Supplementary materials for:

Declining, seasonal-varying emissions of sulfur hexafluoride from the United States point to a new mitigation opportunity

Lei Hu[1,2*], Deborah Ottinger[3], Stephanie Bogle[3], Stephen Montzka[2], Phil DeCola[4,5], Ed Dlugokencky[2], Arlyn Andrews[2], Kirk Thoning[2], Colm Sweeney[2], Geoff Dutton[1,2], Lauren Aepli[5], Andrew Crotwell[1,2]

[1] Cooperative Institute for Research in Environmental Sciences, University of Colorado-Boulder, Boulder, CO, USA
[2] Global Monitoring Laboratory, US National Oceanic and Atmospheric Administration, Boulder, CO, USA
[3] Climate Change Division, US Environmental Protection Agency, Washington D.C., USA
[4] University of Maryland, College Park, MD, USA
[5] Gist.Earth LLC, College Park, MD, USA

*Correspondence to lei.hu@noaa.gov

Figures S1 – S3.

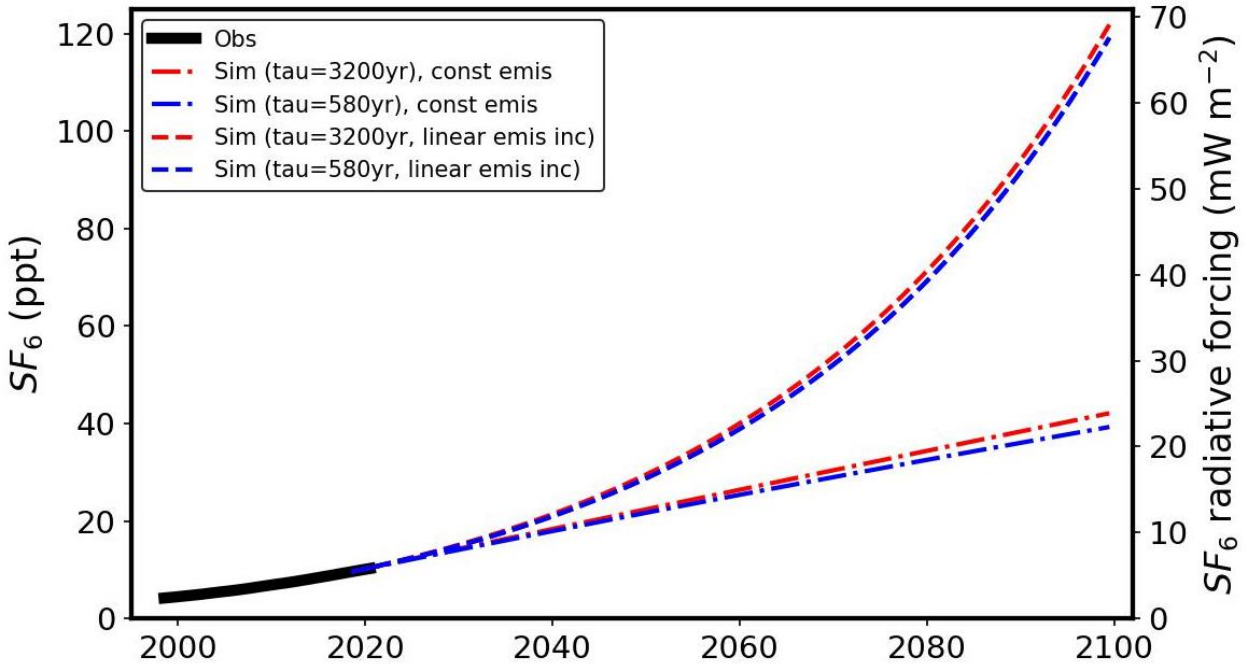

Fig. S1. Global atmospheric SF_6 mole fractions observed by NOAA for 1998 – 2021 and projected to 2100, considering two different atmospheric lifetimes (580 years and 3200 years) and two emission scenarios (a constant global emission of 9 Gg yr^{-1} "const emiss" and a constant emission increase of 0.2 (Gg yr^{-1}) yr^{-1} with an initial global emission of 9 Gg yr^{-1} in 2018 "linear emis inc"). The corresponding radiative forcing is plotted on the right.

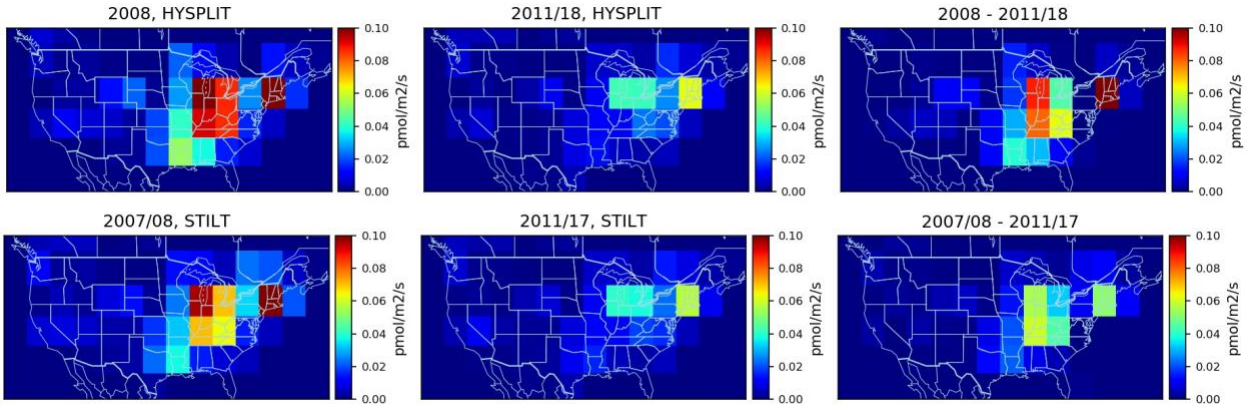

Fig. S2. Emission maps of SF_6 derived from atmospheric observations using two transport models (HYSPLIT-NAMS in upper panels and WRF-STILT in lower panels) for 2007 – 2008 and 2011-2018 periods. The third columns indicate emission differences between both periods. Note that there is a small difference in the time period plotted due to the slightly different availability of footprints from both transport models.

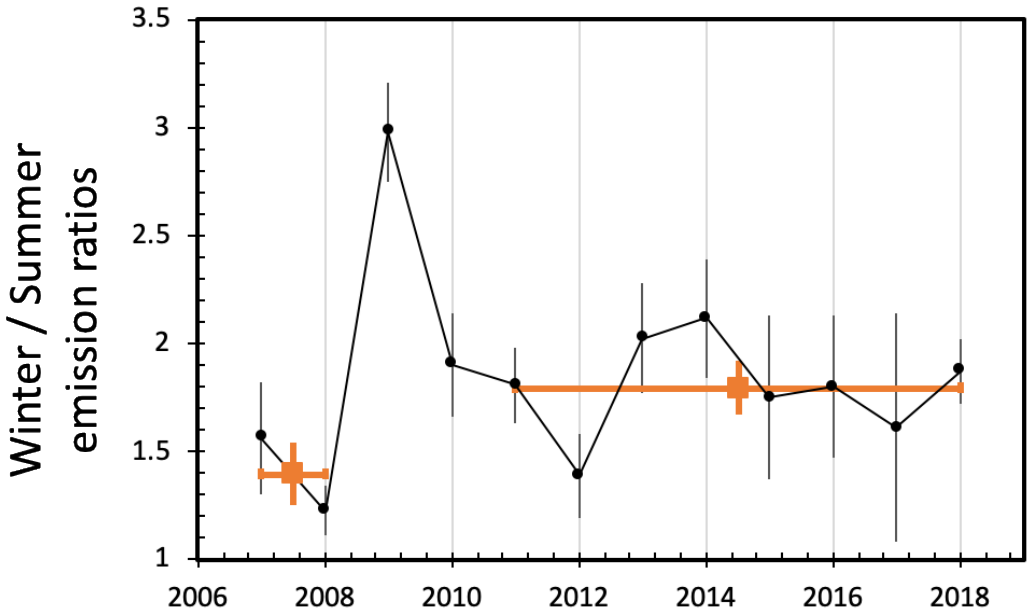

Fig. S3. The winter-to-summer ratios of US national SF_6 emissions between winter (Nov - Feb) and summer (May - Aug) by year, derived from the atmospheric observations. Errorbars represent one standard deviation derived from 12 ensemble members. Orange squares indicate multi-year average ratios with vertical bars indicating one standard error. Horizontal lines indicate years covered.