

论著

基于QuickBird影像提取江滩钉螺分布生态环境要素的研究

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摘要

【摘要】 目的 基于QuickBird遥感资料提取有关钉螺分布生态环境要素, 探索预测钉螺密度的新方法。方法 以血吸虫病流行区安徽省当涂县江心乡为试验小区, 利用米级高空间分辨率QuickBird影像, 结合地面精确定位的实测螺情数据, 提取该地区有关钉螺分布的生态环境因子, 主要包括植被因子(植被指数、植被覆盖度)和土壤因子(土壤质地、土壤覆盖类型、土壤湿度等)。利用主成分分析(PCA)、监督分类法进行定性分析, 并计算归一化差异植被指数NDVI和修改型调整土壤植被指数MSAVI, 反演叶面积指数LAI和植被覆盖度F, 并引进KONOS影像K?鄞T变换(KT)的最新模型, 应用于QuickBird影像上。最后结合地面实测点, 在GIS支持下, 进行空间分析, 探讨钉螺分布与环境因子的关系。结果 获153个地面钉螺分布实测点资料, 建立了钉螺空间分布地理信息数据系统(GIS)数据库, 该数据库包括钉螺密度、NDVI、MSAVI、LAINVDI、LAISAVI、FNDVI、FMSAVI、PCA?鄞1、PCA-2、PCA-3、KT-1、KT-2和KT-3。根据多元逐步回归分析结果, 发现钉螺密度和利用MSAVI反演的叶面积指数(LAISAVI)和覆盖度(FMSAVI)有显著相关关系, 回归方程为: $Y = -3.919 + 1.22 LAISAVI + 16.076 FMSAVI$ 。回归模型的判定系数为0.2。结论 利用米级高空间分辨率QuickBird影像遥感资料反演和钉螺生态环境密切相关的环境因子, 建立的预测钉螺密度空间分布模型有良好的应用前景。

关键词 [生态环境因子](#) [钉螺](#) [植被指数](#) [遥感](#) [QuickBird](#)

分类号

Retrieving Eco-environment Factors Relevant to *Oncomelania* Snail Distribution Based on QuickBird Image

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Abstract

【Abstract】 Objective To estimate snail distribution by using high spatial resolution QuickBird image on the basis of retrieving the eco-environment factors relevant to snail distribution. Methods Combined with the well-positioned ground data of *Oncomelania* snails, the meter-level high spatial resolution QuickBird image was used to retrieve the eco-environment factors related to snail distribution in Jiangxin village of Dangtu county, Anhui Province. The factors included vegetation (vegetation index and vegetation cover ratio) and soil (soil texture, soil cover type and humidity). A qualitative analysis was made by using principle component analysis, K-T transformation and supervision classification methods to retrieve the eco-environment factors. The vegetation index NDVI (Normalized Difference Vegetation Index) and MSAVI (Modified Soil Adjustment Vegetation Index) were calculated, and LAI (Leaf area index) and F (vegetation cover ratio) were retrieved. Information from QuickBird data and corresponding ground data were then used to analyze the relationship between snail distribution and environmental factors by using ArcGIS and statistical software. Results Snail data were received from 153 ground distribution spots and a GIS database on spacial distribution of snails was established. This database covered snail density, NDVI, MSAVI, LAINVDI, LAISAVI, FNDVI, FMSAVI, PCA-1, PCA-2, PCA-3, KT-1, KT-2 and KT-3. Statistical analysis showed that the snail density could be estimated by LAINVDI and FMSAVI quantitatively based on the following regression model: $Y = -3.919 + 1.22 LAISAVI + 16.076 FMSAVI$. Decision index of the regression model was 0.2. Conclusions A quantitative regression model between *Oncomelania* snail distribution and environmental variables retrieved from QuickBird images has been established,

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which may have a wide application prospect.

Key words [Eco-environment factors](#) [Oncomelania hupensis](#) [Vegetation](#) [Remote sensing](#) [QuickBird](#)

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