Dynamic Information Grid Optimization of Trade Logistics Industry Sharing Based on Remote Sensing Image Analysis of Guangdong, Hong Kong and Macao

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Abstract:Using the nighttime light image of "Luojia No. 1", the urban built-up area of the Guangdong-Hong Kong-Macao Greater Bay Area is extracted by the simple threshold method and the urban night light index method adjusted by vegetation. It can weaken the oversaturation phenomenon of the "Luojia No. 1" image and reduce Mistaken extraction due to the "overflow" of the image. Calculate and compare the landscape index of urban built-up areas in the Greater Bay Area. Then use the gravity model to measure the highway logistics gravity in Guangdong, Hong Kong and Macau, determine the road freight volume between cities, and use the logistics network The road logistics network in Guangdong, Hong Kong and Macao is optimized with the goal of minimizing the total cost, and the robustness of the optimization results under different carbon policies is further tested. The economic and social development of mainland China has had an important impact on the evolution of logistics layout in the Guangdong-Hong Kong-Macao Greater Bay Area. In regional logistics planning, attention should be paid to the impact of industrial agglomeration such as spatial correlation, and attention should be paid to the impact of the environment and economic cycles on the optimization of regional logistics layout and the deep integration of industries. influences.

Keywords: Dynamic Information Grid Optimization, Trade Logistics Industry Sharing, Remote Sensing Image Analysis, Guangdong, Hong Kong and Macao

1. INTRODUCTION

From the development status [1] and development practice experience of the three most influential Bay Area urban agglomerations in the world, New York Bay Area, San Francisco Bay Area, and Tokyo Bay Area, it can be found that the spatial distribution of the development of Bay Area urban agglomerations is mostly represented by a balanced development model based on regional division of labor is conducive to the common prosperity of the region. A new model of regional integrated development based on differences in basic economic systems [2].

However, in the process of development, the Guangdong-Hong Kong-Macao Greater Bay Area also faces challenges such as inconsistent strategic goals, uncoordinated systems, unbalanced industrial development, fierce competition for external resources, and spatial imbalance [3]. Finally, the remote sensing monitoring of surface water quality and quantity in Guangdong, Hong Kong and Macao will be implemented, and in conjunction with conventional monitoring, the effectiveness of water environment monitoring in the region will be improved by leaps and bounds, providing important information support for water environment protection in the region. Urbanization and urban expansion monitoring is one of the important research directions of land use change [4].

In recent years, the development of satellite remote sensing technology has provided a new method for the study of urban spatial pattern changes. Many cities in Hong Kong, Guangdong and Macao are one of the starting points of the Silk Road, such as Dongguan, Guangzhou, etc., [5] and Guangdong, Hong Kong and Macao are also the concentrated locations of important regional logistics hubs in my country and one of the key development areas of the country. With the construction of economy, urban infrastructure and the development of the Guangdong-Hong Kong-Macao Greater Bay Area. In the existing research, the research methods are roughly divided into natural science methods and humanities methods [6].

In the aspect of normative analysis, the research focuses on logistics network optimization and shortest path analysis in business management and transportation engineering. In the logistics distribution network [7], how the logistics distributor chooses the optimal path according to certain rules and completes the logistics demand distribution work has always been a researcher [8]. important topics, and the research results are rich. Networked manufacturing poses new challenges to the logistics system, requiring a high degree of agility in the logistics system, informatization, networking, integration, and rapid response. achieve effective integration [9].

Based on the above background, this paper takes the measurement parameter of this service capability in the grid environment as the main index to evaluate the comprehensive capability of logistics information service in the grid area. global limit [10]. Reasonable planning of the layout of urban space can solve the problems caused by the unreasonable urban spatial structure of the Greater Bay Area, promote the economic development of the urban agglomeration in the Greater Bay Area, and strengthen the economic influence of its core cities [11] - Industrial concentration and production factors in geographic The flow of space has changed the structure of urban development, but the industrial isomorphism in some cities also shows an unbalanced situation, which should be revised and improved in terms of promoting the sharing of resource elements, enhancing the level of cooperation between local governments, and optimizing the spatial layout of the industrial chain [12].

The goal is to study the key technologies of remote sensing of surface water quality in Guangdong, Hong Kong and Macao, establish a water quality remote sensing model suitable for the region, realize remote sensing monitoring of the main water quality parameters of surface water in Guangdong [13], Hong Kong and Macao, and obtain important information such as the spatial distribution of the main water quality parameters in the region and the location of pollution sources [14].

Among them, DMSP/OLS noctilucent remote sensing data has been gradually accepted by the academic community due to its wide coverage, data continuity, high accuracy and unique observation angle, and has become one of the important data sources for the study of urban expansion. The regional logistics network is optimized [15]. Gao Ying (2017) took the logistics network in the Beijing-Tianjin-Hebei region as the research object, and constructed a multi-objective optimization model to optimize the logistics network structure in the region [16].

2. THE PROPOSED METHODOLOGY

2.1 The Remote Sensing Image Analysis of Guangdong, Hong Kong and Macao

Logistics network optimization and shortest path focus on the distribution of geographical significance of entities, and there have been some planning studies in the background of cities, emphasizing the urban problems brought about by the spatial performance of logistics, and paying insufficient attention to the spatial connections and correlations between geographical units, which Probably the economics and geographical analysis of logistics is good at. J. More et al. [17] proposed a dual-objective shortest delivery path problem and gave an algorithm. The above models are generally steady demand models or static path models, which are effective for the planning of medium and long-term logistics distribution networks.

2.2 The Guangdong-Hong Kong-Macao trade logistics industry sharing

Currently, the Guangdong-Hong Kong-Macao Greater Bay Area is based on the pattern of "one country, two systems, three customs areas, and four core cities". Element segmentation is very prominent. According to the "dynamic threshold method" proposed by Yang Yang et al. [5], using the built-up area of each city as auxiliary data, the threshold value of the minimum difference between the lighting area under the dynamic threshold of each city and the area of the built-up area in the statistical data in different years is calculated in turn. But these achievements are by no means achieved overnight, and have their important historical and realistic motivations.

Since the handover of Hong Kong and Macao, especially in January 2004, the Mainland and Hong Kong and Macao signed the "Mainland and Hong Kong Closer Economic Partnership Arrangement" and "Mainland and Macao Closer Economic Partnership Arrangement" respectively. , Based on the panel time-varying decay model constructed by Battese and Coelli (1992), it is first necessary to use maximum likelihood estimation (MLE) to analyze the impact of the core explanatory variables, regional economic integration and coordinated development of logistics on the industrial structure. Scale night light remote sensing research, such as the study of housing prices in urban communities, etc. [25] - Higher image spatial resolution can retain more urban interior spatial details [26], thereby improving the accuracy of urban built-up area extraction results. Provide a basis for the spatial distribution pattern.

2.3 The Dynamic Information Grid Optimization of Guangdong, Hong Kong and Macao Trade and Logistics Industry Sharing

Regional innovation is the endogenous force for the continuous breakthrough of industrial total factor productivity, and more regional innovation investment is conducive to high-tech. The subject integrates various remote sensing models and methods such as inland surface water quality, water quantity remote sensing, ocean water quality remote sensing model, and salt tide remote sensing. It is used in remote sensing monitoring of water quality and quantity in Guangdong, Hong Kong and Macao; in terms of data, this project integrates multi-type, multi-temporal remote sensing data and conventional ground monitoring data. Referring to the methods of Wanyi et al. [8] and He Chunyang et al. The change analysis mainly includes the analysis of the change of urban lighting brightness and the analysis of the change of urban spatial pattern.

The main indicator is the average brightness of urban lights. The impact of highway logistics location on logistics is mainly reflected in the impact of the development of urban highway network on the logistics industry, which is one of the core factors affecting the development of urban logistics. When the road location of a city is high, it means that the road network in the city is denser, and the transportation efficiency will be improved accordingly, and transportation is one of the main functions of logistics. In this paper, the actual cost is divided into objective cost and loss of time value of goods. The so-called loss of time value of goods means that the logistics demand does not reach the destination within the specified time, so that the goods lose a certain time value.

3. CONCLUSIONS

The method in this paper only uses the simple threshold method and the U MTH method when extracting urban built-up areas. In the follow-up research, the fusion of night light images and high-resolution remote sensing images can be considered, and the supervised classification method can be used to improve the classification accuracy. Six landscape indices describe the urban built-up area patches. Secondly, the road logistics network in Guangdong, Hong Kong and Macau is optimized from the perspective of the region, and the gravity model is used to measure the logistics gravity between cities in Guangdong, Hong Kong and Macau, and determine the road freight volume between cities, with the goal of minimizing the total cost of the logistics network, considering the capacity decision of the logistics hub.

4. ACKNOWLEDGEMENT

5. REFERENCES

[1] Zhang Yuxin, Li Xi, Song Yang, et al. Analysis of urban spatial form in Guangdong-Hong Kong-Macao Greater Bay Area based on "Luojia No. 1" luminous remote sensing images [J]. Chinese Journal of Applied Science, 2020, 38(3):12.

[2] He Jiajun, Li Xia. Measurement and Analysis of Sustainable Development Goals in Guangdong-Hong Kong-Macao Greater Bay Area [J]. Geography and Geographic Information Science, 2020, 36(2):7.

[3] Zhang Chao. Analysis on the optimization path of the industrial structure of the Guangdong-Hong Kong-Macao Greater Bay Area promoted by regional integration: Based on the test of the intermediary effect of the coordinated development of logistics [J]. Business Economics Research, 2021(23):4.

[4] Qin Yi, Liu Minxia, Song Jiaying, et al. Temporal and spatial variation characteristics of near-surface O3 concentration in the Guangdong-Hong Kong-Macao Greater Bay Area [J]. 2021.

[5] Long Zhenyu, Wang Changquan, Shi Lihong, et al. CO_(2) solubility model in oil-water system based on KRR optimization algorithm [J]. Journal of Jilin University: Earth Science Edition, 2022, 52(1):194-201 .

[6] Jiang Xintong, Liao Xiaolong, Quan Xujian, et al. Analysis of the evolution of water surface rate in the Guangdong-Hong Kong-Macao Greater Bay Area based on Landsat [J]. People's Pearl River, 2022, 43(6):7.

[7] Xiao Zhongyong, Chen Yingfeng, Chen Yifeng, Shi Yiqiang, Liu Shanhong, Xie Jinghan, Xie Xianquan. Remote Sensing Monitoring of PBL SO_2 in Guangdong-Hong Kong-Macao Greater Bay Area [J]. Environmental Science and Technology, 2020, v.43(05):80- 87.

[8] Yan Xiaoyu, Zou Anquan, Xu Jichao, et al. Analysis of the current situation and countermeasures of third-party logistics in the Guangdong-Hong Kong-Macao Greater Bay Area [J]. Logistics Technology, 2021, 44(9):4.

[9] Lou Quanfu, Li Xianqin. Simulation research of picking robot based on nonlinear equation system finite element method [J]. Agricultural Mechanization Research, 2022, 44(2):54-57.

[10] Zeng Lifang, Li Jun, Wang Tianqi, et al. Simulation and optimization of UAV launch separation characteristics [J]. Gas Physics, 2022, 7(4):9.

[11] Zhu Qiangjun, Wang Huilan, Zhang Guanghai. Research on face recognition algorithm based on fast PCA and K-CV optimization of SVM [J]. Journal of Hubei University for Nationalities (Natural Science Edition), 2021, 039(002):193-198.

[12] Luo Jing, Huang Tielan, Wu Guihua, et al. Analysis of urban spatial pattern changes in Guangdong-Hong Kong-Macao Greater Bay Area based on night light remote sensing [J]. Smart City, 2020, 6(1):3.

[13] Zhao Yajie, Qi Xin, Xin Ming. Analysis of the development of cross-border e-commerce logistics in Guangdong-Hong Kong-Macao Greater Bay Area from the perspective of sharing economy [J]. Modern Business, 2021(11):3.

[14] Zhu Haipeng. Analysis of the functional positioning of Zhuhai Logistics Industrial Park in the context of the Guangdong-Hong Kong-Macao Greater Bay Area [J]. 2020.

[15] Huang Yongfu. Research on the high-quality development of my country's logistics industry: Based on the analysis of the development of the logistics industry in the Guangdong-Hong Kong-Macao Greater Bay Area [J]. Price Theory and Practice, 2020(4):4.

[16] Tang Changchun, Li Yaping, Du Ye, et al. Evolution of the spatial structure of the Guangdong-Hong Kong-Macao Greater Bay Area from 1980 to 2018 [J]. Geographical Research, 2021, 40(4):17.

[17] Huang Tielan, Luo Jing, Gao Zhaozhong, et al. Evolution of urban spatial pattern in Guangdong-Hong Kong-Macao Greater Bay Area based on DMSP-OLS and Luojia No. 1 night light remote sensing images [J]. Bulletin of Surveying and Mapping, 2021(12):6.