

Spatio-temporal remotely sensed data for analysis of the shrinkage and shifting in the Al Hawizeh wetland

ABSTRACT

Wetlands are regarded as one of the most important ecosystems on Earth due to various ecosystem services provided by them such as habitats for biodiversity, water purification, sequestration, and flood attenuation. The Al Hawizeh wetland in the Iran-Iraq border was selected as a study area to evaluate the changes. Maximum likelihood classification was used on the remote sensing data acquired during the period of 1985 to 2013. In this paper, five types of land use/land cover (LULC) were identified and mapped and accuracy assessment was performed. The overall accuracy and kappa coefficient for years 1985, 1998, 2002, and 2013 were 93 % and 0.9, 92 % and 0.89, 91 % and 0.9, and 92 % and 0.9, respectively. The classified images were examined with post-classification comparison (PCC) algorithm, and the LULC alterations were assessed. The results of the PCC analysis revealed that there is a drastic change in the area and size of the studied region during the period of investigation. The wetland lost ~73 % of its surface area from 1985 to 2002. Meanwhile, post-2002, the wetland underwent a restoration, as a result of which, the area increased slightly and experienced an ~29 % growth. Moreover, a large change was noticed at the same period in the wetland that altered ~62 % into bare soil in 2002. The areal coverage of wetland of 3386 km² in 1985 was reduced to 925 km² by 2002 and restored to 1906 km² by the year 2013. Human activities particularly engineering projects were identified as the main reason behind the wetland degradation and LULC alterations. And, lastly, in this study, some mitigation measures and recommendations regarding the reclamation of the wetland are discussed. Based on these mitigate measures, the discharge to the wetland must be kept according to the water requirement of the wetland. Moreover, some anthropogenic activities have to be stopped in and around the wetland to protect the ecology of the wetland.

Keyword: Wetland degradation; Change detection; Post-classification comparison; Remote sensing; GIS