

地质信息可视化的应用--城市环境地质研究之发展方向

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摘要: 随着21世纪人类城市化建设的发展, 城市环境地质研究成为水工环地质研究领域的一个重要组成部分, 城市建设中的最主要问题是水资源问题和环境地质问题。城市水资源问题有: 城市后备水源地的研究, 以及应急水资源地和地下水库的研究。城市环境地质问题主要包括:

(1) 围绕城市建设和发展的一般性资源、地质环境问题;

(2) 城市地质作用产生的地质环境问题;

(3) 城市人口密集区及工业区的土壤和水体有机污染问题。

解决城市环境地质问题的关键是对地下空间地层岩性及构造条件的研究, 通过这些基础条件研究分析城市地质环境和地下水资源问题。可视化研究技术通过对城市地质体在地下空间的相对位置、形态、物化特征等三维构模处理, 使这些城市赖以存在的地质基础条件可为非专业的决策层所理解, 并在城市发展的规划中体现这些大自然所赋予人类的地下空间资源的价值。应用三维可视化技术对城市环境地质研究是一个全新的研究领域, 目前尚没有系统完整的应用先例。三维可视化技术将在城市化环境地质研究中, 开拓一个崭新的环境地质研究时代, 成为城市环境地质研究的发展方向。

关键词: 三维可视化; 城市环境地质; 地下空间

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Application of geological information visualization-Direction in development of the study of urban environmental geology

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Abstract: With the development of human urbanization in the twentieth century, urban environmental geological research has become an important component part in the area of hydrological, engineering-geological and environmental-geological research. Water resources and environmental geology are the crucial problems in urban construction. The problems of water resources include reserve water resources, urgently needed water resources and subsurface water reservoirs. The problems of urban environmental geology include: (1) the general problem of water resources and geological environment about urban construction and development, (2) the problem of geological environment resulting from urban geological effects, and (3) the problem of organic pollution of soil and waters in densely inhabited districts and industrial areas. The key to solving the urban environmental geological problems is research on lithological and structural conditions in subsurface space. Through a study of these basic conditions, the problems about the urban geological environment and subsurface water resources can be analyzed. By means of 3D structural model treatment of the relative position, configuration and physico-chemical features of the urban geologic bodies in the subsurface space, visualization technology can make basic geological conditions for city subsistence understood by unprofessional decision makers and present in urban developmental planning the value of subsurface geological resources with which nature endows mankind. The application of 3D visualization technology in the study of urban environmental geology is a frontier and up to now there is no systematic and complete precedent for its application. 3D visual technology will usher in a new epoch of environmental geological study and is a direction of research for urban environmental geology

Key words: 3D visualization; urban environmental geology; subsurface space