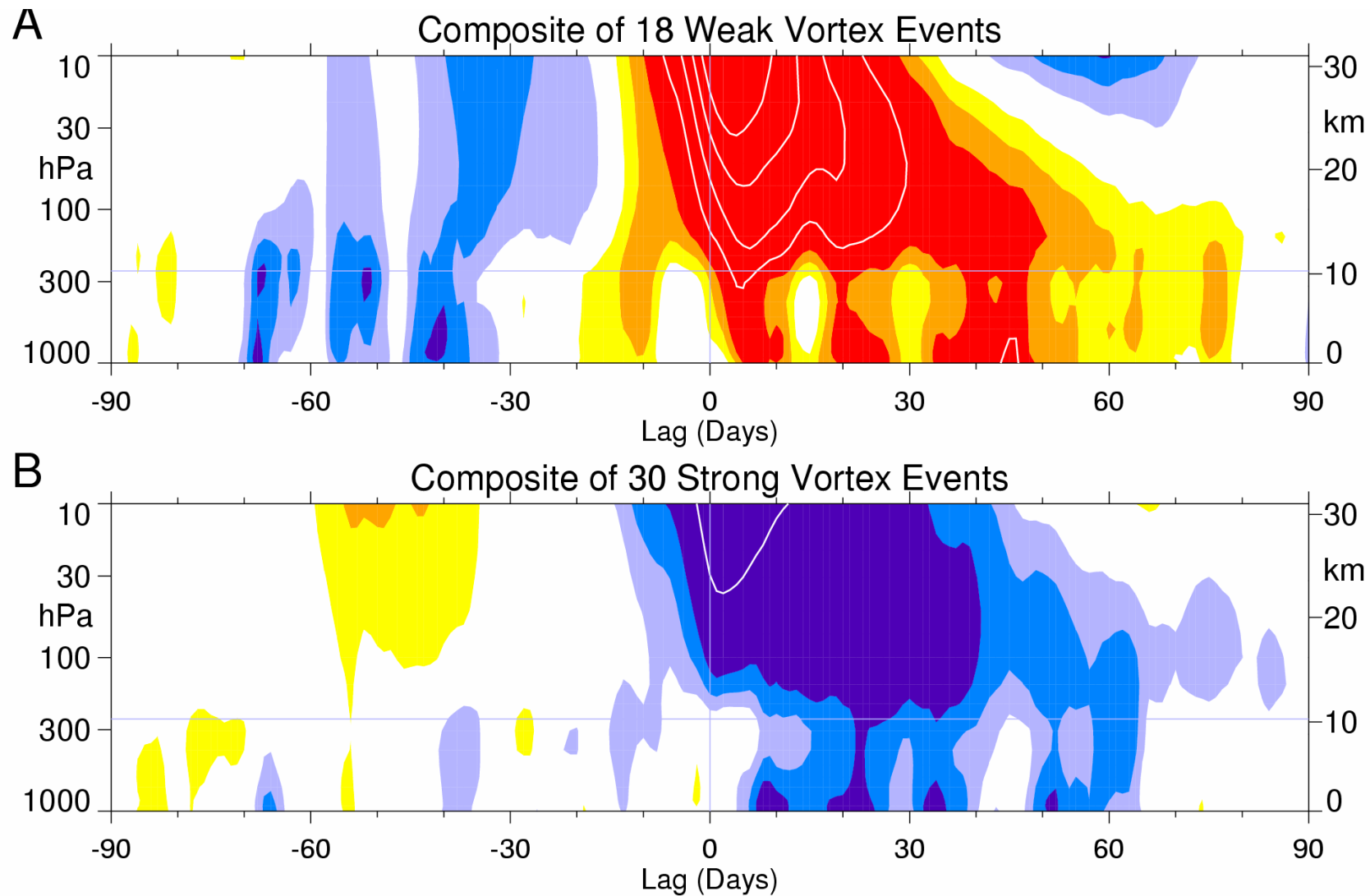


The impact of stratospheric ozone depletion on climate change at Earth's surface*

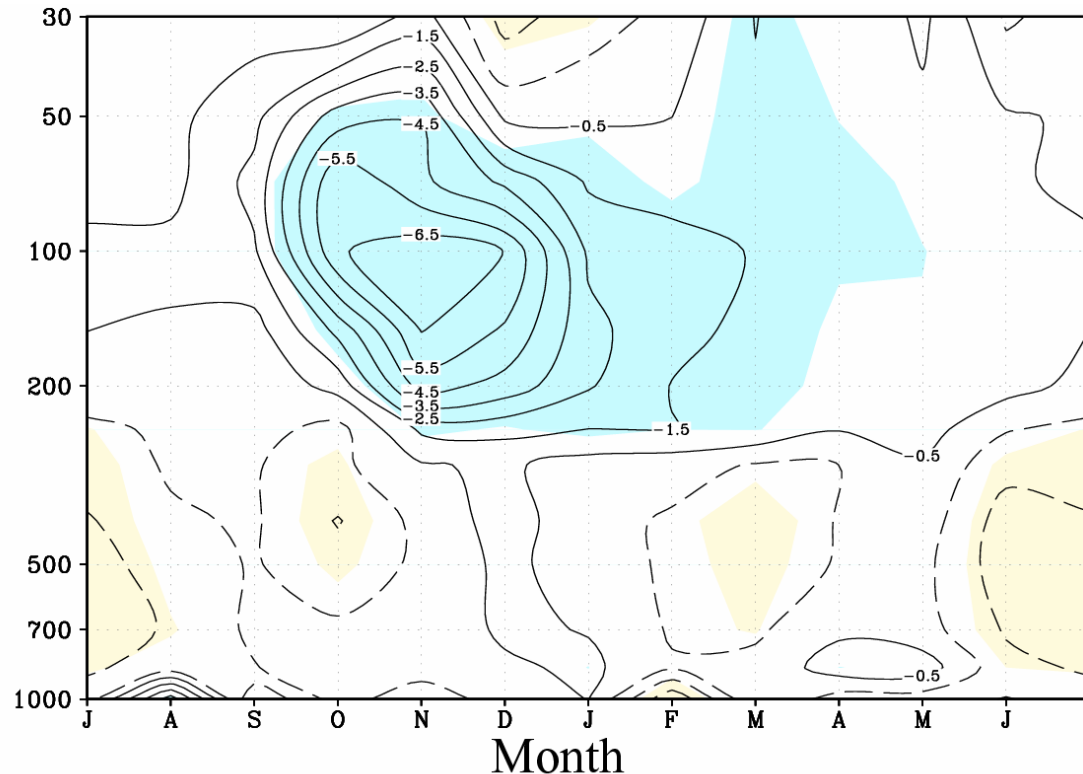
David W. J. Thompson
Department of Atmospheric Science
Colorado State University

Stratosphere/troposphere coupling and the NAM



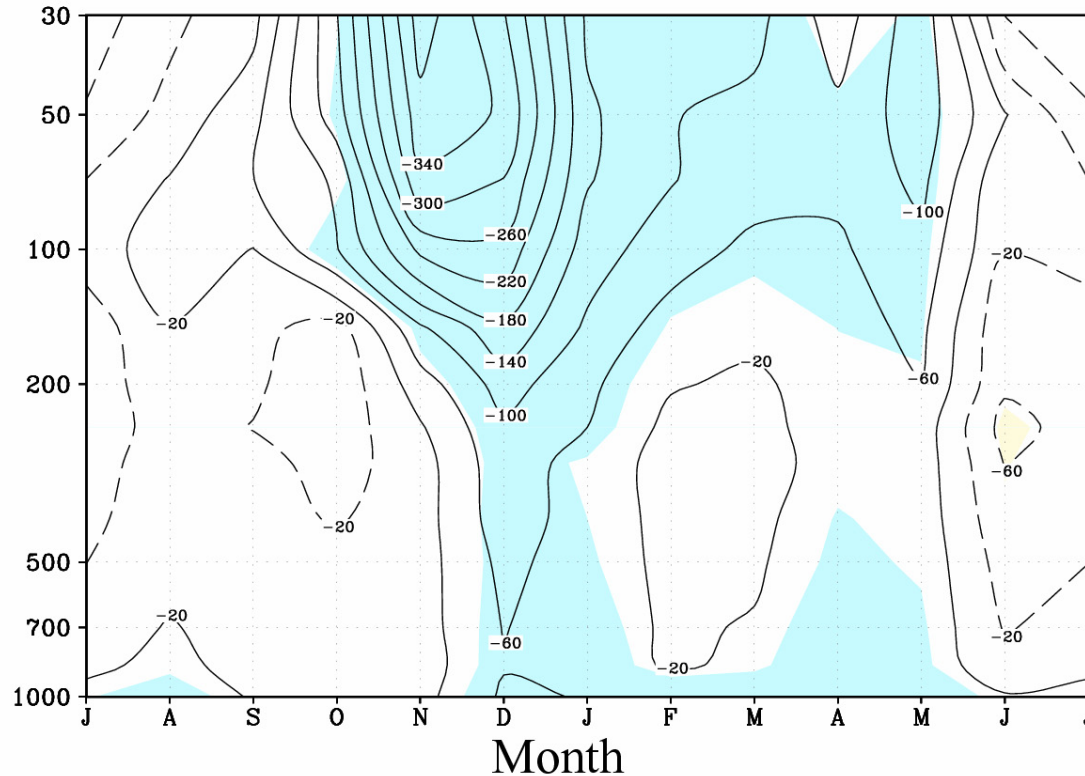
(from Baldwin and Dunkerton)

30-year trends in T_{65-90}



30-yr (1969-98) linear trends in T_{65-90} . Contours at 1 K/30-yr (-1.5, 0.5, 0.5...). Shading denotes trends >1 std.

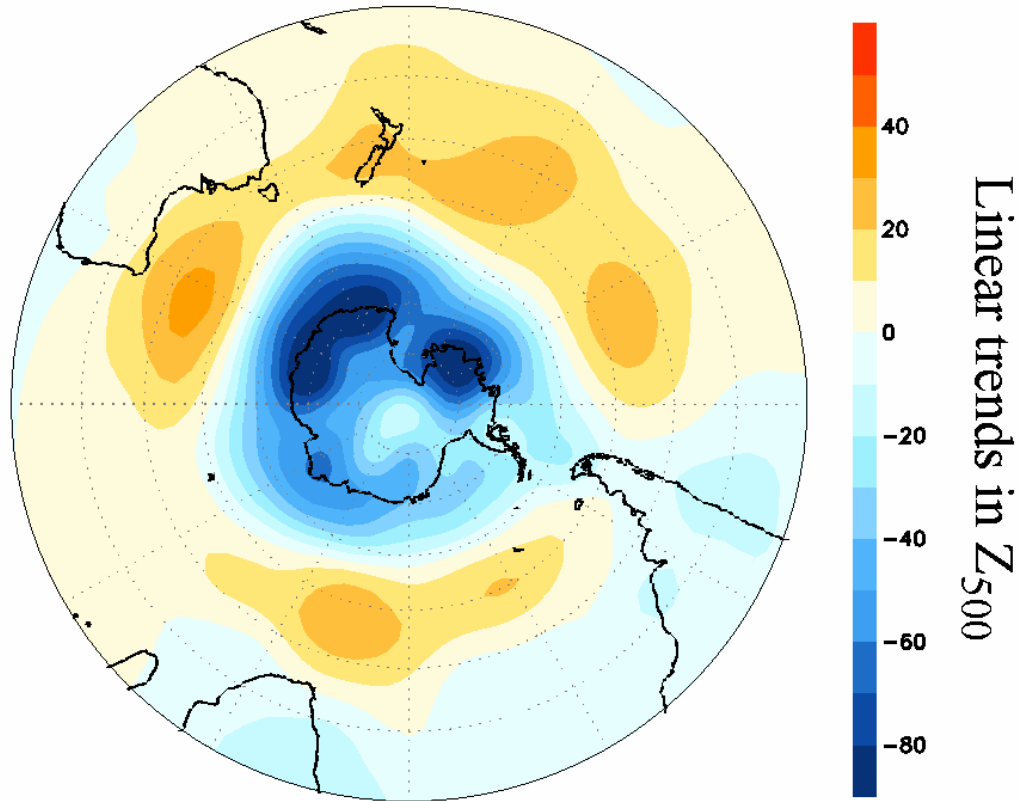
30-year trends in Z_{65-90}



30-yr (1969-98) linear trends in Z_{65-90} °S. Contours at 40 m/30-yr (-60, -20, 20...). Shading denotes trends >1 std.

Simulation of recent SH climate change

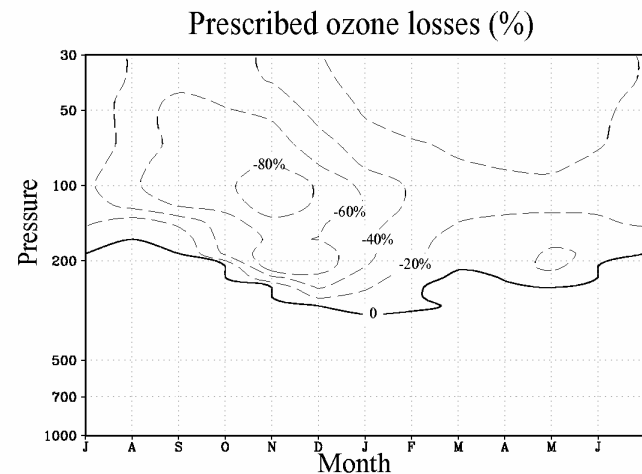
Observations
(adapted from Thompson and Solomon 2002)



Simulation of recent SH climate change

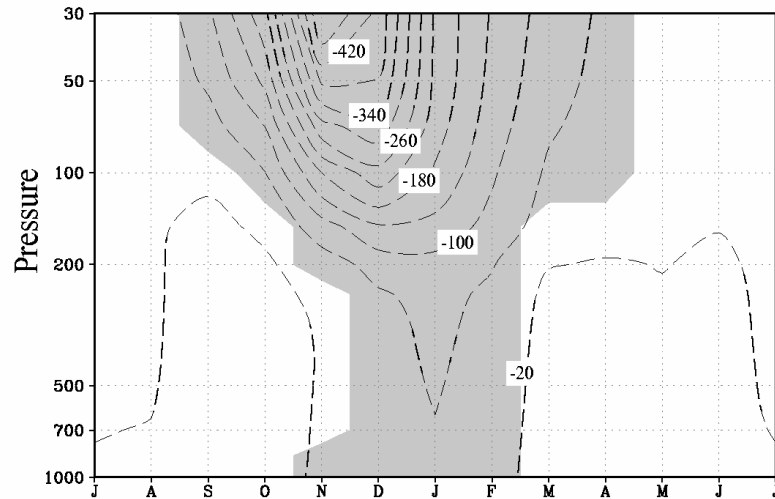
Gillett and Thompson 2003

- 64-level version of the Hadley Centre HADSM3. Extends to 0.01-hPa. Mixed layer ocean. (Gillett et al. 2002).
- All variables held fixed between control and perturbed runs except for stratospheric ozone levels.
- Control run: 25-years run with seasonally varying ozone at (estimated) preindustrial levels.
- Perturbed run: 20-years run with ozone depletion based on observed losses 1979-1998.

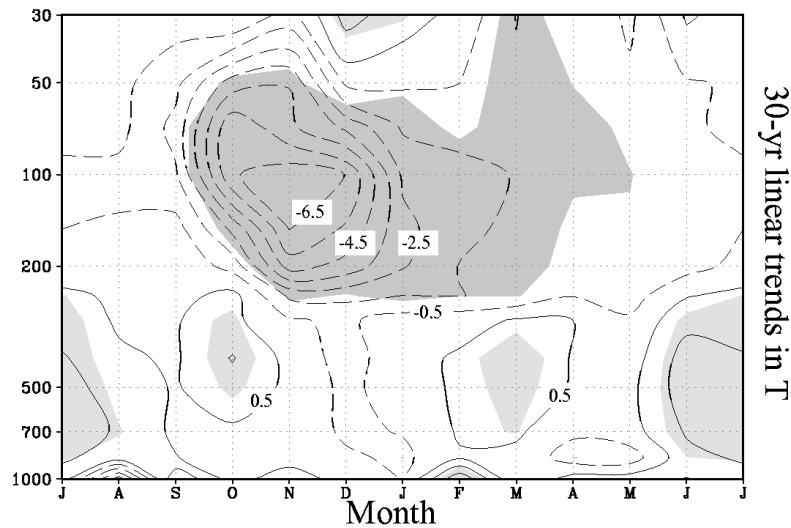
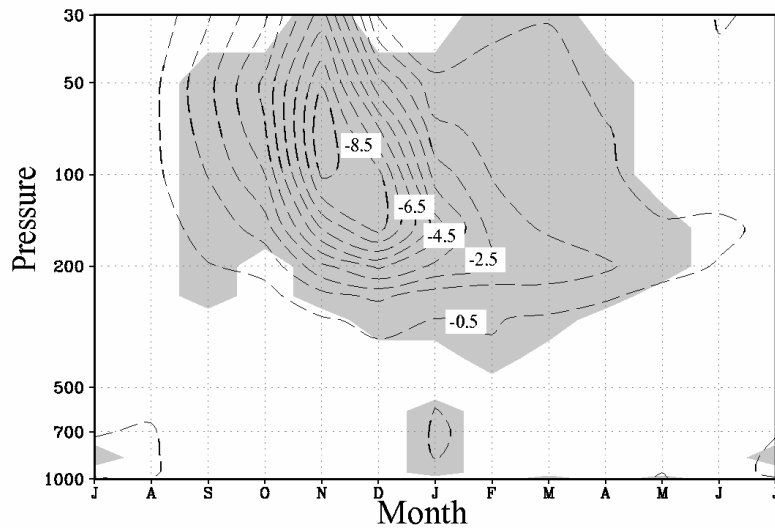
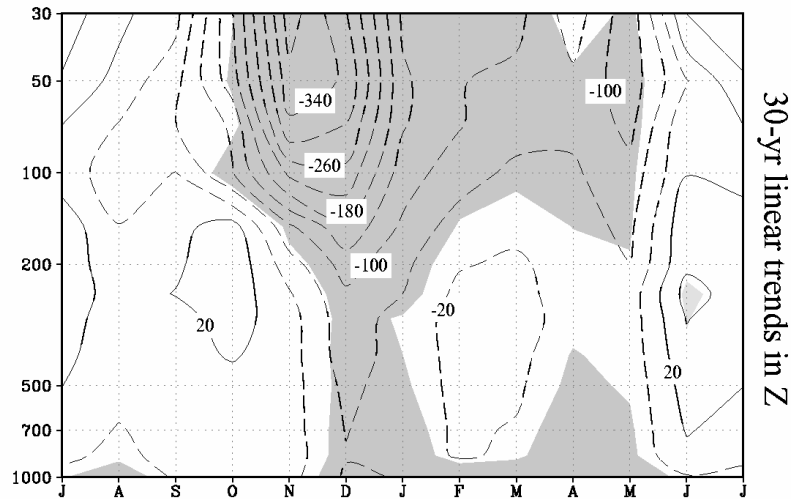


Simulation of recent SH climate change

Model

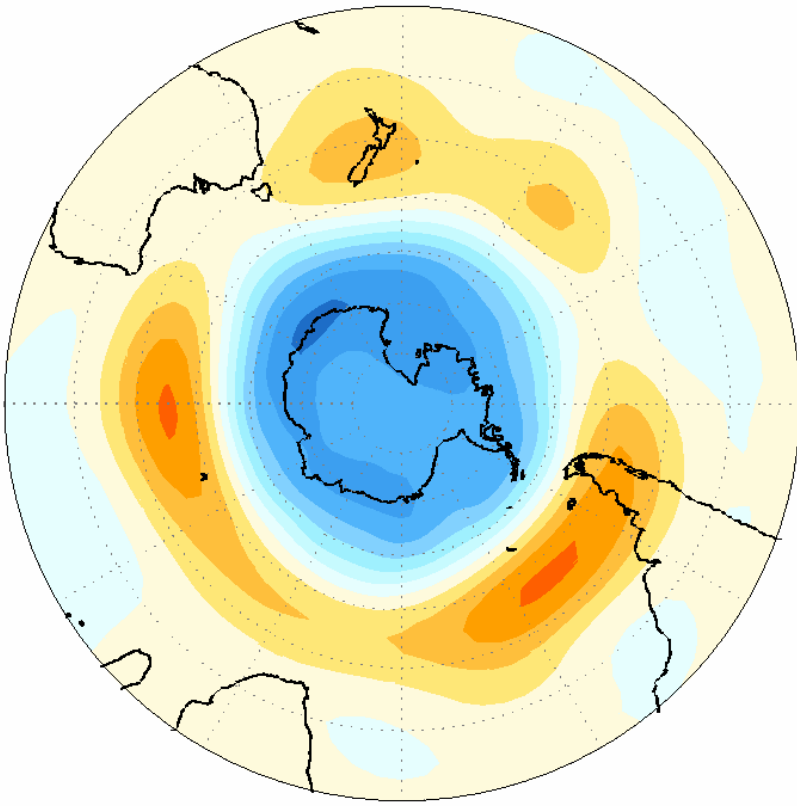


Observations
(from Thompson and Solomon 2002)

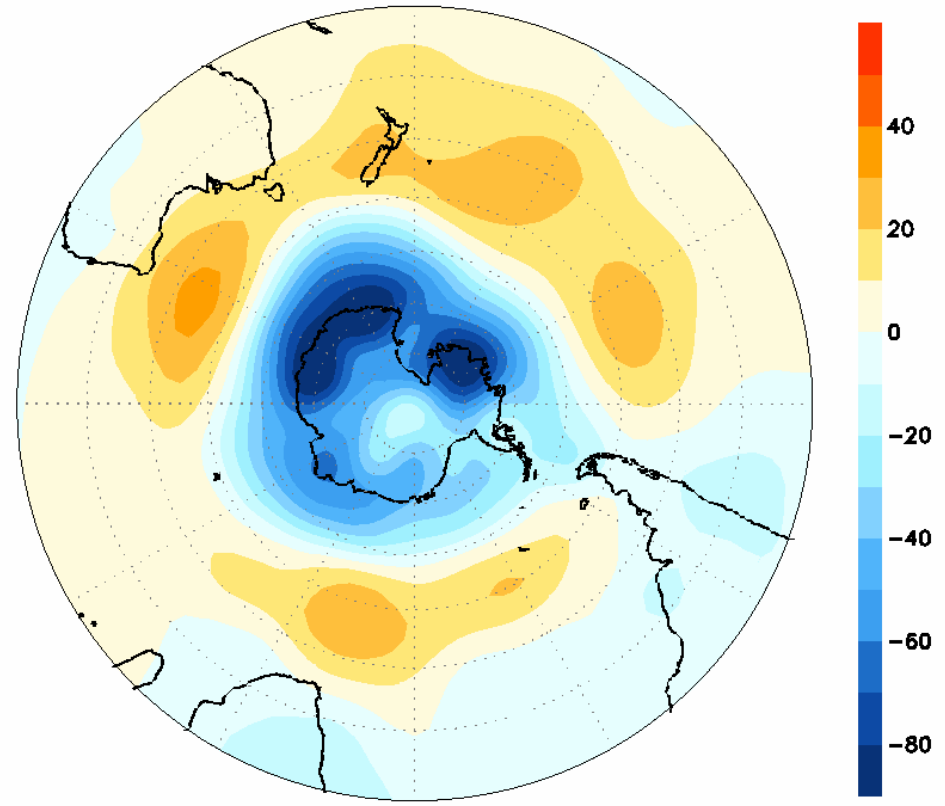


Simulation of recent SH climate change

Model



Observations
(adapted from Thompson and Solomon 2002)



- SH stratospheric ozone depletion is associated with substantial changes in climate at Earth's surface.