This paper proposes the application of genetic programming (GP) to forecast monthly river flow. The river flow models were improved by the monthly rainfall and flow data from three stations for Kizilirmak River, Turkey. The coefficient of determination (R²) and root mean square error (RMSE) values were used for evaluating the accuracy of the developed models. The most appropriate GP model was determined as model having monthly flow data of Yamula and Bulakbas,ı stations according to the model performance criteria for testing data set. The models obtained using the GP were compared with multiple linear regression (MLR) techniques in river flow forecasting. The comparison results revealed that the suggested GP model performs quite well compared to MLR models. It was shown that the suggested GP model with R² = 0.96 and RMSE= 8.02m³/s for testing period could be used in planning and management of water resources.