Abstract. Global hydrological cycles mainly depend on climate changes whose occurrence is predominantly triggered by solar and terrestrial influence, and the knowledge of the high water regime is widely applied in hydrology. Regular monitoring and studying of river water level behavior is important from several perspectives. On the basis of the given data, by using modifications of general approaches known from literature, especially from investigation in hydrology, the problem of long- and short-term water level forecast at one river measurement location is considered in the paper. Long-term forecasting is considered as the problem of investigating the periodicity of water level behavior by using linear-trigonometric regression and short-term forecasting is based on the modification of the nearest neighbor method. The proposed methods are tested on data referring to the Drava River level by Donji Miholjac, Croatia, in the period between the beginning of 1900 and the end of 2012.