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Research on the scheme and improvement strategy of drainage data integration

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Objectives

Aiming at the problems such as simple integration method and insufficient data value depth mining involved in practical application, combined with the relatively mature relevant knowledge in machine learning, Big data, automation and other fields, corresponding improvement and improvement strategies are proposed to improve the efficiency of drainage data integration, improve the availability of data, fully tap the hidden value of drainage data, and better serve the research on water resource recycling, Serving higher-level data applications and providing new solutions for data integration.

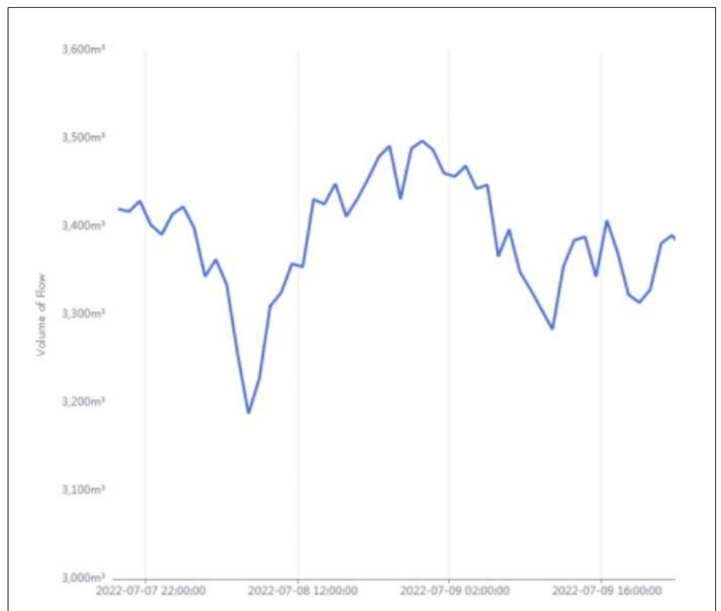

Figure 1 Diagram of the relationship between incoming water volume and time

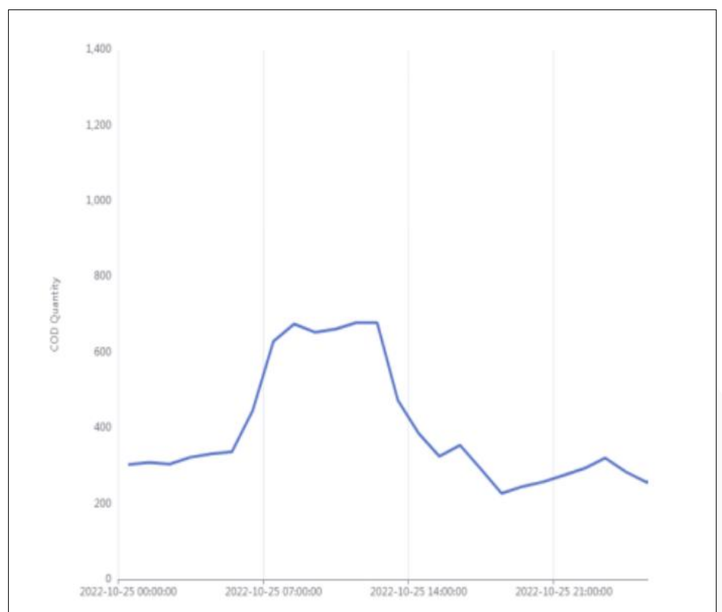

Figure 2 Diagram of the relationship between COD quantity and time

Methods

Reling on the python language and cooperating with the Pyecharts, Pandas, Numpy and other data analysis and Data and information visualization dependency package provided by the python community to integrate, process and analyze the drainage data, and visually display the processed data. This paper selects the hourly data of 10 reclaimed water plants (sewage treatment plants) in Changping District of Beijing from May 9, 2022 to November 6, 2022 as the original data to be treated, to study the drainage situation in this area and the method of drainage data compilation.

Conclusions

This article explores the data value behind using drainage data through some mathematical methods, explores the application fields of using drainage data, provides basic data support for upper level data analysis work, and provides corresponding analysis ideas and methods for data analysis work at the same level. In the future, the analysis work can be completed by automated programs, which process based on real-time updated data, and the processing efficiency is much higher than manual calculations. This article aims to provide reference ideas for the integration of drainage data, help improve the quality of water data application, and expand the application direction.

Results

By analyzing nearly 25000 valid data of 10 reclaimed water plants (sewage treatment plants) in Changping District of Beijing, the following results are obtained:

1. There is a strong temporal correlation between factors such as the amount of incoming water and turbidity. From a single day's data, the overall situation is that the daytime treatment capacity is significantly higher than the nighttime treatment capacity, and the turbidity of the water body also shows the same trend.
2. The Pearson correlation coefficients of COD, NH4, and pH values in water bodies are all less than 0.4, showing weak or no correlation.

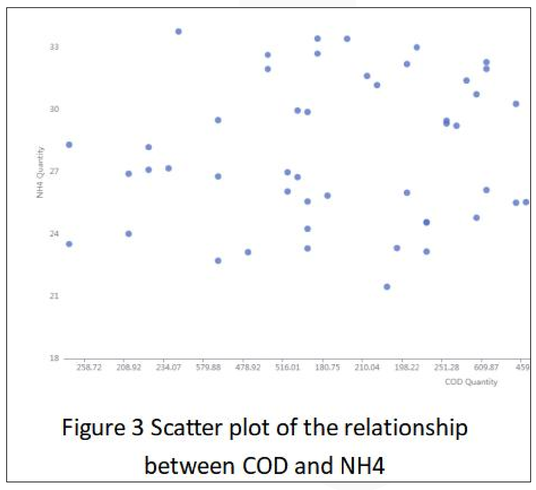

Figure 3 Scatter plot of the relationship between COD and NH4

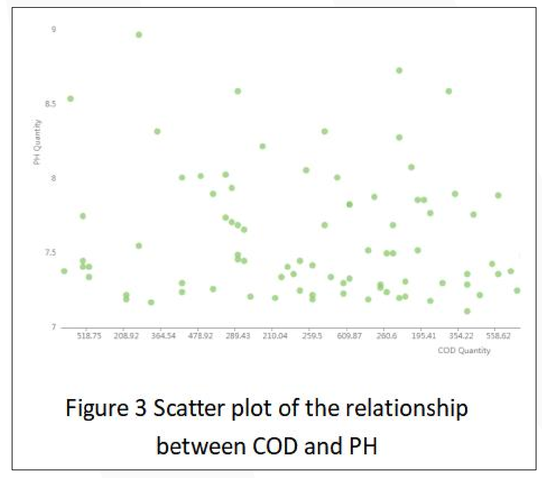

Figure 3 Scatter plot of the relationship between COD and PH