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Use of RADARSAT-2 and ALOS-PALSAR images for organic terrain mapping in New Brunswick

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ABSTRACT

This study used different combinations of LANDSAT-5 TM images with RADARSAT-2 C-band and ALOS-PALSAR L-band SAR images for mapping organic terrains in New Brunswick. The resulting maps were compared to GPS field data as well as the two maps currently in use by the Province of New Brunswick Department of Natural Resources (NBDNR). Whatever the image combination we used (LANDSAT + RADARSAT-2 and/or ALOS-PALSAR), the overall accuracy for the image classification is always higher than 90%, with a maximum of 93.9%. In addition, the number of correctly identified sites is higher with the ALOS-PALSAR-based classified image (91.1%) or the RADARSAT-2-based classified image (88.4%) than with the DNR maps (44.5%). From the classified images, the few misclassifications are due to sites classified in another organic terrain class. For the DNR maps, about half of them are associated to sites that not being mapped, the remaining half being sites that are not classified in the right organic terrain class. The classified images show that the RADARSAT-2 C band better detects marshes than the ALOS-PALSAR L band, but this is the opposite for the detection of the shrub wetlands. Therefore, all the SAR images are complementary and their combination gives the best ground-truth identification accuracy (98.6%). The study was funded by two NB Environmental Trust Fund grants and supported by a NASA Interdisciplinary Science Program grant. The RADARSAT-2 images were provided under a Canadian Space Agency SOAR grant awarded to the Province of New Brunswick.

