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Study on Macroscopical Dynamic Monitoring of New Increased Construction Land in Yinchuan Plain Based on 20m Scale Middle Resolution Remote Sensing Data

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Abstract

Analyzing the significance of macroscopical dynamic monitoring of new add construction land, considering the influence of various factors, this paper selected Yinchuan Plain for a typical experimental zone, built knowledge base of remote sensing images interpretation, used multi-temporal remote sensing images, carried through interactive interpretation of change patterns of new add construction land and field validation. Interpretation results of 20m scale remote sensing image show that the minimum spot average area of new construction land change monitored by 20m scale remote sensing data is about 6 acres. The ability 20m scale remote sensing data identifies new increased construction land change further strengthens, shows in the recognition of the smallest spot area reduces and the recognition accuracy increases.

Keywords: Yinchuan Plain; remote sensing data; middle resolution; new increased construction land dynamic monitoring

1. Introduction

With the further development of economic construction and the transformation of macroscopic land administration requirement, Xi'an Bureau of State Land Supervision needs to obtain the macroscopic change

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information of new increased construction land as quickly as possible to offer target range for supervised points. Therefore, on the basis of using high resolution remote sensing images to supervise the situation of the newly increased construction land in some key zones, it's necessary to use wide covered and relatively cheap middle resolution remote sensing images to supervise the macro situation of the new increased construction land in the whole range. In this way, it could further complete the dynamic remote sensing supervision system of new construction land increase in flatland zones of northwestern five provinces, meanwhile, the macro supervision and micro supervision could compensate each other to offer just-in-time and comprehensive data for macro decision making and land supervision administration in five provinces of the northwest[1-6].

Hence, it's necessary to conduct an experiment about the change detection of new increased construction land with the middle resolution remote sensing images in some flat zones. Then, based on the experiment results, the paper analyzes and discusses the ability of middle resolution remote sensing images in supervising and discovering the change of newly increased construction land, in order to offer experience and reference to the further work of change detection for newly increased construction land, especially for which is changed from plow land.

2. Experimental Zones and Data Processing

2.1. Choosing of Experimental Zone

This research chose Yinchuan Plain as the experimental zone. Yinchuan Plain has a large area, so it's a heavy work to use middle resolution images to supervise the whole zone. Considering the quality of existing high resolution images, this experiment only chose some counties of Yinchuan Plain to conduct the dynamical supervision. This experiment chose Xixia district, Jinfeng district, Xingqing district(the total area of three districts is 9491 km^2), Helan county (1600 km^2) and Yongning city(1020 km^2). The total area is 12111 km^2.

2.2. Data Preparation

(1)Middle resolution images

The collected middle resolution images of Yinchuan Plain were produced in 2007 and 2008. P6 data spatial resolution was 23.5m, which has four channels, CBERS satellite multispectral data spatial resolution was 20m, which has 5 channels, this test will use the remote sensing data for 20m scale of remote sensing data representation.

(2)High resolution images

The collected high resolution images of Yinchuan Plain were produced in 2007 and 2008. This experiment used these images to verify and evaluate the correctness of the newly increased construction land which was extracted from middle resolution images.

2.3. Data Pre-processing

(1)Geomatic correction

①Found out identifiable points from reference images, meanwhile considering the uniform distribution of these points.

②Found out corresponding points from image for corrective, and used the remote sensing processing software to enter the coordinate values of these points one by one.

③Conducted adjustment calculation with controlling points by quadratic polynomial fitting method, resample pixels by double linear interpolation method, and deleted those points which had exceptional RMSE