Research on the spatial database management system of water resources in a river basin

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\begin{abstract}
The planning, management, governance, and ecological protection of a river basin are becoming more and more important, which needs a great support of water resources data both spatial and attribute data. According to the characteristics of these data, a suitable thematic water resources spatial database management system (WRSDBMS) in river basin is proposed to manage these data integrally. In the thematic system, an extensible data model conforming to water resources data is proposed with the synthesization of traditional structured database system and unstructured spatial data management system. In the extendable data model, client/server structure is used, an extended model of Oracle is used to manage both spatial data and property data, and the spatial database engine is used to import/export spatial data to/from Oracle. The WRSDBMS system is finally used for water resources data management of Hanjiang river basin. It is clearly seen that the system is efficient and reasonable in integrated management of spatial and attribute data. And it may provide a strong support for the scientific management of the river basin.

\textbf{Keywords:} Water resources; Spatial database management system; River basin; Extendable data model; Oracle; Spatial database engine; GIS
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