t Sig. Interpretation

For every one degree increase in the daily minimum temperature during the peak season, approximately one less round of golf will be played. During the non-peak season, the relationship is reversed and, on average, every one degree increase in the daily minimum temperature will result in approximately 116 rounds of golf being played that day. Conversely, for every one degree decrease, approximately five fewer rounds will be sold.


tSig. Interpretation

Climate Science for Decision Makers
Pileus Project
Measuring the Impact of Weather Variability on Golfing Activity in Michigan
By Sarah Nicholls, Jeonghee Noh and Donald F. Holecek

Introduction

Golfing is a popular recreational activity that is sensitive to changes in weather conditions. The U.S. Golf Association Research Committee (2003) reported that 2003 was the third warmest year on record, and the hot weather was associated with a decline in golfing activity. The study showed that the number of rounds played in the United States decreased by approximately 950,000 compared to the previous year. This trend is likely to continue in the future due to climate change, which is expected to lead to more frequent heat waves and increased temperatures.

Methods

The study used data from the Pileus Project, a database that includes weather stations across the United States. The data were collected from 1995 to 2004 and included daily minimum and maximum temperatures, precipitation, and other weather variables. The data were analyzed using regression models to determine the relationship between weather variables and golfing activity.

Findings

The results of the regression analysis are presented in Table 1. The results show that daily minimum and maximum temperatures have a significant impact on golfing activity. The number of rounds played decreases as the temperature increases, and vice versa. The coefficient for daily minimum temperature is significant at the 0.05 level, indicating that a one-degree increase in the daily minimum temperature results in approximately one less round being played.

Table 1: Results of Regression Analysis for Peak Season (May-September), 1995-2004

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Beta</th>
<th>Unstandardized</th>
<th>Standardized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°F)</td>
<td>3.81</td>
<td>0.01</td>
<td>0.09</td>
<td>3.81</td>
<td>0.09</td>
</tr>
<tr>
<td>Gas Price ($)</td>
<td>-0.13</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.13</td>
<td>-0.05</td>
</tr>
<tr>
<td>Holiday</td>
<td>0.13</td>
<td>0.01</td>
<td>0.03</td>
<td>0.13</td>
<td>0.03</td>
</tr>
</tbody>
</table>

The number of rounds played also decreases during holidays and holiday weekends. On holidays and holiday weekends, the number of rounds sold declines by approximately 46 rounds relative to non-holidays. Conversely, for every one degree decrease, approximately five fewer rounds will be sold.

Conclusions

The results presented here highlight the need for policymakers and organizations involved in golfing activity to develop strategies to mitigate the effects of climate change on golfing activity. The data suggest that golf courses should consider adapting their operations to accommodate the effects of higher temperatures. For example, courses could implement water management strategies, such as aerating the greens and fairways, to maintain the quality of the playing surface. Additionally, courses could consider offering special rates or promotions during the hottest months to encourage golfing activity.

References


Application of Results

While the results presented above can provide insight into the potential impacts of climate change on golfing activity, further research is needed to develop effective strategies for mitigating these impacts. The results also highlight the importance of continued monitoring of weather patterns and golfing activity to understand the long-term impacts of climate change on this popular recreational activity.

About the Authors

Sarah Nicholls is Assistant Professor with a joint appointment between the Department of Community, Agriculture, Recreation and Tourism Resources in the Department of Parks, Recreation and Tourism Resources and the Department of Community, Agriculture, Recreation and Tourism Resources. Donald F. Holecek is Professor and Director of the Michigan Travel, Tourism and Recreation Research Center.