An inconsistency detection and processing method for patch boundary under multiple constraints

Hongmei Yin and Qifei Mao (China, PR)

Key words: Cartography; Geoinformation/GI; Land management; land-use patch; topological decomposition model; boundary inconsistency patterns

SUMMARY

The traditional inconsistency detection and processing methods are difficult to take into account multiple constraints such as topology correctness, semantic consistency, and area balance, and they usually require manual intervention, which takes a long time. In view of this, an inconsistency detection and processing method for patch boundary based on topological decomposition model is proposed. First, the topological decomposition model was built, topological polygons were converted from patches, and the polygons were dimensionally reduced to agent points. Second, 4 boundary inconsistency patterns were defined, and they were recognized through the topological relationship between agent points and patches and the semantic information of the arcs which were composed of topological polygons. Finally, the merger method and the dissecting method were proposed to modify boundary inconsistency patterns, taking into account semantic similarity and space adjacent indicators. Experimental verification is carried out on the land-use data in Guizhou Province, and the result shows that this method has high accuracy and efficiency of inconsistency detection and processing for patch boundary, and the processing results meet the requirements of the quality inspection.