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"Gheorghe Asachi" Technical University of Iasi, Romania

MONITORING CHANGES AND SEASONAL FLOODS IN HIRM WETLAND, BIDSHAHR PLAYA, EWAZ COUNTY, FARS PROVINCE

Maryam Ansari[1*], Morteza Ansari[2], Mohammad Reza Jamali[3]

[1]*Geomorphological Hazards and Monitoring Expert of Environmental Department, Ewaz county, Fars, Iran*
[2]*Education Department, Khonj County, Fars, Iran*
[3]*Microbiology and head of environmental department, Ewaz county, Fars, Iran*

Abstract

Spatial and temporal monitoring of wetland changes during droughts and floods is crucial for effective environmental management. Given that the efficiency of spectral indices has not yet been comprehensively analyzed in dry and wet years within closed basins or unique environments like playas, this study aims to address this gap. The Bidshahr Playa, located in the southern part of Fars province and home to Hirm Wetland, was selected as a case study. Using spectral indices, this study monitored and assessed wet and dry years, as well as the minimum and maximum flood extents of the wetland, for improved management strategies. The results demonstrated that the Modified Normalized Difference Water Index (MNDWI) outperformed the Normalized Difference Water Index (NDWI) in accurately estimating Hirm Wetland's area variations during dry and wet periods. Based on Landsat satellite imagery, the wetland's maximum extent reached approximately 7,700 hectares in 1993, indicating a widespread flood that year. In contrast, the minimum recorded permanent area of the wetland during the study period was estimated at only 34.5 hectares. Spatial analysis revealed that during flood periods, the eastern part of the playa becomes completely submerged due to its gentler slope, causing the wetland to extend toward the vicinity of Bidshahr and Koureh villages. However, during dry periods, a significant decrease in rainfall threatens the wetland's long-term survival.

Key words: Hirm wetland, MNDWI index, seasonal flood, spatio-temporal wetland changes

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* Author to whom all correspondence should be addressed: e-mail: ansarimaryam149@iran.ir; Phone: +989172250168