Investigation of vegetation changes using Soil Moisture Index in Gavkhouni wetland

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Abstract

Gavkhouni wetland located in the center of Iran's Plateau is one of the important habitat for native flora and fauna. The present study aimed to evaluate change trend of vegetation types and Soil Moisture Index in Gavkhouni wetland since recent ١٦ years. Vegetation types were identified via field visitation during ۲۰۱۱-۲۰۱۷ and the maps were generated in ArcGIS ۱۰,٥. SMI is derived using a triangle space concept between the land surface temperature and normalized difference vegetation index from MODIS satellite data during ۱۳۸۰ to ۱۳۹٦.۲۴ □□□□□□□□□□ □□□□□ □□□□ □□□□□□□□□□ □□ □□□ □□□□□ □□□□. The highest area of the whole study area was allocated to vegetation type named *Salsola tomentosa-Artemisia sieberi* (۸۹٦۳۰ ha). Two vegetation types including *Astragalus squarosus- Stipagrostis plumosa* and *Astragalus squarosus* covered the lowest area (۱٥۸ and ۲۹٦ ha)in ۱۳۹۰ and ۱۳۹٦ respectively. The results showed that major changes in vegetation types occurred from ۱۳۹۰ including deletion of some dominated species such as *Phragmites australis* and *Aeluropus littoralis* in the study area which may be attributed to decreasing soil moisture index. The generated maps of SMI indicated that the area with low level of SMI (۰-۰,۲) have increased while the areas with moderate and high levels of SMI (>۰,۲) have decrease from ۲۰۰۱ to ۲۰۱۷. In order to investigate plant vegetation changes, monitoring of SMI through satellite imagery can serve as an appropriate alternative to direct sampling and field measurement of soil moisture in wetland areas without available soil moisture records. Furthermore, range managers and natural resources and environmental protection authorities can use our findings as basic information in conservation management of endangered plant species and development of restoration and improvement programs.

Keywords: Vegetation types, Surface soil moisture, NDVI, LST, Gavkhouni wetland.