Introduction

The auxiliary figure S1 shows the time series of the edge of the tropics for each hemisphere estimated from ERA40 (black) and NCEP/NCAR (dashed black) reanalysis data, the AM2.1 SST (green), and SST+RAD (red) simulations for (a) DJF; (b) MAM; (c) JJA; and (d) SON. It unequivocally demonstrates that for each season, only under the forcing including the direct radiative effects due to the changing atmospheric constituents can the AM2.1 capture the widening trend of the tropics during the period 1958-1999. SST/sea ice forcing alone causes either no change, or even significant contraction in the width of the tropics.

The auxiliary figure S2 compares the 1958-1999 trends of the tropical width (circles) to the probability density distribution of the trend of the unforced variability. The green, red, black and filled circles correspond to the trends for AM2.1 SST, AM2.1 SST+RAD, ERA40, and NCEP/NCAR, respectively. The probability density distribution of the unforced trend is derived from randomly sampling of a 42-year linear trend from the tropical width data pool constructed by subtracting the ensemble mean from each individual member of the AM2.1 simulations and then concatenating the resultant time series of all the 10 members. The null-hypothesis of the test is that the simulated trends and/or the trends from the reanalyses are the result of intrinsic atmospheric variability under fixed SST/sea ice boundary conditions.

1. 2008gl036076-fs01.eps (Auxiliary figure S1) Time series of the edge of the tropics for each hemisphere for each season, estimated from ERA40 (black) and NCEP/NCAR (dashed black) reanalysis data, and the AM2.1 SST (green) and SST+RAD (red) simulations.

2. 2008GL036076-fs02.eps (Auxiliary figure S2) 1958-1999 trends of the tropical width (circles) relative to the probability density distribution of the trend of the unforced variability. The green, red, black and filled circles correspond to the trends for AM2.1 SST, AM2.1 SST+RAD, ERA40, and NCEP/NCAR, respectively. The filled circle fails to display in NH JJA, SH DJF, SH MAM, because the widening trend of NCEP/NCAR exceeds the axis range.
Figure S1  Time series of the edge of the tropics for each hemisphere for each season, estimated from ERA40 (black) and NCEP/NCAR (dashed black) reanalysis data, and the AM2.1 SST (green) and SST+RAD (red) simulations.
**Figure S2** The 1958-1999 trends of the tropical width (circles) relative to the probability density distribution of the trend of the unforced variability (see text for detail explanation). The green, red, black and filled circles correspond to the trends for AM2.1 SST, AM2.1 SST+RAD, ERA40, and NCEP/NCAR, respectively. The filled circle fails to display in NH JJA, SH DJF, SH MAM, because the widening trend of NCEP/NCAR exceeds the axis range.