

## **Analysis of actual evaporation variability over China during the last half century using the Budyko hypothesis**

**GUANGHENG NI, FUBAO SUN, DAWEN YANG, ZHENTAO CONG & ZHIDONG LEI**

*Department of Hydraulic Engineering, Tsinghua University, Beijing 100084, China*  
[sunfubao98@mails.tsinghua.edu.cn](mailto:sunfubao98@mails.tsinghua.edu.cn)

**Abstract** Using daily climate data from 1951 to 2003 at 726 stations, together with land cover and soil data, the spatial and temporal variability of potential and actual evaporation during the last half century in China is studied. The actual evaporation is estimated using the Budyko hypothesis and taking into consideration the aridity index, the soil moisture holding capacity, and seasonality parameters. It is found that the actual evaporation shows a significant increasing trend in western China, while a significant decreasing trend occurs in eastern China. The trends of potential and actual evaporation are opposite in western China, but the same in eastern China. The actual and potential evaporation have a proportional relationship in the very humid and humid regions, and a complementary relationship in the semi-arid and arid regions. The semi-humid region sees a transition from the proportional to complementary relationship. The desert area is an exception, where actual evaporation variation with change in potential evaporation is very small due to the very dry environment.

**Key words** actual evaporation; Budyko hypothesis; complementary relationship; potential evaporation

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