

ABSTRACTS

The Calendar for Day Time Temperature of Iran

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In this study, the start and ending time of warm and cold periods of the year in Iran has been investigated. To this aim, the grid data of maximum daily temperature of Iran with spatial separation of 15×15 and time interval 21/3/1961 up to 20/3/1-2003 including 15705 days were extracted from Asfazari data base, second edition.

Using the array of Iran's day time temperature data of dimension 15705*7187, the long term mean of temperature was calculated and tabulated, the year was divided in two periods of warm and cold periods based on the long term mean of the temperature of each part of the country. Finally, the maps for the highest and lowest daily temperature start and ending dates of warm period and mean of daily temperature in cold period were calculated and plotted.

The maps showed that, mean of Iran's day time temperature is 25.2 Celsius degree. Warm period of Iran occurs from 18 April up to 25 October and the cold period starts from 26 October up to 17 April of the next year. Cold and warm periods do not start simultaneously all over Iran. At the south and south east parts of the country, the warm season starts earlier and ends later. The peak warm temperature in Iran occurs at different parts with a time interval of 70 days. While the peak cold occurs almost simultaneously with a time interval of 15 days all over Iran.

Keywords: Maximum temperature, Grid data, Warm period, Cold period.

The Usage of Artificial Neural Network in Simulation and Prediction of Flood at Sarbaz Drainage Basin

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The occurrence of horrific floods as a result of climatic changes in recent decades has caused many damages in different areas of the world. In dry areas, the effects of these changes are more tangible. Among these regions, Sistan and Baluchestan province, regarding its warm and dry climate, is flood prone. Sarbaz basin which is located in the southern parts of this vast province, each year is encountered with flood occurrences and its destructive consequences under the affection of the current situation. This aim of this study is to forecast the floods of Sarbaz River via an artificial neural network.

In this study, three networks including multi-layer perception network, back propagation and radial basis were used to predict floods of Sarbaz River and the results of these networks were compared through multiple regression models. To this aim, the data of three daily climatic and hydrological stations of Sarbaz, Pirdan and Iranshahr were used over a period of 28 years (October 1981 upto September 2009). Analyzing the correlation between the data and the flow rate of Sarbaz River, the effective parameters on floods were determined. After normalizing the data, different models were created. Surveying the results showed that the selected network Radial Basis with the correlation 0.97 at the training phase and 0.714 at testing phase and less error comparing with other networks, was selected as the best model among various neural networks. Comparing these network results and regression models showed that the neural network model has a better performance and presents a better prediction of Sarbaz river flood using the regression method.

Keywords: Flood, Artificial neural network, Prediction, Sarbaz drainage basin.

Determination of Thermal Comfort Range in Planning Tourism Climate

Case: Sistan and Baluchestan

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The study of the climatic characteristics of each place plays a special role in its tourism planning. The aim of this study is to determine the range of climatic comfort day or night for tourism planning in Sistan and Baluchestan province in monthly scale. To determine the temperature conditions (warm, comfort, cold), in the range province and in different months, Evanz index has been used in this research. Hence, the climatic data of the maximum and minimum air temperature, relative humidity and also wind speed in monthly scale of six synoptic stations and four climatology stations during statistical period (1997-2008) have been used and their homogenous interpolation method was examined. Then separate day\ night temperature condition tables for different months were prepared and the province environmental climatic comfort maps were drawn.

The results showed that in the range province, the daily climatic conditions in the months of June, July, August and September were warm and nightly climatic conditions in November, December, January, February and March were cold. In March, May, October, November, December, January and February during the day and in May, June, July, August, October and November during the night, is comfort in parts of the province according to Evans model.

Keywords: Tourism, Sistan and Baluchestan, Environmental comfort climate, Evans, GIS.

Analyses the Trend of Dry and Wet Winds in Zanjan

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Climate is a multidimensional, interacted- dynamic system. This characteristic tends to be variety effects-consequences in time and space scale. One of climatic characteristic that can exhibits climate effects-consequences is dry and wet winds. The continuity of dry and wet winds has a great importance from the view point of severity and frequency of precipitation occurrences. Since these features show the rainy climatic characteristics and affect on the other climatic parameters, has attracted the attention of some climatologists to itself.

In the present research, based on the observations of daily precipitation in Zanjan city during 1961-2006 and based on non-parametric technique, the trends of maximum mean and continuation of dry-wet winds were estimated for each year. The results of this research showed that the study indices at each of yearly and monthly time scales had no meaningful trend.

Low precipitations had a meaningful decreasing trend and with respect to the lack of trend in occurrence times, the number of these precipitations and consequently dry and wet winds were constant. Based on the study results, it was cleared that four seasons means (June, July, August and September) has no precipitation. Possible precipitation in these four months, are the results of local-accidental and irregular events. So these four said months are considered as the dry seasons of Zanjan city. The most frequent of precipitations are related to April and May, therefore spring has the most precipitation.

Keywords: Trend, Precipitation permanents, Dry wind, Wet wind, Zanjan city.

Effect of Drought on Vegetation Cover Using MODIS Sensing Images

Case : Kurdistan Province

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One of the most important consequences of drought is reducing the amount of vegetation cover. Due to the Reduction of vegetation, the environmental conditions will be provided for the appearance of various problems such as soil erosion, surface runoff and increasing the flood risk and Accordingly, evaluation of drought effects on vegetation cover is very important. In this regard, the use of reflective remote sensing techniques to evaluate the effects of drought has been known as one of the most efficient methods.

In this study, to evaluate the effect of drought on vegetation in Kurdistan province, meteorological data and remote sensing techniques have been used. Firstly, the standard precipitation index (SPI) for six Meteorological Stations during the years of 2000-2009 was calculated. Next, based on 40 sensing images from TERRA / MODIS 16-days, in months of August, September, October and November, the normalized difference vegetation index (NDVI) was calculated. With regard to this index, vegetation area was classified into 6 groups and the area of each class was calculated. Finally, SPI and NDVI indices were compared.

The results of this study indicate that between the mean indices SPI and NDVI, high correlation (+ .77) with 0.01 significant level, are existing and reducing the amount of SPI index approximately - 0.20, averaged 1.2 percent (equivalent to 350 kilometers) poor vegetation cover increases. The rate of decline for the NDVI index, is approximately 0.01. Results obtained from the index SPI, showed that in 2001 and 2008 the moderate drought occurred in the province of Kurdistan. NDVI index calculated in the two years showed that poor vegetation cover, noticeably increased (respectively 80.6% and 76.6%) while in 2007 almost as a normal year, the amount of poor vegetation based on NDVI index, approximately 69.7% was calculated. Comparison between the years 2001 to 2007 (approximate change of 11 percent poor vegetation), well represents the effect of drought on vegetation in the province of Kurdistan.

Keywords: Drought, Remote sensing, Sensor MODIS, Index NDVI, Kurdistan province.

Identification of Circulation Patterns Producing Floods Over Southwest of Iran Case: Mond Basin

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The aim of this research is identifying the relationship between circulation patterns and floods over southwest of Iran. For this purpose, the daily runoff data of 12 hydrometric stations of Mond basin was prepared and its basic runoff was separated by manual method. Mond basin is one of the sub-basins of Persian Gulf that with about 47000 km² areas is located in Southwest of Iran and covers major parts of Fars and Bushehr provinces. The data of selected stations include the statistical periods of 1961-2000. For synoptic analysis of relationship between circulation patterns and floods the circulation-to- environment method has been selected.

For this purpose, the circulation patterns of elevation 500 hPa which was prepared by Masoodian's was used. The results showed there is a significant correlation between circulation patterns HGT 500 hPa of Middle East with the mean daily floods over Mond basin. So that at all the selected stations, circulation pattern number 2 (Black sea trough) with 35.70 percent, number 7 (Syria sea trough) with 29.14 percent and number 1 (East of Mediterranean Sea trough) with 25.24 percent had the most relationship with floods of the basin.

The map of sample day of circulation pattern No. 2 shows a ridge on Europe and a trough on the Black sea. The most important synoptic phenomena on the map of sample day of circulation pattern No. 7, is a trough that is started from Russia and has continued to Syria. Circulation pattern No. 1 is a trough that is located on the Mediterranean Sea.

Keywords: Floods, Circulation patterns, Geo potential Height, 500hPa Level, Southwest of Iran.

Prioritization of the Areas for Controlling the Soil Erosion Using MCE & GIS Techniques
Case: Vazroud Watershed, Mazandaran

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Prioritization is an important consideration for planning of natural resources management, and allowing decision makers to implement management strategies that are more sustainable in the long-term. However, only the current erosion status or a relative index cannot exactly identify priority area for conservation. The objective of this research is to identify conservation priorities by a specific multi-criteria evaluation method in Vazroud watershed, Mazandaran Province. The changes trend of erosion risk indicate the regions with increasing erosion risk and are also selected as one of the evaluation criteria to identify the priorities. Zoning the Soil erosion risk obtained for both 2000 and 2010 images based on Revised Universal Soil Loss Equation (RUSLE) and divided into six classes: slight, light, moderate, severe, very severe and extremely severe.

Trend of erosion risk were obtained by comparing the results of erosion risk between 2000 and 2010 and Multi-criteria evaluation method. Two levels with the highest priority include the regions with severe erosion or a substantial recent increase in erosion risk (1588.32 ha, or 11.31% of the total of study area), and recommended as erosion control regions with appropriate conservation strategies. The middle two levels cover the regions with stable erosion status or slight change, required only minor controls.

Keywords: Soil erosion, Conservation priorities, Erosion changing trends, RS, GIS, Vazroud watershed.

Identity and Neighborhood Sustainable Development in Shiraz
Case: Fakhrabad Neighborhood

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Today, the social aspects of the cities has been considered by the urban planning experts and has a great importance. The history of urban planning shows a promotion of its programs from a simply skeletal view to a multi-dimensional one, which includes all dimensions. Further, the neighborhood has been one of the tools in urban planning throughout the twentieth century to overcome the urban problems and has been considered from different views. In fact, Neighborhoods are now more social and cultural units than of geographical and skeletal units, therefore, are considered as more reliable units in urban planning. Due to the significance of social dimensions in urban planning, the present study attempts to investigate identity in neighborhoods and analyzes the factors contributing to the formation of identity in them. Because these factors constitute a vital potential source for sustainable development and guarantee the permanence of development indices. Based on field studies, and employing a descriptive-analytic model, the present study investigates the factor of identity in Fakhrabad neighborhood in Shiraz. The data were analyzed using SPSS Software through Chi Square Test, Phi and Cramer Coefficient, and Landa Coefficient. The results show that social-cultural variables have a high correlation with identity with marginal deviation, and that Fakhrabad neighborhood has achieved relative success in providing sustainability in the neighborhood.

Keywords: Identity, Sense of Attachment, Sustainable Development, Neighborhood.

**Study the Spread Amount Sand Dunes at the East of Jask
in the Time Interval of (1990 to 2004) by GIS & RS**

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The study area is located at the east of Jask and is composed of sedimentary, desert environment, river, coastal and shallow marine units. The most important interactive effect of such factors is the formation of sand dunes. The sand dune of the study area has a changing nature and has experienced a great deal of changes including the formation of new sand dunes, erosion and carrying sediments.

The aim of this study is to investigate the extent of spreading the coastal sand dunes in the study area. Also in this research, in addition to the aerial photos of 1990-1991 and IRS Hindi 2003 satellite images of Jask east coastal area, the basic data, field surveying data and RS and GIS methods were used. The results show that the area of sandy dunes at the under study time limit has had an increase of 10.169 km².

Keywords: Oman coastal areas, Sand dunes, GIS method, RS method.

Estimating the Risk of Flood Occurrences on Meandering Rivers
Case : Shor River (Located on the East Slope of Sahand Mt)

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Meanders are the most important of hydrologic landscapes which causes more important geomorphological changes. These landscapes are considered as the signs of sudden hydrological and geomorphological changes. In fact, the existences of meanders are considered as the most important signs of the flood occurrences in the related areas. Along Shor River, at the eastern slopes of Sahan and Jari Mountain, a great deal of curvatures have been formed in one of Gharangooy Chai sub basins, which with respect to the created curvatures, this meander is considered as the most typical one.

In this paper, for the study of this phenomenon and also for studying the potential of the risk of flood occurrences along some parts of meander, LFH index has been used. For using this index, topographic maps, satellite images, aerial photos and field data have been used. The results obtained from the studies and used index shows that LHF value is different in the entire route; the average of LFH with the amount of 0.77 along Shor meander is high. In other words, based on this index, the risk of occurrence of large floods, particularly along some parts of the meandered route of this river is high. Also the studies indicate that after each flood and displacement of each meander curve and its moving to the sides, the lateral erosion along of Shor river is intensified and consequently its risks will increase.

Keywords:Meander, Flood hazard, Shor river, East slope of Sahand Mt.

Spatial Analysis of Precipitation Variations in Middle Zagros Using Geo-Statistical Methods (1995-2004)

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This study aims to describe and model the spatial variations of precipitation in the mountainous areas of middle Zagros using geo statistical techniques. To this aim, a dataset was obtained from 249 precipitation recording stations of Meteorological organization (climatologic, synoptic, and rain gauge) and Ministry of Energy of Iran in a 10-year period (1995-2004). Among these stations, 219 stations were used for modeling the spatial variability of precipitation, and the remaining 30 stations were used to evaluate the proposed method. To check the normality of data and detect the trend, Kolmogorov- Smirnov test and Trend Analysis of ESRI Arc GIS 9.3 is utilized, respectively. An evaluation of simple, ordinary, and general kriging with and without auxiliary variables of altitude, latitude, slope, and distance from ridges show that the ordinary kriging with latitude and distance from the ridge auxiliary variables are more precise. To illustrate the spatial variability of precipitation in the area of study, profiles of precipitation and altitudes perpendicular to ridges were plotted in the 50 Km intervals. These profiles make evidence that despite the relative correlation between precipitation and topography, the points with maximum precipitation does not correspond to the highest topographic points. Moreover, leeward and windward sides present different behaviors with respect to precipitation. Finally, it is found that topographies act as barriers in the way of air masses, thus air masses in clash with mountain release large amounts of their humidity.

Keywords: Modeling, Geo statistics, Variogram, Anisotropy, Trend, Precipitation, Middle Zagros.

**A Fast Method for Determining the Cloud Top Pressure in Modis Photos
(Fast CTP) in MODIS Images**

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Clouds, because of their significant effects on energy balance on the ground surface and in the atmosphere, has always been considered by different meteorologists and climatologists. The ability of remote sensing in the assessment of cloud characteristics has been proven by in the study of their changes in different locations and times. One of the important aspects of the study regarding the clouds, is to determine the pressure at their top, which the aim of the current study is to present a fast method for its determine by using MODIS images.

Therefore, by using Radiosonde data in Mehrabad and Kermanshah stations, the atmospheric temperature profile was extracted. Then using a five stages technique, the pixels of the considered image were grouped into 4 different categories including cloudy, possibly cloudy, possibly non- cloud and non- cloudy. Then by using LSE model on channels 31 and 32 of MODIS, the emissivity of cloud in cloudy pixels was determined.

Then by using this temperature and the temperature profile extracted from Radiosonde data, the pressure at the top of the clouds were extracted. To review the accuracy of the obtained results, the results obtained from Fast CTP method with those of standard CTP method were compared. Based on this comparison, it is found that the presented method for the clouds with optical depth of more than 10 is optimal and the results obtained from CTP model, shows a very small difference. But the difference regarding the thin clouds with low optical depth (lower than 10) is considerably great in comparing with the clouds of high optical depth.

Keywords: Cloud height, Brightness temperatura, Cloud Top pressure, MODIS, Remote sensing.