Analysis the impact of drought and land use/cover changes on wetlands ecosystem of Sulduz region

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Abstract

Increase of temperature, decrease of annual and seasonal precipitation and Land use/Land Cover changes (LULCC) threaten water management and catchment basins. These conditions can lead to unbalanced distribution of water resources and destruction of aquatic ecosystems like wetlands and lakes. Using of multi-spectral and multi-temporal remotely sensed imageries can be beneficial to study and evaluate the spatial and temporal changes of wetlands. In this study, Landsat data of 1989, 2000, 2003, 2007, 2009, 2011 and 2013 used to monitor LULCC. The precipitation data of synoptic stations used for the drought analysis, Land uses of the study area and local climate exhibited fluctuations over time. These changes have also affected the wetland ecosystem and caused area of them swing over time. The correlation coefficient of the climate change with the fluctuations of wetlands area is 63%. Besides the droughts, the development of agricultural and residential lands was effective in wetlands changes, and has negative correlation with them. The correlation coefficient between aquatic plants growing of wetlands and the development of agricultural lands is 91.5%, which it confirms the arrival of fertilizers and pesticides in to wetlands. Accordingly, maximum changes caused by human intervention, corresponds to the plant population of wetland ecosystem. Zoning of sensitive wetlands habitat, reveals the vulnerable and relatively stable areas, and can help managers and decision makers in conservation of wetland ecosystems.

Keywords: wetland ecosystem, climate change, Land use/cover changes, Drought