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## **The Impact of Global Warming on Tourism Areas in Southern Coast of the Caspian Sea**

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### **Abstract**

The purpose of this study was to investigate the repercussions of global warming and its effects on the tourist areas of the southern shores of Mazandaran. In this descriptive-analytical study which was carried out on the eight synoptic stations of Gilan, Mazandaran and Golestan provinces, with the help of tourism climate index and one-way ANOVA, the current status of tourism in provinces was monthly, seasonally and yearly examined. With the help of multiple linear regression and based on available data, this indicator was predicted until 2100 and analyzed by one-way ANOVA with repeated measurements of the changes in this index. All tests were performed using SPSS software version 24. There was a significant difference between the cities of Gilan, Mazandaran and Golestan in terms of TCI. ( $P < 0.01$ ). Also, the cities of Gorgan, Qara Kheyl and Babolsar were in better conditions than other cities. There was a significant difference between the current value of this indicator and its predicted value in the coming years. The predictions showed that one would see an increase of 5 units in the TCI index ( $P < 0.01$ ). In the coming years, one will see a dramatic escalation in the conditions of the tourism climate of the southern shores of the Caspian Sea. Accordingly, the phenomenon of global warming does not seem to worsen the tourism conditions of the northern provinces of the country.

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## **Introduction**

In the present era, the vast majority of people in the world have somehow accepted the inevitable reality of climate change and are worried about its repercussions. The rapid growth of human activities and increased greenhouse gas emissions from these activities have led to the emergence of the phenomenon of global warming in the twentieth century; it is expected that in the 21st century the global average temperature will increase by about 2 to 4.5 degrees. (Salinger, 2005, IPCC., 2014). The phenomenon of global warming and climate change may not only lead to displacement by climate change but may also lead to major changes in the tourism condition in the region, which will have widespread economic consequences (Amlang et al., 2012, Mihailovic et al., 2015). Climate is an important factor in tourism activities, which can affect operating costs such as heating, cooling, snowmaking, irrigation, food and water supply, and insurance costs. It's worth mentioning that the tourism industry is very susceptible to climate change and any alteration in the climate could result in change over the duration and quality of the tourist areas (Scott et al., 2007: 3). The present research tries to examine the repercussions of global warming and its effects on the tourist areas on the southern shores of the Mazandaran Sea.

## **Materials and Methods**

This study is a descriptive-analytic observational study. In order to evaluate the tourism climate conditions, the TCI tourism climate index was used (Mieczkowski., 1985). In this regard, the synoptic stations were first identified in the specified areas, and among them eight which had common monthly data from 1986 to 2016, were collected from the Iran Meteorological Organization. The dependent variable in this study was tourism climate index and independent variables were average precipitation, average temperature and average monthly humidity of each center. First, the tourism climate index was calculated for each center through the standard formula, and then the tourism status of the centers was compared with each other in annual, seasonal and monthly terms in two parts of the status quo and the status of the future.

## **Discussion and Results**

The results of the study showed that the seasons of spring, summer, autumn and winter respectively had the best conditions for tourism among the studied cities. Also, the May and June have the best weather conditions for tourism unlike February which has the worst weather conditions ( $P < 0.01$ ). Descriptive-Analytic studies that were carried out to predict the future tourism climate conditions of the selected five stations showed that the cities of Noshahr and Ramsar respectively have the highest rates of TCI and Rasht has the lowest rate in the study period.

### **Conclusion**

An important result of the prediction of the future conditions of the cities was the signs of the displacement of seasons. In all likelihood with the climate warming in the coming years, this displacement will show itself with the longer warm season. Although the results of the predictions of the two RCP2.6 and RCP8.5 models were similar, but in the RCP8.5 model, cities are better off in terms of tourism index. In the present study, it was found that in the next 10 years we will see the improvement and advancement of the tourism condition from the acceptable status to good.

**Keywords:** Southern Provinces of Mazandaran Sea Basin, Global Warming, Climate Change, TCI Tourism Climate Index.

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