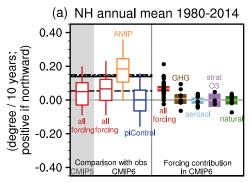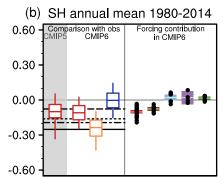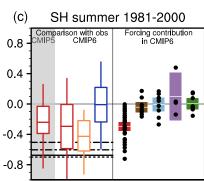# Tropical overturning circulation changes
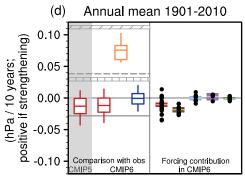
Trend in Hadley cell's subtropical edge latitude

(a) NH annual mean 1980-2014   (b) SH annual mean 1980-2014   (c) SH summer 1981-2000

Trend in Walker circulation strength

(d) Annual mean 1901-2010   (e) Annual mean 1951-2010   (f) Annual mean 1980-2014

ERA-20C - - -   ERA5 ———   95th 75th mean 25th 5th   Ensemble range (all members)   mean of each model   5-95% confidence int. (models with ≥ 3 runs)

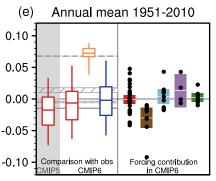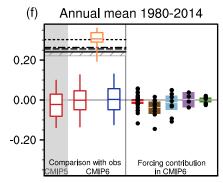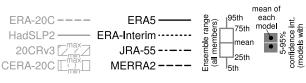HadSLP2 ———   ERA-Interim ·······

20CRv3 [max/min]   JRA-55 —·—·

CERA-20C [max/min]   MERRA2 — — —

CMIP5 historical-RCP4.5 (33 models, 106 runs)
CMIP6 historical (41 models, 377 runs)
AMIP (a-c: 32 models, 111 runs, e-f: 9 models, 38 runs)
piControl (41 models, a,b,f: 631, c: 1103, d: 186, e: 363 segments)

hist-GHG (9 models, 45 runs)
hist-aer (9 models, 58 runs)
hist-stratO3 (4 models, 26 runs)
hist-nat (9 models, 53 runs)