Publications

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Forecasting Water Use in Texas Cities

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- Full Text

In this research project, a methodology for automating the forecasting of municipal daily water use is developed and implemented in a microcomputer program called WATCAL. An automated forecast system is devised by modifying the previously-developed WATFORE model so that potential seasonal water use is calculated from a Fourier series fitted to seven-day weighted moving average values of daily maximum air temperature. A study is made comparing Kalman filtering and Box-Jenkins time series methods for automated model calibration. Although the Kalman filter method explains more of the time variation of the model parameters, the forecast accuracy of both

methods is about the same. Box-Jenkins time series estimation algorithms specially designed for daily water use model parameter calibration, along with graphics and data editing routines, are implemented in WATCAL.

A study is also made of the impact of conservation programs implemented in Austin and Corpus Christi, Texas during the dry summers of 1984 and 1985. Mandatory conservation programs reduced water use in Austin about 10% and in Corpus Christi about 30% of peak summer usage. The effects of an undesirable five-day cycle in Austin's water use (caused by a mandatory watering scheme where addresses ending in a specified pair of digits were allowed to water on a given day) were analyzed. An alternative address digit pairing devised as part Of this research eliminated the cycle during the summer Of 1986.

A study of monthly and daily water use in five cities in Southern California shows that once water use data are made dimensionless, they follow a generic, weather-dependent pattern that is independent of city size and location within the region.

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