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基于Geo-WebServices的农田环境动态监测与评价分析系统

System for farmland environment dynamic monitoring and evaluation based on Geo-WebServices

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中文摘要:

为实现农田环境质量数据的在线共享、查询统计与评价分析服务,该文结合地统计学及农田环境质量监测相关专业知识建立采样点布设优选评价模型,并基于GIS、S、角色访问控制等技术,设计开发了农田环境动态监测与评价分析系统。应用证明,系统采用Geo-WebServices技术能够实现分布式存储的极高分辨率遥感影像和大比例尺基础地理数据等数据服务的实时在线集成与共享,提高了数据分析精度,也解决了高精度基础空间数据的共享安全性及数据版权的问题;能依据角色分配用户权限,系统安全可靠;能灵活定制与管理农田环境监测评价与预警分析等模型,并实现从采样布设优选评价、采样点数据预处理、环境质量评价与预警分析及结果多方式直观可视化等全流程的动态监测分析功能,系统能有效应用于农田环境质量监测与管理。

英文摘要:

Farmland environmental quality is important for safeguarding the quality and safety of agricultural products. At present, due to the majority of farmland environment quality evaluation systems lack of available models and simple function structures, most systems are difficult to use to realize cross-platform data sharing, distributed data access and heterogeneous spatial data interoperability. Furthermore, they are unable to realize, from sampling design, environment quality evaluation analysis, crop suitability evaluation and warning analysis. Based on related knowledge of farmland environment quality monitoring, this study established an appraisal model for optimizing sampling distribution, and the integrated GIS, GNSS and RBAC technology. It designed the system for farmland environment dynamic monitoring and evaluation, which can realize data online sharing, data que and statistics analysis and farmland environmental quality evaluation analysis. The application of the system showed that using Geo-WebServices technology can realize real-time online integrating and sharing with distributed storage high resolution of remotely sensed imageries and large scale fundamental geographical data. This, in turn, can improve the accuracy of data analysis and solve problems of sharing security and data copyright of the high-precision spatial data. Meanwhile, by designing permissions and roles and distributing them to users, the safety and reliability of the system can be guaranteed. What is more, the system functions to manage and customize the models for farmland environmental monitoring and evaluation and warning analysis bringing about both powerful analysis and intuitive visualization abilities for the dynamic management and monitoring of the whole process, such as sampling layout optimization and evaluation, sample point data pretreatment, environment quality evaluation and warning analysis, thematic mapping and so on. The system basically realized visual management of farmland environmental attribute data and spatial data share and exchange, for monitoring and evaluating soil environmental data, irrigation water environmental data and atmospheric environmental data with dynamic and efficiency. The system is effective for farmland environment quality monitoring and management.

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