Study on Precipitation Anomalies of Northern China in April and Its relationship to Sea Surface Temperature Evolvement

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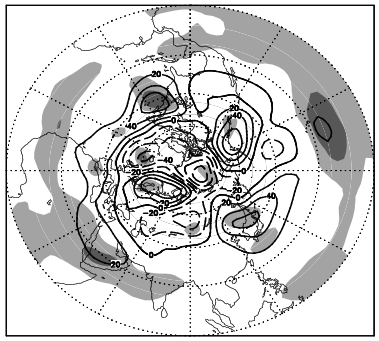
Rainfall in April over Northern China is vital to crop production and spring sowing.

More rain years:
1964,1969,1979,1983,1990,1991,1998,2002.
Less rain years: 1971,1972,1978,1986,1995.

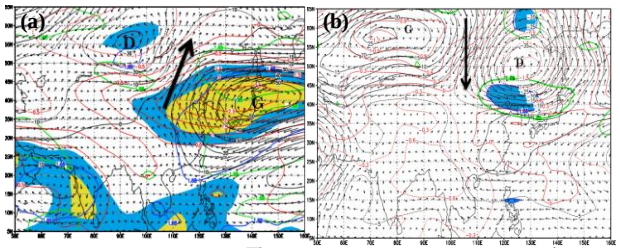
(1) In more rain years cold and warm air masses met and interacted over Northern China in April.

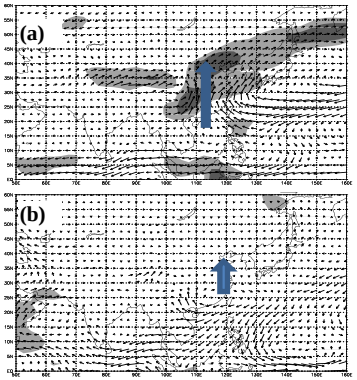
The difference of geopotential height at 500hPa between more rain years and less rain years over Northern China in April and significance test



(2) The atmospheric circulation in more rain years was quite different from that in less rain years. So was the water vapor transport.

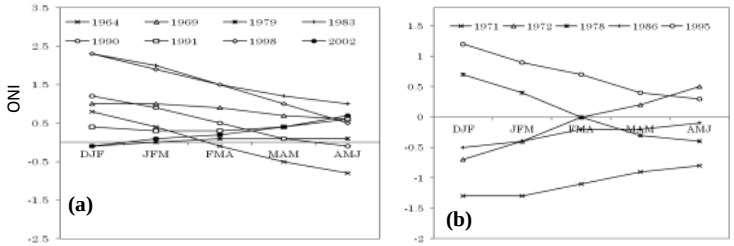
The composite of temperature, geopotential height and wind departures in 500hPa over Northern China in April in more rain years(a) and less rain years(b).



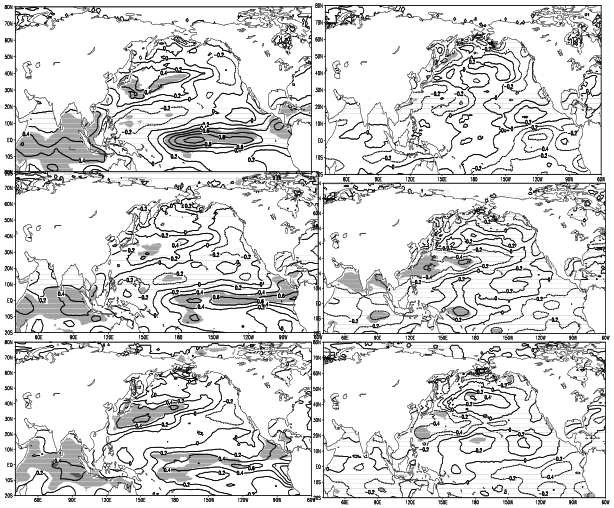


The composite of water vapor flux for 1000-300hPa in more rain years(a) and less rain years(b) over Northern China in April.

(3) In more rain years the precipitation closely related to SSTA in key oceanic regions and SST evolvement. However, in less rain years it was not. Therefore, the relationship of rainfall to SSTA and SST evolvement appeared unsymmetric .



Evolvement of running-mean monthly ONI in more rain years (a) and in less rain years (b) over Northern China in April.



The composite of sea surface temperature anomalies in February, March and April over Northern China in April in more rain years (left top, left middle and left bottom), and in less rain years (right top, right middle and right bottom)