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Recognition of the Synoptic patterns of one-day rainfall In Kurdistan Province

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Abstract

One of the most important features of precipitation is continuing. It is important for the survival of organisms and human activities. This study aims to identify synoptic patterns of one-day rainfall during the period 1961-2011 in Kurdistan Province. Average of the precipitation of 1 mm and above was chosen as the threshold of rain days. Moreover, occurrence of pervasive precipitation in Kurdistan province as an indicator to determine the origin of the Synoptic precipitation was used. For this event, the main patterns of sea level pressure and 500-1000 hPa thickness were obtained using cluster analysis. In the days of the band members, a day was chosen as a representative. In fact, these days to other days his teammates have shown the highest correlation. The results show that the Synoptic precipitations of one-day in Kurdistan Province occur roughly all year round (except August). The frequency of these events reached a peak in December and January. The six main patterns of sea level pressure are the cause of these events and the two main patterns 500-1000 hPa thickness in the event they have been effective. The first pattern of 500 - 1000 hPa thickness in one-day rainfall synoptic cold period of the year, and the second pattern of these occurrences during the warm months have been effective.

Keywords: precipitation, Synoptic pressure, thickness, Kurdistan.

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Frequency Analysis of Daily Droughts in Iran by Using Effective Drought Index

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Abstract

Iran's Potential for the occurrence of drought at various severities illuminates the need to examine this phenomenon with new indexes. The major deficiency of the current indexes is that they cannot monitor the droughts in daily scale. Effective Drought Index (EDI) overcomes this defect. The goal of this study is to analyze the frequency of daily droughts by EDI in 43 synoptic stations in a 30-year period. Accordingly, the frequency of daily droughts in the stations was calculated by EDI during the seasons and the year. Then the stations were divided into five groups using cluster analysis based on total frequency of mild to most severe droughts (categories 1 to 4), and frequency patterns in each group were examined. The results showed that the most severe droughts have not happened in the stations except for Gorgan, Zanjan and Torbat-Heydariyeh. In contrast, the frequencies of mild, moderate and severe droughts, all being equal, are much more than most severe droughts, and their frequencies are almost equal. In 56 percent of the days, a variety of droughts (mild to most severe) has occurred in the whole country. Based on the output maps, frequency distribution of droughts in the country does not follow a certain geographical pattern, so it could be cocluded that all types of droughts have happened in all regions of the country. However, maximum total frequency of daily droughts (mild to most severe) is observed in the east and center parts. The decrease in the EDI values over time shows the tendency of the most stations towards drought.

Keywords: daily drought, frequency, Effective Drought Index (EDI), trend, Iran.

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Comparative Analysis of Sustainable Development Indices of Bushehr City with Country Urban Regions

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Abstract:
Nowadays, with regard to urbanization characteristics and necessity of sustainability of development, analyzing of the sustainability of cities in Iran is necessary for sustainable development. So, because there is no study about Bushehr city sustainable development, this research defined base on this question: Are there differences between Bushehr city sustainable development and country urban regions? Then, based on the investigation of theoretical bases and research background, and characteristics of Bushehr city, the hypothesis offered. For measuring development degree and testing hypothesis, first, operational definition of sustainability offered at 4 dimensions and 44 indices. Necessary data gathered by library method and analyzed by Sign Test method in SPSS. Result showed that there are no differences between Bushehr city and country urban regions about social, economical and ecological Indices. But there are meaningful differences about physical indices. Result also showed that with respect to all indices, there are meaningful differences between Bushehr city and country urban regions, and the status of Bushehr city is better than country urban regions.

Keywords: Sustainable Development, Comparative Analysis, country urban regions, Bushehr City

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Trend Analysis of Stream flow changing of the rivers of Lorestan Province with MK-TFPW

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Abstract
Study and prediction of changing stream flow of rivers is very important in water resource management and planning. With respect to this issue in this study the trend analysis of changing stream flow of the rivers of Lorestan Province in three times span namely month, season and annual were investigated by TFPW-MK method. The data used include data from 25 hydrometric stations selected in 40-years period (1969-2009). In this study, the slope of the linear trend in the data sample estimated using the TSA and then the effect of coefficient of self-correlation of data was eliminated using TFPW method, and the trend of changing flow with MK test were analyzed. The results showed that at the most stations (20 stations out of 25 stations) the trend of changing flow was decreasing and at the 40 yeras the reducing of changing flow is significant at 10% level.

Keywords: Autocorrelation, Mann-Kendall, Stream flow, Trend, Lorestan's rivers.

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Analyzing socio-economic effects of the border wall on the Sistan's rural areas

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Abstract

Several droughts during the last years and reduction of agricultural activities have caused both formal and informal trade exchanges of borderline people have become more than ever. Due to this, the income of most of rural natives-directly or indirectly-was receiving from the border. However, since the concrete wall built along the borderline, those exchanges have faced many troubles. Hence, purpose of the present study is to analyze the socio-economic effects of building the border wall on the life of rural natives. The present research adopts a descriptive – analytical methodology based on reviewing library resources, field studies and filling in questionnaires. A statistical community of 384 men was considered as sample, selected randomly from 40 country sides based on their distance from the border. The results of the present study proves that although building the border wall along the borderline has had negative socio-economic effects such as less incomes and migration of the natives, but it also has positive effects such as decreasing the amount of illegal-traffics and illegal trading of fuel and goods.

Key Words: droughts, Borderline wall, socio-economic effects, traffic, Sistan

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Disaster Management and Identification of Safe and Hazardous Landslide Zones in Rural Areas of Sarwabad County

(Manuscript received: November 27, 2012, in final form: December 31, 2014)

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Abstract

Iran's rural settlements, in spite of their comprehensive and multi-faceted developments in the last decades, are still considered to be among the settlements faced with crucial challenges in the face of environmental hazards. As a result, prearrangement for upcoming events and disasters, as well as paying attention to the management of rural disaster in dealing with particularly natural events turn out to be necessary. The rural areas of Sarwabad, in Kurdistan, are also considered among the areas susceptible to natural disasters, such as floods, earthquakes, and landslides. The purpose of the research is the identification of settlements, and safe and hazardous landslide zones with particular focus on disaster management in Sarwabad. This research is methodologically analytical and essentially functional, and, by using geographical information system (GIS) and the analytical hierarchical process (AHP), the researchers analyzed the data and the layers and provided the ultimate version of combined hazard maps and also overlaying maps for the purpose of factorial assessment. The findings have been in the form of spatio-populatory analysis of the settlements, and resulted in identifying the safe and unsafe villages and zones. Moreover, it is found that nearly 46 percent of the rural population and 31 villages of the area are located in safe or low-hazard-level landslides, while the rest of the settlements and rural population are located in the mid and high-hazard-level zones and, as such, are need to be secured in these zones.

Key Words: Disaster Management; Rural Settlements; Landslide; Sarwabad Counnty.

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Study on different geostatistical algorithms for annual rainfall zoning in Ilam province

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Abestract

According to point measurements of precipitation and lack of coverage for all catchments, prediction of such a data is essential. There are various techniques for rainfall data estimation in areas with no recording data. In general, geostatistical methods are more accurate for precipitation estimation in comparison with classical statistical methods. In this regard, the mean annual precipitations of 97 pluviometer stations in Ilam Province were studied for a 23-years period (1987-2010 years). After collecting the relevant data, the isohyetal map was prepared and variogram analysis was performed. In this study, three types of Kriging including ordinary, simple and general Kriging were used. To assess all models, the root mean squared error with standard error was used. The results showed that the general Kriging method with lowest level of mean error (0.003) and root mean square error (74.97) is the best method for interpolation. Also, comparison of root mean square error with standard error for estimation of the expected values showed that all four models estimate the values more than the expected values. Finally, it is observed that there is a significant exponential relationship between altitude and precipitation until 117.4 km radius distance and after this interval, their relationship is randomly.

Keywords: kriging, annual rainfall, geostatistics, GIS, Ilam Province.

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Land use planning of development potentials of ecotourism area-Case study: Qom province

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Abstract

Urban Life and its mechanical necessities led to the interesting in nature and find peace among the citizen increasingly raised. Related to answer to this subject, a new type of tourism has been framed in tourism literature. Nowadays, Ecotourism is outstanding type among other types of tourism and has grown significantly in the past twenty years. Qom province is one of the most famous Iranian destinations and is necessary for this province to be notice of diversifying of its tourism products as well as religious tourism. Aims to this, ecotourism potential areas are identified and prioritized in the Province; The Ecological Capability Evaluation model is used to identify potential areas and the analytic hierarchy process (AHP) to prioritize. Related to configuring ecotourism zones and attracting investors, the article is focused on Intensive ecotourism areas. Among of These areas, 6 areas are selected and prioritized based on 5 factors and 29 indexes. The results were finally indicated that Hoze soltan, Kahak, Dastjerd, Salafchegan, Ghahan and Palang dare are ranked sequentially by 0.83, 0.74, 0.73, 0.72, 0.62 and 0.57 scores.

Key words: Ecotourism, Ecological Capability Evaluation, analytic hierarchy process, prioritizing potential areas, development of Intensive ecotourism, Qom province.

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Analyzing the effects of urbanization on the temperature trends in the northeast of Iran

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Abstract
In order to analyze the effects of urbanization on the temperature trendsو the annual mean, minimum and maximum of the data of the Mashhad, Sabzevar, Birjand, Torbat Heydariyeh and Bar stations were used for the period 1960-2011. To identify any change in the time series the Mann- Kendal and **t** tests were used. T-test was used to compare the first and last decades. The results showed that the temperature time series were increasing inside the cities. While at the stations outside the city the mean temperature did not show any trend. The time series of maximum temperature in Torbat and bar stations and the minimum temperature of Birjand showed a decreasing trend.

Keywords: temperature change, ARIMA, Mann-Kendall, t-test, climate change.

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Iran's Precipitation Markov attributes

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Abstract

In this paper a statistical model termed Markov chain has been utilized to analyze attributes of wet and dry spells in Iran. In order to do this research Asfezari database was used. This database contains 7187 spatial grids and covers a period of time from 21/3/1961 to 31/12/2004 (15991 day). Chi-square test for two-state Markov chain fitted and confirmed with first-order model. In order to have more certainty of data, 0.5mm threshold applied to distinguish wet and dry days. First, the transfer matrix of the transition probability matrix was constructed using maximum likelihood. Then by determining P (occurrence) and q (nonoccurrence) Markov, attributes were calculated. Simple, static and climatic probabilities compared to each other. Return period of wet and dry spells and two and three return days of precipitation were calculated. The findings of the recent paper indicated that for all seasons and months the probability of dry days is greater than wet days and for all the studied months the frequency of dry days is not less than 21 days. The longest expected wet spell is for Esfand with 1.99 day and the longest wet spell is for Tire with 40.32 days. Winter weather cycle showed that after every 5.74 dry
Days, 1.97 wet days would occur.

Key words: Matrix, Probability transition, Markov chain, Asfezari database, Return period, Iran.

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Effects of check dam construction on hydrological characteristics in Mohamadabad watershed-Sari

(Manuscript received: July 2, 2013, in final form: May 10, 2014)

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Abstract

Evaluation and awareness about the effect of constructed dams on watershed response to rainfall, is one of the main problems in watershed management and flood control studies. The aim of this study is to investigate the effect of constructed check dams in Tadjan dam upstream (Sari) on flood maximum discharge. 67 constructed check dams in 10 sub watershed at 75 km distance to sari were studied. Time of concentration before and after check dam construction was estimated with drawing longitudinal profile of those channels. Also, flood maximum discharge before and after check dam construction were predicted for each sub watershed using SCS method. The results showed most changes in flood maximum discharge were estimated in D sub watershed by 10.3% decreasing to before dam construction. The results of means comparison by T-test method indicated that there are significantly difference in channel slope (P_{value}=0.001) and flood maximum discharge (P_{value}=0.017) and no significant difference in time of concentration (P_{value}=0.107) between pre and post check dams construction. Also, the results revealed that change in flood maximum discharge have significant relation in level of 99% with change in channel slope and number of check dams and no significant relation in level of 95% with change in channel length.

Keywords: Longitudinal profile, Flood maximum discharge, Check dams, Mahammad Abad.

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Evaluation of capacity of natural environments for urban development potentials using fuzzy operators and FAHP model in Ghafar watershed basin

(Manuscript received: May 7, 2013, in final form: April 19, 2014)

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Abstract

Today, with respect to urban population growth and ever increasing urban expansion and urbanization, main challenge in urban management and planning is to site and select suitable areas such as plains and natural environment like watersheds for feature urban expansion. In this between, paying attention to the issues and natural and human indices that exist in these environment with the aim of having information on the selection type for the future urban development is necessary. In this regard, with the aim of evaluating capacity potentials of natural environment and based on descriptive-analysis method, an attempt has been made to select suitable and non-suitable areas of urban development using 11 indices divided into two different human and natural classified categories. To identify potential capacity of urban development in the Ghaffar watershed and comparison of the analytical results, Fuzzy AND, OR, Product and Gama and FAHP model are used. Based on fuzzy operators and fahp model, results show that the central, northern and the extreme end of the south part of watershed have a very less potential for urban development. And limited southeastern parts of the basin and East border area have been suitable for urban development. Fuzzy gamma operator with a threshold of 0.7 has greater accuracy and detail than other operators and FAHP model because of its risk controlling effect. However, FAHP model and OR operators show weak results due to their risk inducing effect.

Key word: Urban development, capacity development, fuzzy operator, Ghaffar catchment

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