IN THE NAME OF GOD

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THE IMPACT OF NORTH ATLANTIC OSCILLATION ON BOTH PRECIPITATION AND TEMPERATURE FLUCTUATIONS IN IRAN

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DEDICATED TO:

MY KIND PARENTS

MY SISTER, BROTHERS

AND

MY WIFE

WHO OFFER THEIR KINDNESS TO

ME IN ALL OF TIMES

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((The best and the most thanks is special for god))

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ABSTRACT

The Impact Of North Atlantic Oscillation On Both Precipitation And Temperature Fluctuations In Iran

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During the last years, teleconnection patterns, i.e., the southern oscillation and its associated El Nino phenomenon (ENSO) have been the focus of broad attention. As a result, some of the characteristics, consequences and challenges of ENSO are now known to many scientists.

In the present research, an other phenomenon known as the North Atlantic Oscillation (NAO) and its influences on both precipitation and temperature has been investigated. Also an outline of the concept of the NAO, along with some of its history is presented.

In this study, correlation has been investigated between the NAO and both precipitation and temperature data of 38 synoptic stations in Iran.

Signification of obtained relationships and temporal stability are assessed by use of correlation analysis [(r), by use of common data and r(t) by use of total data] and Median of Sequential Correlation analysis (MdSC).

Fluctuations in both precipitation and temperature have been investigated on the seasonal basis. Obtained results show that the NAO phenomenon influences seasonal variations more than the monthly variations.

Winter precipitation is shown to be inversely related with the state of the NAO in the northwestern of Iran. Whereas, autumn precipitation with the NAO phenomenon were positively correlated for most parts of country (in 1% and 5% significance levels). In this research no relationship was found for both summer and spring precipitation in Iran.

On the other hand, both winter and autumn temperature have demonstrated a negative correlation with the NAO phenomenon for most parts of Iran (in 1% and 5% significance levels). But no significant relationship was obtained for both summer and spring temperature with the NAO phenomenon.

Iso- correlation line maps, were designed for the obtained results. These maps present regions that are influenced by the NAO phenomenon.

Also in this research, the response of both precipitation and temperature to the extreme phases of the NAO phenomenon was examined. The best results were found for winter and autumn. The results of this study show that the low phase of the NAO affects both winter rainfall and winter temperature. Also the high episode of the NAO has a significant effect on autumn precipitation in Iran.

Finally, it is necessary to emphasize that the NAO (as a main teleconnection pattern) has a major influence on both precipitation and temperature variability in Iran.

LIST OF CONTENTS

CONTENT **PAGE**

CONTENT **PAGE**

CONTENT **PAGE**

LIST OF TABLES

TABLE **PAGE**

LIST OF FIGURES

FIGURE **PAGE**

FIGURE **PAGE**

FIGURE **PAGE**

FIGURE **PAGE**