



地理学报(英文版) 2004年第14卷第4期

Natural runoff changes in the Yellow River Basin

作者: LI Chunhui YANG Zhi feng

The driving factors of runoff changes can be divided into precipitation factor and non-precipitation factor, and they can also be divided into natural factor and human activity factor. In this paper, the ways and methods of these driving factors impacting on runoff changes are analyzed at first, and then according to the relationship between precipitation and runoff, the analytical method about impacts of precipitation and non-precipitation factors on basin's natural runoff is derived. The amount and contribution rates of the two factors impacting on natural runoff between every two adjacent decades during 1956-1998 are calculated in the Yellow River Basin (YRB). The results show that the amount and contribution rate of the two factors impacting on natural runoff are different in different periods and regions. For the YRB, the non-precipitation impact is preponderant for natural runoff reduction after the 1970s. Finally, by choosing main factors impacting on the natural runoff, one error back-propagation (BP) artificial neural network (ANN) model has been set up, and the impact of human activities on natural runoff reduction in the YRB is simulated. The result shows that the human activities could cause a $77 \times 108 \text{ m}^3 \cdot \text{a}^{-1}$ reduction of runoff during 1980-1998 according to the climate background of 1956-1979.

Paper (PDF)

关键词: natural runoff; precipitation; non-precipitation; natural factor; human activities; the Yellow River Basin (YRB) doi: 10.1360/gs/040405