Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

ANALYSIS OF WATER AREA IN CAOFEIDIAN WETLAND IN 1984~2013 BASED ON REMOTE SENSING IMAGE DATA

Shaoxiong Zhang[1], Weixing Zhang[1], Liting Zhang[1*], Qinglan Qi[1], Feifei Xu[2], Wenli Huang[3]

[1]Shijiazhuang Tiedao University, Shijiazhuang 050043, China
[2]Committee of Tangshan Caofeidian wetland cultural tourism resort, Tangshan 063200, China
[3]Nankai University, Tianjin 300071, China

Abstract

As one of the largest coastal wetlands in northern China, the ecological function of Caofeidian wetland has gradually degraded due to the influence of climate and surrounding environment. In order to regulate and repair the water area of the wetland, it is necessary to study and analyse the historical changes and influencing factors of the water area of Caofeidian wetland This paper extracts the water area of Caofeidian Wetland in 1984~2013 from the images collected by Landsat satellites using the normalized difference water index (NDWI), and analyzes the causes of water area variation in the wetland according to the climate data of Caofeidian Meteorological Station and the Tangshan Statistical Yearbook. The main conclusions are as follows: (1) the water area of Caofeidian wetland had been fluctuating in 1984~2013, showing a slow upward trend. (2) Considering the water area variation and the climate data of Caofeidian Meteorological Station, it is concluded that the mean precipitation of Caofeidian Wetland showed a slight decrease while the annual mean temperature exhibited a slow increase. The correlation analysis reveals that the water area variation is not highly correlated with annual precipitation or annual mean temperature. Thus, the natural factors have a slight impact on the water area variation in Caofeidian Wetland. (3) Based on the water area variation and the data in the Tangshan Statistical Yearbook, the author discovered a prominent growth in resident population in Caofeidian District, and a huge increase in the local aquaculture area. The correlation analysis shows that the water area variation in the wetland is highly correlated with the resident population and strongly correlated with aquaculture area. Because Caofeidian wetland is located in the underdeveloped areas of industry and economy, local people have built a large number of breeding ponds in the wetland, so the main influencing factor of the wetland water area is the breeding area, followed by the permanent population.

Key words: Caofeidian wetland, climate factors, human activities, remote sensing data

Received: January, 2019; Revised final: March, 2019; Accepted: May, 2019

[*]Author to whom all correspondence should be addressed: e-mail: zhanglt0709@sina.com; Phone: +86 13931890317