Monitoring of spatial and temporal variability of desert dust over the Hamoun e Jazmurian, Southeast of Iran based on the Satellite Data

Maryam Arjmand
M.Sc. Student of management of desert regions, Department of natural resources and environment, Ferdowsi University Of Mashhad
Alireza Rashki *
Faculty of natural resources and environment, Ferdowsi University of Mashhad
Hossein Sargazi
Department of natural resources of Sistan and Baluchestan Province, Zahedan

Date of receive:95.03.12 **Date of accept:95.11.10**

Extended Abstract

Introduction

Dust cycles are an integral part of the Earth system, which emits about 2000 tons of dust every year (Shao et al., 2011) and plays an important role in the global climate changes (Park & Jong, 2008). The frequency of dust events in the arid and semi-arid regions is much higher, meanwhile, dried lakes have the largest ration in dust emission (Goudie and Middleton, 2006). Hamoun e Jazmurian is a dried lake located in an homonymous topographic-low basin in southeast Iran and a main source for high dust emissions under favorable weather conditions, but so far limited studies have been carried out in this area, especially on dust. Remote sensing provides useful information about spatiotemporal variability of dust storms over the arid environment of the world. So the present study examines the spatiotemporal variability of dust activity over the region by identifying the dust events from the satellite data.

Materials & Methods

In this work, spatial and temporal variability of dust aerosol were analyzed over the arid environment of Jazmurian region and surroundings located on southeast of Iran by means of monthly mean data, including Absorption Aerosol Index (AAI), values products of TOMS-Nimbus7 (N7) (1979-1984), TOMS-Earth Probe (EP)(1990-2005) and OMI (2005-2014) as well as Deep Blue AOD of MODIS-Terra (2000-2007) and MODIS-Aqua(2002-2014) and Aerosol Optical Depth (AOD_{555nm}) of MISR (2000-2013).

Results & Discussion

The results indicated that several hot points of dust including Sistan/Hamoun, Rootak, a region in Pakistan near the border with Iran, Makran coast, Gwadar Bay ion the southeast corner of Iran and the Jazmurian region. Overall, the annual trend of both AAI and AOD values obtained from all sensors, are increasing during the periods expect MODIS retrievals which has negative partial amounts, the time periods of 2002-2004, 2008-2009 and 2011-2012 are the peak of dust storms over the Jazmurian region because of human activities and severe droughts. Seasonal variations of AAI and AOD values showed the major dust activities occur during spring and summer and it is minimum in autumn over

Jazmurian region. high activity of dust storms are in four months of May, June, July and August and low in the four months of November, December, January and February

Conclusion

Hamoun e Jazmourian is one of the active dust emission regions in south east of Iran. The amount of dust and affected areas have increased in recent years. Severe droughts in recent years and numerous dam construction are one of the main factors of dust emission increase in this region.

Keywords: Dust, AAI, AOD, Hamoun e Jazmurian, Satellite data