MONITORING AGRICULTURAL PRACTICES IN JIANSANJIANG FARM WITH MULTIPLE REMOTE SENSING DATA

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1.Abstract

Food security is an important foundation of national security, Jiansanjiang farm has a total cultivated land area of 776000 hectares, the average annual grain output accounts for about 1/11 of Heilongjiang Province, 1/100 of the country, An important grain production base in China, in order to fully and timely understand the progress of spring ploughing in Jiansanjiang, to ensure food security, to Jiansanjiang Branch under the jurisdiction of 15 farms as the research object, based on sentinel-2 satellite April 19, April 24, Images from April 29 and images from the Landsat-8 satellite on April 28. Monitored the progress of spring preparations for paddy fields on fifteen farms. Based on the random forest algorithm and expert prior knowledge, the images of each period are divided into three categories: undisturbed, irrigated and flooded. According to the classification results, the growth rate of irrigated plots between April 19 and April 24 was faster, and the process of flooded was slower; As of April 29, the proportion of the flooded in Jiansanjiang Farm that has been the promotion of large-scale mechanization operations has increased rapidly, accounting for about 90% of the total paddy field area, and the spring preparation of paddy fields has basically ended.

2.Classification Approach

The classes were set as Undisturbed、Irrigated and Flooding.The samples used for this classification were field sampled and all sample points were randomly divided into 70% training samples and 30% validation samples when processing the samples, which were then used for classification and validation respectively. Random forest was used as the key classifier. The classification accuracy was evaluated by the error confusion matrix.

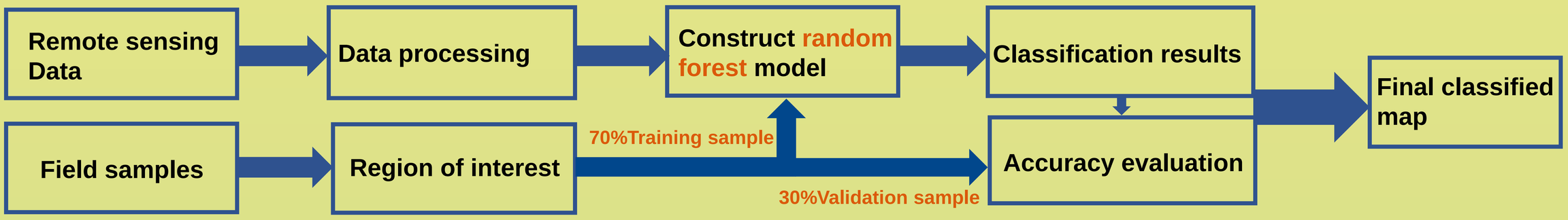
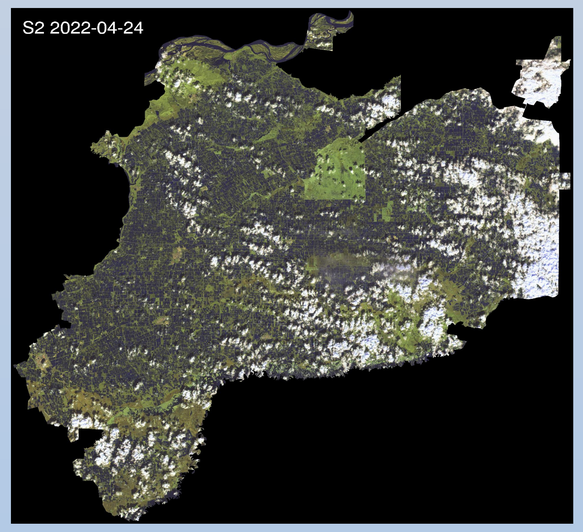
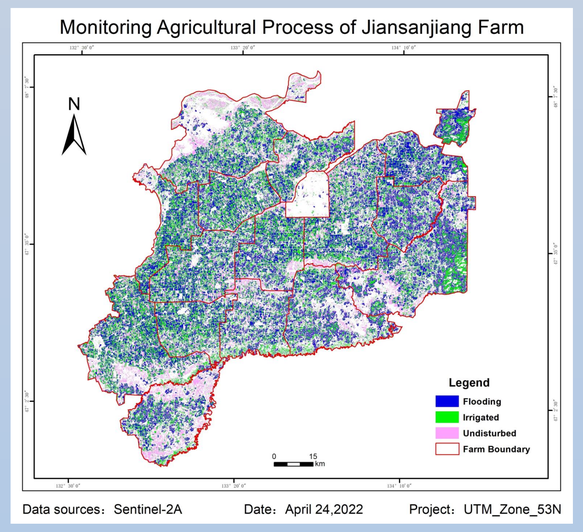


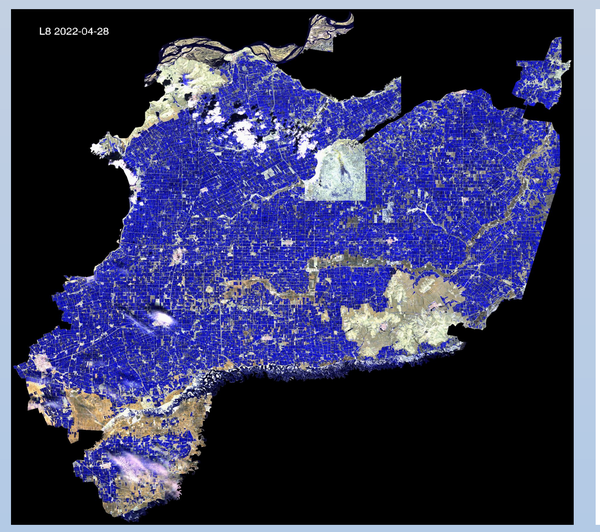
Fig. 1 Shows the logic flow for this study

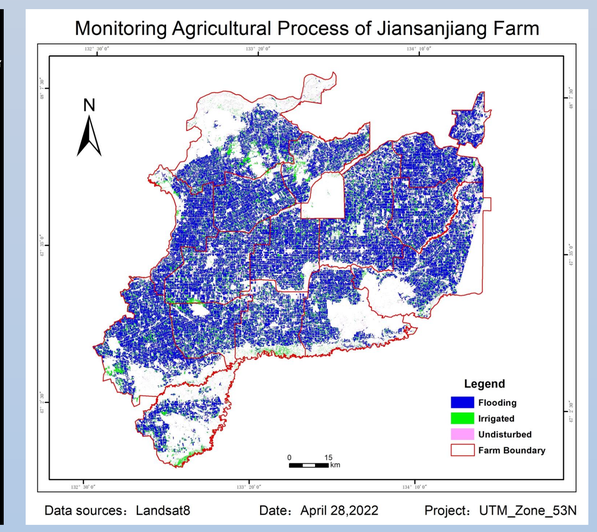
3. Results





Sentinel-2A on April 24,2022, Overall Accuracy 83.7%, Kappa 81% and F1 Score 81.3%





Landsat-8 on April 28, 2022.Overall Accuracy 92.1%, Kappa is 91.0% and F1 Score is 90.3%

4. Conclusion

This research uses a random forest classifier to extract the agricultural operation information of Jiansanjiang Farm. When Ntree=100 and Mtry is logarithmic, the optimal classification result can be obtained

5.Acknowledgement

Dragon58944 - Retrieving the Crop Growth information From Multiple Source Satellite Data to Support Sustainable Agriculture

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