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CHARACTERISTICS OF THE NUMERICAL BINARY RELATIONSHIP (STATISTICAL) BETWEEN THE POSITIVE AND NEGATIVE EAWR INDEX AND THE DURATION OF SURVIVAL OF SURFACE SYSTEMS AT THE LEVEL OF 1000 MILL BARS IN THE MOSUL STATION IN IRAQ

[1]Alyaa Mutti Hamid
Geographical Department - College of Education for Girls - University of Kufa – Iraq
Email : Alyaa.alyaseen@uokufa.edu.iq
[2] Prof. Nisreen Awad Abdoun
Geographical Department - College of Education for Girls - University of Kufa – Iraq
Nisreen.abdoon@uokufa.edu.iq Email :

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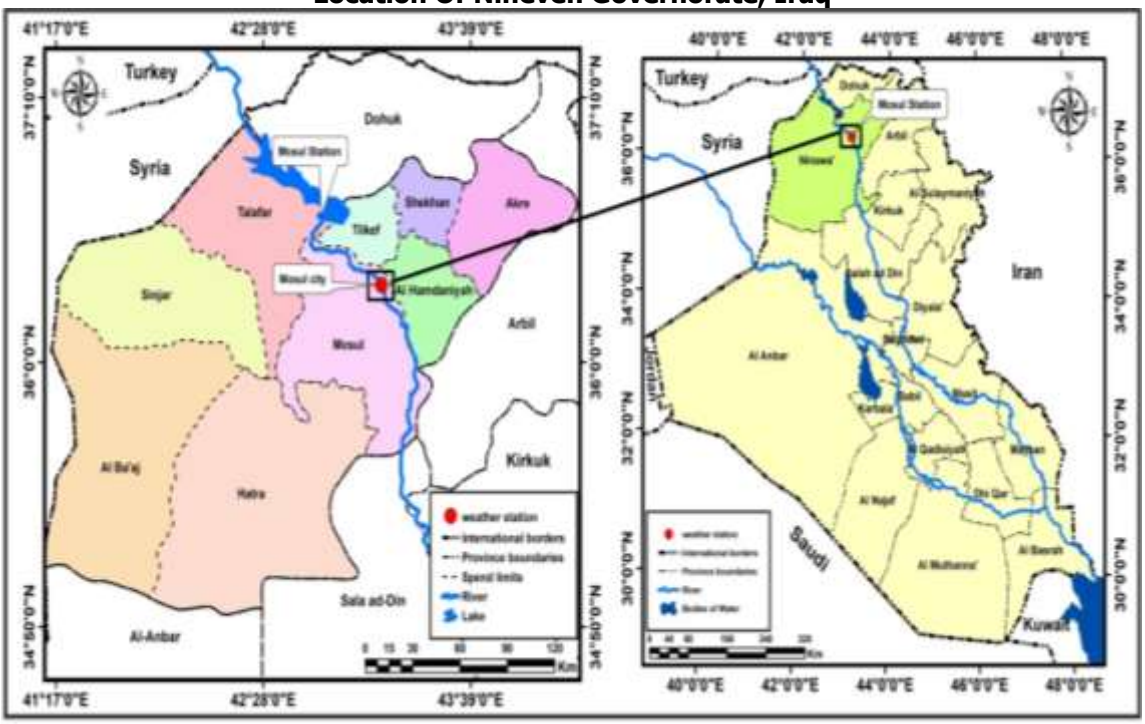
Abstract:
The study attempts to find out the effect of the pressure anomaly generated in the North Atlantic Ocean at latitude (40°N-40°W), which causes the East Atlantic-Western Russia pattern, and to identify its most important effects in increasing or decreasing the number of days of pressure systems survival through Analysis of daily weather maps of the surface level of 1000 millibars for observation (00) and during two climatic cycles, the first climatic cycle spanned (1961-1950) and the second climatic cycle (2008-2019) and the identification of the values of the correlation coefficient through the relationship between the types of pressure systems such as the atmospheric highlands, including the Siberian High The European high, the semi-tropical high, as well as the air depressions such as the Sudanese low, the integrated low, the Indian seasonal low, the Mediterranean low, and finally the West Asian seas depression and the Arabian Peninsula low, in both cases, whether they remain an extension or a secondary center and the nature of the work of the mentioned systems during the negative and positive phases of the East Atlantic Index west of Russia EAWR and what is the nature of the results obtained about the statistical relationship between them .

Keywords: East Atlantic - Western Russia , EAWR , statistics Science

INTRODUCTION

The EAWR pattern affects the control of the strength and direction of the westerly winds that reach the European coasts and the location of the storm paths across the North Atlantic extending from eastern North America (eastern Canada and the United States) through European lands, including the Mediterranean basin to the Caspian Sea system, reaching Siberia and eastern Asia, the climatic influence (air bridge) across eastern North America, North Africa, Europe and Asia, and as a result of the effectiveness of the wave exchange, anomalies occur in four main centers. The wave is negative (positive) Over the middle of the North Atlantic Ocean Its impact reaches the Mosul station in northern Iraq, which lies between longitudes (41-44) east and latitudes(34 – 37) north West syrian arab republic map (1).

Map (1)
Location Of Nineveh Governorate, Iraq



Source: Arc Map 10.4.1

STUDY CONTENT

The type of Pearson correlation coefficient that measures the strength of the relationship between two variables has been determined, as it cannot be more than (+1) or less than (-1) [1] , and the correlation coefficient was tested using (T-Test), which It gives the possibility of testing geographical data before reaching certain conclusions about it, and this is done by developing a hypothesis and then testing its validity. Statistical means to detect the presence or absence of a difference between them, as the first steps (t-test) are done by formulating what is known as the original hypothesis or (the null hypothesis H0) or the null hypothesis that decides that there is no significant difference between the variables, if the tabular data match the calculated data. A simple difference appeared that could be accepted, then the hypothesis is accepted, but if the difference is so great that it is not possible to accept the hypothesis, the hypothesis is rejected Usually a low value is taken with Amount (01, 0.05, 0.01, 0.001)

The study has adopted a level of significance (0.05), as the occurrence of the calculated value outside the limit of the level of morality leads to the rejection of the hypothesis[2]. Calculated with a tabular or theoretical value (t) and a certain degree of freedom (df) and at the level of significance (0.05), then the test result appears that confirms the acceptance of the hypothesis and the existence of a significant correlation between the variables, or supports its rejection and therefore the presence of significant differences Among the variables, therefore, the study relied on developing two hypotheses to clarify the relationship between the indicator (vibration) and the days of survival of the pressure system, which states (there is no correlation between the EAWR indicator and the type of survival of pressure systems on the multiplicity of their types.

As for the second hypothesis, which is the alternative hypothesis (H1), which includes (there is a relationship between the entered variables) and then prove the acceptance of one of them and the rejection of the other by clarifying the final analysis in the test result in the attached table for each phase (+, -) and the statistical program is also adopted (SPSS) or (Statistical Package for the Social Sciences Version 21) to determine the relationship of the oscillation index under study and the type of survival of surface systems, and the coefficient of determination (interpretation) was adopted, which is the square of the correlation coefficient R-square, being a measure of the quality of line matching The goodness of fit regression line[3], as R2 shows the percentage of the total changes in the dependent variable (the indicator) whose effect can be explained by the independent variable (the system), and the regression coefficient and symbolized by the symbol (B) and it is used for the purposes of estimating and predicting the value of A specific variable, which is called the functional relationship that summarizes the features of the spread of a particular shape by predicting one of the two variables through the other variable.

It is clear from Table (1) the positive and negative impact on the East Atlantic-West Russia index, which demonstrated the emergence of five wet seasons (positive phase), four of which are wet during the first climatic cycle: 1955-1954, 1958-1957, 1959-1958, 1960-1959 And one season of the second climatic cycle 2014-2015, and all the remaining seasons with approximately (17 seasons) [4] are dry seasons (negative phase) and the impact of anomalous years will be tested negatively and positively on the fluctuation of the duration of survival of the centers and extensions of pressure systems in the study area.

Table (1)
Years of positive and negative anomalies in the East Atlantic-West Russia Index during the two climatic cycles (1950-1961) (2008-2019)

phase	oscillation	Climatic seasons	phase	oscillation	Climatic seasons
negative	-0.30	1951-1950	negative	-0.85	1951-1950
negative	-0.70	1952-1951	negative	-0.31	1952-1951
negative	-0.35	1953-1952	negative	-0.37	1953-1952
negative	-0.06	1954-1953	negative	-0.05	1954-1953
negative	-0.70	1955-1954	positive	0.03	1955-1954
negative	-0.56	1956-1955	negative	-0.12	1956-1955
positive	0.04	1957-1956	negative	-0.03	1957-1956
negative	-0.88	1958-1957	positive	0.33	1958-1957
negative	-0.07	1959-1958	positive	0.69	1959-1958
negative	-0.68	1960-1959	positive	0.64	1960-1959
negative	-0.04	1961-1960	negative	-0.15	1961-1960

http://www.cpc.ncep.noaa.gov/data/teledoc/eawruss.shtml : Source

Statistical analysis data in Table (2) Figure (1) for the binary correlation between the positive phase of the vibration under study and the number of days of survival of the centers and extensions of pressure systems indicates a direct relationship between the positive phase of the vibration of the East Atlantic - western Russia, which corresponds to the descent of air grooves from the center of the pressure anomaly north The Caspian Sea to match the relationship directly with the duration of survival of the center of the Siberian high, which brings cp masses to the majority of the study stations with direct correlation values that amounted to (0.69) The arithmetic value of t (3.5) is greater than the tabular value of (2.57), which confirmed the significance of the relationship climatically as well as its statistical significance.

While the relationship was negative and weak with the duration of survival extension of the Siberian Highland with a correlation value of (0.40), and the coefficient of determination explained about (16%) of the changes that occurred in the duration of the extension of the Siberian Highland, and the arithmetic t value (0.98) was less than the scheduled t value, and accordingly The relationship is not significant, statistically and climatically

The relationship between the positive anomaly EAWR and the number of days of stay for the European high centers was direct, weak, with a correlation coefficient (0.16), but it was significant climatically compatible with the withdrawal of cold air towards the study area. The coefficient of determination (0.03) explained the effect of the positive anomaly in the European system and the regression coefficient (0.19) The arithmetic value of (1.54) was less than the tabular t, which is a relationship with a significant nature that is climatically significant and not numerically significant, as well as the nature of the relationship with the survival of the European High Extension, weak, negative, non-climatically significant, and statistically, with a correlation of (-0.19), which indicates the weakness or lack of influence of the indicator in The days of the extension of the European high compared to the center .

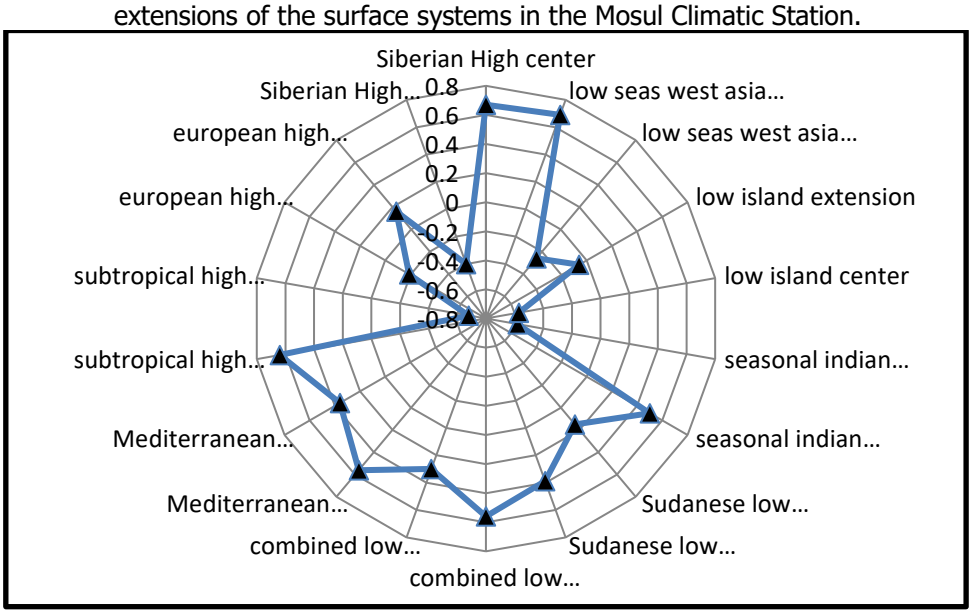
Table (2)
Statistical relationship between EAWR+ and survival times of surface systems centers and extensions in Mosul Climatic Station

Arithmetic (t) value	coefficient Regression	R2 % Interpretation	Correlation coefficient (r)	type of stay	pressure system
3.5	0.64	0.45	0.67	center	Siberian High
0.98	-0.05	0.16	-0.40	extension	
1.54	0.19	0.03	0.16	center	european high
0.43	-0.34	0.04	-0.19	extension	
2.79	-1.74	0.46	-0.68	center	subtropical high
2.54	1.34	0.41	0.64	extension	
1.72	0.1	0.13	0.36	center	Mediterranean low
2.67	0.17	0.32	0.56	extension	
1.65	0.12	0.09	0.30	center	combined low
2.65	0.16	0.31	0.56	extension	
1.77	0.21	0.15	0.39	center	Sudanese low
0.34	0.26	0.02	0.15	extension	
2.0	0.11	0.25	0.50	center	seasonal indian low
2.22	-0.12	0.34	-0.58	extension	
2.22	-4.8	0.32	-0.57	center	low island
0.13	-0.42	0.0	-0.06	extension	
1.61	-1.12	0.07	-0.26	center	low seas west asia
2.64	2.29	0.48	0.69	extension	

Source: researcher

The results of the statistical analysis showed that there is a significant agreement with a strong opposite climatic significance, which is the higher the positive anomaly of the EAWR index, accompanied by a decline and decrease in the survival of the subtropical elevation. 2R is about (46%) of the change in the sub-tropical system due to (+EAWR) and the arithmetic t value was (2.79) which is higher than the tabular one, which indicates the significant relationship statistically with climate , the relationship between the two variables anomalies + EAWR and the extensions of the semi-tropical elevation was a direct, average, non-climatically significant relationship that amounted to (0.64) with an interpretation coefficient (41%), and the trend coefficient between the two variables was direct reached (1.34). It is noted that the calculated t value is relatively close to the tabular one (2.54) The relationship is statistically significant, not climatic .

Shape (1)
The results of the statistical correlation between the EAWR + and the duration of survival of the centers and extensions of the surface systems in the Mosul Climatic Station.



Source Table (2)

The results of the correlation relationship between the positive index of the East Atlantic – Western Russia indicated a significant climatic correlation between them. The coefficient of determination explained about (13%) of the effect of the positive anomaly, the EAWR indicator, on the course of the Mediterranean system (centered survival days), but the correlation showed a higher agreement with the duration of stay. An extension (0.56) with a determination coefficient explains about (32%) of the mutual effect between the inputs, and the arithmetic t value (2.67) was greater than the tabular t value, which proves the significance of the statistical correlation with the presence of a significant climatic significance, which is that the dominance of the positive phase is accompanied by an increase in the days of survival .The extension of the Mediterranean depressions

The statistical relationships vary between the anomaly of the positive EAWR index and the duration of survival of the centers of the integrated depression, as 2R explained about 9% of the effect between them with a correlation coefficient (0.30), which indicates the contribution of the cold basins on the eastern Mediterranean and northern Iraq to the dominance for a longer period of time of the integrated depression in the Mosul station, The regression coefficient was (0.12), and the t-test value was about (1.56), which is less than the tabulated value, to make it clear that the numerical correlation between the two variables is not significant, but it is climatically significant, which increased in the duration of the extension of the low for the occurrence of the direct correlation of (0.56) in accordance with the climatic reality and the exchange contribution Atmospheric for the positive phase EAWR in the clouds of the Mediterranean and sometimes Sudanese depressions to the study area, as the value of t was (2.56), which shows the significant statistical agreement for both variables

The correlation coefficient recorded a strong direct relationship between the strength of the effect of the positive phase of the EAWR index and the high number of days of the extension of the extension of the depressions of the West Asian seas (0.69), and the interpretation coefficient was able to analyze (48%) of the mutual effect between the two variables, and the arithmetic t value was (2.64) which is higher than the tabular Which proves the moral significance of the correlation statistically and climatically, but in the case of days of stay center, no significant significance appeared in the statistical and climatic sides.

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