4.14 A Univariate Box-Jenkins Model to Predict Relative Humidity Levels in Puttalam at Night.

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ABSTRACT

Humidity is among one of the most important weather conditions that influence salt preparation. Technical processes and treatments carried out in salt factories and laboratories require relative humidity levels to be maintained using control systems. Puttalam is a reputed saltern in Sri Lanka. The knowledge on the fluctuations of relative humidity is paramount for the management of Puttalam saltern, to carry out their activities in a proper manner. This paper presents the results of a study carried out to develop a prediction model for relative humidity during night time in Puttalam saltern, using Box-Jenkins methodology.

This study is based on percentage mean relative humidity data collected from the Puttalam weather station from January 1998 to December 2007. Sample autocorrelation functions and sample partial autocorrelation functions are used as the major diagnostic tools in this model building procedure. Model parameters were estimated using the non-linear least squares method. The adequacy of the fitted model was checked by analyzing the residuals.

According to the analysis it was revealed that the ARIMA (1, 0, 1) $(1, 1, 1)_{12}$ model is the best model that could be used to forecast the percentage mean relative humidity at Puttalam saltern during night time.

Forecasts can be readily generated using the above model up to a period of twelve months without using any external variables.