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Intelligent Supervision and Health Risk Assessment of Groundwater in Beijing

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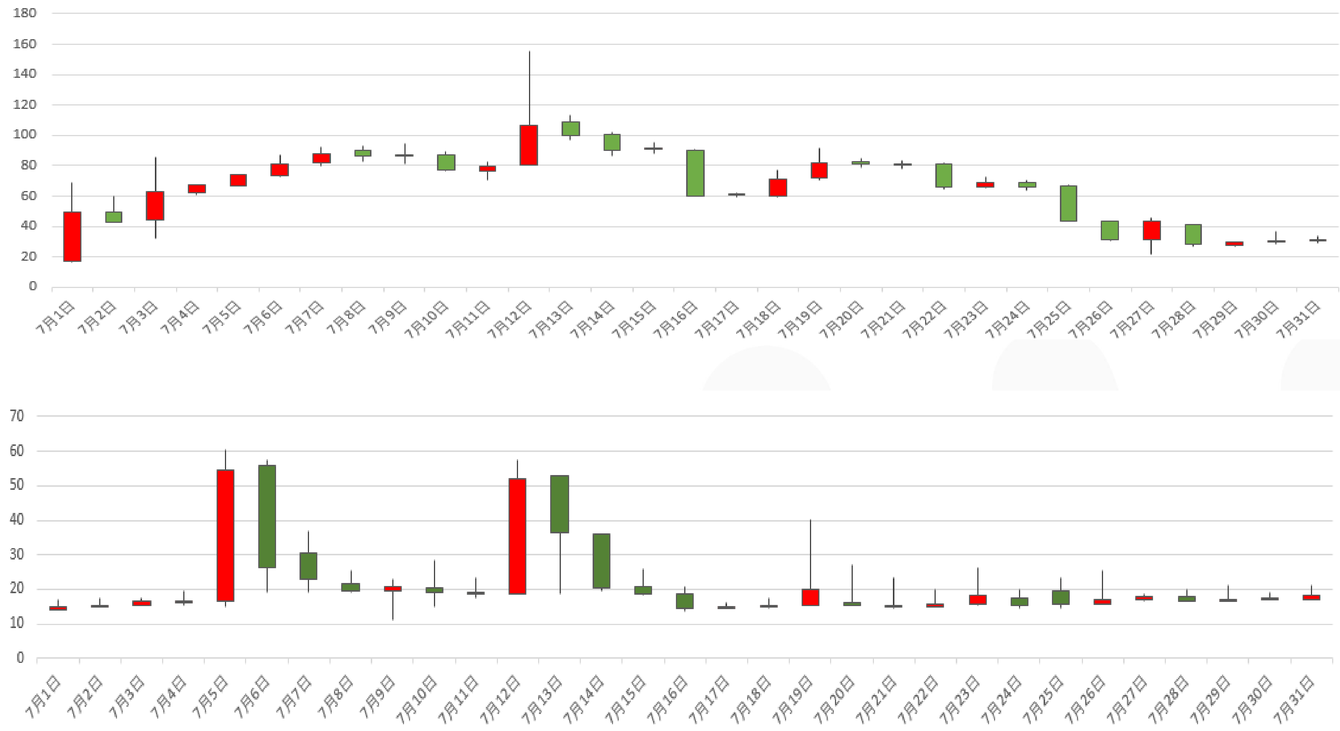
Objectives

In recent years, with the arrival of the "South Water" in Beijing and the overall abundance of precipitation, it has played an important role in extracting groundwater and promoting the rise of groundwater levels. However, the comprehensive management of groundwater overexploitation in Beijing still faces enormous pressure. To further promote the precise control of groundwater extraction, prevention and control of ground subsidence, and groundwater conservation management in Beijing.



Methods

This study construct a relationship, by collecting and analyzing data on the distribution of shallow groundwater depth and water intake dynamics in Beijing, and the control factors for changes in shallow groundwater in overexploited areas were determined using the BP neural network method; Through the dynamic evaluation of groundwater resources development and utilization based on the nested grid of administrative regions and hydrological units, and based on the big data technology to analyze the water use level of non-residential water users and the synergy of water use, explore and propose the technical path of dynamic physical examination and collaborative supervision of Beijing's collaborative water use management.

Results

scanning the code (including mechanical water meters, electricity conversion and quota calculation, filled in monthly) and remote transmission (updated daily), 100% of the water flow in the city's active wells can be gathered; Based on the above water intake data and groundwater depth data in the Water Resources Bulletin, it can be concluded that since 2021, except for a few areas in Beijing where the depth has decreased, most of the remaining areas have shown a continuous increase in depth; The shallow groundwater level in the plain changes significantly in depth, with contribution rates of 0.647 and 0.391 respectively due to precipitation and groundwater supply.

Conclusions

This research has realized the whole life cycle management of pumped wells, established an account book for water intake management, effectively supported the refined management of groundwater, and laid a data foundation for the implementation of the strictest water resource management system.