

Prediction of Hamoun Wetland Land Cover Changes in Different Scenarios of Wetland Watering Using Markov-Automatic Cells Method

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Abstract

Hamoun international wetland includes the three wetlands of Hamoun Hirmand, Sabri, and Pozak and is shared between the countries of Iran and Afghanistan. A long period of drought has happened in this area by human interventions after 1999. The objective of current study is to predict the Hamoun wetland situation in scenarios with and without human intervention using the Markov model-automated cellular for 2019 and the next forty years. Land cover maps of the study area using satellite images for 1987 as a normal year, 1991 as a wet year, and 2019 as a year with human effects were prepared. Then, prediction model for 2019 were prepared using 1987 and 1991 cover layers in four scenarios, prediction models were prepared for the next forty years in normal, drought, and wet conditions. If the natural process of watering of Hamoun wetland continues, lower than 362735 hectares of wetland should become watering in 2019, while, according this year land cover map, less than 50000 hectares of wetland have water. Also, by continuation of the current trend and the effect of human activities in the 40-year models, 11230 hectares of the area will be watering, and if the natural process of the wetland continued using the model of 2019 this amount was equal to 373311 hectares. The results of the research show the completely different situation of the Hamoun wetland in the case of no human intervention in the watering of this wetland in 2019 and the model of the next forty years.

Keywords: Hamoun wetland, Hirmand river, Human intervention, Drought

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