

Zoning of Bamdej Wetland Water Quality based on the Spatio-temporal Kriging

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Abstract

Inland wetlands are of the most important natural terrestrial types of water resources. Against its importance in protecting and improving biodiversity, air quality and macro-climatic condition of their regions, industrial development, and urbanization treat their natural existence and behavior. Therefore, monitoring and quality evaluation of wetlands are necessary to analyze and infer their natural mechanism. In this research, a spatio-temporal kriging approach with different water quality indices, including the United States of America Water Quality Index (NSF), Canada standard index (CCME), and the index of Iran have been used to study the quality of Bamdej wetland located in the north of Ahvaz, the capital of Khouzestan province. The Bamdej wetland classified as an interior freshwater wetland that is fed from Shavour River, surface runoff, and agricultural wastewater. In the current research, monthly samples during a year from 23 points (2009-2010) and 20 quality indicators have been used to provide its monthly water quality pattern and inundation boundary of the wetland with the previously mentioned quality indicators. The results of the current research are used for a better understanding of the wetland behavior using different indices based on the provided plans of the wetland. The results showed that the NSF index was obtained between 50% and 90% in April; therefore, the quality of most of the Bamdej wetland differs between medium and good ranges. Also, according to the NSF index in June, the wetland quality was placed in a moderate range. The maximum and minimum values of the CCME were 31.4% and 79%, respectively; therefore, the wetland quality varies mostly in low-quality ranges. Overall, the quality of the Bamdej wetland has a better condition in the northeast, west, and occasionally in the southeast.

Keywords: Water Quality Index, Bamdej Wetland, Geostatistics, CCME, NSF.