The Rangeland Resource Status and Its Variability in Zoige, Qinghai-Tibetan Plateau

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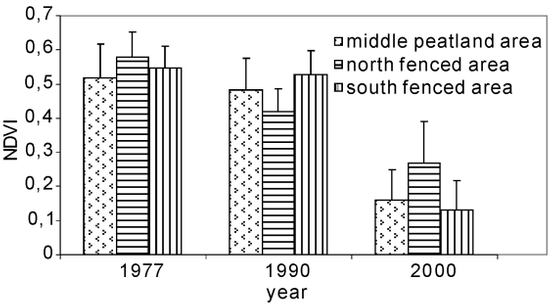
Introduction The high frigid pasturelands of Qinghai-Tibetan Plateau have experienced a dry conditions ,especially in wetland areas ,in recent decades . Past research on the subalpine meadows suggest that sedge meadows ,grass meadows ,and forb meadows are close relationships between succession on these meadows and the intensity of grazing (Wu et al . ,2004) . The time series of Landsat images can be used to verify the vegetation changes and biomass dynamics .

Materials and methods Study area is located in Zoige County in the extreme north western Sichuan ,China (N33 .84°-34 .00° , E102 .74°-102 .96°) . The vegetation can be divided into three general types : shrubs ,peatland vegetation ,and subalpine meadow . Hills are commonly covered with shrubs (*Potentilla fruticosa* and *Spiraea* spp . etc .) ,and subalpine meadow usually occupies the gentle slopes of mountains . The peatland is characteristiced by small hummocks with vegetation dominated by sedges . The average grazing intensity has increased to 4 sheep unit per hectare since middle of 1980s . Figure1 . NDVI series in three plots . Two fenced blocks for winter and summer rangeland were located on subalpine meadow in the north and south of the area ,and a third block representing peatland was located in the middle of this area . Satellite images in 1977 (Landsat MSS) ,1990 (Landsat TM) and 2000 (Landsat ETM+) are used for change detection .

Results From the figure of NDVI series ,there is a clear trend of biomass decrease (Figure 1) . The whole area in 1977 can be generally claimed to produce high biomass . The very low biomass area were usually present in the peatland vicinity of the lakes , but their area is quite small . Biomass on the northern fenced block (winter rangeland) declined from high to middle from 1977 to 1990 ,while biomass in the southern fenced block (summer rangeland) and the middle peatland areas remained high . This situation was totally changed in 2000 ,when the area was characterized with an overall degradation in biomass . Degradation has spread from peatland to the subalpine meadow . The significant reduction in biomass occurs from 1990 to 2000 in the south fenced block . The vegetation biomass in the north fenced block increased during 1990-2000 ,and was even higher than the south fenced block . Similar patterns of decrease in biomass occured in the middle peatland area . A prominent dry period since 1977 occured in the peatland ,but this can not be detected from the changes in lake area of this area . Concomitant with this drying process is the vegetation changes from a community of *Carex muliensis* one of *Kobresia tibetica* .



Conclusions Different pastureland management has profound influence on the composition of vegetation . Winter pastureland has much more diverse vegetation than summer pastureland under heavy grazing . The decrease of water table in peatland drastically influences the type of vegetation . Climate changes may have much more profound influence on regional biomass .

Reference

Wu ,N ,Liu ,J and Yan ,ZL (2004) Grazing intensity on the plant diversity of alpine meadow in the eastern Tibetan plateau . *Rangifer* ,special issue 15 ,9-15 .