

1. Motivation:

We examine the tropopause height (p_{tp}) over all the world from 1960 to 2050 as simulated by a high-resolution CCM to determine:

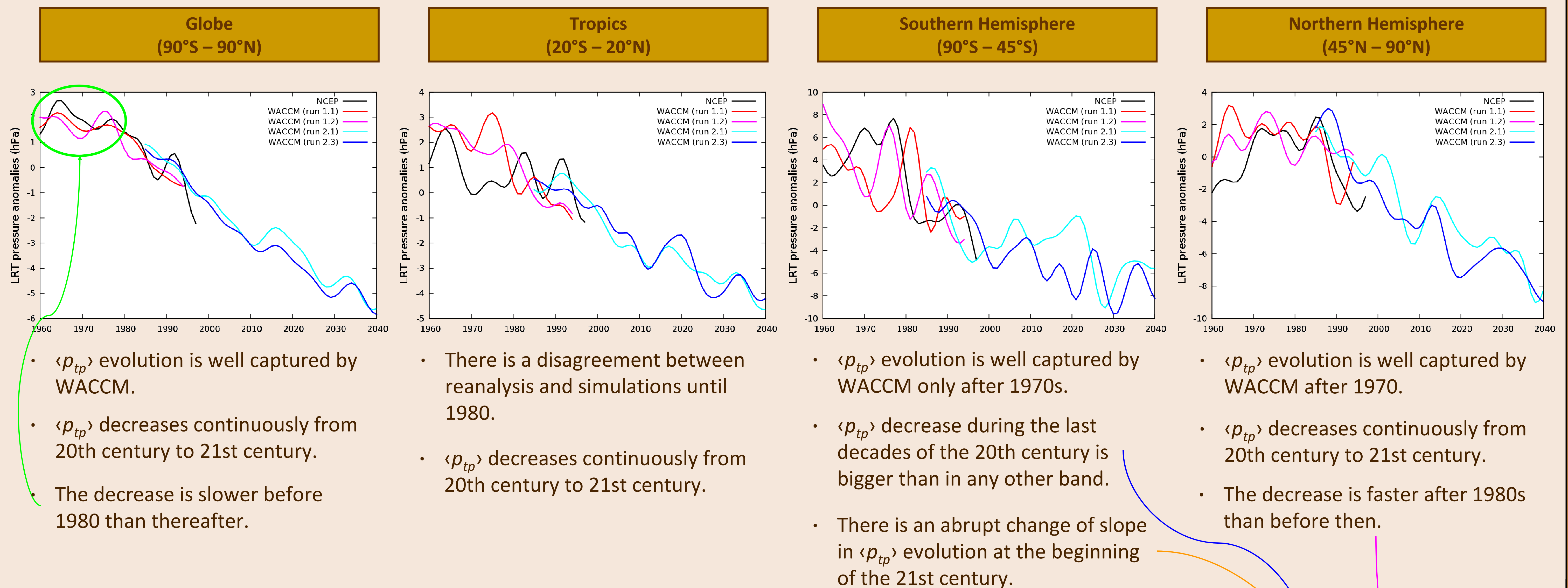
- ✓ if simulated trends coincide with reanalysis at the end of the 20th century.
- ✓ the nature of trends projected for the 21st century.
- ✓ the differences in projections over different latitudinal bands.

2. Data used:

- NCEP reanalysis ($2.5^\circ \times 2.5^\circ$, 17 pressure levels)
- WACCM model ($2.5^\circ \times \approx 2.8^\circ$, 66 pressure levels):
 - 2 runs (1.1 and 1.2) from 1950 to 2004
 - 2 runs (2.1 and 2.3) from 1975 to 2050

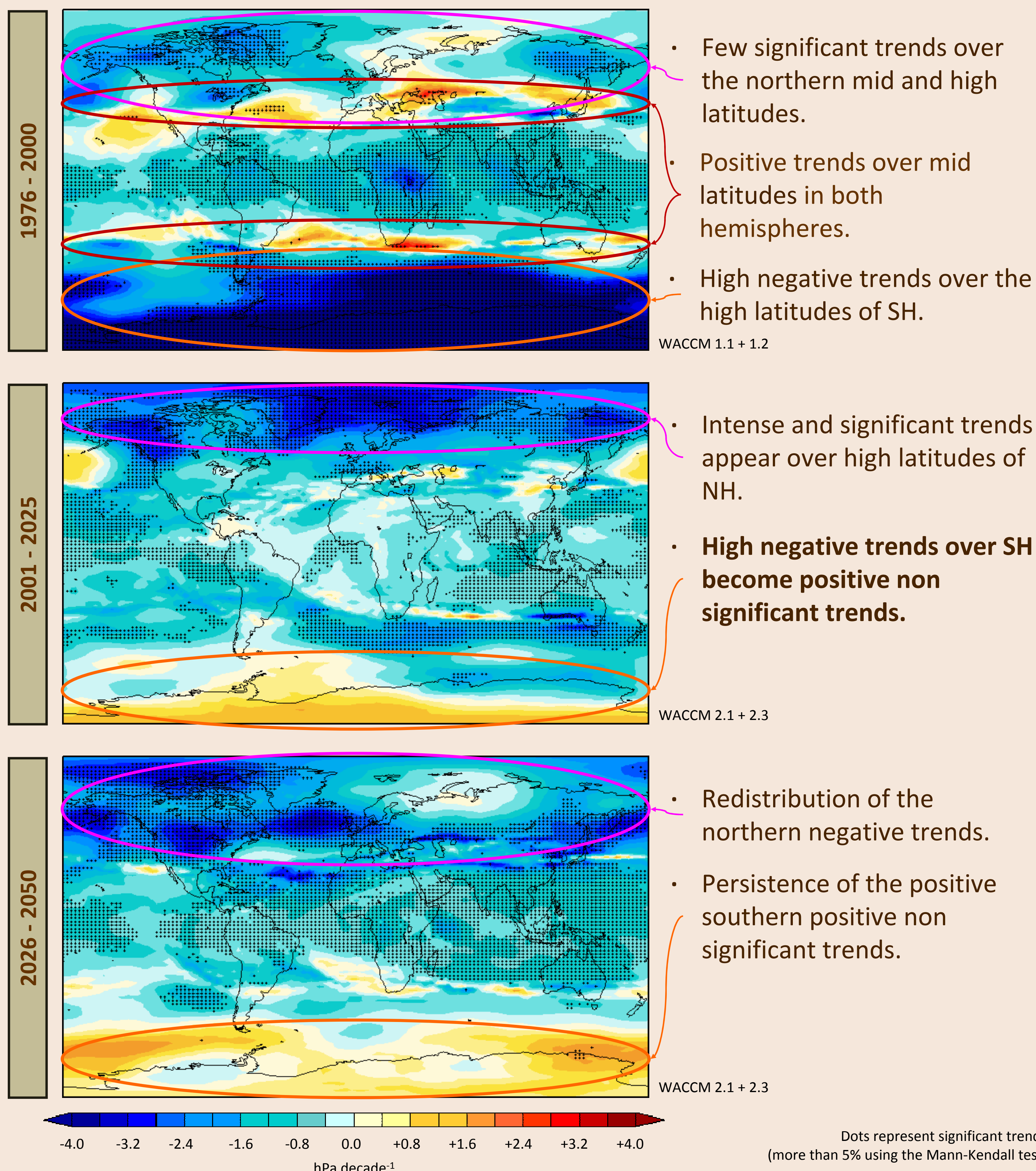
3. Does WACCM reproduce mean tropopause height trends obtained from reanalysis? What are the projected changes for the 21st century?

ANOMALIES DEFINED AS THE DEVIATION FROM THE 1975-2004 MEAN

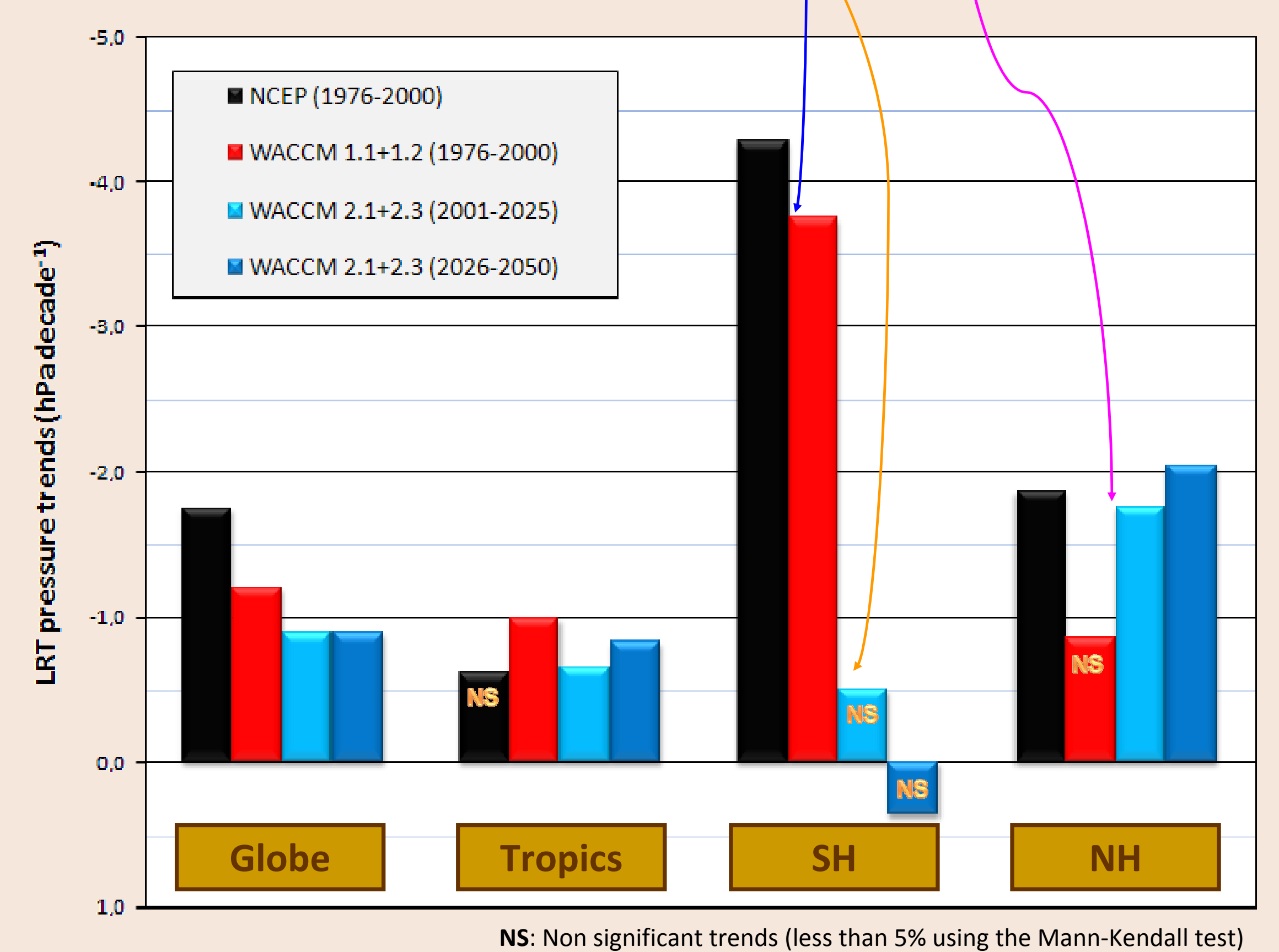


4. Which is the spatial pattern of the simulated trends?

TRENDS DEFINED AS LINEAR REGRESSIONS



Magnitude of the trends



5. Conclusions:

- ✓ WACCM reproduces correctly the behavior of the global mean tropopause height computed from NCEP reanalysis in the last four decades of the 20th century. However, the mean values over individual latitudinal bands are not so well simulated.
- ✓ WACCM projects a continuous decrease of global mean tropopause height during the first half of the 21st century.
- ✓ WACCM also projects a decrease of tropopause height over all the world except over Antarctica and surroundings.
- ✓ WACCM projections for the 21st century include changes in tropopause height trends. The most important changes are:
 - A disappearance of high negative trends in high latitudes over SH.
 - An increase of the magnitude of the negative trends over NH.