

## عنوان مقاله:

Predictors for Long-Lead Precipitation Forecasting in Western Iran

## محل انتشار:

اولین کارگاه مشترک ایران و کره در مدلسازی اقلیم (سال: 1384)

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## خلاصه مقاله:

In this paper, the effects of large scale climate signals on the low and high precipitation spells in the western part of Iran are investigated. In order to quantify the effects of large scale climate signals on the precipitation in the study area, long-term records of Southern Oscillation Index (SOI) and North Atlantic Oscillation (NAO) as well as variations in Sea Surface Temperature (SST), Precipitation, and Sea Level Pressure (SLP) in the Mediterranean Sea and Europe are investigated. SOI and NAO did not show strong correlations with the variations of precipitation, however variations of average standardized SLP and SST in a number of characteristic locations showed that specific thresholds can be identified for SLP and SST in the months of June through November as the predictors for occurrence of lower and higher than normal precipitation in the period of January through June of the following year. The characteristic locations include Persian Gulf, Red Sea, Indian Ocean at north side of Australia, Arabian Sea, Mediterranean Sea, Black Sea, Caspian Sea, Siberia, Sudan, and some parts of Atlantic Ocean. In order to quantify the effects of climate signals on the wet and dry spells in the study area, specific thresholds are defined for different ranges of seasonal precipitation jointly based on long-term records of average area precipitation and cumulative stream flows in winter and spring considering different statistical indicators such as Standard Precipitation Index (SPI). The results have shown that standardized SLP difference between South of Greenland and the selected locations in Azores, Black Sea, East and West of Mediterranean Sea and also standardized SLP difference between Siberia and selected locations in Sudan and East of Persian Gulf can be used for predicting the range of total precipitation in the Winter and Spring in the study area. Relatively strong relations between the SST anomalies in a number of selected locations and the wet and dry spells in the study area are also detected. Also the 500 hpa Geopotential height data between the years of 1948- 2004 is used to estimate the polar vortex intensity and area and their correlation with the precipitation variations. Considering the effects of Mediterranean Sea on the precipitation over the study area, factor analysis has also been used for estimating predictors of the 500 hpa Geopotential height data. The results show that considering the set of predictors developed in this study could significantly reduce the uncertainty of long-lead precipitation forecasting for the study area.

## کلمات کلیدی:

Climate Signals, Seasonal Precipitation, Sea Surface Temperature, Sea Level Pressure, Western Iran

