**Analysis of drought situation in Iran using**

**ECMWF precipitation product**

**Extended Abstract**

Drought is one of the natural disasters that occur over a long period of time compared to other natural phenomena that intermittently impede human societies through negative impacts on water resources, agriculture and subsequently the economy. Among natural disasters, drought is one of the phenomena that has occurred at different times in the world, so due to high frequency of drought phenomena studying of drought situation can be of interest for any researchers around the world. One of the methods of drought monitoring is the use of drought indices. The Standardized Precipitation Index (SPI) is a widely used index to characterize meteorological drought on a range of timescales. On short timescales, the SPI is closely related to soil moisture, while at longer timescales, the SPI can be related to groundwater and reservoir storage. The SPI can be compared across regions with markedly different climates. It quantifies observed precipitation as a standardized departure from a selected probability distribution function that models the raw precipitation data. The SPI can be created for differing periods of 1 to 36 months using monthly input data. as aforementioned The SPI index is purely based on precipitation, so it is important to select a proper precipitation dataset to extract the SPI index at different time scales and being aware of drought situation with high accuracy. Synoptic stations, due to lack of proper spatio-temporal distribution and high statistical gaps, cannot be a reliable source of precipitation in this type of researches, so global precipitation datasets having high spatio-temporal resolution can be used as a viable alternative to ground stations, in this study the Era-interim precipitation product, which is the product of the European Center for Medium range Weather Forecast was used as precipitation data and for drought the SPI 3 to 12 month was used to study drought over the period of 2001 to 2016 for the whole Iran for all six main basin in the country. Initial results show that Era-interim precipitation dataset performs well in all months and the correlation coefficient between ERA-interim and observational data varies from 0.45 to 0.9 for different months. Correlation coefficient were highest in December, February, and January, and were above 0.8 for the entire country. The results also show that the best performance among the rainy months is for December, February, and January. The second measure for assessing the ERA-interim was NRMSE , the results show that NRMSE index is below 0.2 which is due to the good performance of ERA-interim. For example, in the three wet months of December, February and January, the NRMSE was below 0.2, which show that in these months it has high accuracy and also the worst performance of ERA-interim belongs to September, August and July. In general, it can be said that the Era-interim precipitation dataset in the wet season has a good performance and for the dry seasons does not perform well. The results also show that long-term precipitation for the Era-interim is very different from the long-term precipitation recorded by the synoptic stations. For example, in the Karun catchment, which is one of the most important sub-basins in the country, the amount of precipitation recorded for the Era-interim precipitation is in the range of 150 to 232, while for the synoptic stations at this basin reaches to 615 mm. On the whole based on these NRMSE and Correlation Coefficient indices, it can be concluded that the ERA-interim precipitation dataset on a monthly time scale has a good performance at the country level. The results of SPI show that in all of the three time scales including SPI 3month, SPI 6month and SPI 12 month in the early years, there is a moderate to severe drought throughout the country, and in the late years the country is in a mild to severe drought period. Also in 2007, the country was in the mild to severe humidity range and immediately afterwards a severe to mild drought occurred nationwide, which show that 2007 can be a transition point from wet to drought. The study of drought status with respect to SPI indicated that with increasing SPI time scale dry and wet conditions became more severe so that mild dry and wet conditions in most month and years turned into severe dry and wet conditions.

Keywords: Era-interim, Drought, SPI index, Spatio-Temporal resolution, Synoptic