地理学报(英文版) 2004年第14卷第3期

# Influence of groundwater level change on vegetation coverage and their spatial variation in arid regions

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Sampling and testing are conducted on groundwater depth and vegetation coverage in the 670 km2 of the Sangong River Basin and semi-variance function analysis is made afterwards on the data obtained by the application of geo-statistics. Results showed that the variance curve of the groundwater depth and vegetation coverage displays an exponential model. Analysis of sampling data in 2003 indicates that the groundwater depth and vegetation coverage change similarly in space in this area. The Sangong River Basin is composed of upper oasis, middle ecotone and lower sand dune. In oasis and ecotone, influenced by irrigation of the adjoining oasis, groundwater level has been raised and soil water content also increased compared with sand dune nearby, vegetation developed well. But in the lower reaches of the Sangong River Basin, because of descending of groundwater level, soil water content decreased and vegetation degenerated. From oasis to abandoned land and desert grassland, vegetation coverage and groundwater level changed greatly with significant difference respectively in spatial variation. Distinct but similar spatial variability exists among the groundwater depth and vegetation coverage in the study area, namely, the vegetation coverage decreasing (increasing) as the groundwater depth increases (decreases). This illustrates the great dependence of vegetation coverage on groundwater depth in arid regions and further implies that among the great number of factors affecting vegetation coverage in arid regions, groundwater depth turns out to be the most determinant one.

Paper（PDF）

关键词： geo-statistics; groundwater level; groundwater depth; arid regions; vegetation coverage; semi-variance function; spatial variation; Kriging doi: 10.1360/gs040308