

*Effect of ENSO Phenomenon on Monthly Seasonal Temperature  
Variations of Country Half South*

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**Extended Abstract**

**Introduction**

Studies have shown that Earth's climate is not stable and any changes in climate can be result of climatic system variability and external factors that can be assessed at various scales monthly, quarterly and annually. Teleconnection such as ENSO, including measures are able to assess the quantity, quality and power of a broad synoptic pattern, in the form of numerical criteria are. ENSO is one of the atmospheric phenomena with warm phase (El Nino) and cold phase (La Nina) that occurs in East of Darwin and Tahiti and West of Pacific. In recent years researchers have paid particular attention to the effectiveness of temperature, as one of the basic elements of climate formation and its role in global climate stability, ENSO phenomenon. In the present study to investigate ENSO phenomenon with the parameters of temperature, a broad sector of the country was considered and Southern Oscillation Index and Trans-Nino Index as role models for large-scale atmospheric - oceanic components on changes in average temperature in the southern half of the country was studied.

**Methodology**

In this study the relationship between the ENSO phenomenon with a mean monthly and seasonal air temperature of the country half south over a period of 55 years (1951-2005)

was considered. For this purpose, temperature data of 12 synoptic stations gathered from Meteorological Organization and SOI and TNI indexes data were obtained from the Australian Meteorological Center. One of the powerful tools in defining the relationship between patterns is the correlation method. In the present study, to analyze data and explore relationships, the correlation method was used. First Pearson correlation between SOI and TNI indexes with temperature in both seasonal and monthly time step analysis was performed. Also, the effective temperature of the warm phases (El Nino) and cold (La Nina) phenomenon was considered to help index percentage changes of temperature.

### Results and Discussion

The results showed that in both the time scale (monthly and seasonal), the most significant correlations were negative. This means that with increasing amounts of ENSO indexes, temperature decreases.

Comparison of results of both indexes showed that the number of stations with significant correlation temperature with TNI index was far more than the SOI index. Based on the TNI Index, the air temperature in January and based on the SOI index, air temperature in October were the effective months from ENSO. The seasonal scale, in the summer in most stations had a significant correlation with the ENSO index. Also the results showed that in this season, the negative correlation of seasons will turn to positive. Amplitude of the correlation between the values of SOI and the temperature was varied in all the months of minimum -0.549 in August to maximum +0.463 in October and for the TNI index from -0.458 in August and September to +0.512 in September. In seasonal scale for SOI index from -0.365 in spring season to +0.459 in autumn and for TNI index from -0.530 to +0.384 in summer season were. Based on TNI index, Percentage changes of stations temperature in each of the phases were showed in seasonal scale; La Nina phase increased 4 percent winter temperature and in monthly scale La Nina phase increased 8 percent in December temperature. Also, higher air temperature in the phase La Nina to El Nino phase was observed in all months and seasons of the study area.

### Conclusion

This study investigated the relationship between ENSO phenomena and mean air temperature in monthly and seasonal scales in southern half of the country over a period of 55 years (1951-2005). Some reviews and studies on the temperature of 12 selected stations in the southern part of Iran were done. It was shown that the temperature of 12 selected stations had a significant relationship with SOI and TNI indexes. But many more stations had significant correlation with the TNI index. In Both monthly and seasonal scale, the effect of La Nina phase was more than El Nino phase. So that in the seasonal scale, La Nina phase increased 4 percent winter temperature and in monthly scale La Nina phase increased 8 percent temperature in December. The overall results confirm considerable effective

temperature of the ENSO phenomenon that explain the region temperature fluctuations as an important role.

Keywords: ENSO, Southern Oscillation Index, Trans-Nino Index, Air Temperature, El Nino, Iran half South.

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