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Study on Geomorphologic Spatial Information Mining and Application	
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Abstract	Digital Elevation Models (DEM) implies numbers of geomorphologic spatial information. It not only includes the three-dimensional coordinate but also has unique texture information, which can describe the ‘true’ land surface adequately at relation of neighbors (plan) and relative (amplitude). We will use a method to study the wavelength characters by data mining and distribution of slope and local relief on the altitude steps through a local window. The Shuttle Radar Topography Mission (SRTM) collect detailed Digital Elevation Models(DEM) data between 60° N and 57° S, 80 percent for all land masses, and it provides reliable, high precision surface elevation data for us, suits to analyze efficiently landscape pattern. SRTM-DEM data simulate three-dimensional land surface with regular gridded matrix, and these discrete points are fit for spatial neighbors’ analysis and statistics, and convenient to geomorphologic pattern computation and analysis in digital computer. Geomorphologic pattern is influenced by Physical properties and human activities in a most direct way, but whilst it record numbers of geological evolution evidence, and these records provide some important information for climate change, geological and geographical processes and ecological environment researches in science. In this study, making the whole Jilin province as study object, we propose a fourth-order equation to approximate land as a continuous curved surface, association neighbors’ analysis method, utilize digital elevation matrix to validate an optimal statistic window, and subsequent study the area spatial distribution by parameterization and classification, get a satisfactory effect.
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Study on Geomorphologic Spatial Information Mining and Application

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Key words: Digital geomorphology; Partial quartic equation; Spatial Analysis; Shuttle Radar Topography Mission (SRTM)

Abstract. Digital Elevation Models (DEM) implies numbers of geomorphologic spatial information. It not only includes the three-dimensional coordinate but also has unique texture information, which can describe the 'true' land surface adequately at relation of neighbors (plan) and relative (amplitude). We will use a method to study the wavelength characters by data mining and distribution of slope and local relief on the altitude steps through a local window. The Shuttle Radar Topography Mission (SRTM) collect detailed Digital Elevation Models(DEM) data between 60°N and 57°S, 80 percent for all land masses, and it provides reliable, high precision surface elevation data for us, suits to analyze efficiently landscape pattern. SRTM-DEM data simulate three-dimensional land surface with regular gridded matrix, and these discrete points are fit for spatial neighbors' analysis and statistics, and convenient to geomorphologic pattern computation and analysis in digital computer. Geomorphologic pattern is influenced by Physical properties and human activities in a most direct way, but whilst it record numbers of geological evolution evidence, and these records provide some important information for climate change, geological and geographical processes and ecological environment researches in science. In this study, making the whole Jilin province as study object, we propose a fourth-order equation to approximate land as a continuous curved surface, association neighbors' analysis method, utilize digital elevation matrix to validate an optimal statistic window, and subsequent study the area spatial distribution by parameterization and classification, get a satisfactory effect.

Introduction

Geomorphologic research has been attracting much attention due to its huge influence in the research study of ecology, soil erosion, geological hazards assessment and climate change (Dendoncker & Rounsevell et al., 2007). Earth's surface shows significant regional differentiation on account of morphological features, force types and the role of nature, material composition and formation age, thus, it forms different landscape patterns, and these spatial patterns to some extent reflect geomorphologic formation and evolution law. Along with the continuous improvement by means of acquiring spatial data and developing geographic information systems, it is possible to implement high-resolution data for spatial analysis.

During the last three decades the availability of DEM data has been continuously growing, data accuracy has improved, and additional algorithms have been developed to derive new properties from gridded DEM data (Drăgut, 2006).The Shuttle Radar Topography Mission (SRTM) provided detailed digital elevation models (DEM) for all land masses between 60°N and 57°S (Ehsani &Quiel, 2008). Since 3 arc-second SRTM-DEM data became widely available, many studies use them for applications in topography (Falorn, 2005; Centamore & Palmieri, 1996), geomorphology (Horton, 1945; Drăguţ，2006；Ehsani，2008), vegetation cover research (Florinsky & Kuryakova,1996), land use (Dendoncker，2007) and hazard assessment (Blumberg，2005). Arell et al.(2007) applied the method of fuzzy C-means classification for a sample DEM from Snowdonia, wales, with a number of morphometric measures as different resolutions as input , and morphometric classification

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