The Study of the Effects of Landuse Changes on Flood Occurrence in Sofi Chai Basin

Abstract

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The present work aims to assess the effects that landuse change has induced on the flood frequency regime. Study area covers upstream of Alavian Dam (250 km$^{2)}$ in the Sofi Chai basin. The torrential periods (in terms of flood event frequency and duration) has been carried out by comparing each daily discharge with the base flood. Here, the base flood (flood with 2 years return period) was calculated from maximum annual discharge based on fitting various distribution models, and then the best fit model was chosen by considering RSS criteria. The results indicate that flood events and their duration tended to be abated on the last decade.

In this research, landuse/cover changes have been detected by interpretation of remotely sensed data based on object oriented method. The results indicated that the positive changes of crop patterns (overdeveloping of orchards as well as dry farming increasing) were occurred in the study basin.

HEC-HMS model was applied for simulation of rainfall-runoff process and assessment of the effects of landuse changes on the flood frequency. HEC-HMS simulated results based on corresponding CN derived from 2000 to 2005 satellite images show 36% abated of flood event respectively.

It should be noticed that the construction of a part of mechanical watershed management operations can reduce the flood events by reserving the surplus runoff.

Keywords: Flood, Landuse changes, Sofi Chai, HEC-HMS Model.

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Investigative Trend of Commencing and Ending Date of 0.1 and 5 mm Rainfall Thresholds of in Selected Stations of Iran

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Abstract

The global warming process during the last century not only has affected meteorological elements, but it also affected onset and end of meteorological elements. For studying probability changes in time series of onset and end date of rainfall thresholds 0.1 and 0.5 mm and more in the country level and deciding on the kind and its direction, daily rainfall data during past 45 years (1962-2006) of 29 synoptic meteorology stations has been used. First, onset and end date of rainfall in Julius code has been implied. The homogeneity of time series was tested by run-test missing value and was constructed by auto-correlation. For distinguishing random data and trend, Mann-Kendal method was used. The type and commencement time trend was calculated and the changes were also calculated on daily basis with Mann-Kendal graphical test and moving average of 5 years. The findings of this research show that there are trends at onset and end date of rainfall in some stations. On the other hand, in some meteorological stations, onset date of rainfall shifted forward and end date of rainfall shifted backward and the rainfall period length in some stations has been decreased.

Keywords: Climate Change, Time Series, Rainfall Threshold, Mann-Kendal.

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A Statistical Investigation on Analysis of Oscillations Trend and Forecasting of High Extreme Temperatures Time Series in Tehran

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Abstract

In this study the data relating to the maximum daily temperatures of Tehran Mehrabad synoptic station during the statistical period of 1951-2010 (60 years) have been analyzed. The regression models along with Mann-Kendal statistic were employed for detecting the significance of trend in temperature series.

Considering the long-term average high extreme temperatures and compared with the average six decades in the statistical series revealed those three decades of temperature 50, 80 and 90 are below the 60 years long-term average and instead of three decades of 60, 70 and the first decade of the 21st century, temperature changes are higher than from long term average.

In this regard the decade 80 is the coldest and the first decade of the 21st century, according to the minimum and the higher range of 60 and 70 decades are the warmest decades of Tehran Mehrabad station. Overall results of this study revealed the existence of seasonal fluctuations in the high extreme temperatures series of Tehran which do not have significant trend. Trend of high extreme temperature changes of Tehran was positive, meaning the increasing the intensity of summer warming.

The results of high extreme temperatures forecasting indicated that the high extreme temperatures in Tehran in years 2018 will lift up to the 43.25 degree of centigrade. The results of goodness to fit test proved that the Halt-Winters model is the appropriate model to forecasting of future high extreme temperatures of Tehran.

Keywords: High extreme temperatures, Decadal Trend, Mann-Kendall Test, Halt-Winters forecasting method, Tehran.

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The Study Tabriz City Air Pollution Condition on the Basis of Principal Component Analysis (PCA)

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Abstract

Nowadays rapid development of urbanization, population growth, industrialization, unorganized transport system and urban traffic and green space shortage have caused increase of air pollution concentration in cities, especially in large cities. Therefore, attention into air pollution and factors and causes of increased pollutant concentrations are very important. Hence the purpose of this paper is to identity the effective factors on air pollution at Namaz Square station in Tabriz city.

Therefore, through of component analysis method, main components were determined in each season of year and by the application of multivariate regression model, main factors were defined. Results show that climatic factors (such as temperature, wind speed and direction) human factors (such as crowded population, green space shortage, high traffic, unsuitable roads) have the highest influence in the air pollution. Special attention therefore, to human factors can cause to the decrease of air pollution in urban central area.

Keywords: Air pollution, Principal Component Analysis, Multivariate regression model, Tabriz city.

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Analysis of Heavy Precipitation Trends in Zanjan City

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Abstract

Understanding the heavy precipitation behaviors tend toward easy planning, designing, act and management of the water recourses. There are many definitions on heavy precipitation in different professional references. Two important extreme indices are maximum precipitation and five highest precipitations in a year. One characteristic of heavy precipitation is variation in time and space. Accordingly' it is important to study this phenomenon by high resolution in time and space. To investigate heavy rains in Zanjan, daily precipitation during 1961-2006 have been analyzed. The trends of maximum precipitation and their ratio to annual precipitation, the trends of five highest precipitations and their ratio to annual precipitation have been modeled by Non-parametric methods.

The results in two scales (annual and monthly) show no trends in time series, while there are high fluctuation periods during 1961-1973 and low fluctuation periods during 1974-2006.

Keywords: Maximum precipitation, Heavy Precipitation, Five highest precipitations, Trends, Zanjan.

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Frame Changes Process Analysis of Dormitories Villages
(Case Study: Villages of Tabriz Megalopolis)

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Abstract

In late decades, quick burgess growth and presence of corresponding spatial effects and operational relations between large cities with surrounding areas, has made main changes in societies and especially in rural spaces of their influence domain. Operational and frame structures changes are among them. Presence of problems in large cities (both of land and building expensiveness, extra contamination of air, etc.) as repulsive factors, and against land and building cheapness and air cleanliness can be effective and attractive factors.

The present analysis which has a focus on frame changes of dormitories villages has been a development and application analysis and the way of its analysis will be descriptive- analytical. The basis of study was field studies and has been accomplished to describe the changes, out of the data and satellite photos concerning the years 2008 and 1989.

The analysis results show that the considerable frame changes have occurred in dormitories villages. Destroying of agricultural lands and gardens for the benefit of other applications and especially residential applications have become the negative subjects. Meanwhile, the evolutional dynamics of Tabriz indicate its development towards the studied areas and especially Karkaj, Nematabad and Kojabad villages.

In any case, since the changes have been made without programming, it occurs that the studied villages in its evolution process for development are involved in problems especially in countless bio-environmental problems.

Keywords: Dormitories villages, Frame changes, Tabriz megalopolis.

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The Effect of Mediterranean Sea Surface Temperature Oscillations on Precipitation of East Mountainsides of Zagros and Iran Central Basins

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In this research amount of seasonal effect of the Mediterranean Sea surface temperature (MedSST) has been investigated on seasonal precipitation of East Mountainsides of Zagros and Iran Central basins. For this purpose, warm, cold and base periods were determined for dates of MEDSST[4] in statistics period of (197-2005) for every season. Then statistic Medians of precipitation were determined so as (Rw, RC and Rb)[5] in each period and for all stations. Theses medians in every season and period were compared to specify amounts of these effects. The results indicated when MedSST is colder than base in winter season, precipitation of winter increases in the studied regions, but the temperatures of warmer than base in autumn increase autumn precipitation. Also MEDSST of colder than base of autumn is the cause of precipitation increase in winter and MEDSST of warmer than base of summer is cause of precipitation increase in autumn. The results of correlation analysis indicated that between oscillations of MEDSST and precipitation in winter there is negative correlation, in autumn it is positive correlation and between oscillations of MEDSST in autumn season and precipitation in winter season there is negative correlation. Between anomalies of MEDSST in summer and precipitation of autumn there does not exist any relevant correlation but between increases of autumn precipitation of the study region and warmer than normal MedSST of summer season the trends exist.

Keywords: SST, Prediction, Precipitation fluctuation, Mediterranean, Eastern Piedmonts of Zagros, Central Basins of Iran.

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5- Rain Median of Warm period, Rain Median of Cold period and Rain Median of Base period of Mediterranean SST.

Planning the Development of Ecotourism in Wetland basins Gavkhuny
Using biological Indicators of Climatic

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Abstract

Using biological indicators of climatic comfort or Bioclimatic in different geographical areas can help the planning of ecotourism attractions. Binding to peripheral areas used for leisure. In this paper, using data from meteorological stations adjacent to wetlands Gavkhuny including Isfahan, Isfahan East, Kbautarabad, Bafq and Yazd, during the years 1975 to 2005, conditions of human comfort model based on climatic and environmental factors (Baker, Terjung, stress, Thermo-hygrometric) has been analyzed. The results of this paper to analyze the findings indicate that the climate is cool to hot conditions. Months of May and September, the day and night for comfort climate and the month of June, July and August have a relatively favorable conditions in spring and summer, the planning and operation of tourism are important. Now we plan to develop ecotourism in wetland basins Gavkhuny results of this study can be used. He said that May and September are very suitable for travel Gavkhuny wetlands.

Keywords: Comfort, Eco-pond Gavkhuny, Index, day and night.

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