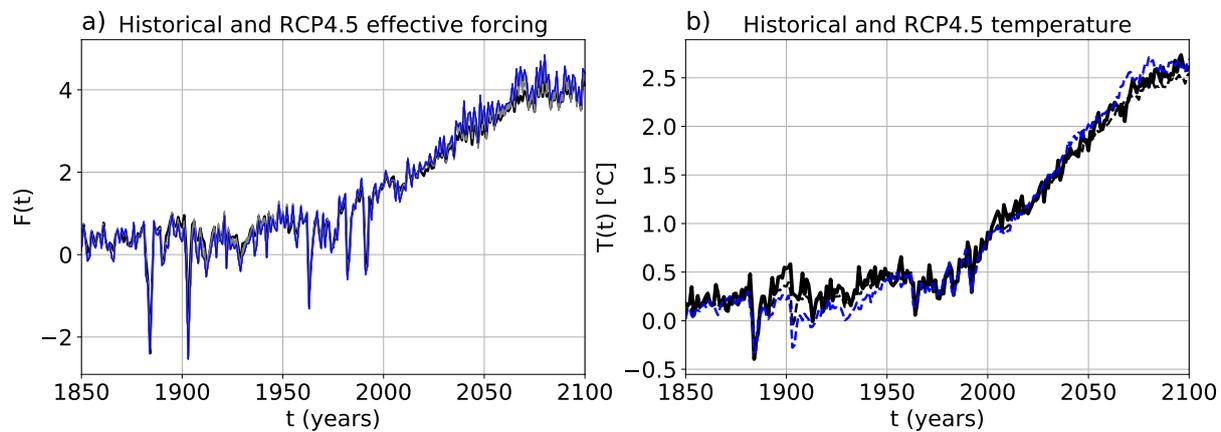


Figure S18. As Figure 3, but for the model CNRM-CM5 and experiment RCP4.5.

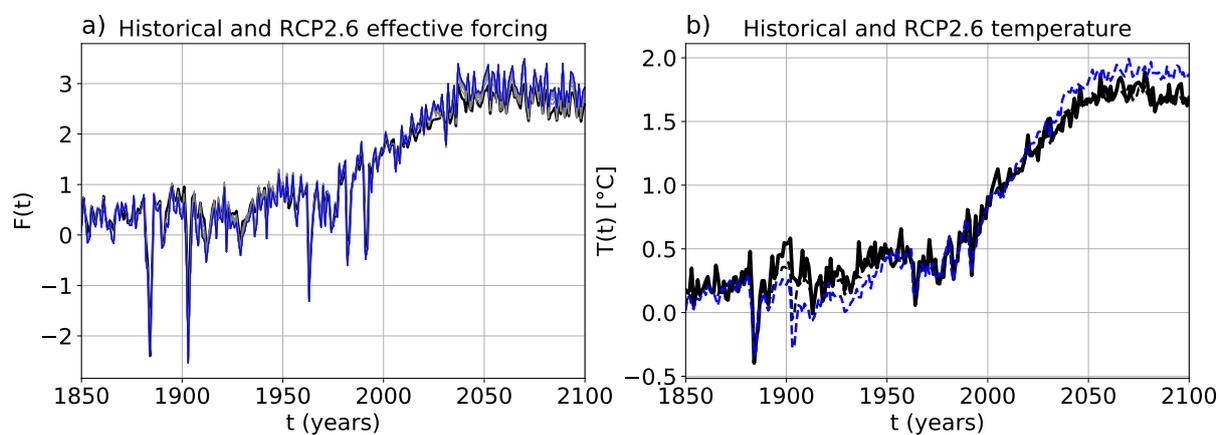


Figure S19. As Figure 3, but for the model CNRM-CM5 and experiment RCP2.6.

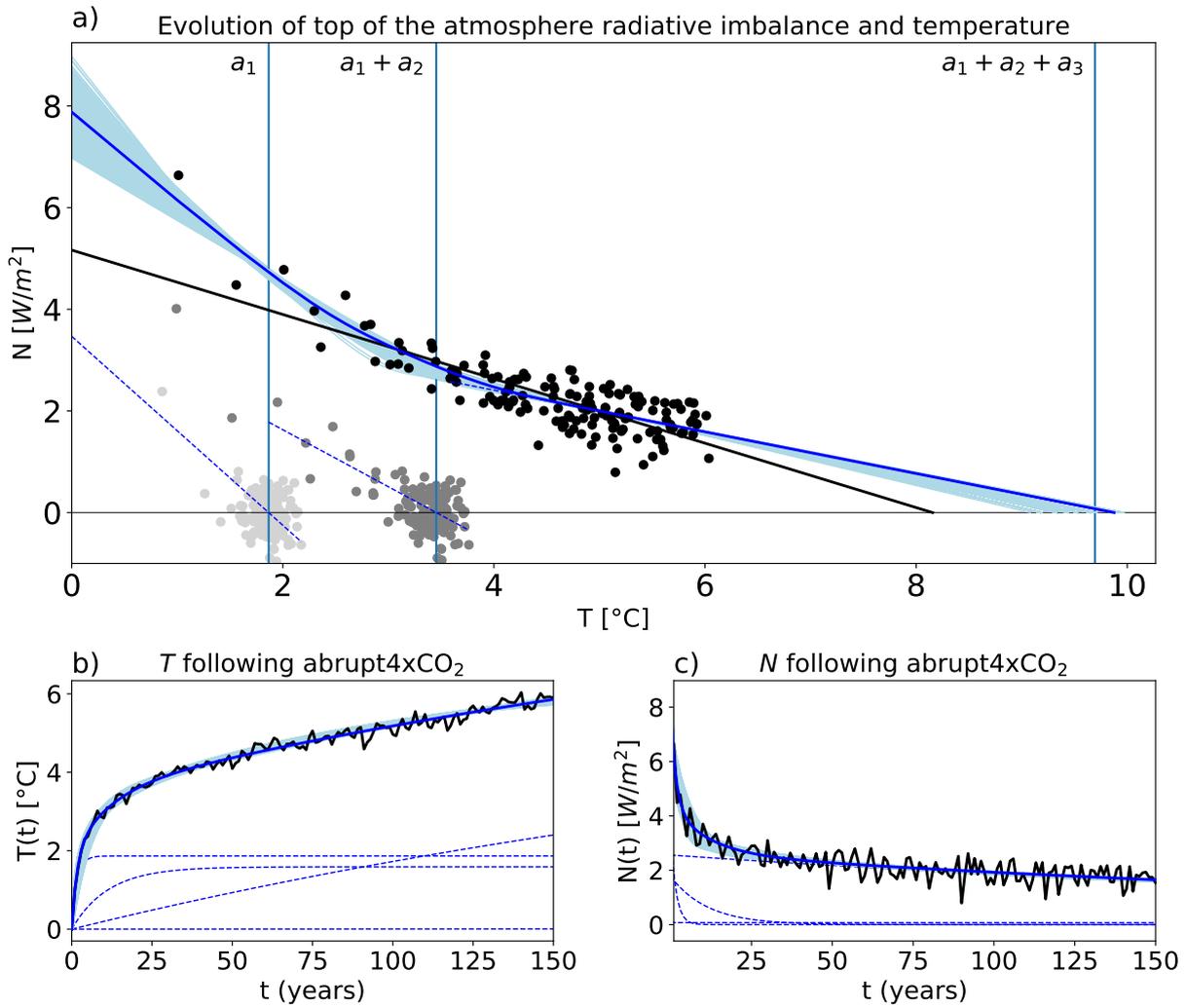


Figure S20. As Figure 1, but for the model CSIRO-Mk3-6-0.

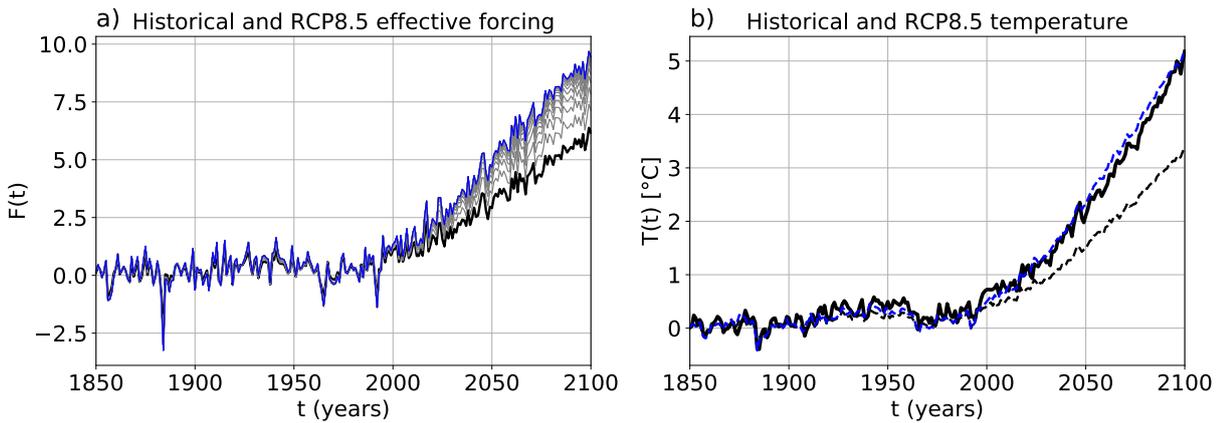


Figure S21. As Figure 3, but for the model CSIRO-Mk3-6-0.

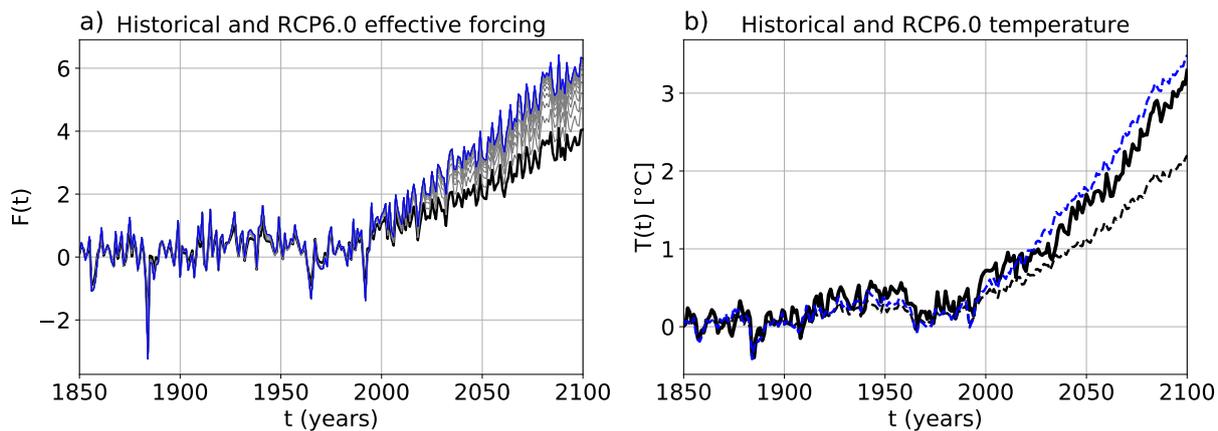


Figure S22. As Figure 3, but for the model CSIRO-Mk3-6-0 and experiment RCP6.0.

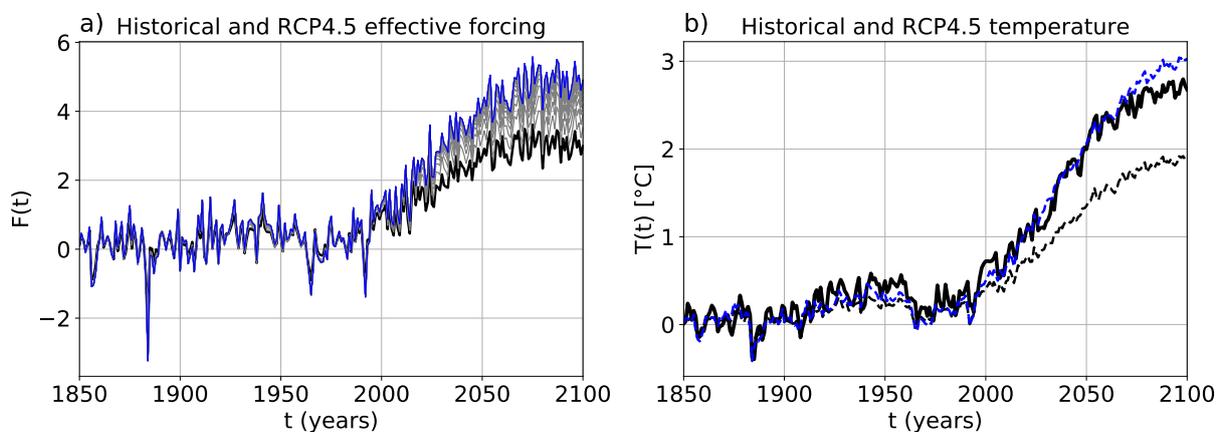


Figure S23. As Figure 3, but for the model CSIRO-Mk3-6-0 and experiment RCP4.5.

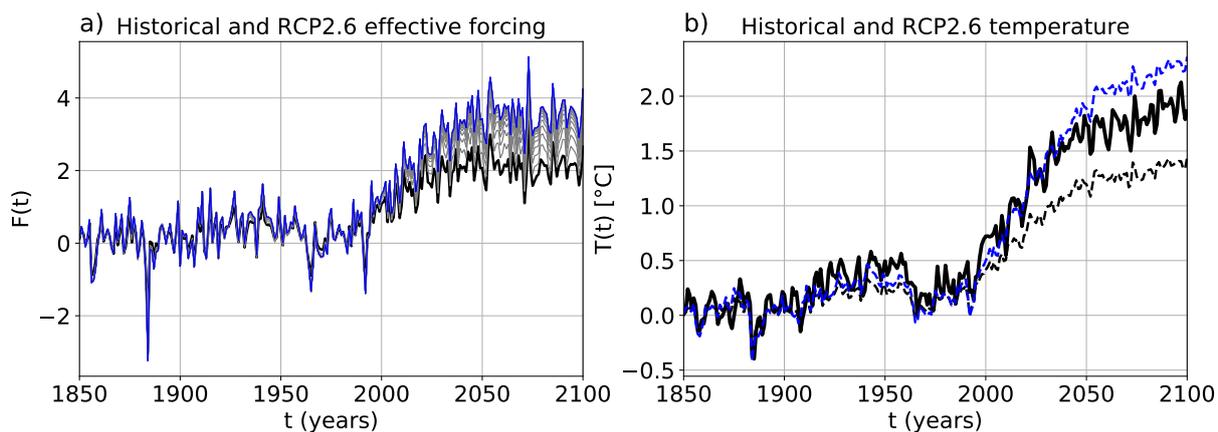


Figure S24. As Figure 3, but for the model CSIRO-Mk3-6-0 and experiment RCP2.6.

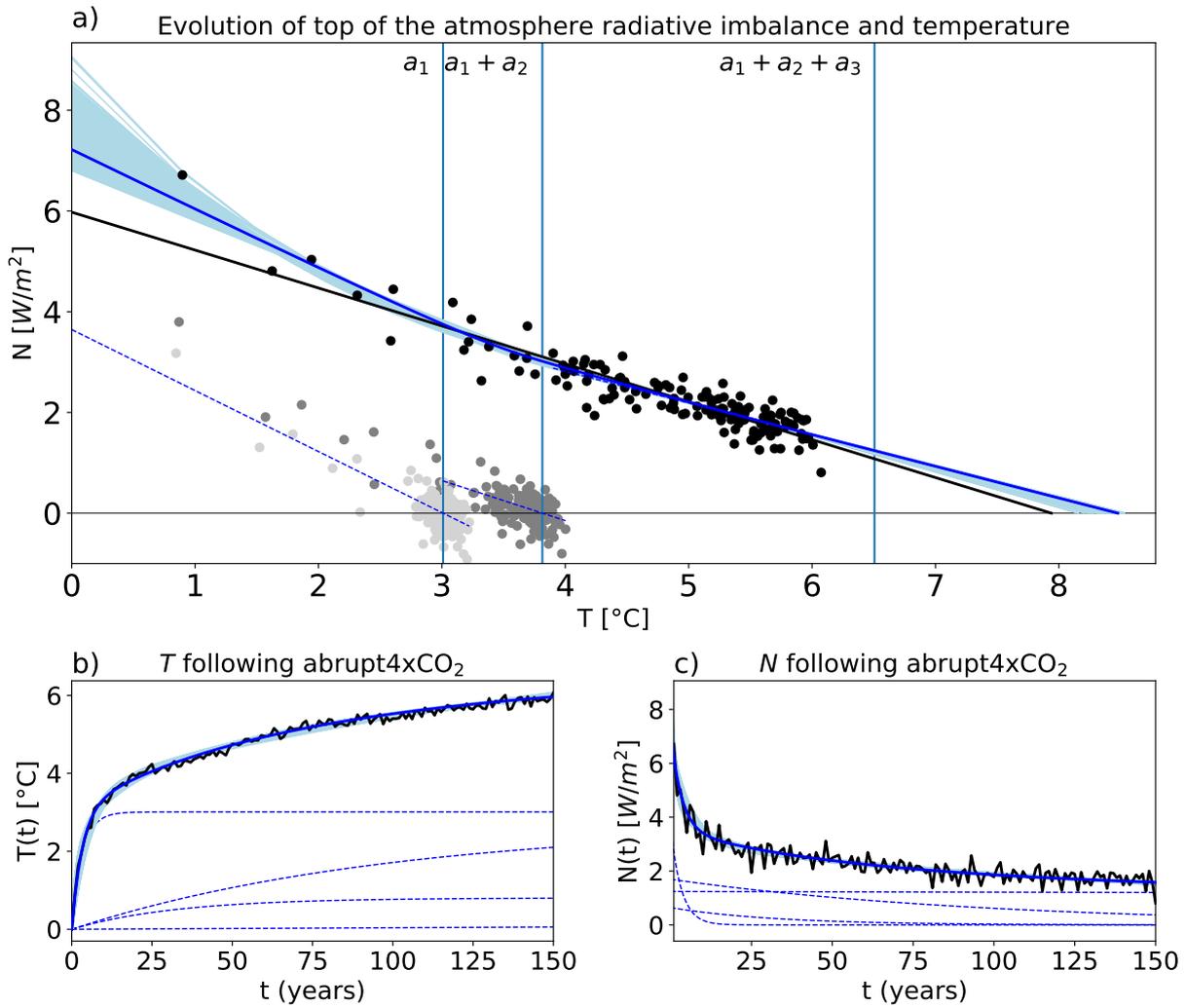


Figure S25. As Figure 1, but for the model GFDL-CM3.

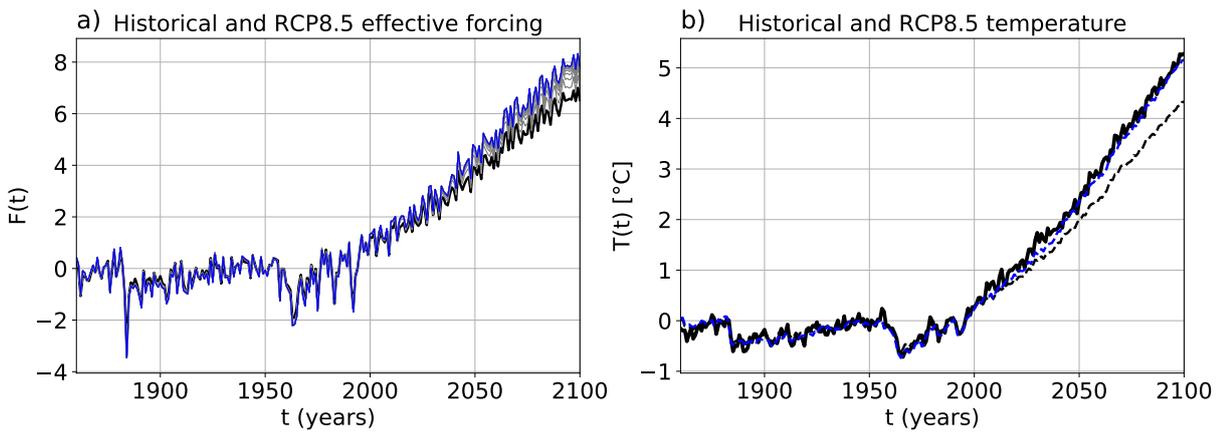


Figure S26. As Figure 3, but for the model GFDL-CM3.

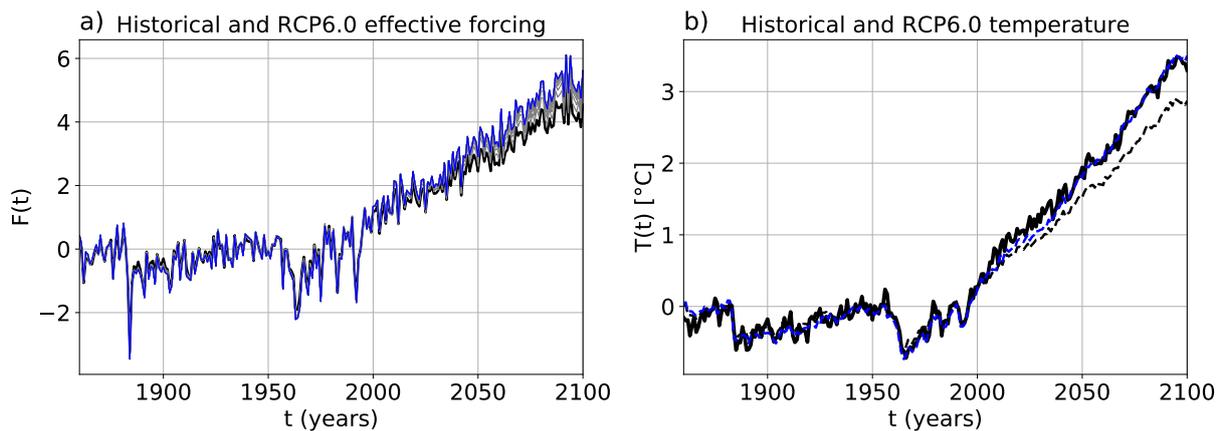


Figure S27. As Figure 3, but for the model GFDL-CM3 and experiment RCP6.0.

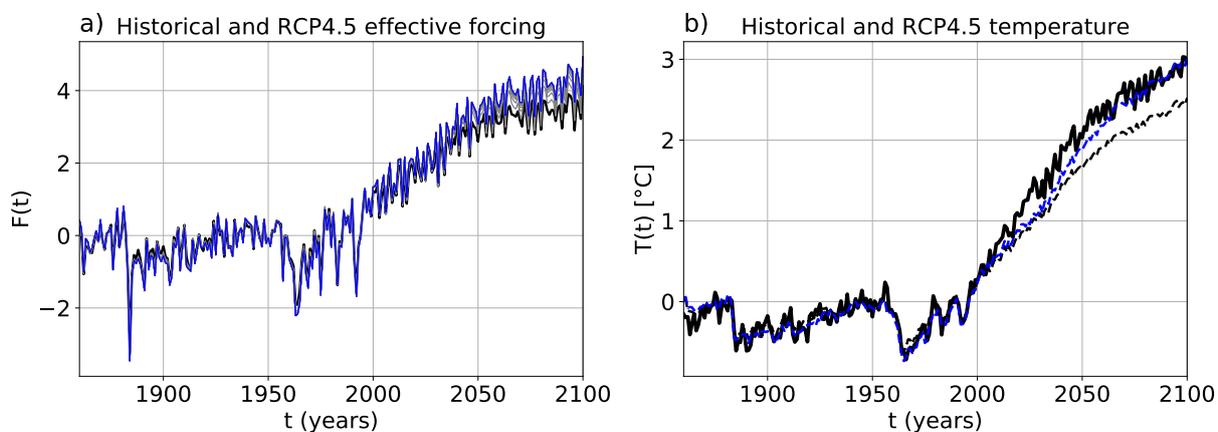


Figure S28. As Figure 3, but for the model GFDL-CM3 and experiment RCP4.5.

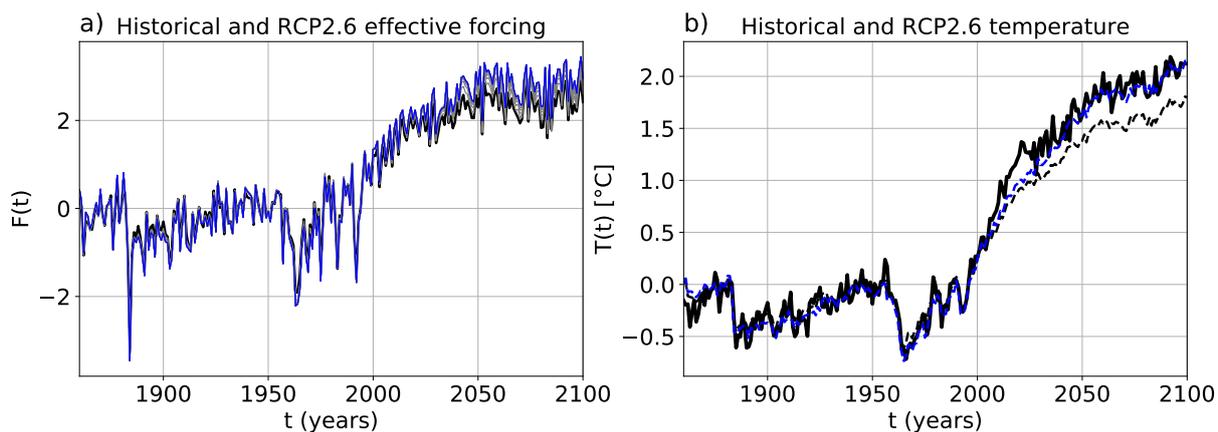


Figure S29. As Figure 3, but for the model GFDL-CM3 and experiment RCP2.6.

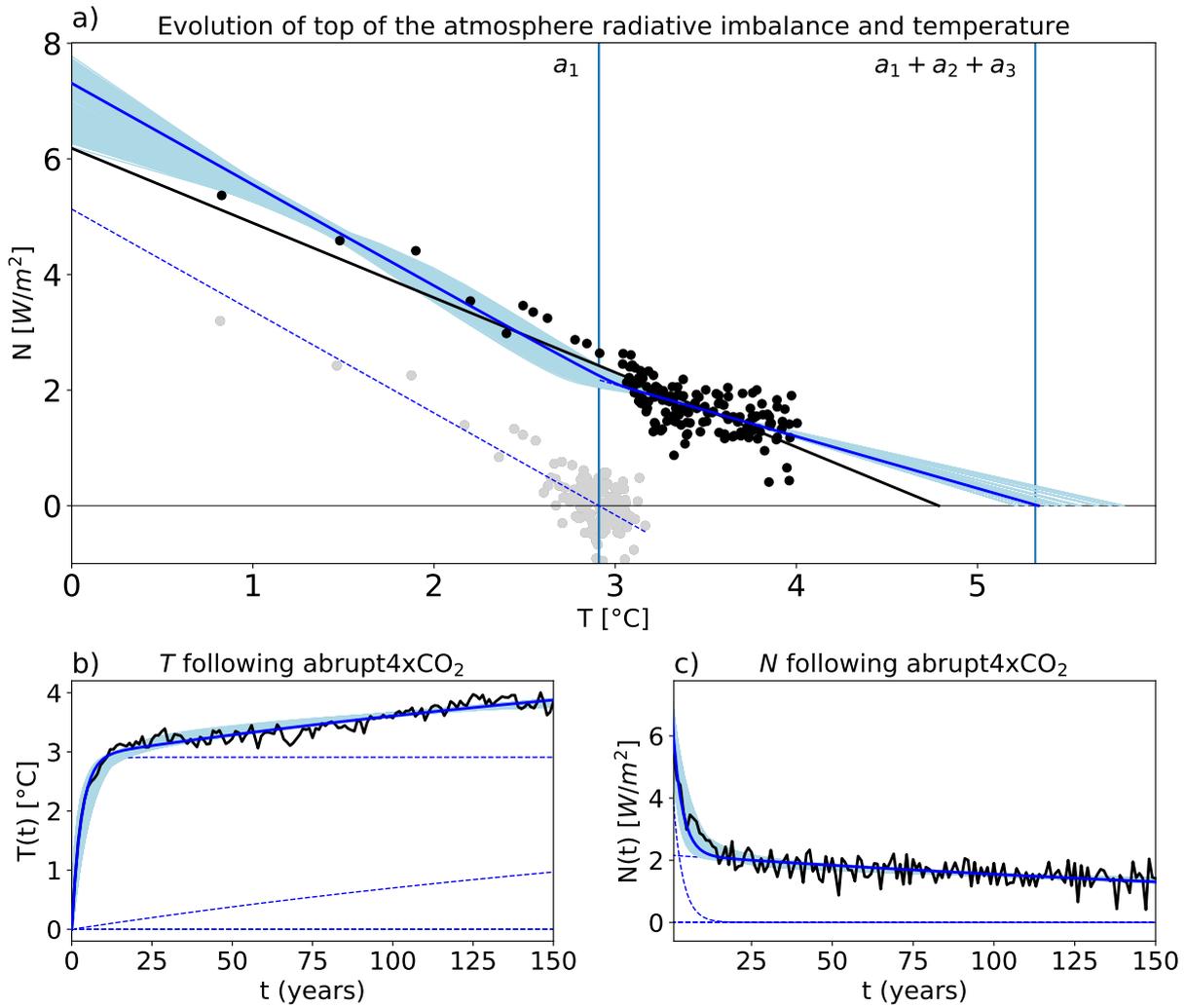


Figure S30. As Figure 1, but for the model GFDL-ESM2G.

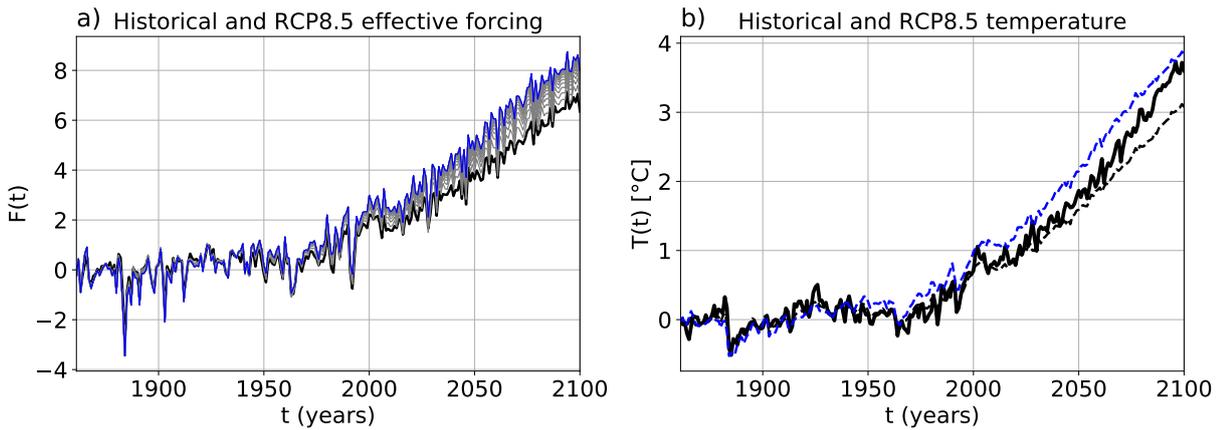


Figure S31. As Figure 3, but for the model GFDL-ESM2G.

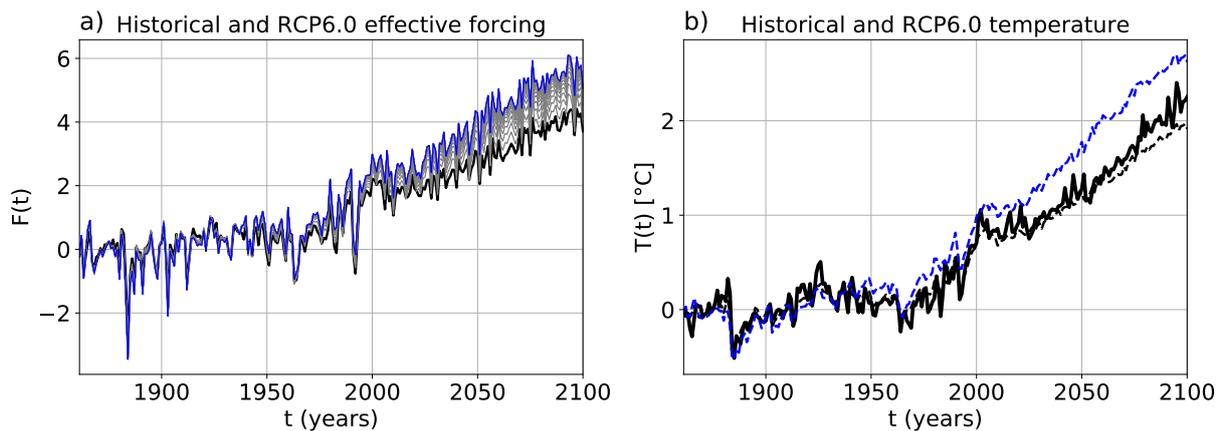


Figure S32. As Figure 3, but for the model GFDL-ESM2G and experiment RCP6.0.

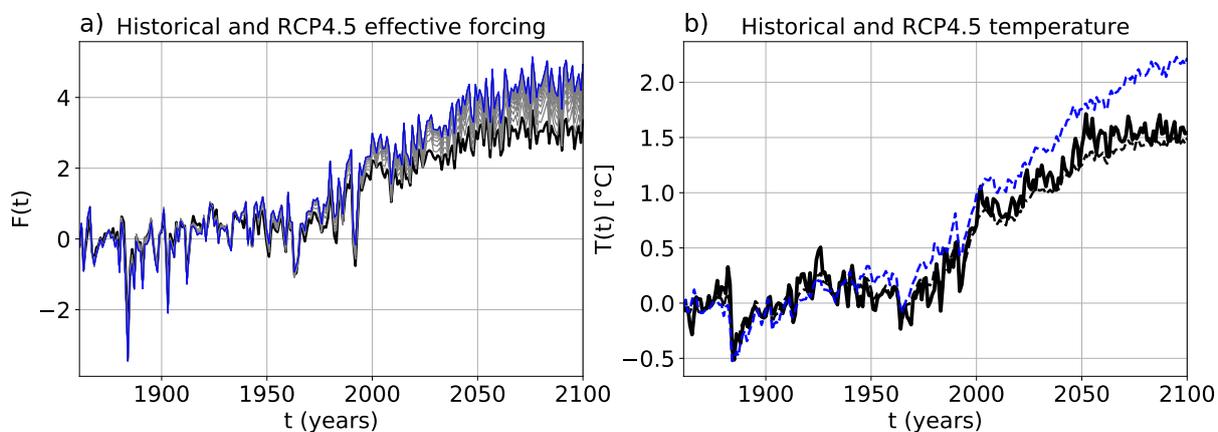


Figure S33. As Figure 3, but for the model GFDL-ESM2G and experiment RCP4.5.

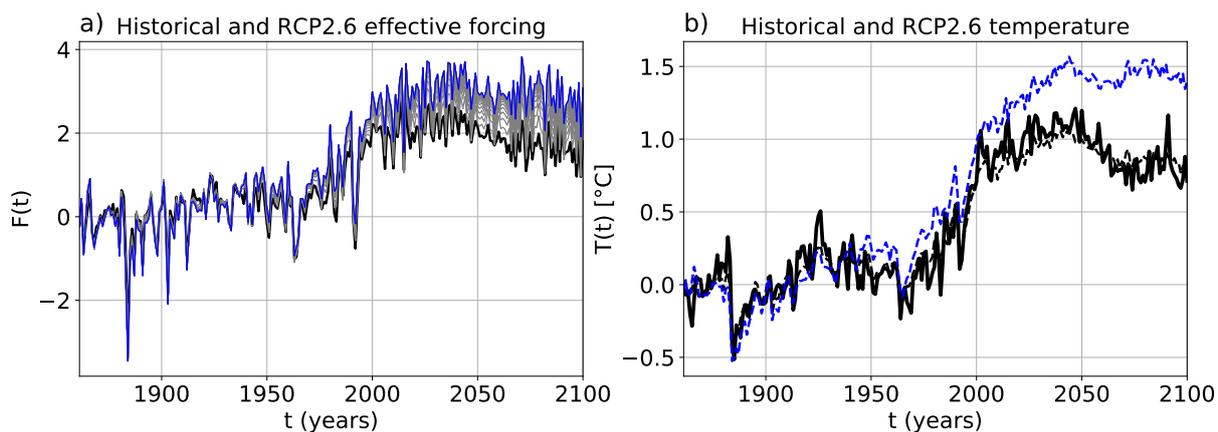


Figure S34. As Figure 3, but for the model GFDL-ESM2G and experiment RCP2.6.

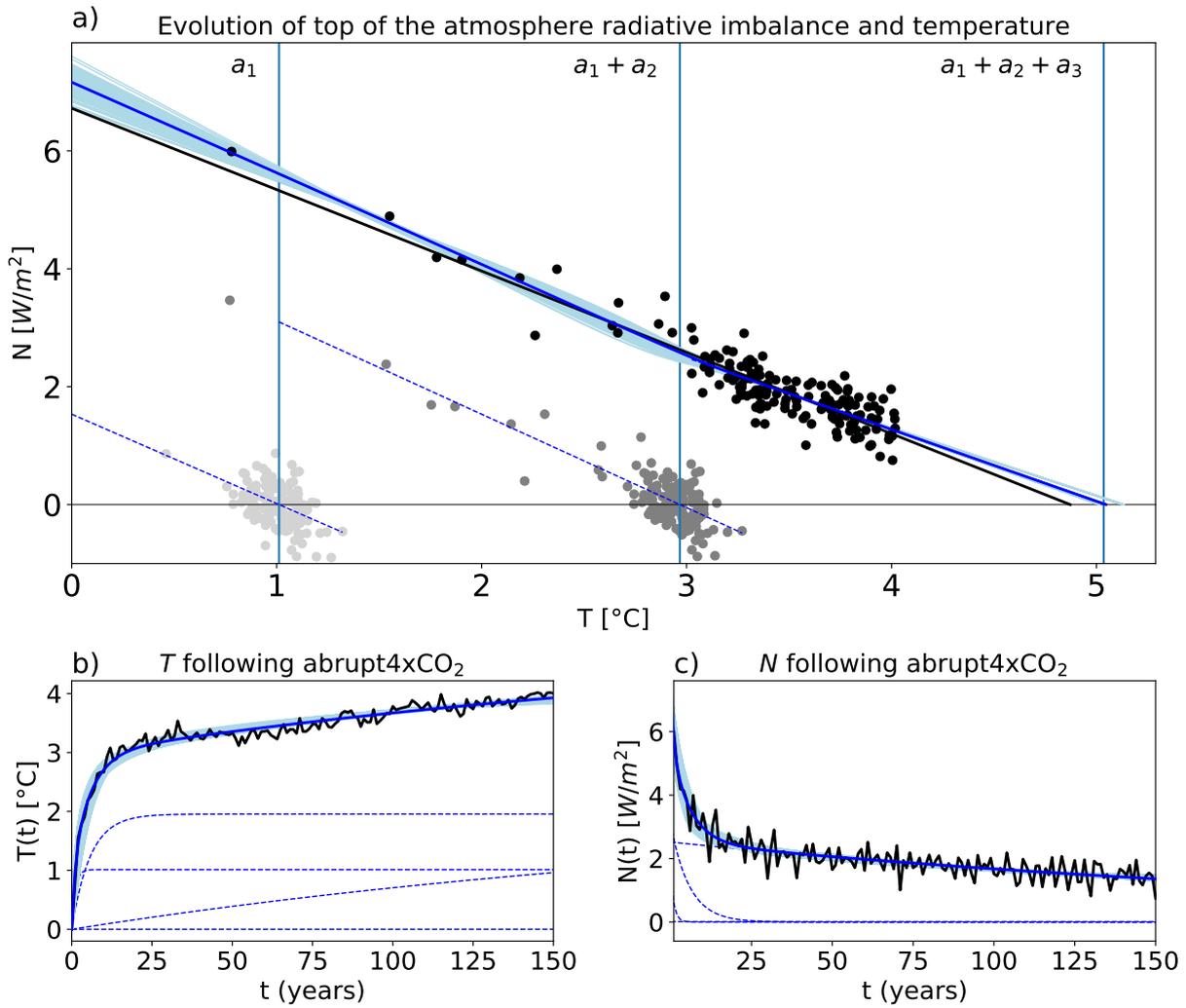


Figure S35. As Figure 1, but for the model GFDL-ESM2M.

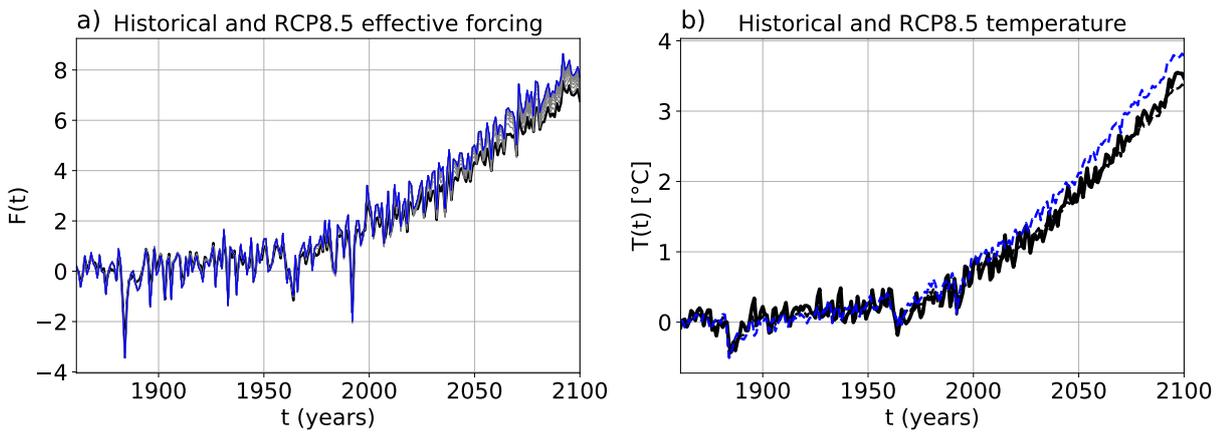


Figure S36. As Figure 3, but for the model GFDL-ESM2M.

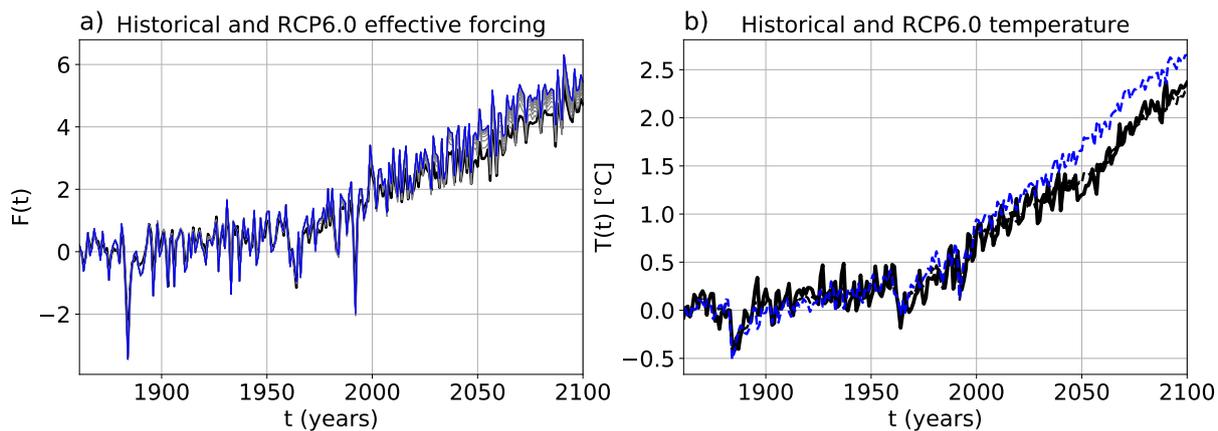


Figure S37. As Figure 3, but for the model GFDL-ESM2M and experiment RCP6.0.

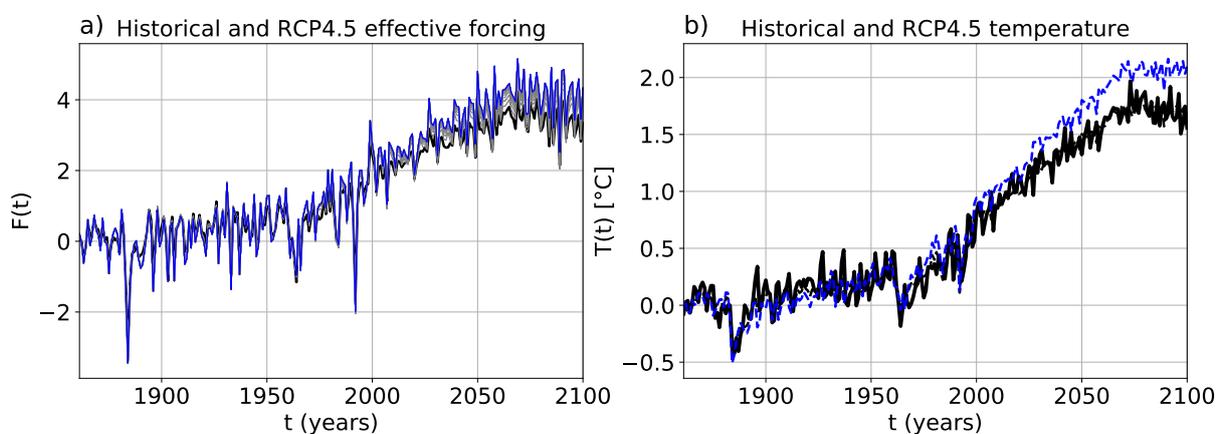


Figure S38. As Figure 3, but for the model GFDL-ESM2M and experiment RCP4.5.

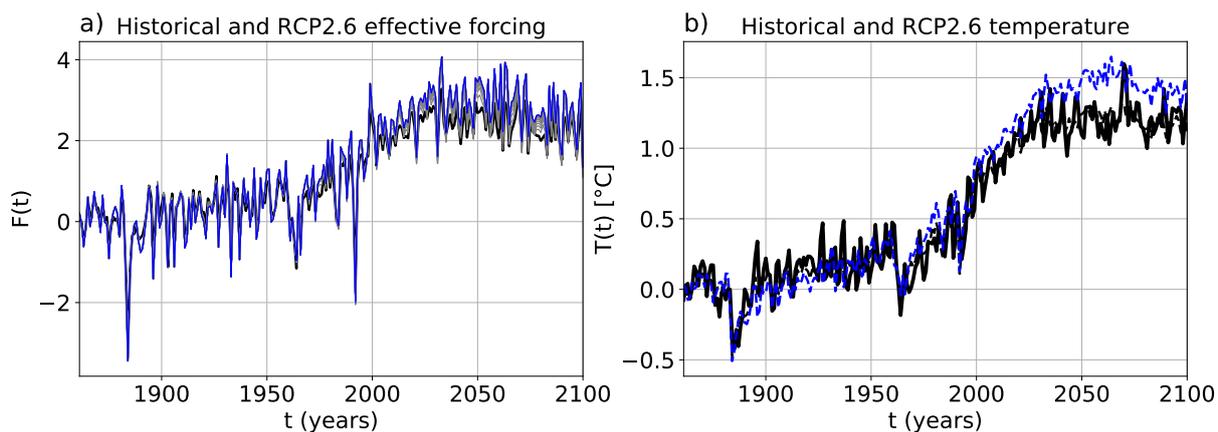


Figure S39. As Figure 3, but for the model GFDL-ESM2M and experiment RCP2.6.

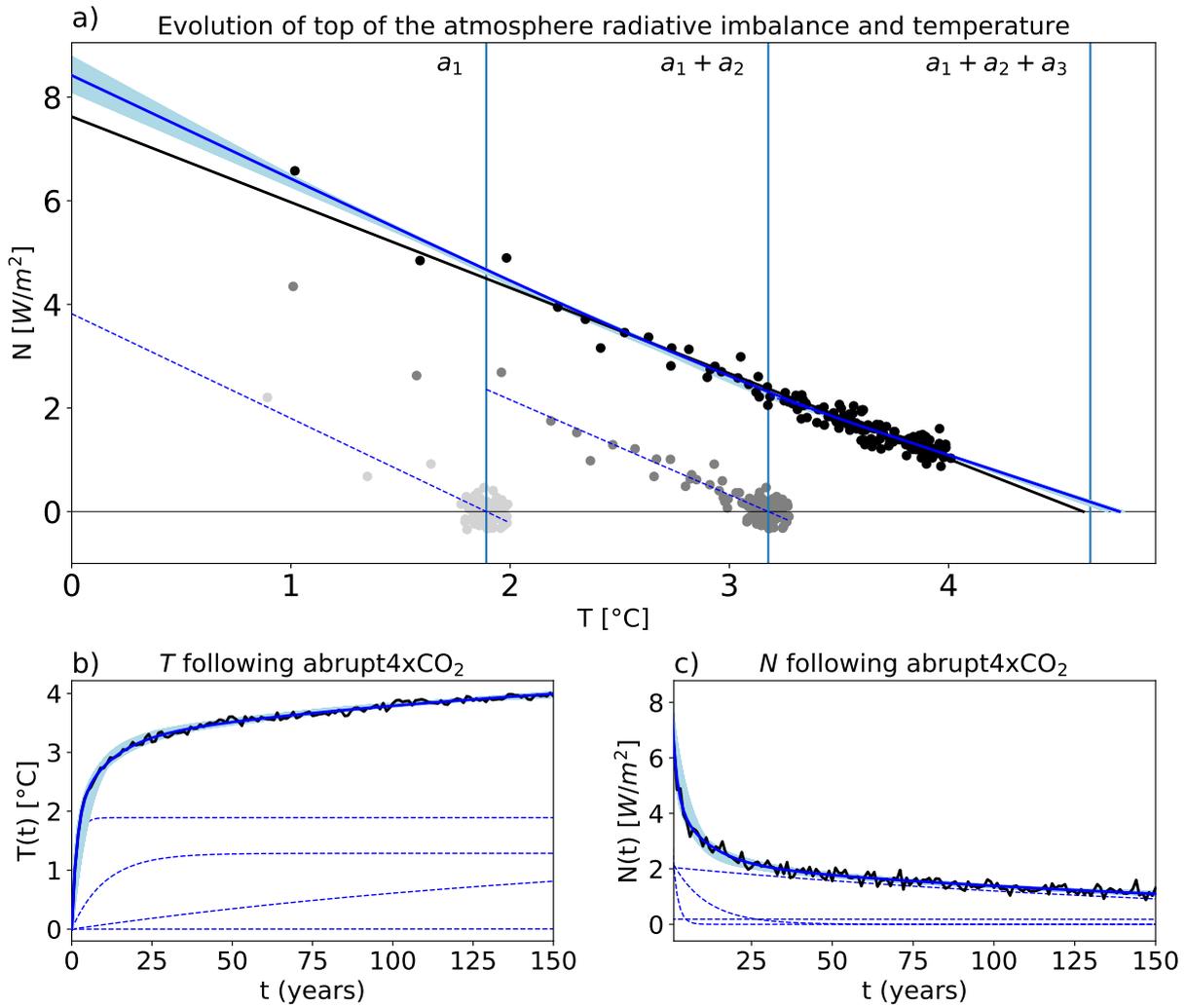


Figure S40. As Figure 1, but for the model GISS-E2-H.

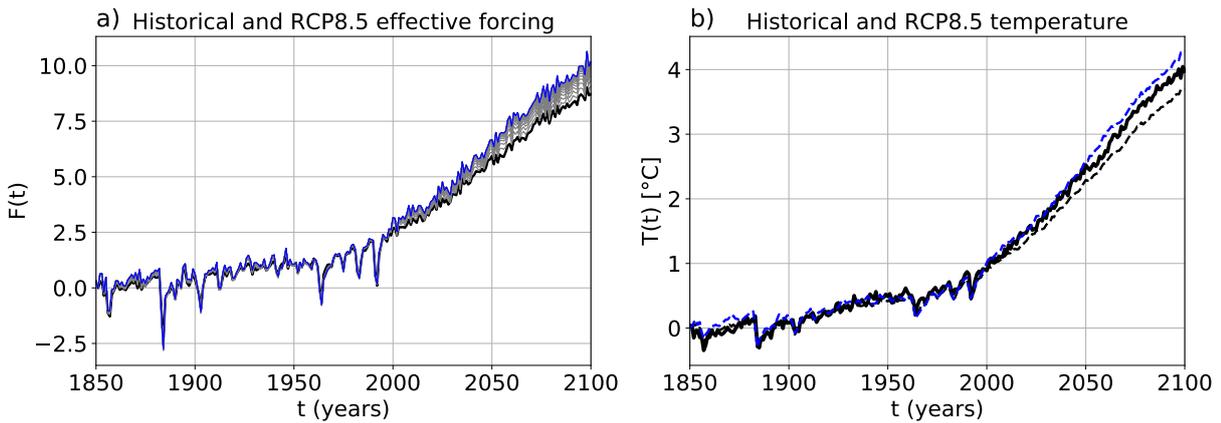


Figure S41. As Figure 3, but for the model GISS-E2-H.

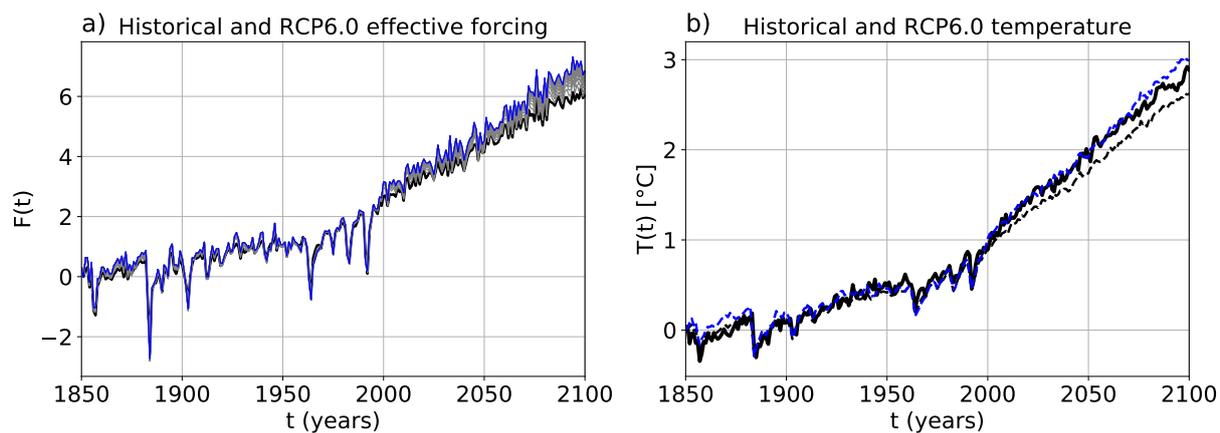


Figure S42. As Figure 3, but for the model GISS-E2-H and experiment RCP6.0.

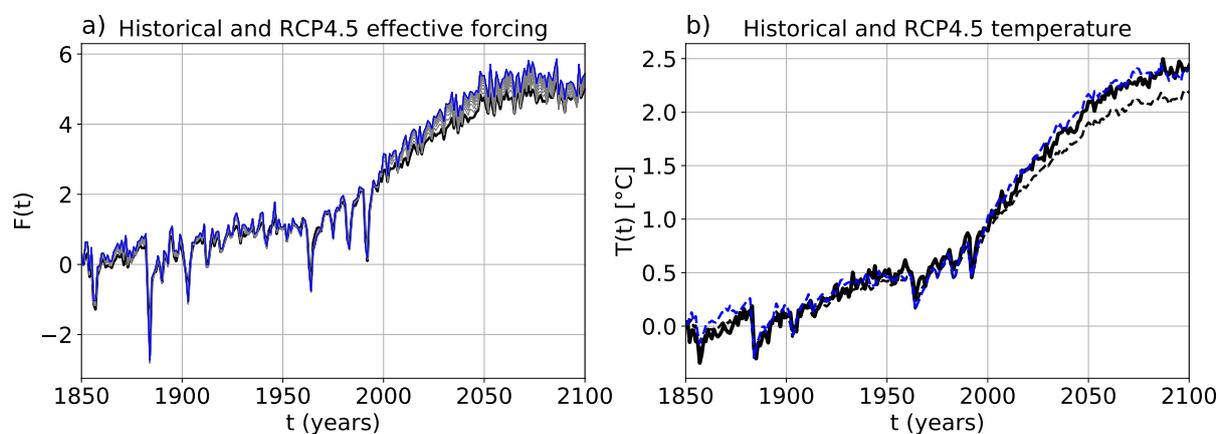


Figure S43. As Figure 3, but for the model GISS-E2-H and experiment RCP4.5.

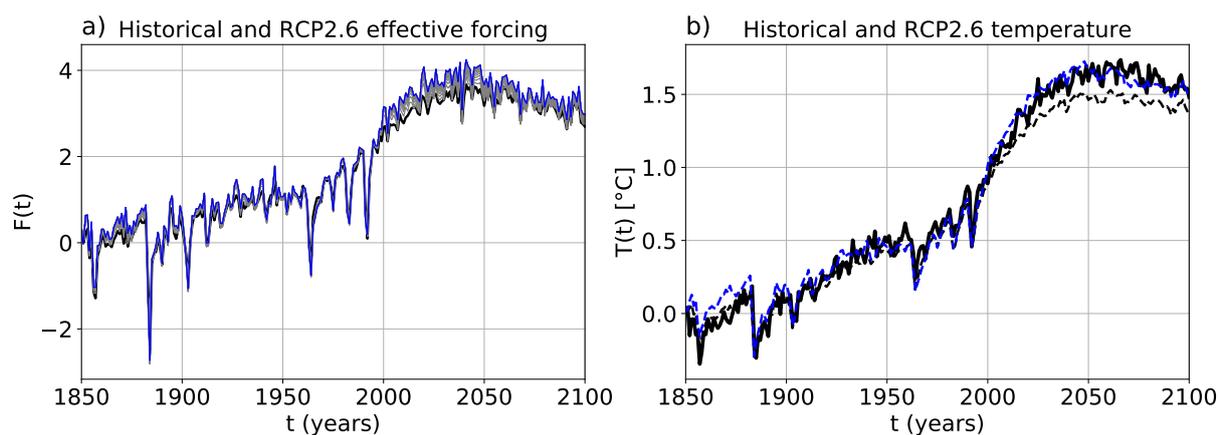


Figure S44. As Figure 3, but for the model GISS-E2-H and experiment RCP2.6.

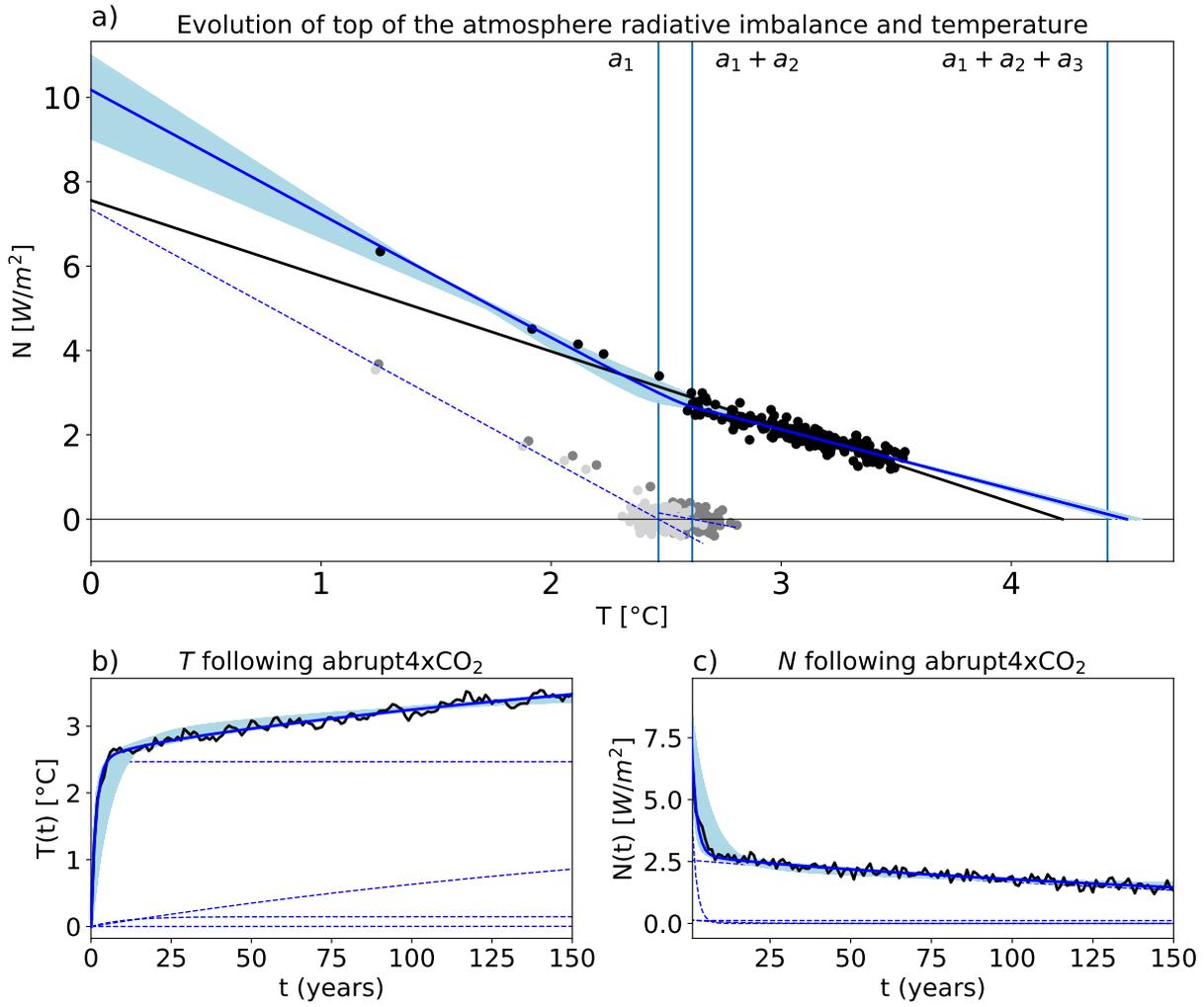


Figure S45. As Figure 1, but for the model GISS-E2-R.

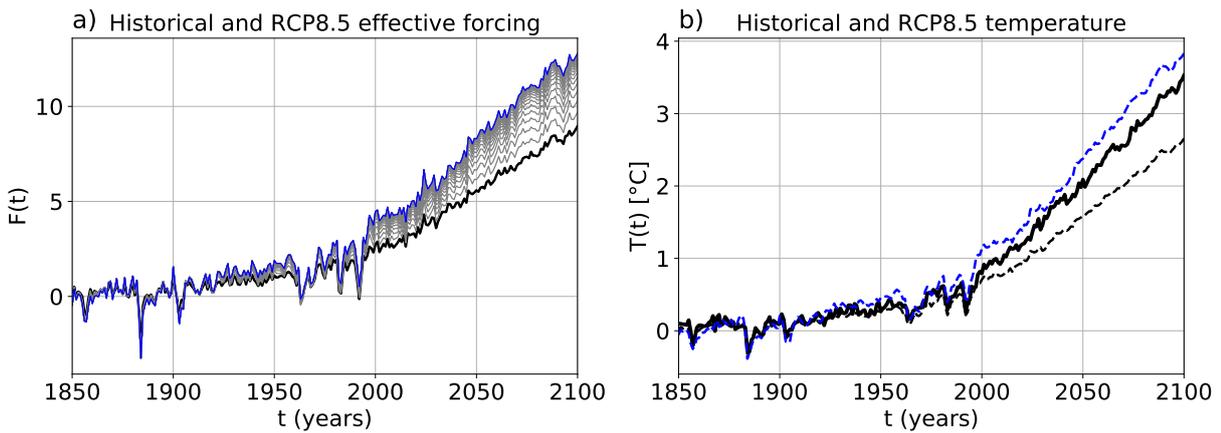


Figure S46. As Figure 3, but for the model GISS-E2-R.

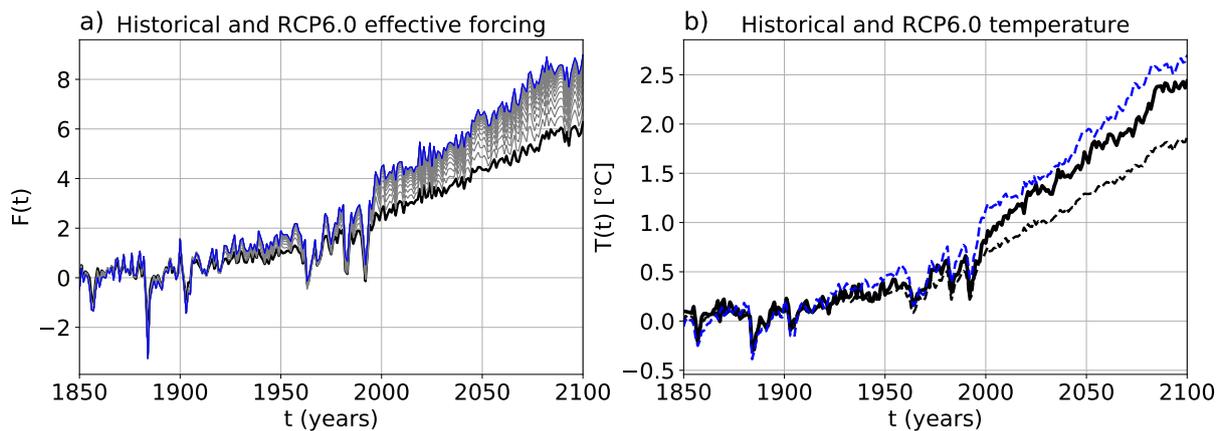


Figure S47. As Figure 3, but for the model GISS-E2-R and experiment RCP6.0.

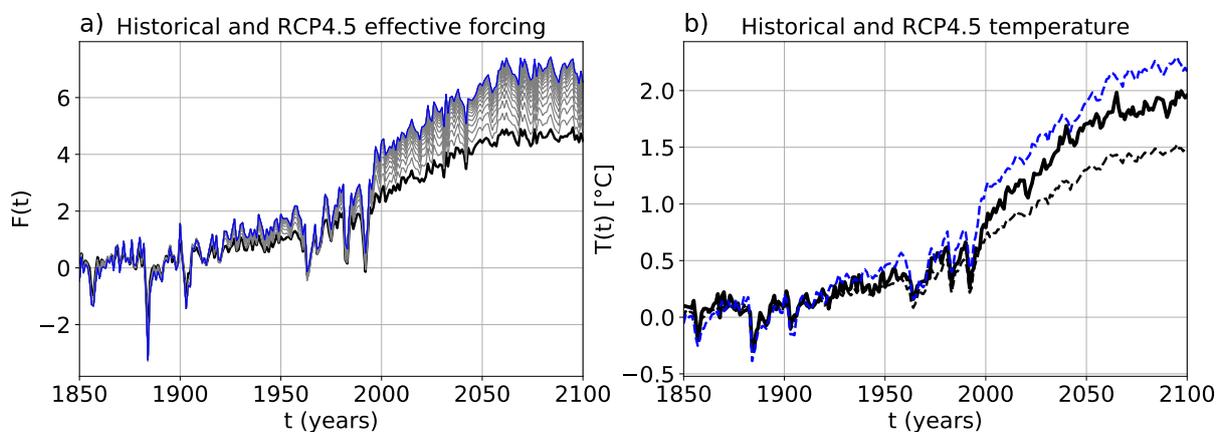


Figure S48. As Figure 3, but for the model GISS-E2-R and experiment RCP4.5.

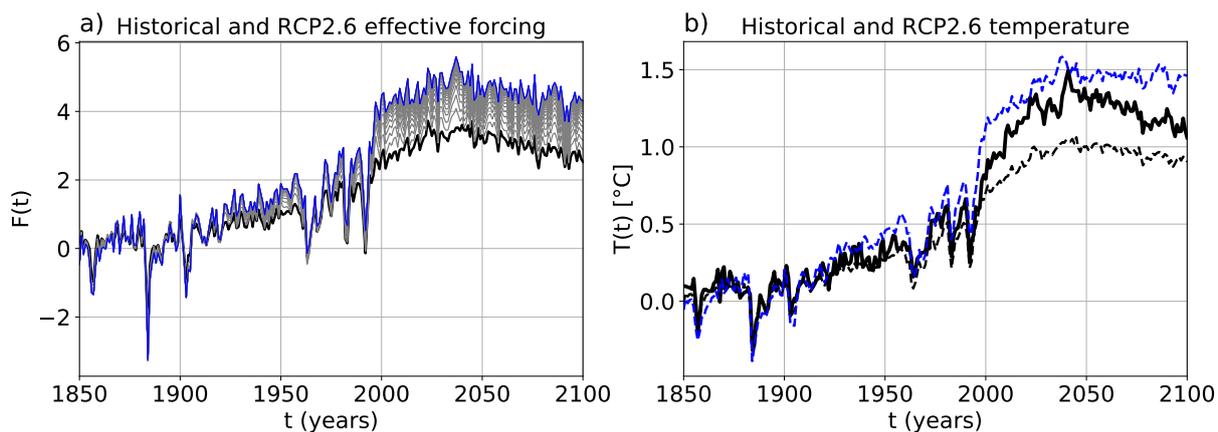


Figure S49. As Figure 3, but for the model GISS-E2-R and experiment RCP2.6.

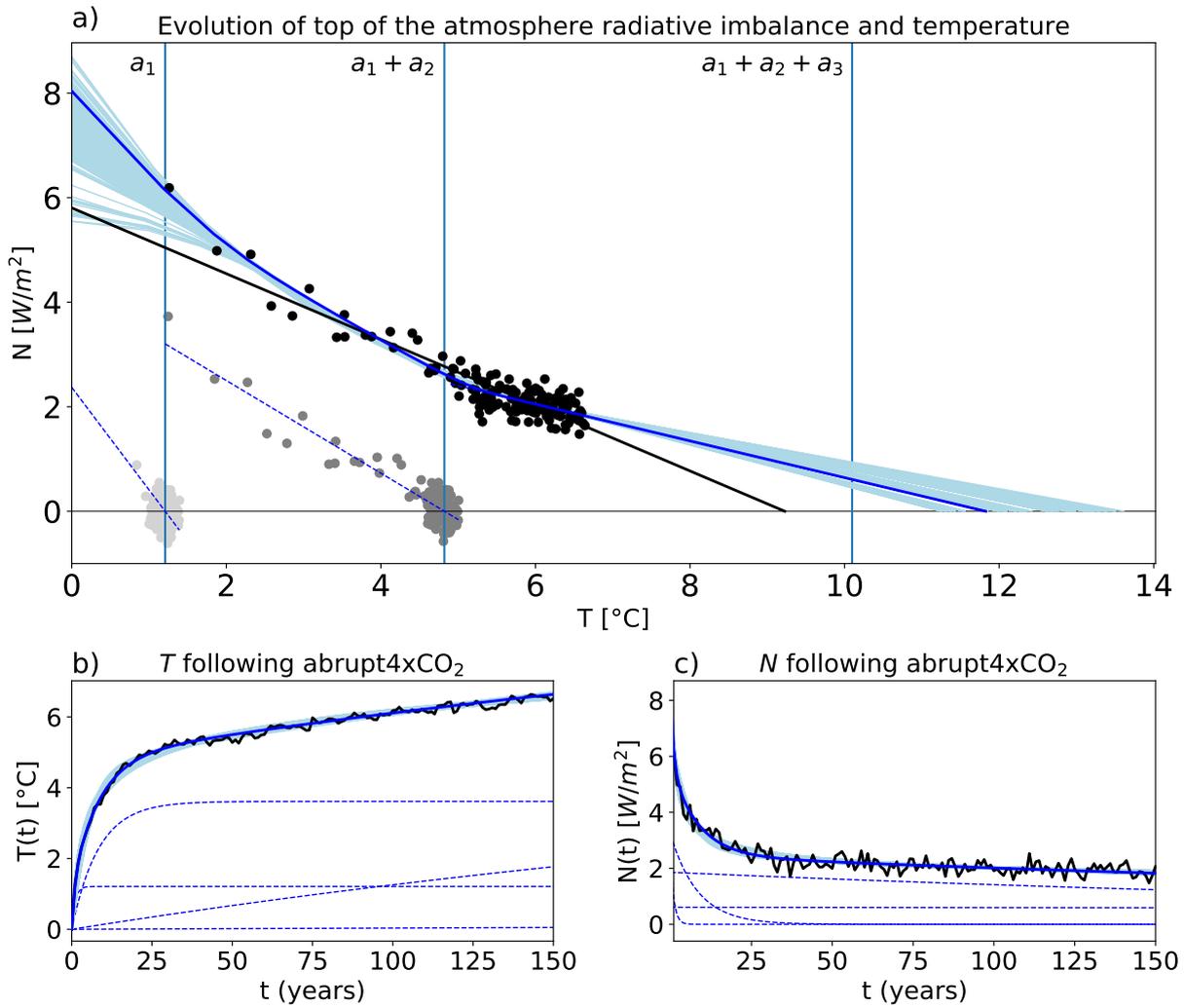


Figure S50. As Figure 1, but for the model HadGEM2-ES.

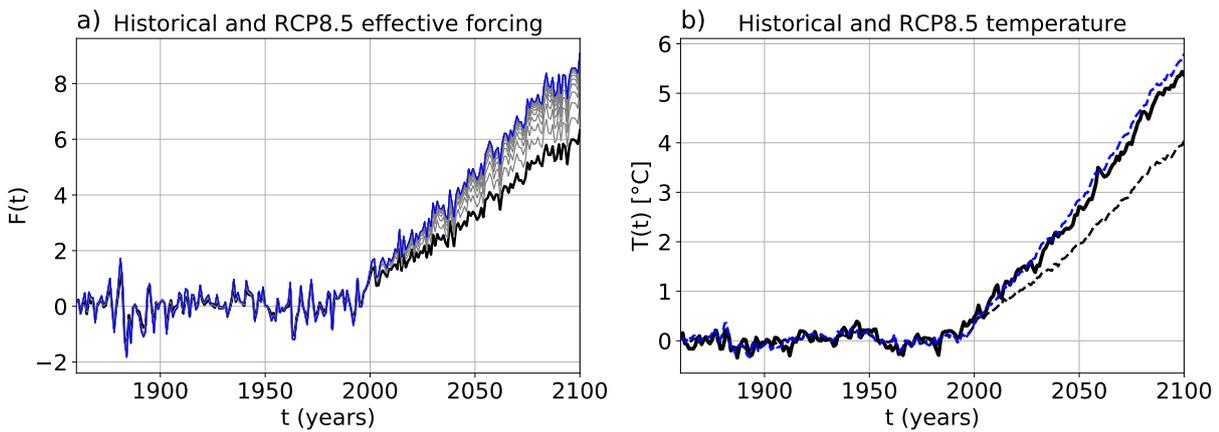


Figure S51. As Figure 3, but for the model HadGEM2-ES.

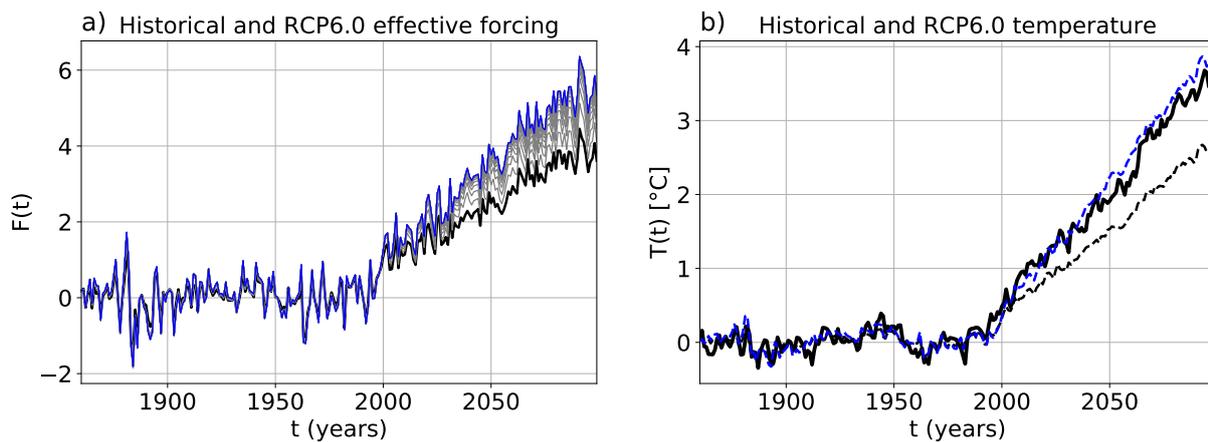


Figure S52. As Figure 3, but for the model HadGEM2-ES and experiment RCP6.0.

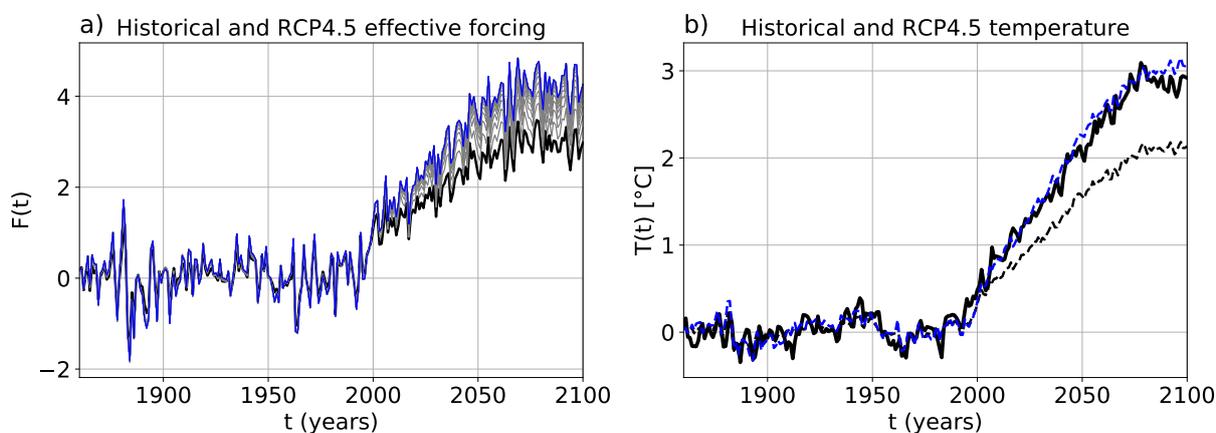


Figure S53. As Figure 3, but for the model HadGEM2-ES and experiment RCP4.5.

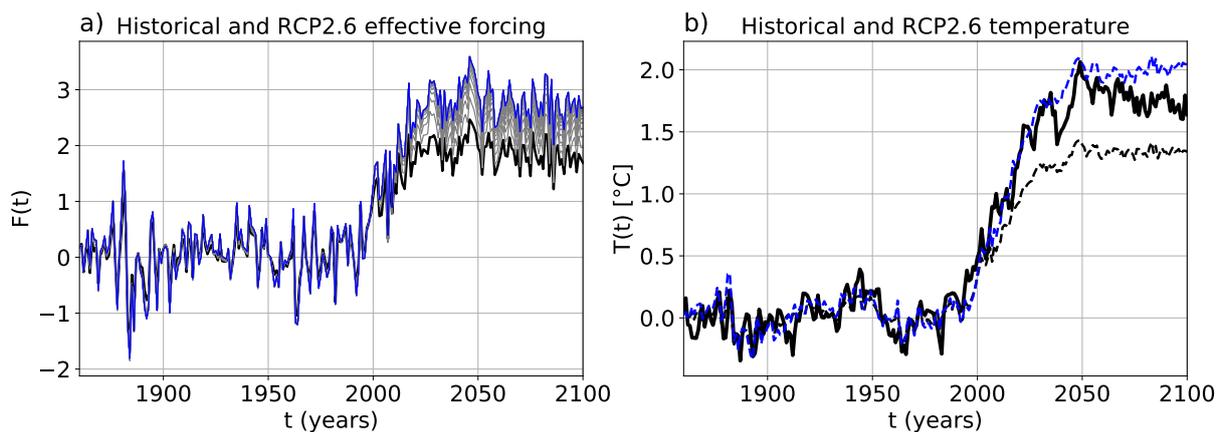


Figure S54. As Figure 3, but for the model HadGEM2-ES and experiment RCP2.6.

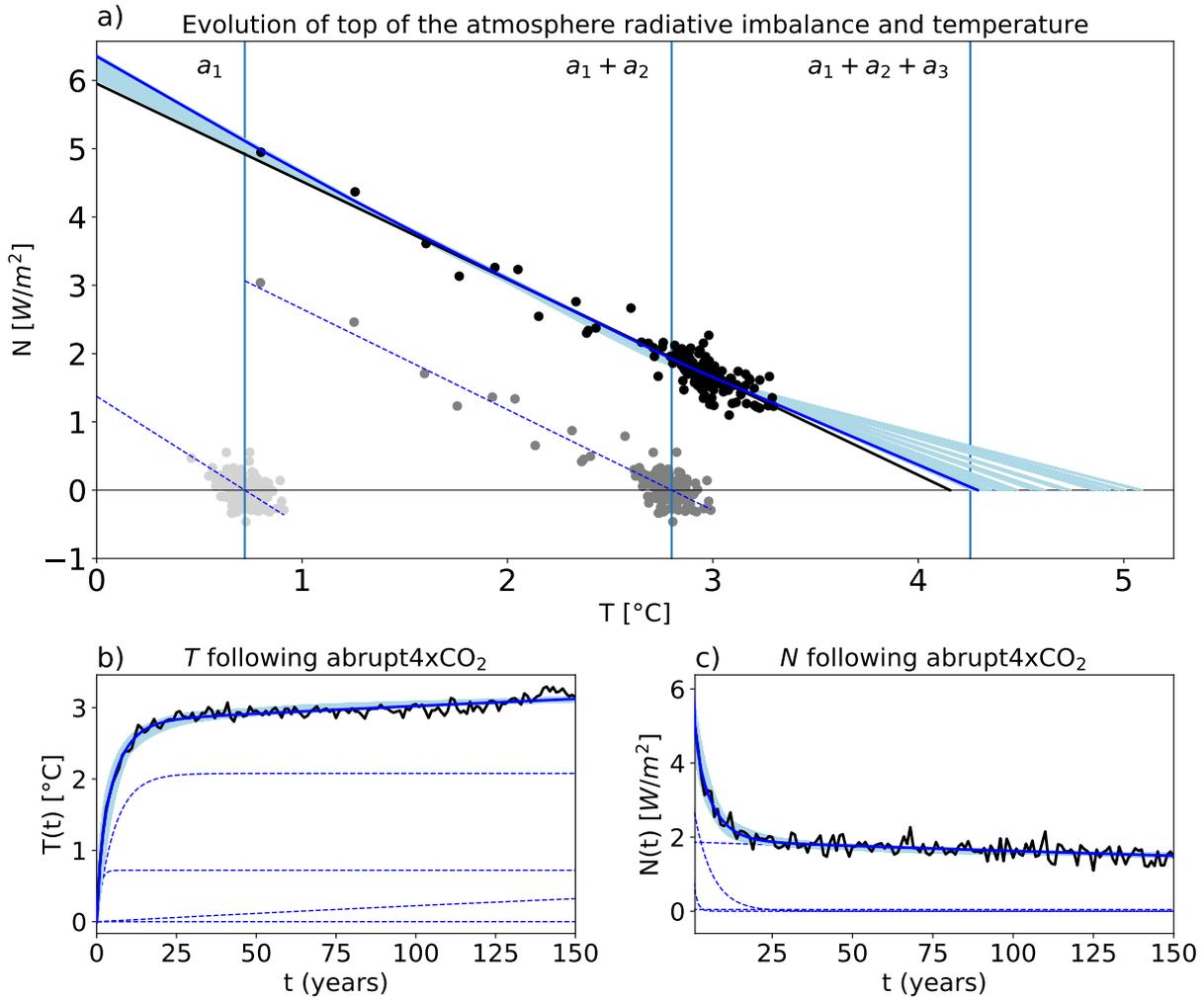


Figure S55. As Figure 1, but for the model inmcm4.

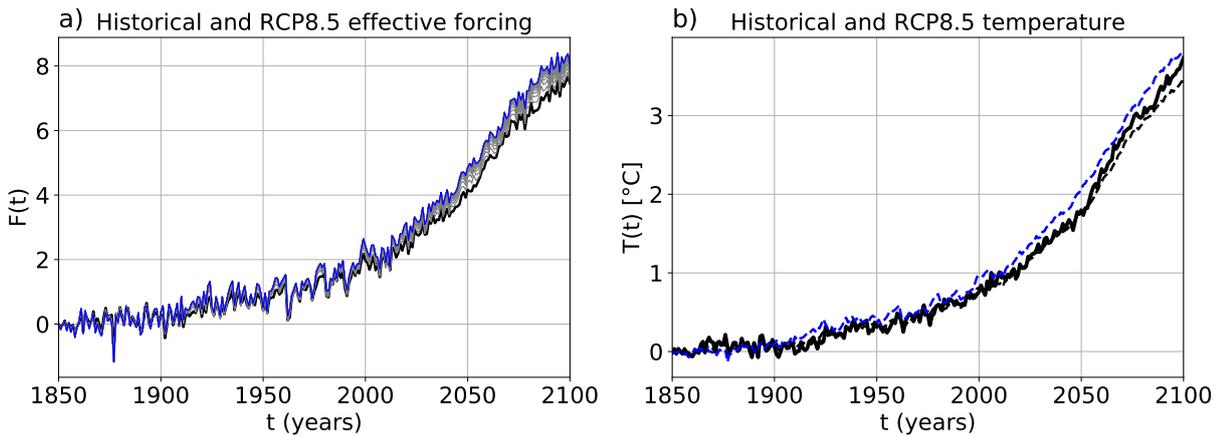


Figure S56. As Figure 3, but for the model inmcm4.

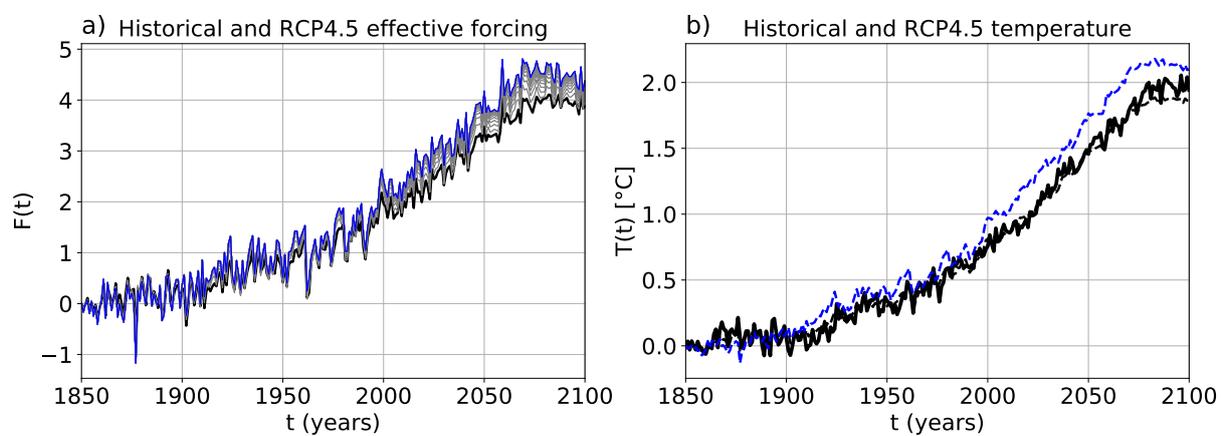


Figure S57. As Figure 3, but for the model *inmcm4* and experiment RCP4.5.

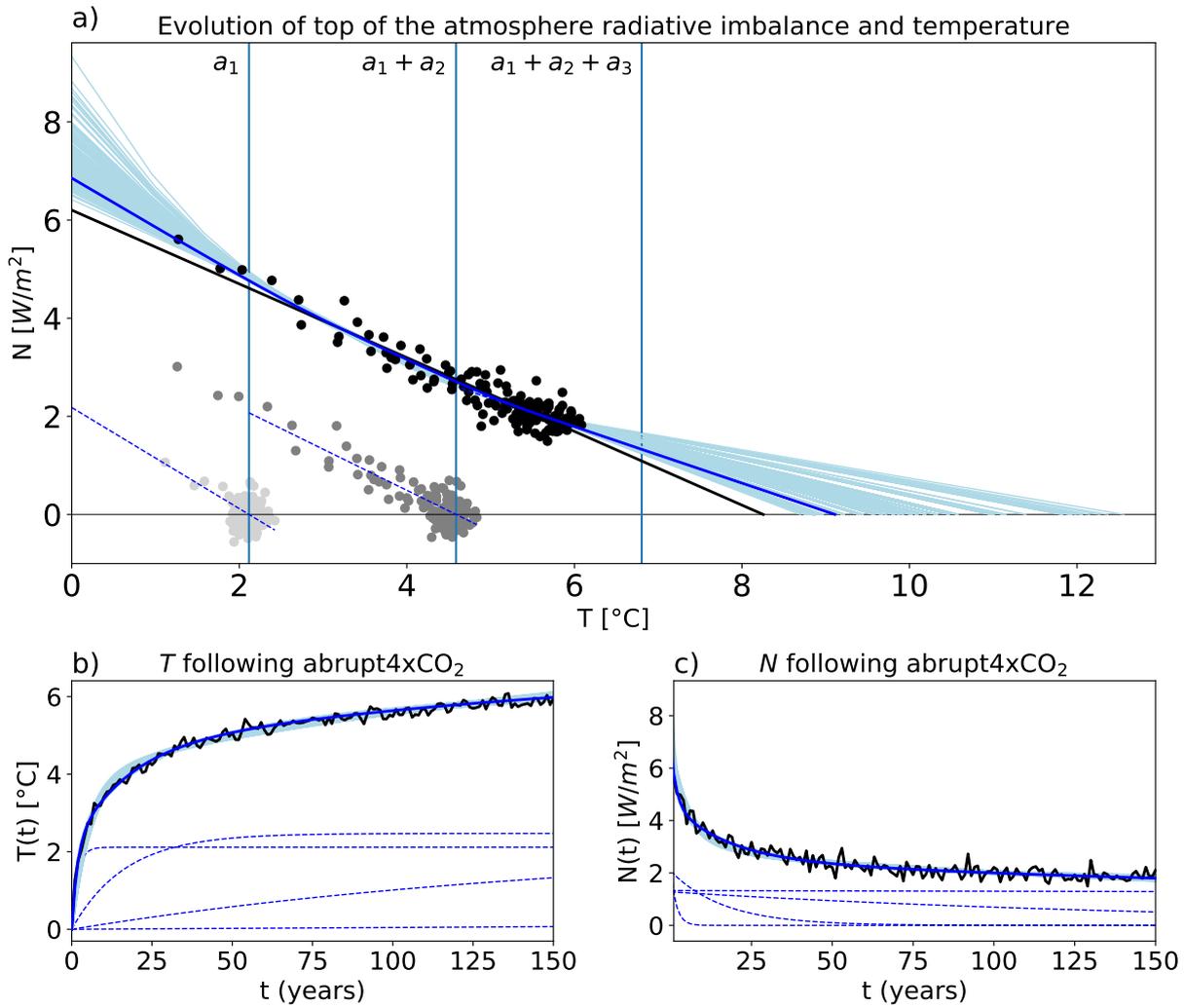


Figure S58. As Figure 1, but for the model IPSL-CM5A-LR.

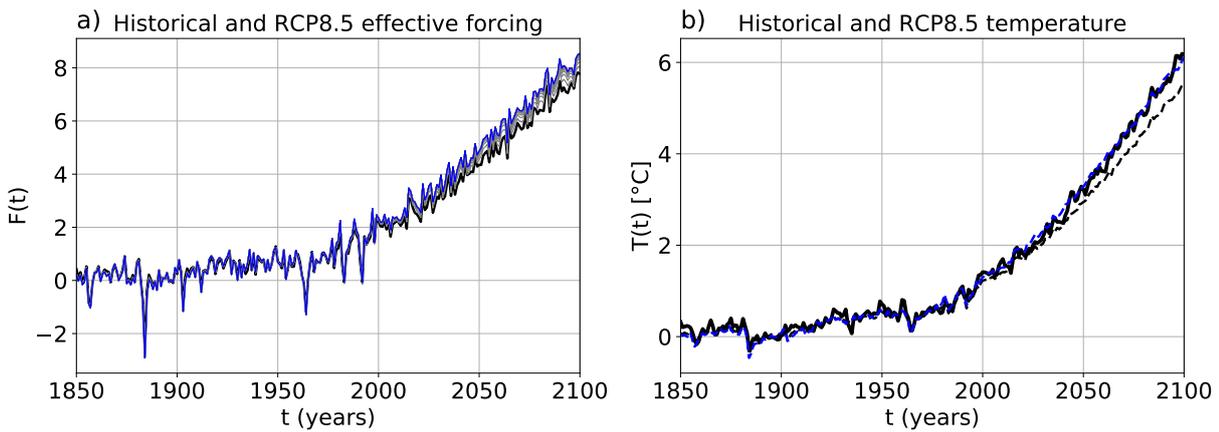


Figure S59. As Figure 3, but for the model IPSL-CM5A-LR.

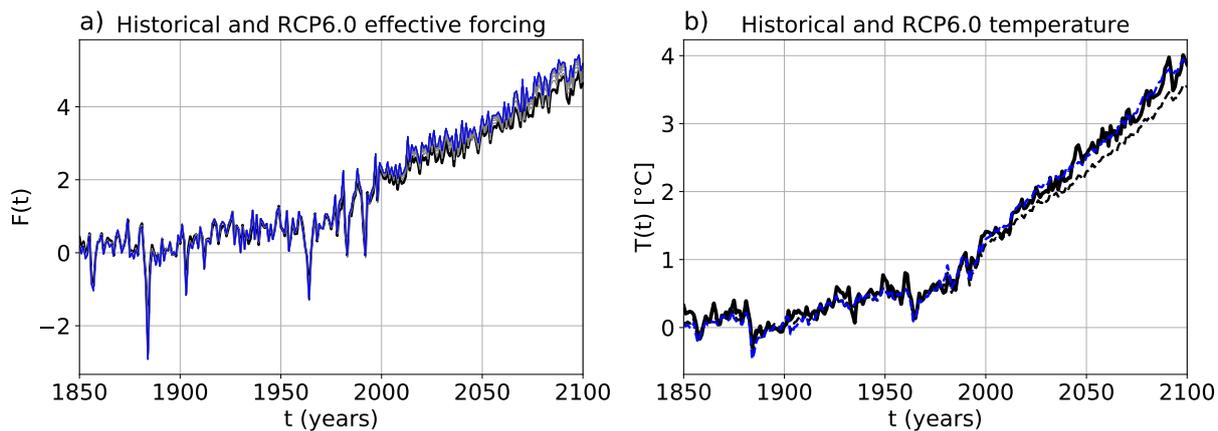


Figure S60. As Figure 3, but for the model IPSL-CM5A-LR and experiment RCP6.0.

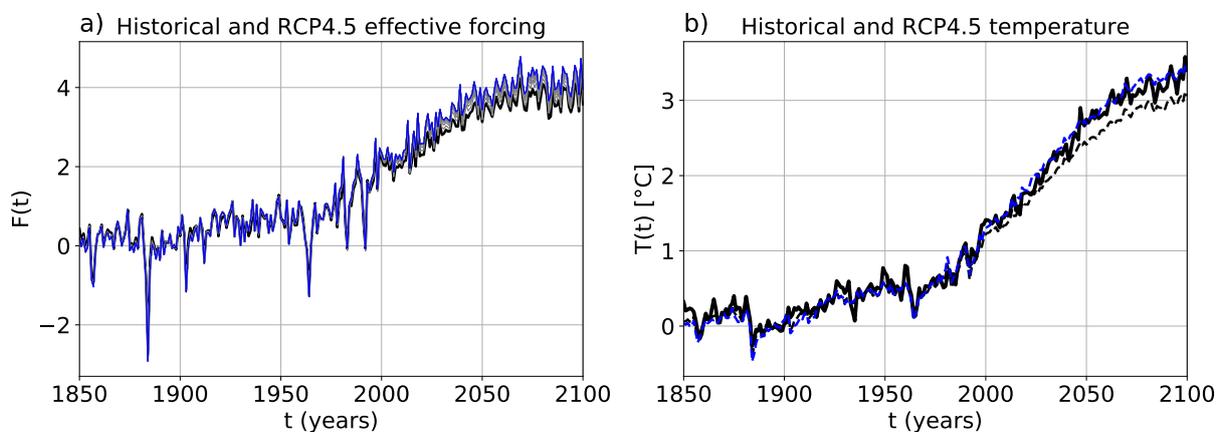


Figure S61. As Figure 3, but for the model IPSL-CM5A-LR and experiment RCP4.5.

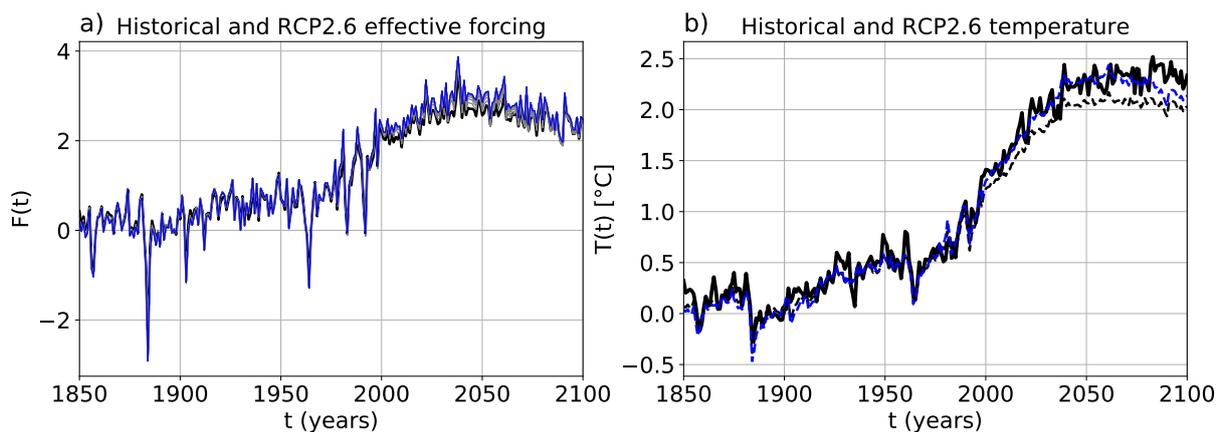


Figure S62. As Figure 3, but for the model IPSL-CM5A-LR and experiment RCP2.6.

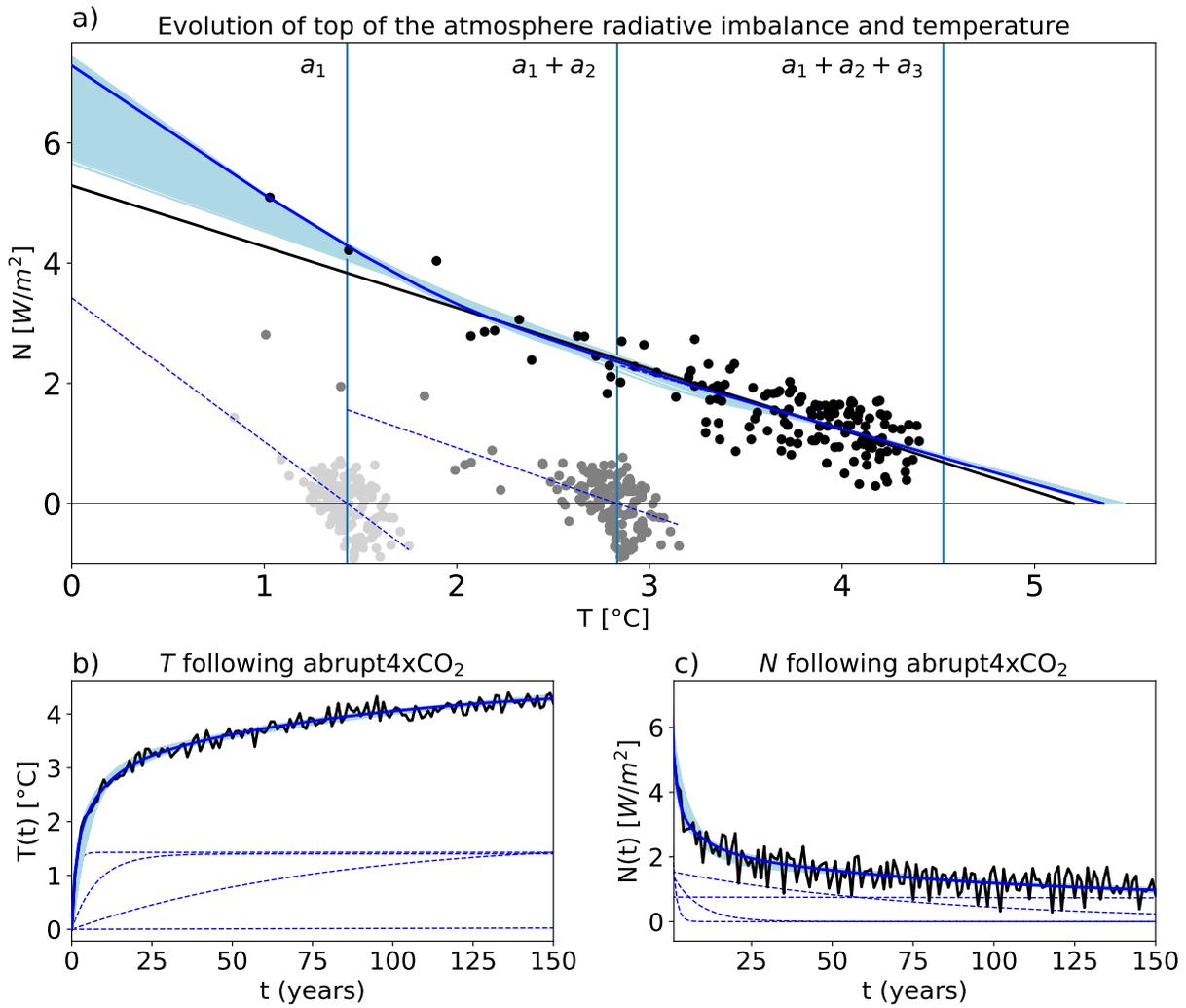


Figure S63. As Figure 1, but for the model IPSL-CM5B-LR.

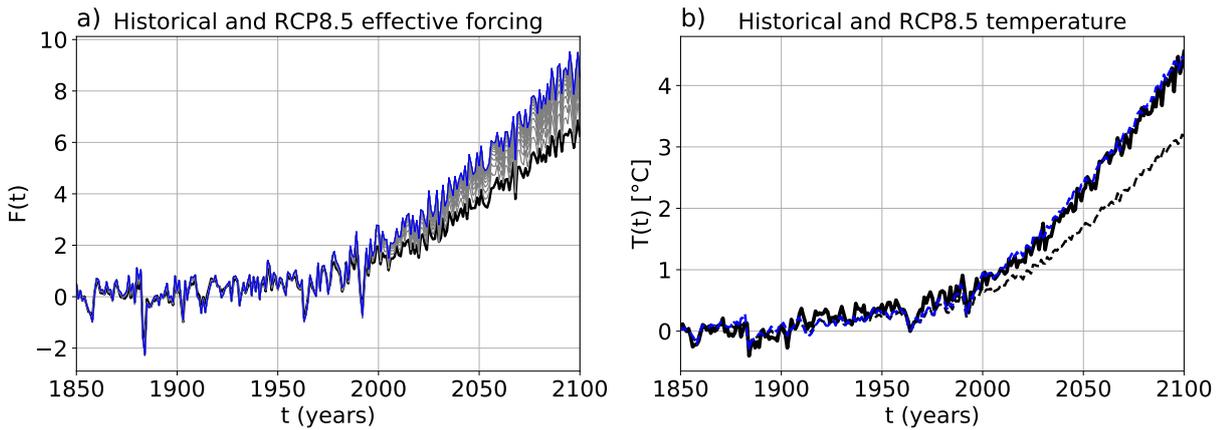


Figure S64. As Figure 3, but for the model IPSL-CM5B-LR.

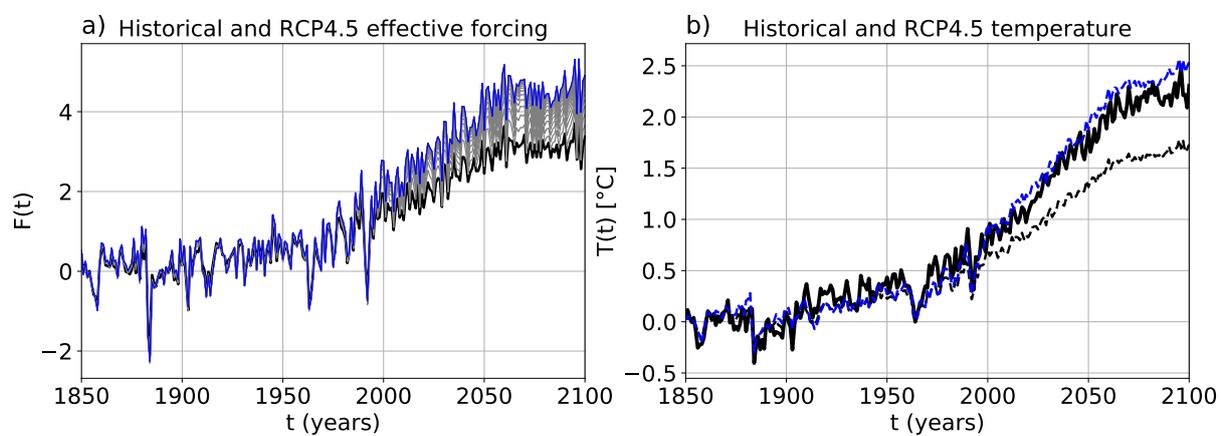


Figure S65. As Figure 3, but for the model IPSL-CM5B-LR and experiment RCP4.5.

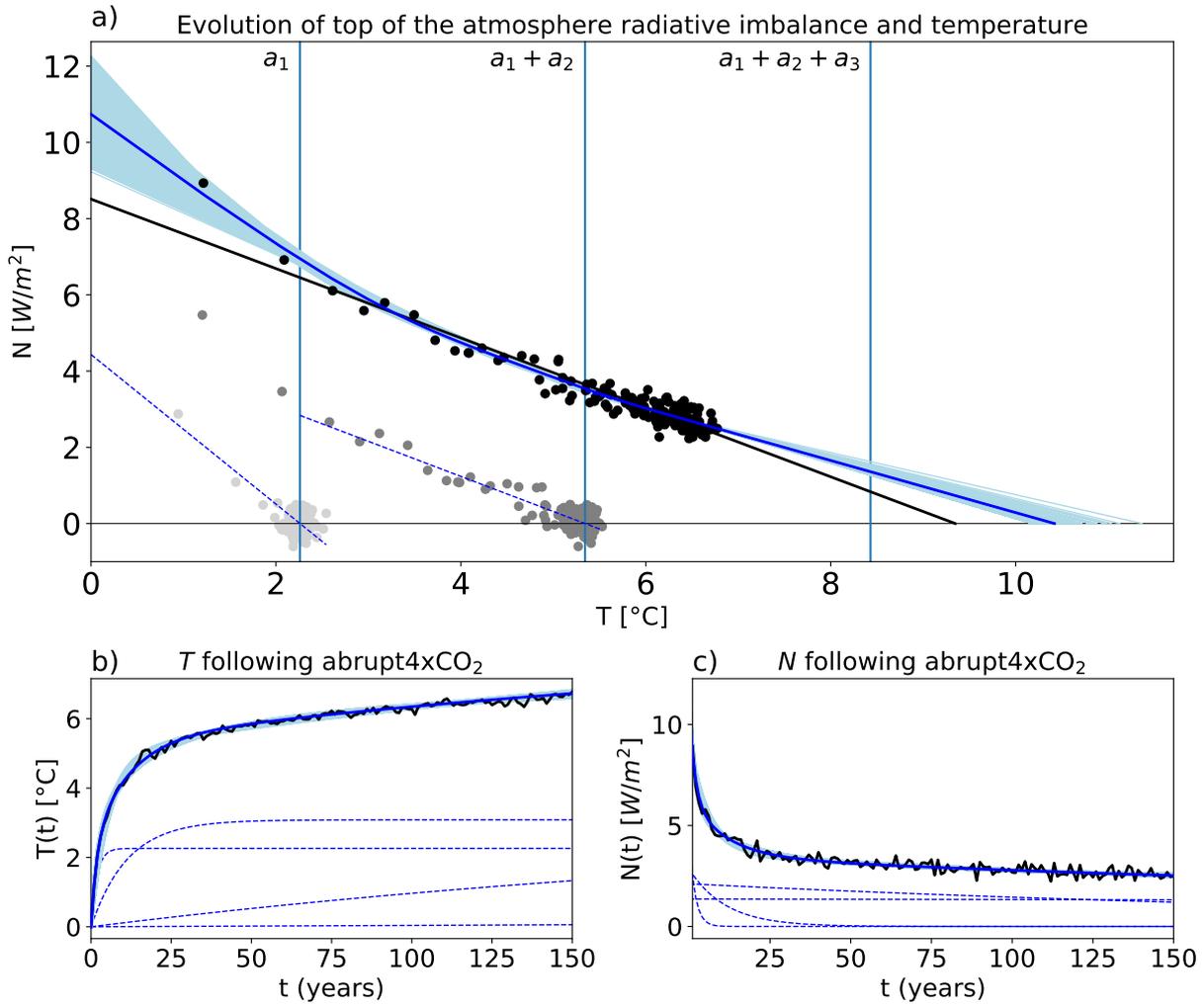


Figure S66. As Figure 1, but for the model MIROC-ESM.

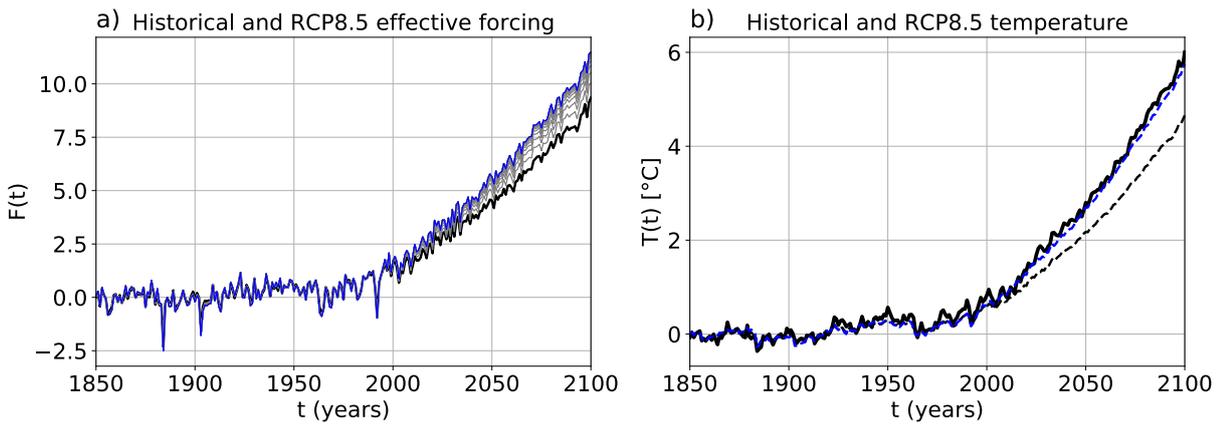


Figure S67. As Figure 3, but for the model MIROC-ESM.

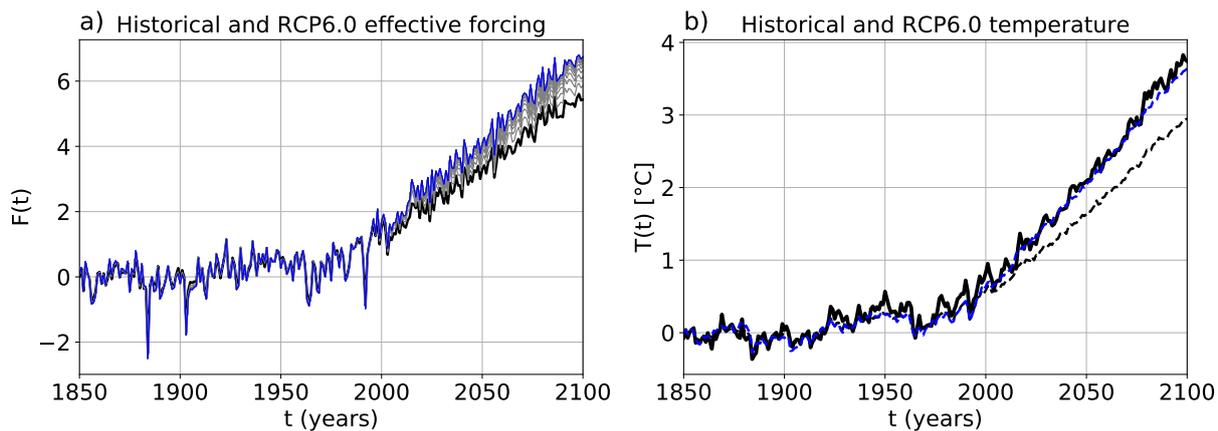


Figure S68. As Figure 3, but for the model MIROC-ESM and experiment RCP6.0.

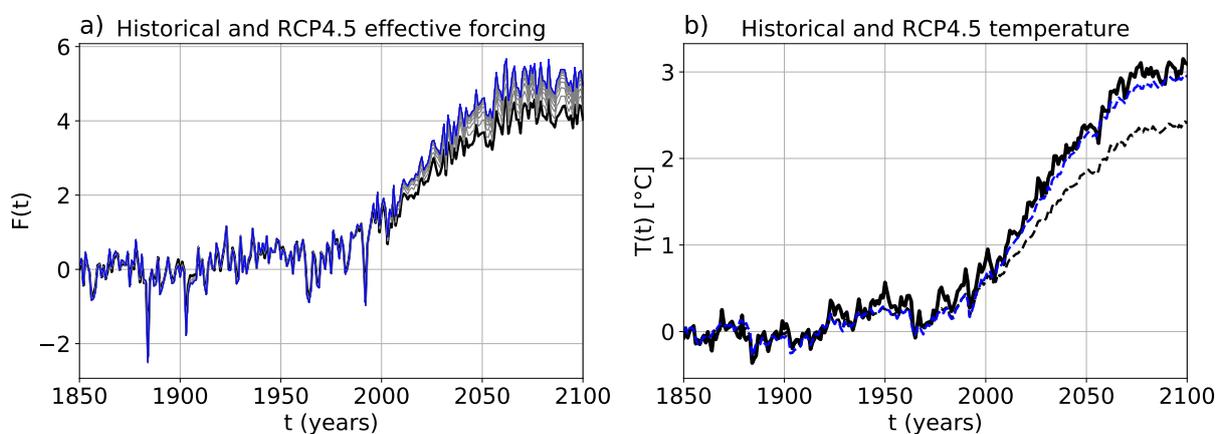


Figure S69. As Figure 3, but for the model MIROC-ESM and experiment RCP4.5.

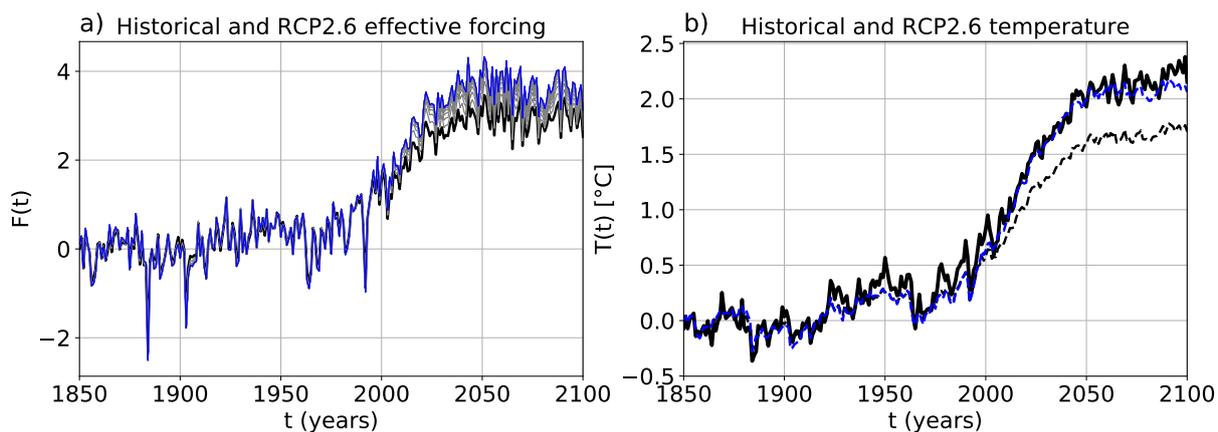


Figure S70. As Figure 3, but for the model MIROC-ESM and experiment RCP2.6.

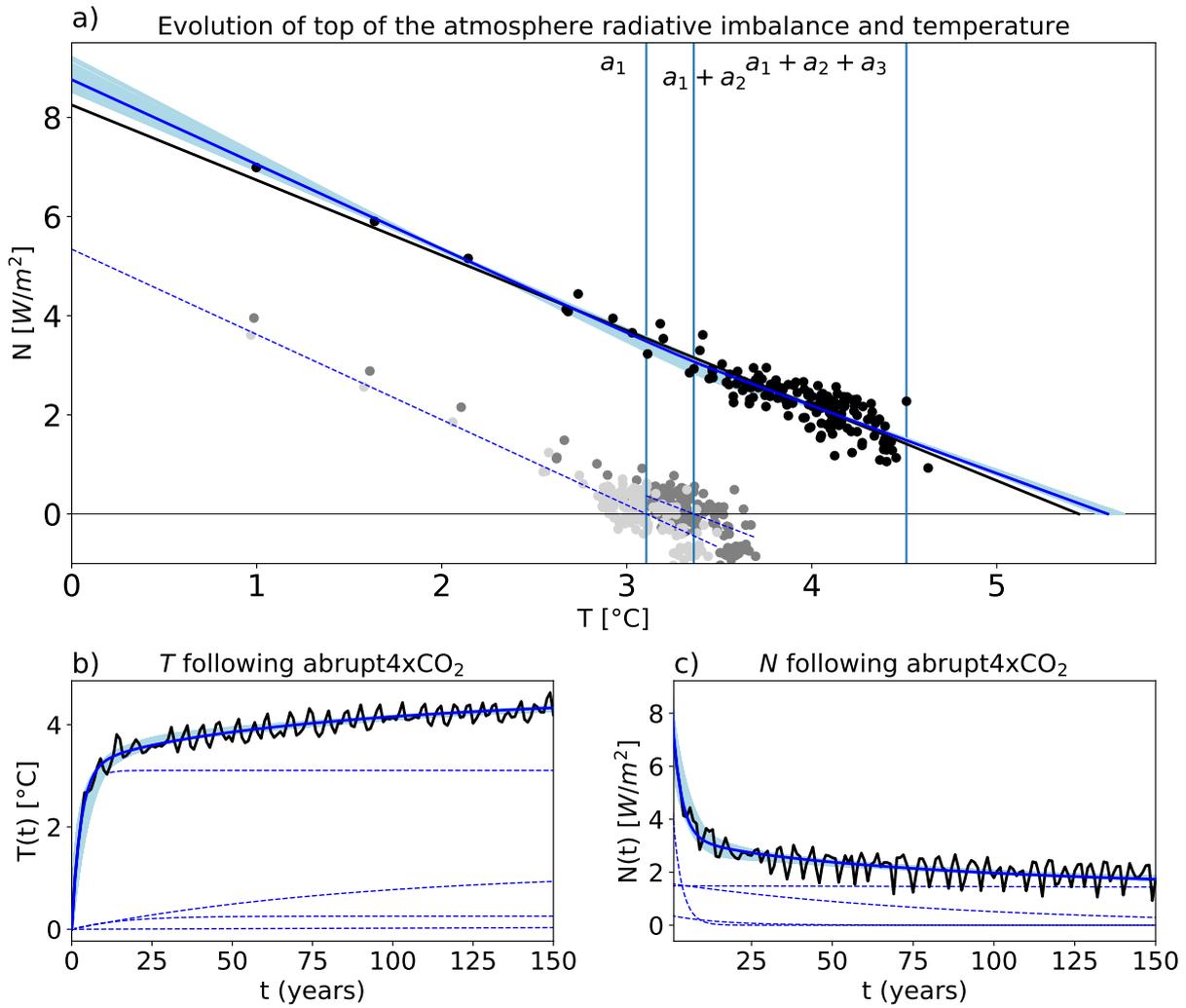


Figure S71. As Figure 1, but for the model MIROC5.

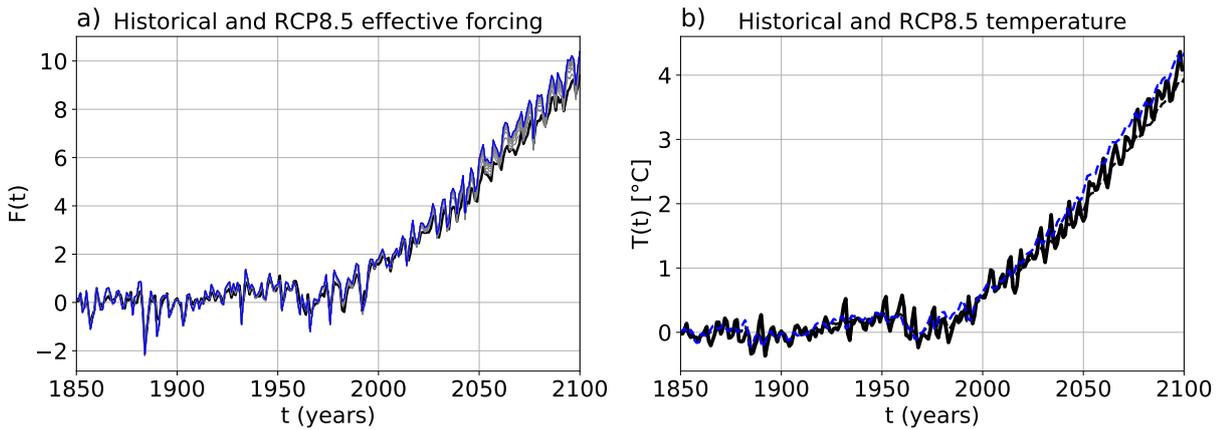


Figure S72. As Figure 3, but for the model MIROC5.

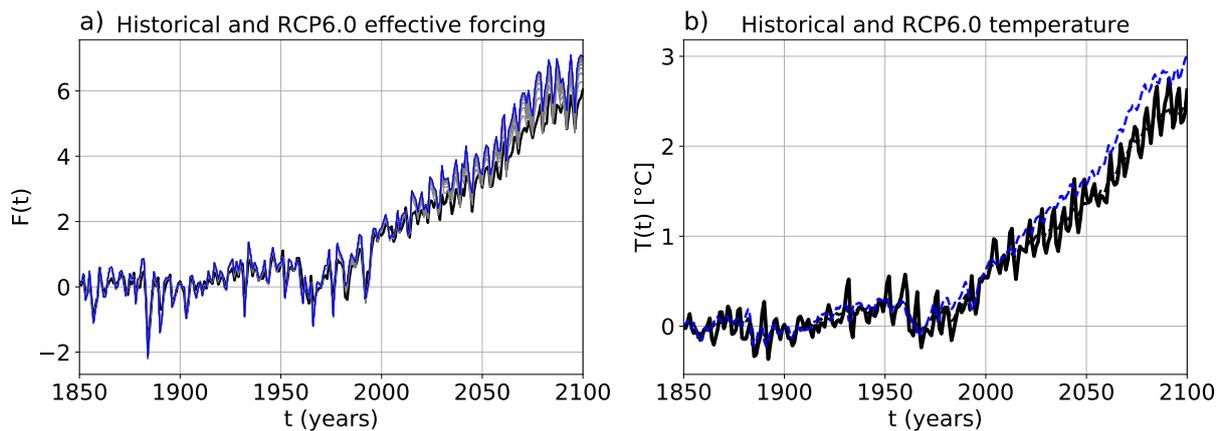


Figure S73. As Figure 3, but for the model MIROC5 and experiment RCP6.0.

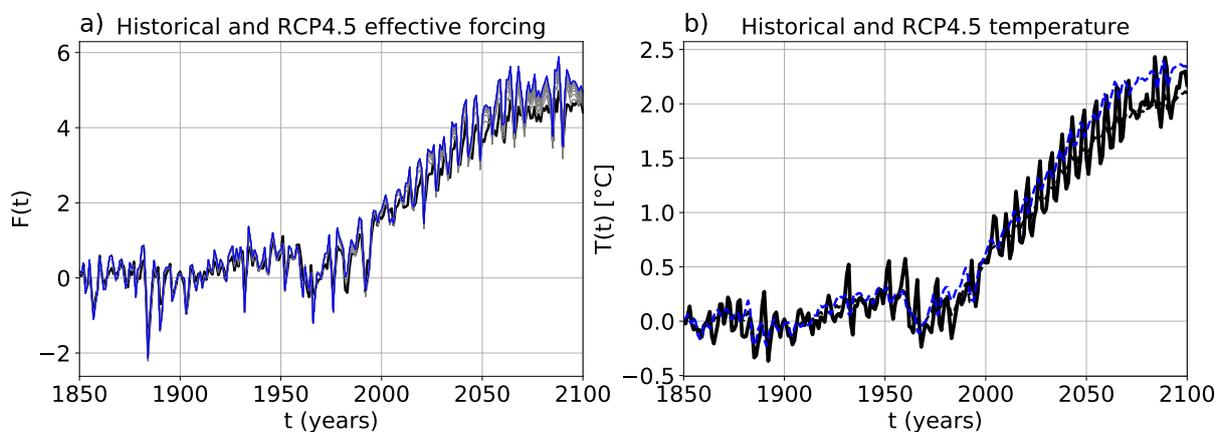


Figure S74. As Figure 3, but for the model MIROC5 and experiment RCP4.5.

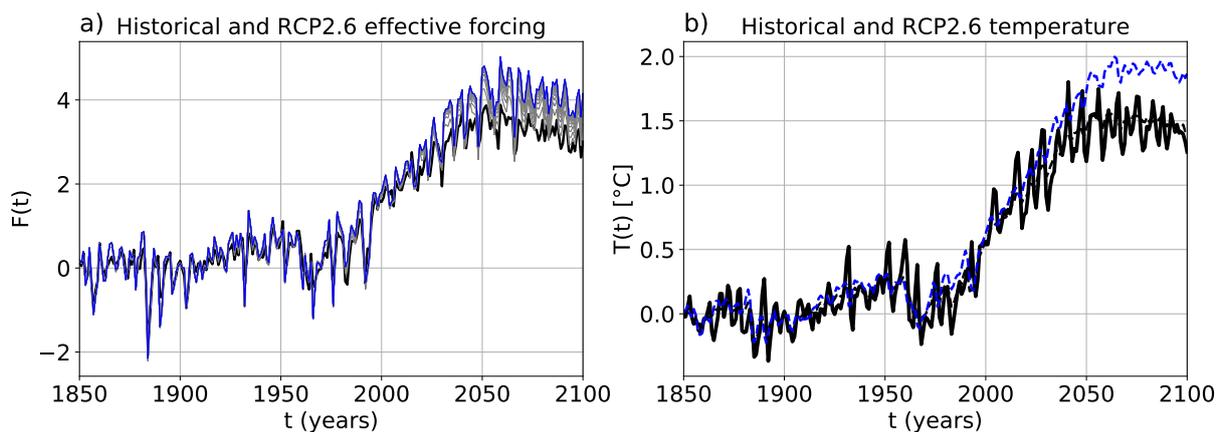


Figure S75. As Figure 3, but for the model MIROC5 and experiment RCP2.6.

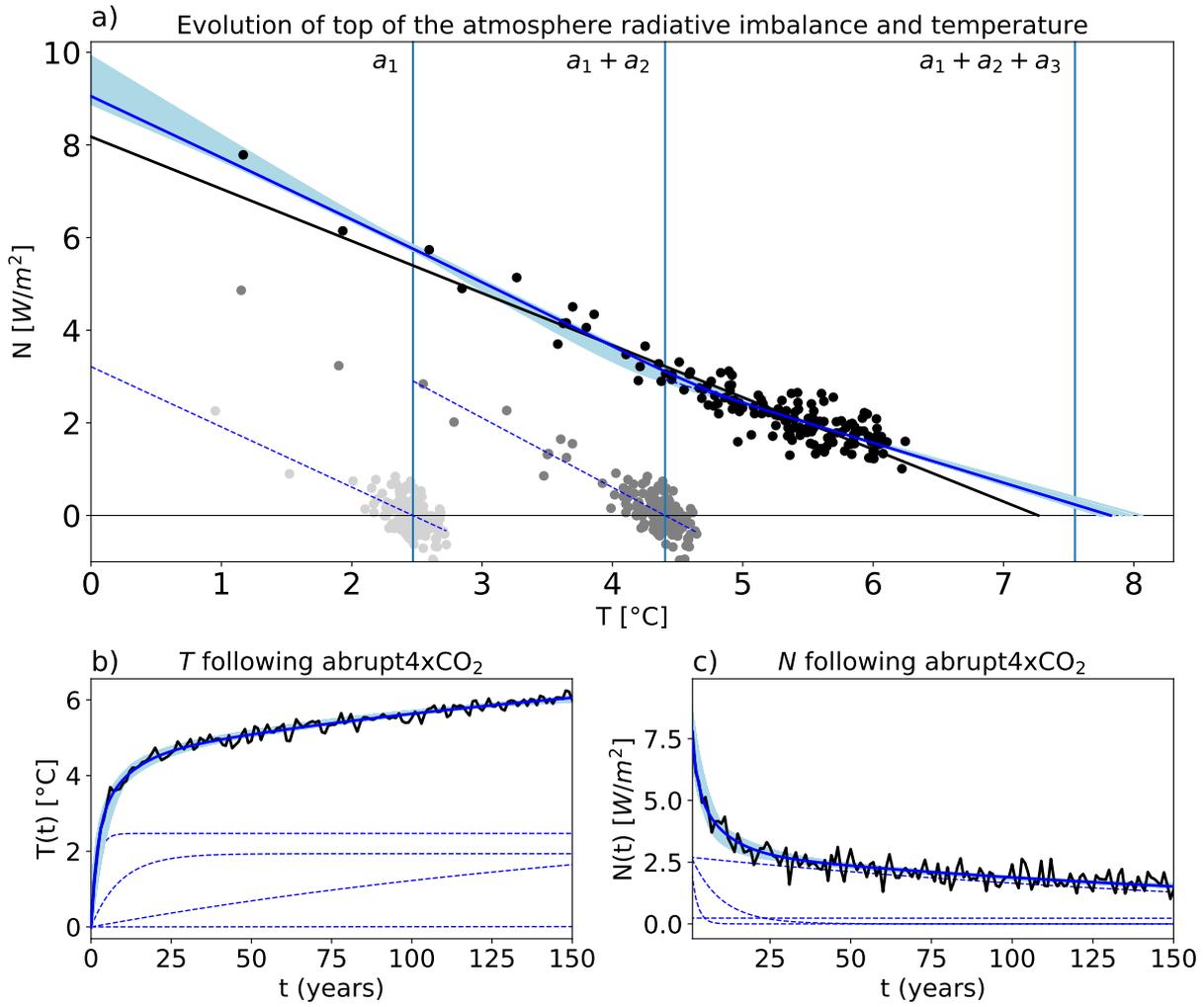


Figure S76. As Figure 1, but for the model MPI-ESM-LR.

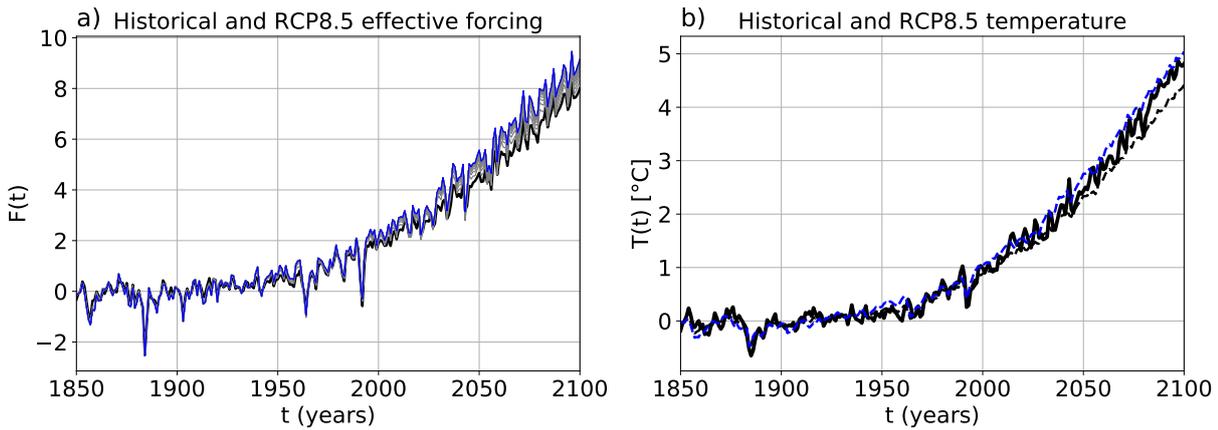


Figure S77. As Figure 3, but for the model MPI-ESM-LR.

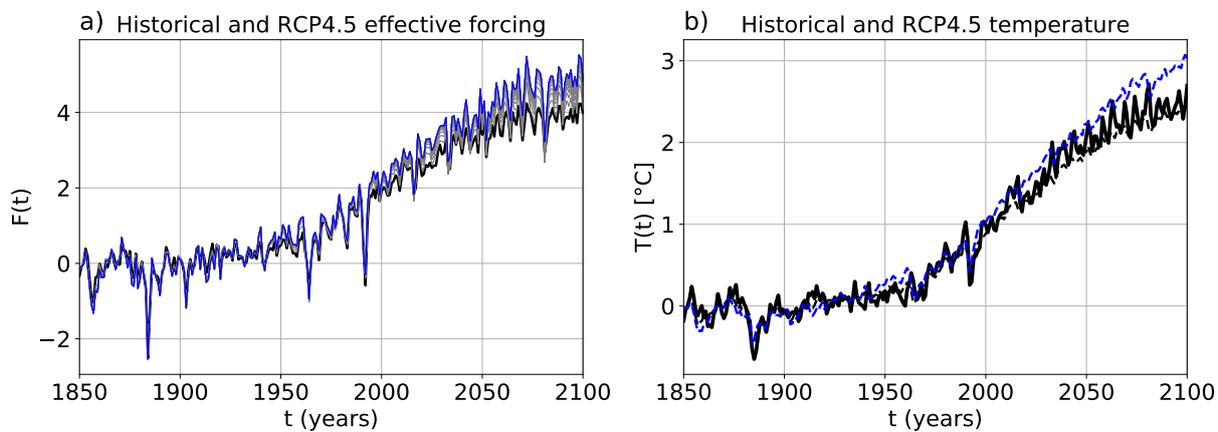


Figure S78. As Figure 3, but for the model MPI-ESM-LR and experiment RCP4.5.

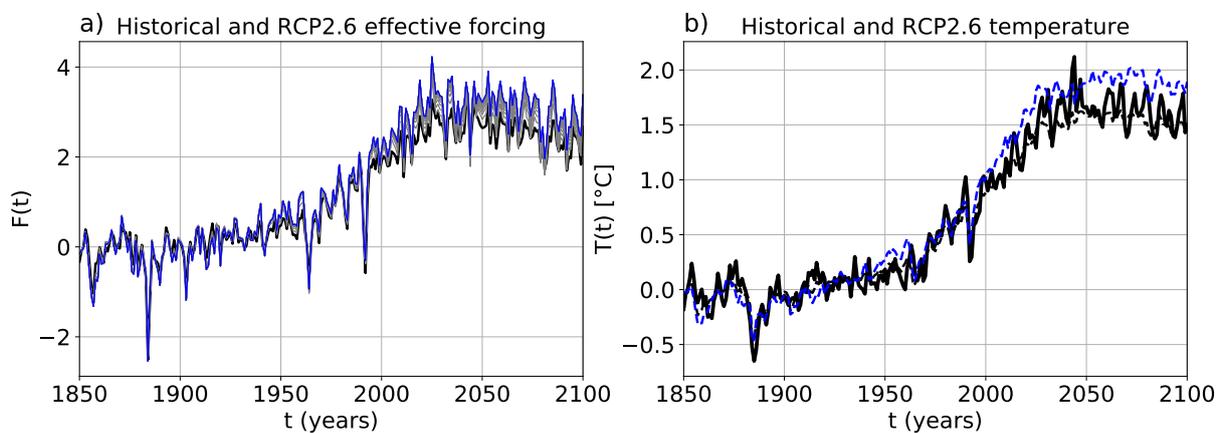


Figure S79. As Figure 3, but for the model MPI-ESM-LR and experiment RCP2.6.

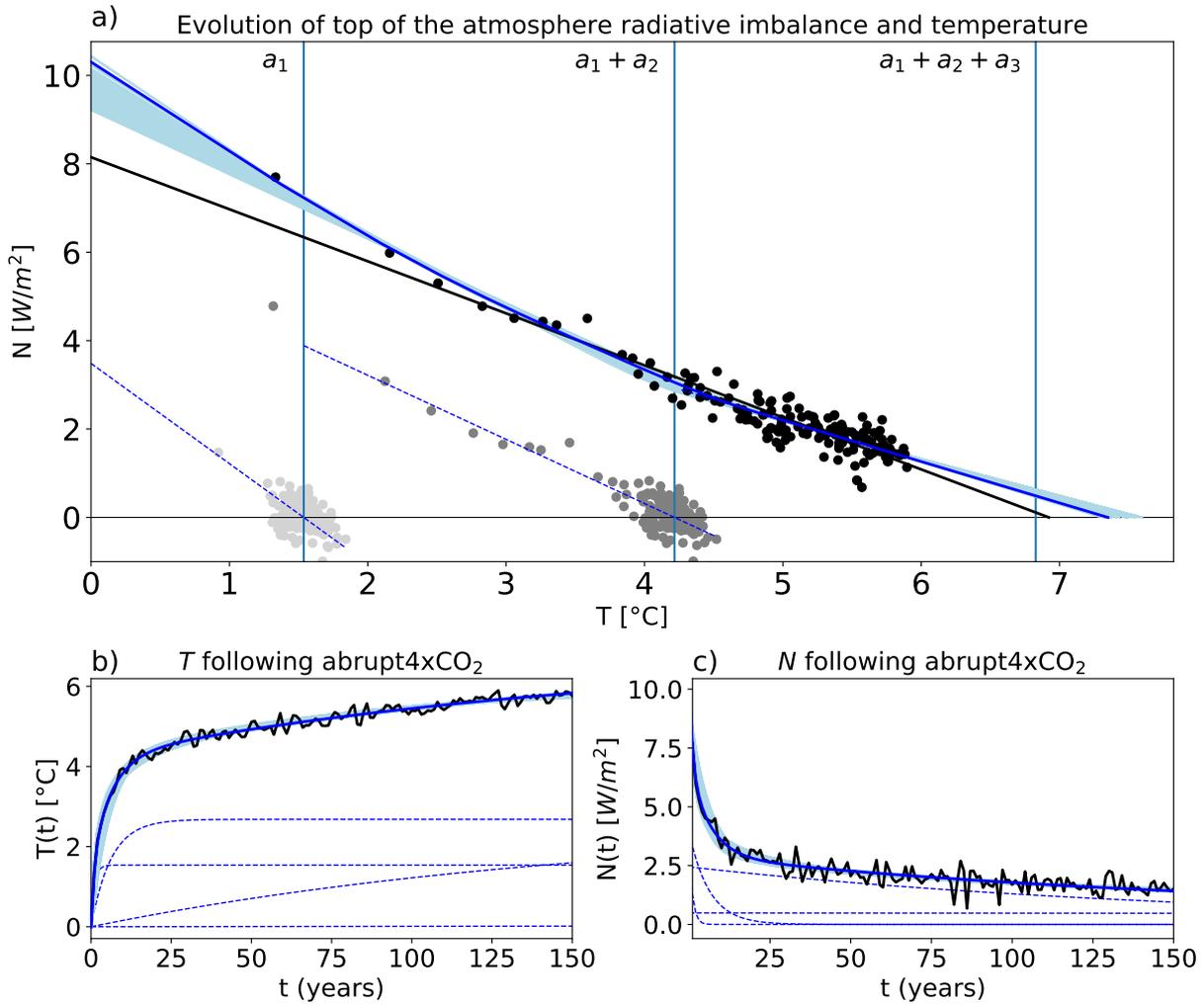


Figure S80. As Figure 1, but for the model MPI-ESM-MR.

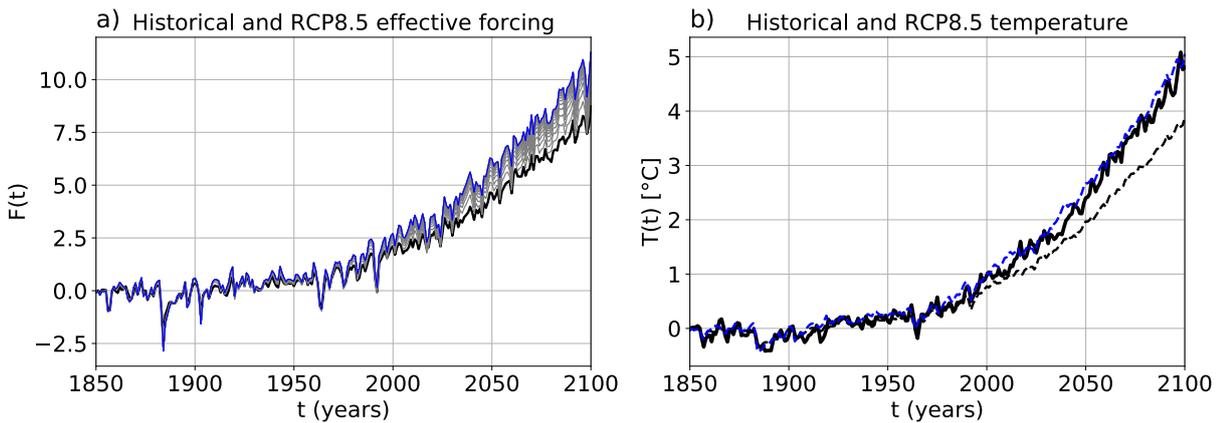


Figure S81. As Figure 3, but for the model MPI-ESM-MR.

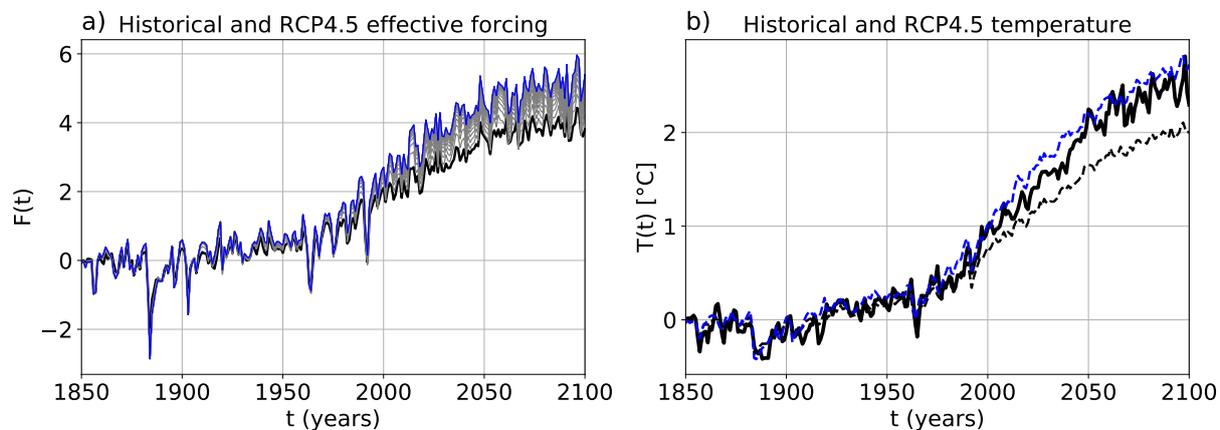


Figure S82. As Figure 3, but for the model MPI-ESM-MR and experiment RCP4.5.

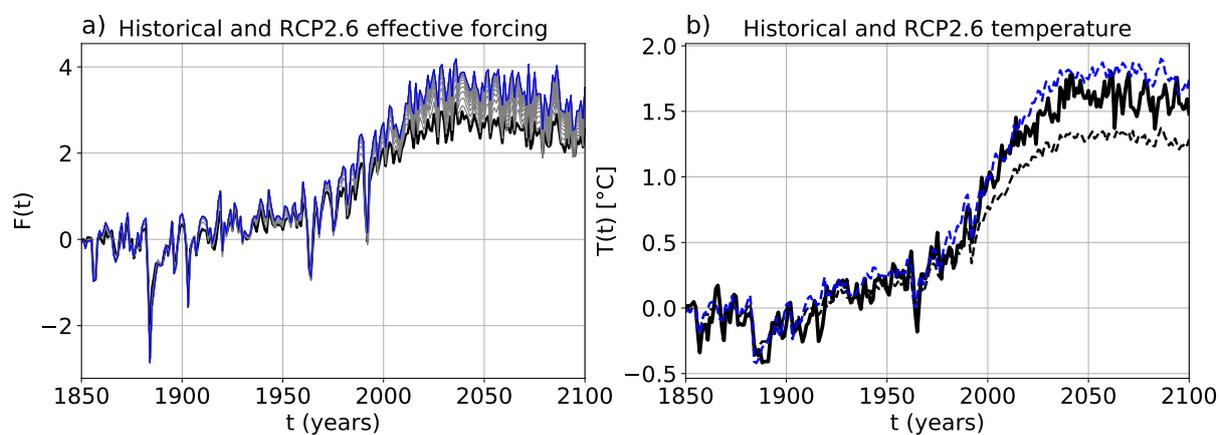


Figure S83. As Figure 3, but for the model MPI-ESM-MR and experiment RCP2.6.

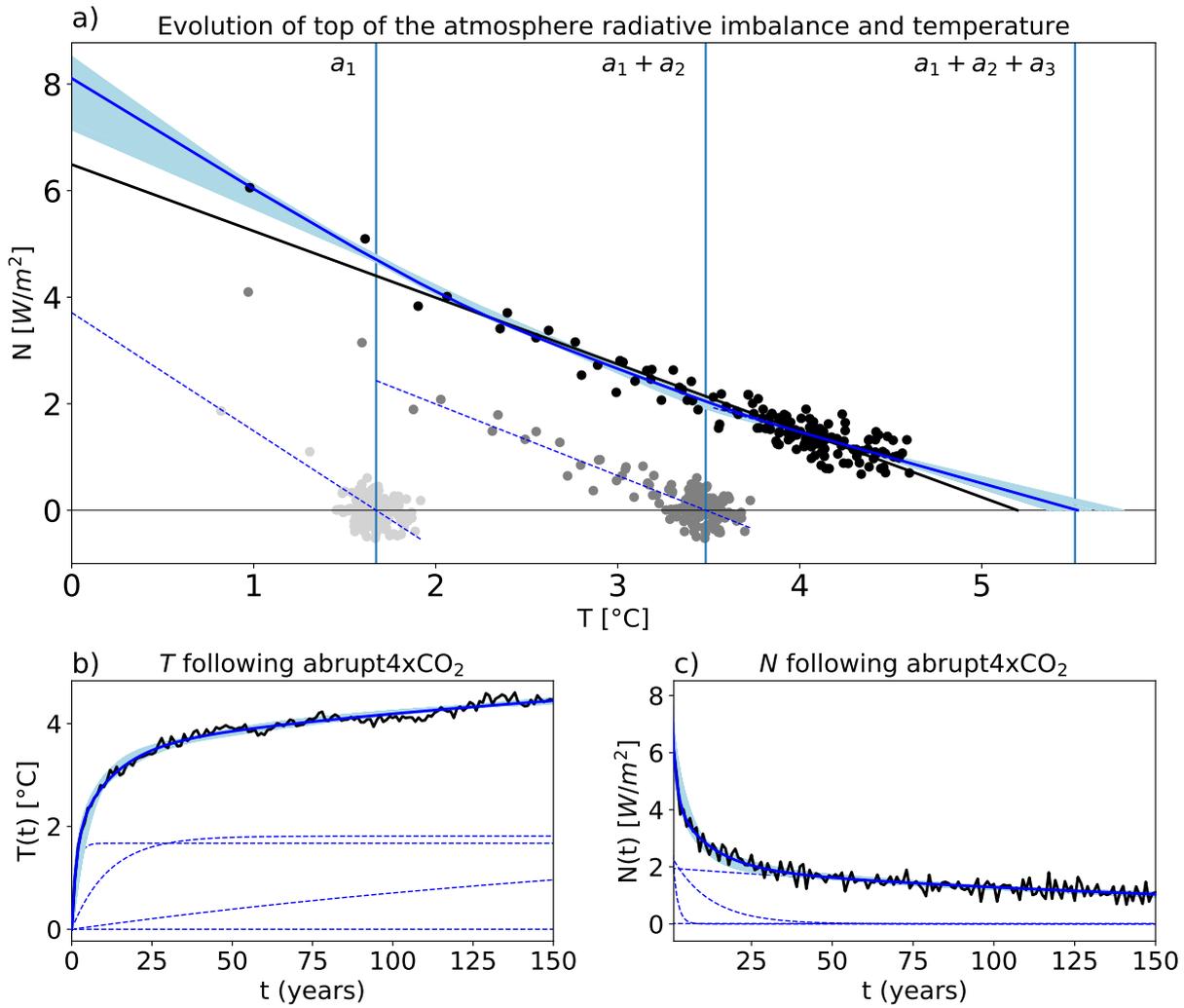


Figure S84. As Figure 1, but for the model MRI-CGCM3.

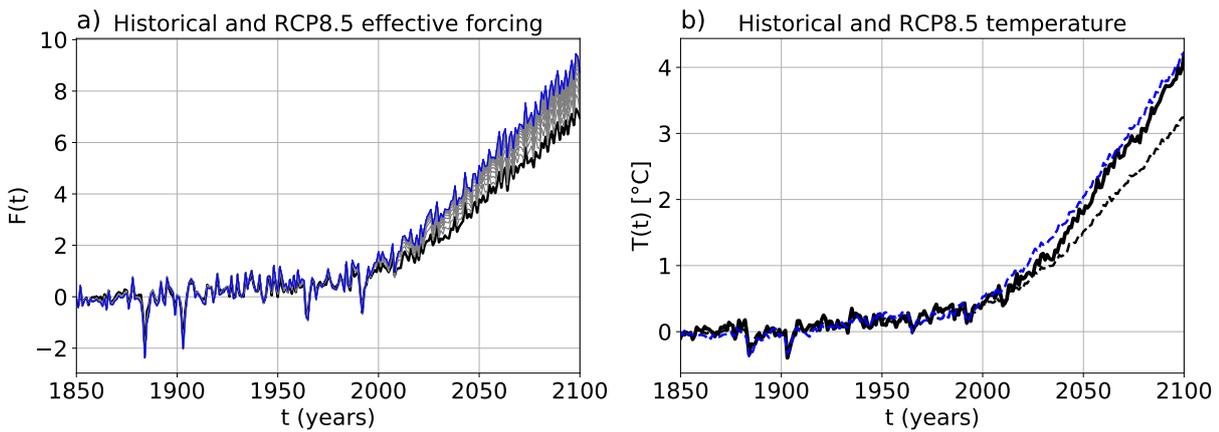


Figure S85. As Figure 3, but for the model MRI-CGCM3.

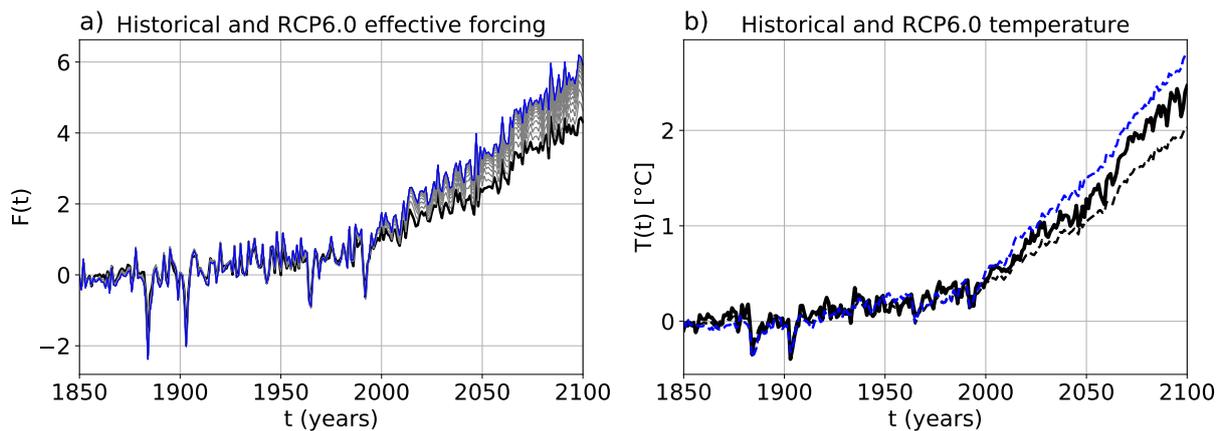


Figure S86. As Figure 3, but for the model MRI-CGCM3 and experiment RCP6.0.

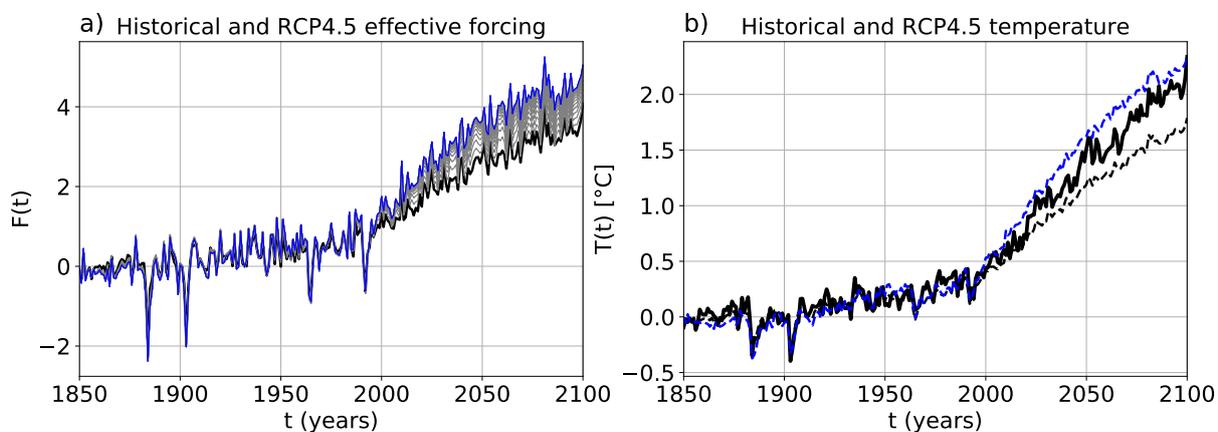


Figure S87. As Figure 3, but for the model MRI-CGCM3 and experiment RCP4.5.

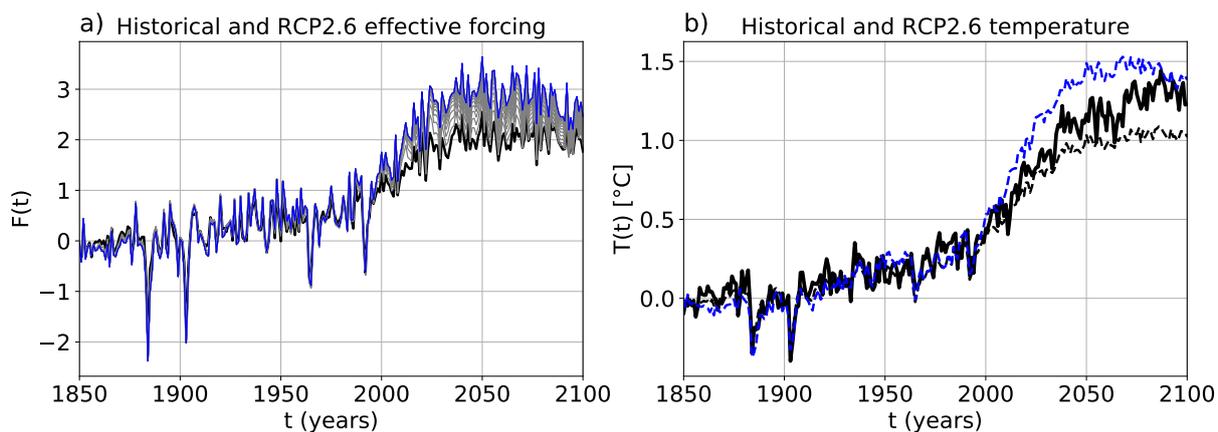


Figure S88. As Figure 3, but for the model MRI-CGCM3 and experiment RCP2.6.

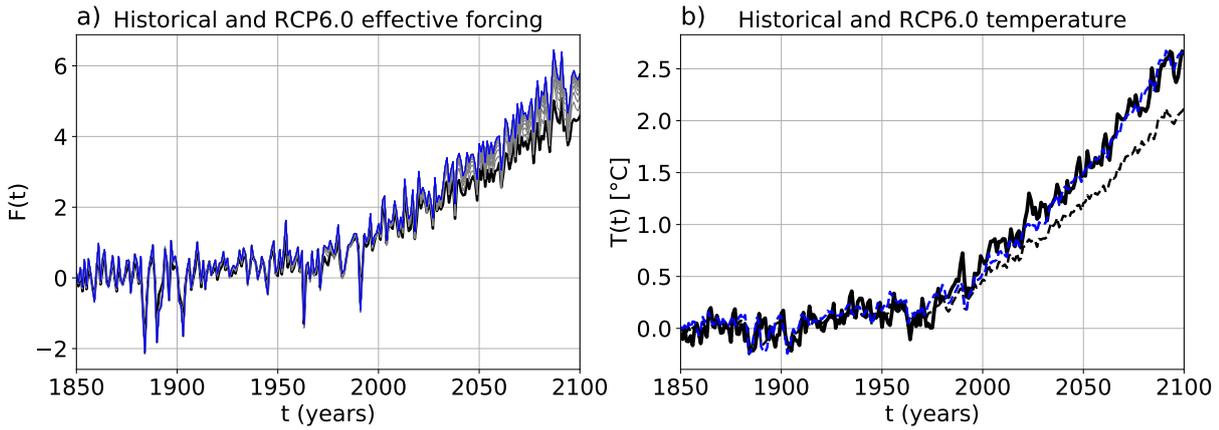


Figure S89. As Figure 3 with the model NorESM1-M, but for the experiment RCP6.0.

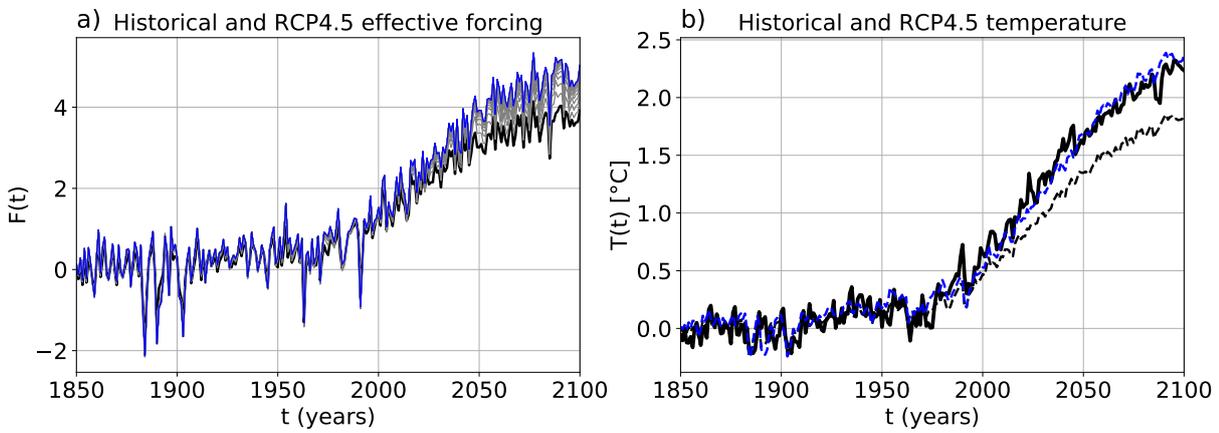


Figure S90. As Figure 3 with the model NorESM1-M, but for the experiment RCP4.5.

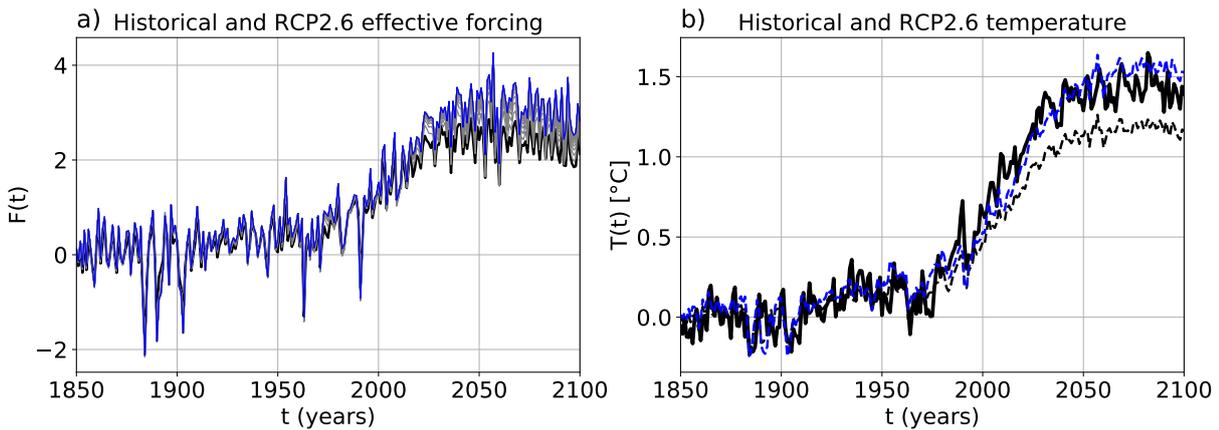


Figure S91. As Figure 3 with the model NorESM1-M, but for the experiment RCP2.6.

Table S1. The piControl trends computed over the 150 year period after branching of the abrupt4xCO₂ experiment. Temperature trends have units °C per year, and the top of atmosphere radiation components have units W/m^2 per year.

	$\Delta T/\text{year}$	$\Delta \text{rlut}/\text{year}$	$\Delta \text{rsdt}/\text{year}$	$\Delta \text{rsut}/\text{year}$
ACCESS1-0	1.05e-03	1.52e-03	1.66e-06	-1.31e-03
ACCESS1-3	4.76e-04	1.14e-03	1.79e-07	-6.73e-04
CanESM2	1.80e-04	2.02e-04	9.70e-17	-2.18e-04
CCSM4	-5.03e-04	-4.86e-04	-1.28e-15	7.58e-04
CNRM-CM5	1.16e-03	1.61e-03	-1.09e-06	-9.32e-04
CSIRO-Mk3-6-0	6.71e-04	8.82e-04	-3.76e-09	-1.09e-03
GFDL-CM3	8.09e-04	1.51e-03	-1.29e-15	-9.08e-04
GFDL-ESM2G	-1.04e-03	-1.86e-03	0.00e+00	1.93e-03
GFDL-ESM2M	-1.11e-04	-3.93e-04	0.00e+00	-3.21e-04
GISS-E2-H	8.76e-04	9.77e-04	-1.02e-15	-6.38e-04
GISS-E2-R	5.33e-04	7.95e-04	-3.75e-16	-6.00e-04
HadGEM2-ES	-2.84e-04	1.06e-04	0.00e+00	1.67e-04
inmcm4	-7.63e-04	-1.18e-03	1.48e-06	1.03e-03
IPSL-CM5A-LR	-3.86e-04	-3.81e-04	1.02e-10	1.01e-03
IPSL-CM5B-LR	1.36e-03	2.84e-03	-2.39e-10	-1.62e-03
MIROC-ESM	6.67e-04	7.70e-04	-2.85e-06	-9.82e-05
MIROC5	-3.60e-04	-2.79e-04	4.66e-10	6.02e-04
MPI-ESM-LR	-5.64e-05	2.76e-04	-8.26e-07	-1.28e-04
MPI-ESM-MR	2.89e-05	8.32e-05	-1.40e-07	-1.91e-05
MRI-CGCM3	2.93e-04	1.07e-03	2.75e-06	-4.39e-04
NorESM1-M	-4.72e-04	-9.77e-04	1.14e-10	3.36e-04
min	-1.04e-03	-1.86e-03	-2.85e-06	-1.62e-03
max	1.36e-03	2.84e-03	2.75e-06	1.93e-03