

Monitoring and scheduling of pollution disaster in agricultural waters based on INSAR

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ABSTRACT

Objective: To improve the quality of monitoring image in agricultural waters by effective methods, to obtain information of the pollution disaster in agricultural waters in time, to provide the necessary data for the disaster management and decision making of agricultural waters, and to promote the development of agricultural economy in this region.

Methods: by using the monitoring and scheduling method for pollution disaster in agricultural waters based on INSAR, comprehensive and accurate monitoring of pollution disaster in agricultural waters can be conducted. SRTM3 DEM is used to eliminate baseline error in INSAR interferogram. According to different scattering characteristics of different ground objects in the INSAR image, the gray value is different, and a two-dimensional gray histogram is built to preprocess the INSAR image so as to avoid the false alarm in the detection of the edge of the agricultural waters. Through the monitoring method of ground wave spectrum, the two directions reflection ratio factor of waterbody is measured, and the correlation between the pollution of agricultural waters and the ground spectrum is studied, and the monitoring and scheduling of the pollution disaster in the agricultural waters are effectively carried out.

Results: there is a significant correlation between the pollution in agricultural waters and the satellite reflectance spectrum on the ground, with a correlation coefficient of about 0.8. The false area which is not connected with the agricultural waters of the preprocessed INSAR image is almost completely removed by using the proposed method. The boundary of the extracted water area is well matched with the boundary of the actual image. The false alarm rate and the leakage rate for processing the agricultural waters image under different scenes are all very low, and the accuracy of the INSAR image extraction and calculation efficiency are better and with good robustness. The proposed method can reduce the strong scattering point and the speckle noise of the building, and effectively restrain the edge of the buildings, such as the buildings around the agricultural waters. The information of disaster change in agricultural waters obtained by the proposed method is relatively accurate.

Conclusion: the proposed method can extract the image of agricultural waters and obtain the information of the pollution disaster in agricultural waters in real time and accurately, so as to realize the effective monitoring and scheduling of the pollution disaster in the agricultural waters.

Keywords: INSAR; Agricultural waters; Monitoring and scheduling of pollution disaster; Two-dimensional gray histogram; Mathematical morphology; Spectral monitoring

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