ABSTRAK

FITA TRI WANTIKA. Pemodelan Amonia dan *Total Suspended Solid* (TSS) di Sungai Code menggunakan Metode *Artificial Neural Network* (ANN). Dibimbing oleh Dr. Joni Aldilla Fajri, S.T., M.Eng dan Dr. Nur Aini Iswati Hasanah, S.T., M.Si.

Aktivitas di sepanjang sungai sangat mempengaruhi kualitas air sungai. Pemantauan perlu dilakukan untuk mengetahui kondisi kualitas air sungai tersebut. Pemantauan kualitas air sungai selama ini dilakukan menggunakan alat ukur terstandar dan petugas pengukur yang berpengalaman. Metode pengujian atau pengukuran tersebut diduga dapat dibangun menggunakan model *Artificial Neural Network* (ANN). Tujuan dari penelitian ini adalah membangun model ANN untuk memprediksi amonia dan TSS serta mejelaskan perubahan karakteristik amonia dan TSS terhadap perubahan parameter fisika. Metode *Artificial Neural Network* (ANN) merupakan metode yang dapat membantu peramalan dan pemantauan kualitas air sungai. ANN tersebut memiliki 3 layer, meliputi layer input (*total dissolved solid*, pH, dan suhu), layer tersembunyi, dan layer output (amonia dan *total suspended solid*). Model ANN yang dikembangkan dalam penelitian ini mampu memprediksi output parameter amonia dengan R^2 = 0.86 dan RMSE = 0.07 pada proses *training* serta R^2 = 0.91 dan RMSE = 0.09 pada proses *testing*. Parameter *total suspended solid* dengan R^2 = 0.84 dan RMSE = 0.29 pada proses *training* serta R^2 = 0.75 dan RMSE = 0.26 pada proses *testing*. Hasil ini menunjukkan bahwa ANN mampu memodelkan amonia dan TSS dengan baik.

Kata kunci: Pemodelan lingkungan, RMSE, Sungai Code, *testing, training.*

ABSTRACT

FITA TRI WANTIKA.. *Modeling Ammonia and Total Suspended Solid (TSS) in Code River using Artificial Neural Network (ANN) Method*. *Supervised by* Dr. Joni Aldilla Fajri, S.T., M.Eng *and* Dr. Nur Aini Iswati Hasanah, S.T., M.Si.

Activities along the river greatly affect river water quality. Monitoring needs to be done to determine the condition of the river water quality. River water quality monitoring has been carried out using standardized measuring instruments and experienced measuring officers. The test or measurement method is thought to be built using the Artificial Neural Network (ANN) model. The purpose of this study is to build an ANN model to predict ammonia and TSS and explain the changes in the characteristics of ammonia and TSS to changes in physical parameters. Artificial Neural Network (ANN) method is a method that can help forecast and monitor river water quality. ANN has 3 layers, including the input layer (total dissolved solid, pH, and temperature), the hidden layer, and the output layer (ammonia and total suspended solid). The ANN model developed

in this study was able to predict the ammonia parameter output with R2 = 0.86 and RMSE = 0.07 in the training process and R2 = 0.91 and RMSE = 0.09 in the testing process. The total suspended parameters are solid with R2 = 0.84 and RMSE = 0.29 in the training process and R2 = 0.75 and RMSE = 0.26 in the testing process. These results indicate that ANN is able to model ammonia and TSS well.

Keywords : Environmental modeling, River Code, RMSE, testing, training.