Research on Application of GIS Technology in Water Environment Planning of Basin

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Abstract. Water environment is a typical public goods. When the market fails, government intervention is needed at this time. The local environmental protection department should strengthen supervision of enterprises, comprehensively investigate enterprises and factories in the river basin that do not meet environmental protection requirements and carry out rectification within a specified period of time for units that have not entered the unified sewage pipe network. At the same time, strengthen inspections and pay close attention to secret discharge and leakage. On the other hand, it is necessary to strengthen public supervision, establish and build a public participation mechanism and give full play to the consciousness and enthusiasm of the people, so as to stop and resist pollution and highlight the power of the public. At present, only relying on manual treatment can no longer meet the needs of river basin development. Especially after the completion of large-scale water resources network planning and construction, water basin planning has become an important problem that needs to be solved urgently. GIS technology integrates functions such as remote sensing mapping, terrain perception, etc. and has long been used in watershed planning in developed countries. This article analyzes it.

Keywords: Water Environment, Watershed, Management

1. Introduction
Geographic Information System (GIS) is an information system used for spatial data collection, processing, storage, management, analysis and expression. At present, GIS is widely used in various fields of people's production and life, such as resource survey, environmental assessment, disaster management. Using GIS can track the occurrence and development of disasters in real time, quickly analyze, evaluate and simulate disasters and assist in post-disaster emergency and recovery work. In the disaster monitoring stage, GIS has played a huge role in analyzing and determining the types of disasters, the causes of disasters and future trends; in the process of commanding disaster relief after disasters, the combination of GIS and remote sensing data can quickly and accurately determine the affected area[1]. Estimating and predicting the scope and scope, designing rescue routes and providing detailed and accurate data for rescue work.
2. GIS technology analysis
In the watershed management application, with the support of the background database, the GIS comprehensive analysis and statistical analysis methods are used to find out the disaster location, the large-scale disaster occurrence range and the extent of the disaster and give a detailed assessment of the post-disaster loss status of different land types and generate qualitative, positioning and quantitative maps, summary data and statistical reports according to different levels of administrative units and provide them to relevant departments to assist in decision-making. GIS can be used for scientific post-disaster reconstruction planning and reconstruction program evaluation.

3. Current status of river basin water environment planning

3.1. The main work of the watershed soil and water conservation planning project
The design scheme of the water and soil conservation planning of the river basin is an important basis for the state to allocate funds for water conservancy project management projects and it is also a blueprint for construction companies during construction. Regardless of the various review work before the water conservancy project, the approval, plan issuance, bidding, inspection, acceptance, payment, etc., all links need to use the design plan of the watershed water and soil conservation plan[2]. Therefore, the design of the basin is very important for all aspects. The water and soil conservation planning and design of the river basin will mainly design many aspects. First, the basic situation of the river basin needs to be understood in detail; secondly, the management plan and the task of selecting and constructing measures are involved in the details and characteristics of soil erosion; To the design of the construction, the follow-up of the construction quarter, the management of the construction organization and the inspection of the project. Including investment estimates, etc. are all within the scope of the basin design and planning. In particular, the design of measures and investment estimates are the most important.

3.2. Technical Difficulties of Water and Soil Conservation Planning in the Basin
The water and soil conservation planning project of the river basin is a project involving a wide range of projects, which is different from the general point-shaped current water conservancy project. As mentioned above, the phenomenon of soil erosion in my country is relatively serious and it is not only concentrated in one area, so the water and soil conservation planning of the river basin has its flexibility, but it also has many difficulties. Watershed design needs to be planned differently according to different regions, requiring precise positioning. Fitting the positioning to the boundary, area and height of the site is the focus of the design or the difficulty of the design, but it must be done in order to get accurate information and master The current situation of water and soil utilization and soil erosion[3]. The current way of making these is mainly to artificially construct drawing spots and manually fill in legends, land use conditions and soil erosion status through CAD importing drawings. CAD drawing not only requires a lot of work, but also takes a long time. Work composition can easily lead to inaccurate information. So at present, the main technical difficulty in water and soil conservation planning in a river basin is to simulate on-site information.

4. Application of GIS in water environment planning of river basin

4.1. Relying on GIS technology for reasonable and safe management of water quality
When carrying out water resources management, the introduction of GIS technology into the geographic information system can not only effectively help practitioners to develop and use water resources in a reasonable and effective manner, but also effectively promote in-depth analysis and research on water resources[4]. So as to realize the scientific management of water resources. In the specific work of water resources management, GIS technology can be used to establish a complete water resources information management system and a large amount of monitoring water resources data can be used to realize the rational development and utilization of water resources. At the same
time, a water resource management model is built with the support of GIS technology to realize the rational use of water resources, reduce the waste of water resources, improve the management efficiency of managers and realize the rational deployment and use of water resources. The GIS management system is shown in the figure below.

**Figure 1. GIS management system**

4.2. Relying on GIS technology to establish water resources geospatial database

It is very important to use GIS technology to establish a complete hydrology and water resources geospatial database for hydrology and water resources management. GIS technology itself has strong spatial characteristics and can update data and transmit information in real time [5]. At the same time, it also has a very clear visualization effect, so that all kinds of information can be clearly presented. To get information from data, data processing is a very important link. The so-called data processing process refers to the process of collecting, filtering, arranging, categorizing, converting, storing, retrieving, calculating and analyzing, simulation and predicting data. The purpose of data processing is to: (1) convert the data into a form that is convenient for observation, analysis, transmission or further processing; (2) process the data so that the collected data becomes useful data for correct management and decision-making; (3) Store the edited data for subsequent use. This ensures that the water resources database can obtain accurate hydrological data in real time. The GIS database is shown in the figure below.

**Figure 2. GIS database**
4.3. Relying on GIS technology for flood prevention and disaster reduction work

With the rapid development of our country's economy, it has brought very bad effects to the ecological environment. In recent years, frequent floods have not only caused immeasurable economic losses, but also endangered people's lives and property safety. In the process of hydrological data information monitoring, not only real-time monitoring and comprehensive control of river water level, flow, precipitation and other information, but also drought, waterlogging, water quality, topography, climatic conditions, river conditions, etc. Various information such as greening conditions and water conservancy facilities are obtained. Use the very powerful information integration capabilities of GIS to fully integrate the acquired information and build a special and effective forecast system. Give full play to the advantages of GIS\[6\]. In addition, GIS technology can also obtain accurate hydrological conditions in real time, use GIS technology to deal with the relevant conditions and carry out a comprehensive assessment work, do a good job in prevention and minimize disaster losses.

5. Conclusion

At the same time, the geographic information system is used to collect spatial data in the map drawing link to make the map drawing technology more perfect. In recent years, my country's science and technology have developed rapidly and the theoretical and practical systems of geographic information systems have been gradually improved. With the practice of geographic information system in most fields, it is effectively combined in cartography to improve the accuracy of the map. In cartography, geographic information systems provide them with a large amount of spatial data, thereby improving the efficiency of watershed management.

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