

林学—研究报告

基于二维小波分析的丘陵山区景观特征尺度识别

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摘要:

以胶东半岛具有典型山地丘陵特征的栖霞市为例, 选取A、B、C、D、E 5个代表性研究样区, 用归一化植被指数(NDVI)和地形位指数作为植被和地形景观变量, 分别应用sym2和Haar小波基, 探讨二维小波分析在景观特征尺度识别中的有效性。结果表明: 经小波变换, 5个样区的景观图像表现出不同尺度和方向的结构特征, NDVI检测出农村居民点、工业用地的典型长宽尺度以及农田景观粒径; 地形位指数检测出山体坡长和山脊线之间的距离; 在景观相对破碎的B、C样区, 小波方差变化幅度大于A、D、E样区, 在地形起伏大的E样区, 小波方差变化幅度大于A、B、C、D样区; 经多尺度特征检验, 栖霞山区景观最典型的特征尺度出现在3200 m和6400 m。研究结果为山区景观格局分析和土地利用提供科学依据。

关键词: 二维小波分析; 特征尺度; 景观格局; NDVI; 地形位指数

Recognition of Landscape Characteristic Scale Based on Two-dimension Wavelet Analysis in Mountainous Area

Abstract:

With the normalized difference vegetation index (NDVI) and terrain niche index as the landscape variables of vegetation and topography respectively, the validity of two-dimension wavelet was analyzed in recognizing the landscape characteristic scales in Jiaodong mountainous area. In the five sample plots (A, B, C, D, E), the landscape images appeared structure characters on different scales and directions. The results of NDVI detected characteristic scales of country residential, industrial site and farmland, terrain niche index showed typical slope and the distance between the ridge lines. The variations of B, C plots' wavelet variance were larger than A, D, E plots', because B, C plots' landscape were more fragmented than A, D, E plots'. The variation of E plot's wavelet variance was larger than A, B, C, D plots', because E plot's terrain fluctuated more strongly than A, B, C, D plots'. The most typical characteristic scales were 3200 m and 6400 m for mountain landscape of Qixia city by multiscale characters detection. The research provides scientific basis for the analysis of mountainous landscape pattern and land use.

Keywords: two-dimension wavelet analysis characteristic scale landscape pattern; NDVI terrain niche index

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