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The variation trend of soil dryness/wetness over North China in recent 20 years and its countermeasures of water management and regulation

X.L. Zhao

National Meteorology Center, China Meteorological Administration, Beijing, P. R. China
(zhaoxl6864@yahoo.cn / Fax: +86-10-62172982 / Tel: +86-10-58995037 / ZIP Code: 100081)

Soil moisture plays an important role in the global hydrological cycle. Under the background of global climate warming, it is urgent to study the temporal and spatial characteristics in soil dryness/wetness variation in China region in recent several decades and its response to climate change. This study aims to investigate the variation trend of soil moisture storage over North China in recent 20 years and its temporal and spatial characteristics using the soil moisture observation data from 35 stations over North China.

The results show that the whole trends of annual mean soil moisture storage averaged by different soil layers from soil surface to top 50 cm is decreasing generally, but the geographical differences over the region are evident. Moreover, the most remarked centers of soil dryness are in the Jingjintang Region and in the western of Shanxi Province, respectively. From soil surface to top 50 cm, the decreasing extent of annual mean soil moisture storage for the region increases with vertical soil depth. The drier trend in spring and autumn are more evident than in summer and winter. The inter-decadal variations of soil moisture storage for the different divisions show the different notable characteristics, but the common among them is the fluctuant decrease over the period from 1995 to 2002.

In order to lessen the disadvantageous influences of soil dryness on ecology and agriculture in North China, it is necessary to take effective measures of water management and regulation.