

Synoptic Classification of Effective Circulation Patterns on the Climate of Iran in Sea Level

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Received: March 2, 2012/ Accepted: May 9, 2012, 5-8 P

Extended Abstract

1- Introduction

Classifications are an important tool in both general and applied climatology. The derivation and application of classifications have considerably increased in the climate research during the last decades, but already in earlier times of scientific evolution, we can find prominent and long-lived examples like the well-known global climate classification. This classification was based on threshold climatically regarding temperature and precipitation. Unlike the threshold classification for applying classification by multivariate analysis the condition of classification should be done without considering objective threshold and base on the

self-definitions. In This paper have been classified the sea level pressure and for achieving the most important circulation pattern on the sea level pressure on the climate of Iran. In Iran amply has studied about effective circulation pattern over Iran climatology.

2- Material and methods:

In this paper using circulation under environment approach, the most important of patterns which play key role over climate of Iran were classified. In the first step the mean daily sea level pressure from -10 to 100 degree eastern meridian and 10 to 80 degree northern latitude from reanalyze NCEP/NCAR database were collected. Then the spectrum analysis lower or 10 day changes from the principles data were removed and with applying principal component analysis the volume of database was reduced and a classified component was

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provided by cluster analysis. Two climate elements including temperature and precipitation data from Iran Meteorology Organization in 212 synoptic stations were extracted. Ultimately the mean, area, max as daily for both element precipitation and temperature were calculated.

3- Discussion:

Matrix-based filtering using principal component analysis was

reduced and obtained 57 factors that have eigen value greater than 1. This factor explains 97 percent of all data variation. In these 57 factors were selected 14 factors that are 1 percent of all data variation. With objective and subjective approach were found 5 clusters which can display the circulation pattern on sea level. The results of these 5 types have indicated in the table 1.

Table 1: the clustering data by climatic factors

Cluster	Event	Event Percent	Max-precipitation-mean (mm)	Area (percent)	Precipitation-mean (mm)	Temperature-°c (mean)
1	1290	14.1	34.4	24.4	1	11.8
2	1102	12.1	29.1	22	0.9	11.1
3	2122	23.2	28.7	23.9	0.9	15.5
4	1427	15.6	34.5	24.6	1.1	9.9
5	3190	34.9	17.5	7.3	0.2	26.1

The mean of temperature and precipitation were calculated in each of cluster. Then the composited pattern of the each type was drawn as the circulation of pattern on Iran climate. At final five weather types including cold and rainy, cold and low rainfall, very cold and rainy, modest and rainy, warm and without precipitation was developed.

4- Conclusion

With applying the circulation under environment approach, the pattern circulation in sea level pressure was classified. At the first was identified the grid point data and the atmospheric circulation pattern and then was correlated this pattern over climate of

Iran and obtained five weather types including cold and rainy, cold and low rainfall, very cold and rainy, modest and rainy, warm and without precipitation. The results showed that whenever two high pressure placed on west and east of Iran formed, the dynamical low pressure on Iran caused the heavy precipitation with very low temperature. Azores high pressure is one of them that placed on west of Iran and high pressure tongue development until west of Iran. The other one is Siberian High Pressure that placed on north earth of Iran. This high pressure merges with Tibet high pressure and formed the potent high pressure that develop the tongue high pressure and to enter cold air and reinforcement the

dynamical low pressure. The movement of this low pressure was intensified with Sudan low pressure, because of Sudan low passed over the warm sea and transfer the moisture of this seas and its cases that warm air from low pressure and cold air from high pressure formed the baroclinic air and front field. It is noteworthy that the extensive precipitation will have occurred in Iran when synchronism was occurred all condition that mentioned above.

Keyword: Circulation to environment approach, Composite pattern, Synoptic classification, Dynamical low pressure

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