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## Assessing the hydrologic regime alteration of a Wadi system as a proxy on initial ecological responses to climate change and growing water demand

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Most Wadi systems of the world are threatened by climate change and unsustainable consumption through different water use systems (WUS) which can result in an alteration of the hydrologic regime, a deterioration of water resources, and their valuable ecosystems. The objective of this study is to assess the impact of climate change and growing water demand on the alteration of the Halilrood River's flow regime and the associated impacts on the ecosystem of the Jazmorian wetland in central Iran. The Soil and Water Assessment Tool (SWAT) model is used to simulate the flow regime of the near and far future (2030-2059 and 2070-2099). Based on 32 Indicators of Hydrologic Alteration (IHA) in conjunction with the Range of Variability Approach (RVA) alterations in the flow regime are evaluated. Impacts of three scenarios for future water use (No-, Constant-, and Projected-WUS) are assessed. No-WUS assumes pristine conditions in the future when no water use system are included in the model (no demand) and we only account for the impact of climate change; Constant-WUS assumes unaltered groundwater demand in the future; and Projected-WUS corresponds to the increases in the number of water use systems in the future (increasing demand). Flow regime alteration assessment indicates that climate change will severely affect the magnitude of monthly and annual extreme flows, frequency and duration of high and low Pulses in the Halilrood Basin, especially in the far future. The comparison of model simulations under different scenarios shows that the impact of climate change was more intense when growing water demand in the future is taken into account. The result of the RVA test indicates moderate and high level of changes for 18 indicators, thus likely affecting the environmental flows required for the health of the downstream wetland.