D:\peak\Now\Autocorrelation.tiff

https://statisticsbyjim.com/time-series/autocorrelation-partial-autocorrelation/

The x-axis gives the lag (k) and the y-axis gives the autocorrelation (ρk) at each lag, i.e. the correlogram is a plot of ρk against k. In this example, the units on the x-axis are ‘years’, so lags 0, 1, 2, . . . (in months) appear at times 0, 1/12, 2/12, . . . (in years). Correlation is dimensionless, so there are no units for the y-axis. Any correlations that fall outside these lines are ‘significantly’ different from zero. 5% of the values would show up as ‘significant’, due to sampling variation, even when their underlying values are zero. It is worth looking for significant values at significant lags, such as the lag that corresponds to the seasonal period. The lag 0 autocorrelation is always 1 and is shown on the plot. It provides an indicator of the relative values of the other autocorrelations; if a correlation turns out to be statistically significant, but is actually very small in magnitude, it may be of little or no practical consequence, and will look ‘insignificant’ alongside ρ0.

Each lag corresponds to the significant correlation. When these correlations are present, they indicate non-randomness, that is, that past values influence the current value. However, if a correlation turns out to be statistically significant, but is actually very small in magnitude, it may be of little or no practical consequence, and will look ‘insignificant’ alongside ρ0; which is the case for this study. At lag 5 autocorrelation of 0.17 (minimum value) implies that a linear dependency of xt on xt−1 would only explain 3% of the variability between the two variables. At lag 7 autocorrelation of 0.36 (maximum value) implies that a linear dependency of xt on xt−1 would only explain 13% of the variability between the two variables. On the other hand, usually a deterministic trend in the data will show in the correlogram as a slow decay in the autocorrelations, due to similar values in the series occurring close together in time, which is not observed in the Figure. Such finding implies that it is possible that these trends are stochastic (or could arise from a purely stochastic process). Of course, this does not imply that there is no underlying reason for the trends – if a valid scientific explanation is known, then this information would clearly need to be included in any future forecasts of the series. A simple stochastic model, therefore, cannot ‘explain’ the trends in this type of time series. When seasonal patterns are present, the autocorrelations are larger for lags at multiples of the seasonal frequency than for other lags, which is also not the case for this specific station. Therefore, seasonal pattern is not evident. Stationarity means that the time series does not have a trend, has a constant variance, a constant autocorrelation pattern, and no seasonal pattern. The autocorrelation function declines to near zero rapidly for a stationary time series. Therefore, for the station the stationary is also not evident.