

**Title :** Comparative Machine Learning Models for Monthly Reservoir Water Volume at Mae Ngat Dam, Chiang Mai

**Author :** 1. Mr.Sin Ruenngam

**Student ID :** 650510590

**Major :** Statistics

**Advisor(s) :** 1. Assistant Professor Dr.Parichart Pattarapanitchai

2. Acting Capt. Dr.Chalermrat Nontapa

**Type of presentation :**

- Oral Presentation
- Poster
- Cooperative Education

## ABSTRACT

The objective of this study is to develop and compare forecasting models for the monthly water volume of the Mae Ngat Somboon Chol Dam in Chiang Mai, Thailand. Five predictive models were evaluated: Random Forest, AdaBoost, XGBoost, Light GBM, and Decomposition Ensemble Component Boosting (DEC-Boosting). The Time Series dataset, sourced from the Royal Irrigation Department, was divided into two subsets. The training set comprised 136 months of data from January 2013 to April 2024 to determine the optimal model parameters. The testing set included 12 months of data from May 2024 to April 2025 to validate forecasting accuracy. Performance was measured using the Mean Absolute Percentage Error (MAPE) and the Coefficient of Determination (R-Squared). The results demonstrated that the Decomposition with Multiplicative XGBoost model was the most effective for forecasting the water volume of the Mae Ngat Somboon Chol Dam. This model achieved the highest accuracy, with a training MAPE of 2.6272%, a testing MAPE of 3.2852%, and a high R-Squared value of 96.10%.