



The Climatology Characteristics of Summer Torrential Rain and Its Influencing Weather System over China's Yangtze-Huaihe River Region in the Context of Climate Change

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Since 1980s, there have been a significant trend of climate warming in China. In this paper, ERA-Interim wind data and China's 756 station daily precipitation data are used, the torrential rain, shear line and shear line torrential rain over China's Yangtze-Huaihe river region during June-July from 1981-2013 are analyzed objectively by statistic method. Conclusions are drawn as follows:

- 1) On average, during the 61 days from June to July, there are 30.2 torrential rain days, 33.2 shear line days and 22.0 shear line torrential rain days over China's Yangtze-Huaihe river region in the last 33 years from 1981 to 2013. It means 2/3 of shear line can lead to torrential rain, 3/4 of torrential rain are caused by shear line. Therefore, shear line is the major influencing weather system for torrential rain over Yangtze-Huaihe river region.
- 2) Since 1980s, torrential rain days, shear line days and shear line torrential rain days over Yangtze-Huaihe river region during June and July have different annual growth rates. The number of shear line torrential rain days is basically stable in the last 33 years, the number of torrential rain days and shear line days are growing annually at some extent.
- 3) By averaging 33 years, it is shown that shear line torrential rain over Yangtze-Huaihe river region mainly concentrate in the period from the 4th pentad in June to the 2nd pentad in July that is called as the Meiyu period. And no significant cycle of shear line torrential rain days can be found during such period.
- 4) Of shear line torrential rain days, warm shear line torrential rain days have the highest occurrence with the percentage 38%, followed by cold shear line torrential rain days 22%, quasi-static shear line torrential rain days 19% and vortex shear line torrential rain days 21%. However, the precipitation intensity of warm shear line torrential rain is the lowest, the precipitation intensity of vortex shear line torrential rain is the highest.
- 5) The precipitation intensity of shear line torrential rain over Yangtze-Huaihe river region correlates with the vorticity intensity of shear line.

Key words: climate change, shear line over Yangtze-Huaihe river region, torrential rain, climatology characteristics