Analysis of Island Land Use Change Based on Transfer Matrix—a Case Study of Dongtou Island in Zhejiang Province

Liang Wang, Kunwang Tao, and Xinlin Qian
Chinese Academy of Surveying and Mapping

With the increasing developments of islands, the protection and management of island's natural resources are imperative. The core of islands' protection and management is to acquire the information of changes of the land use and land cover. What's more, the purpose of the islands' land use change information analysis is to plan the effective protection of land resource, achieve scientific management and sustainable utilization. Based on the improved calculation method of land use change and the computational model of change rate of the land use, an analysis of land use transfer matrix and transfer probability matrix is presented, and the method of land use change analysis based on the transfer matrix is proposed in this paper. And then the comparative analysis of all types of land use transfer is introduced. Taken the island of Dongtou in Zhejiang Province as the case, with the SPOT-5 satellite image in 2005 and the aerial image in 2011 as the data source, the current situation of land utilization of Dongtou Island and its land use change are analyzed. The experiment results show that, from 2005 to 2011, the greatest changes are the structures and water, followed by the forest land, grassland, cultivated land and others. The major change of structure and forest is the net change, while the major change of the water and grassland is the swap change. From the perspective of increment, the conversion from waters to structure has the most advantage, followed by water converted to grassland and road. To see from the loss, structures converted into roads and buildings have the most superiority transformation, followed by structures converted to grassland. The analysis of the case proves that the proposed process and method in this paper could achieve better results in the practical application. The experiment results also demonstrate that the proposed method could effectively obtain the dynamic change information of land use which is much helpful for land management and decision-making.