

Trends in Cloud Water Path and Total Cloud Amount Over China



Xingyu Li

Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences (CAS)

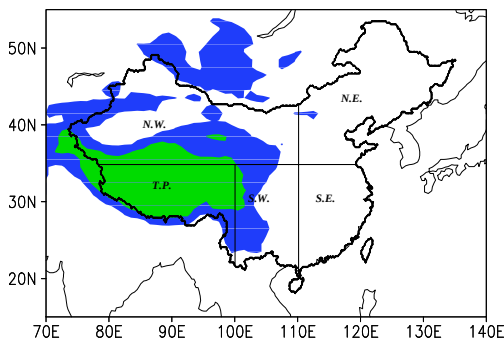
E-mail: lxy@mail.iap.ac.cn



Introduction

Climatic features of total cloud amount (TCA) over China, especially the trend of TCA, have been involved in many researches using data from surface and satellite observations. But little attention has been devoted to the long-term variation of cloud water path (CWP) and the relationship between trends in TCA and CWP. The aim of this study is to investigate the trend of CWP using over twenty years satellite observations and compare it with the trend of TCA in different climate regions of China.

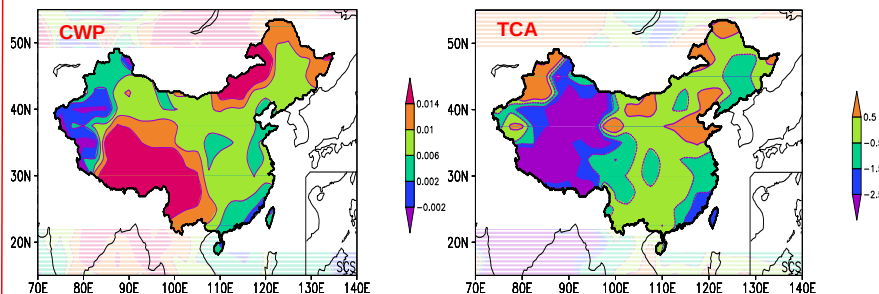
Analysis area



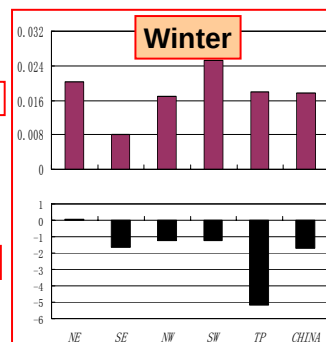
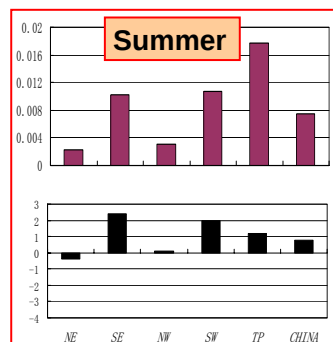
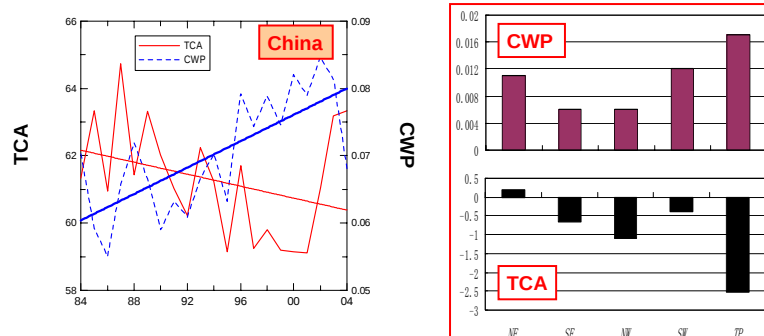
Data Set

- Data sources: ISCCP D2, NCEP Reanalysis, NOAA Interpolated OLR, ERA-40, GPCP V2
- Time period: 1984-2004
- Data resolution: $2.5^\circ \times 2.5^\circ$
- According to regional climatic features, the analyses are carried out in five different areas

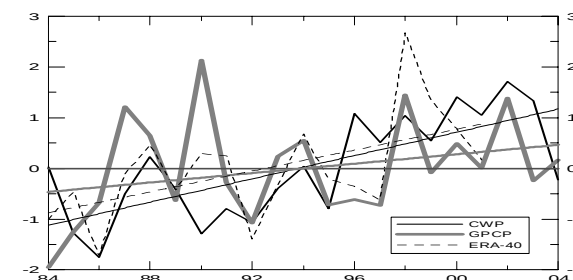
Linear trend (1984-2004)



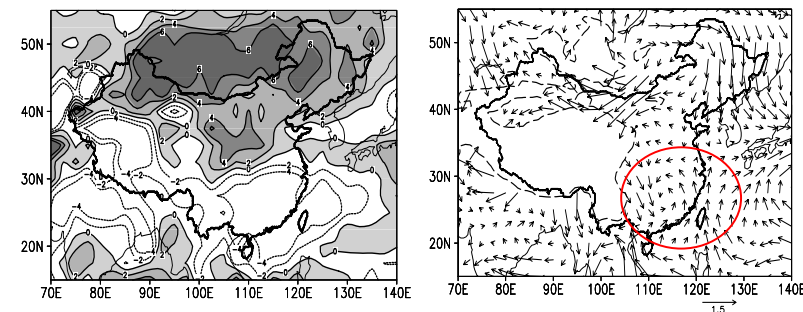
Linear trend (regional average)



Linear trend of annual mean CWP, precipitation (GPCP) and water vapor (ERA-40)



Difference (1995-2004 minus 1984-1994) of summer mean OLR and 850hPa circulation



Summary

- The increasing trends of annual mean CWP are found in most regions of China when the decreasing trends of TCA are shown in the same period.
- The linear trend pattern of increasing CWP and decreasing TCA can be found in spring, fall and winter.
- For summer, increasing trends exist in most regions with higher linear trends in the southeastern (SE) China where a weakening east asian summer monsoon and increasing precipitation are found during the period.