MULTITEMPORAL RADARSAT-2 POLARIMETRIC SAR DATA FOR URBAN LAND-COVER MAPPING

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ABSTRACT:

The objective of this research is to evaluate multi-temporal RADARSAT-2 polarimetric SAR data for urban land-cover classification using a novel classification scheme. Six-date RADASAT-2 Polarimetric SAR data in both ascending and descending orbits were acquired during June to September 2008 in the rural-urban fringe of the Greater Toronto Area. The major land-cover types are built-up areas, roads, golf courses, forest, water and several types of agricultural crops. In this research, the different urban land-cover types and their corresponding polarimetric behaviors were studied. The polarimetric signatures of the various urban land-cover types were extracted from the RADATSAT-2 SAR images and analyzed using a new hierarchical multitemporal classification method. The results showed that the new classification method yielded high classification accuracy, with overall accuracy of 82.1% and Kappa coefficient 0.80 for the major 11 land-cover classes. The classification scheme can effectively extract the urban structures by mapping urban related classes such as streets and major roads with the higher user's accuracy, which is difficult to achieve using a single-date data.

TOPIC: Land cover classification
ALTERNATIVE TOPIC: Land cover classification