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## **Use of RADARSAT-2 SAR and LANDSAT-5 TM Images for permafrost feature distribution mapping**

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Over a discontinuous permafrost region located in the Hudson Bay Lowland (northern Ontario, Canada), we applied the *Northern Ecosystem Soil Temperature (NEST)* to map the distribution of permafrost conditions and their changes from the 1960s to the 2000s at high spatial resolution. Some of the model inputs were estimated based on land cover and surficial material maps derived from *Landsat-5 TM* and *RADARSAT-2 SAR* C-HH and C-HV images. By comparison to field observations, we were able to achieve an average accuracy of more than 90% for both the land cover and surficial material maps when both Landsat-5 TM and RADARSAT-2 SAR were used. The distribution maps of permafrost features (palsas and peat plateaux), the active layer thickness, and the depth of permafrost base show that the increases in mean annual air temperature (1.9°C) and precipitation (2.4%) since the 1960s has deepened the active layer by 20.5%, reduced the depth of permafrost base by 3.1%, but only reduced permafrost extent by 0.4% on average. Both last studies were funded by the *Canadian Space Agency* and a *NSERC/NBIF Post-graduate Scholarship*. Support to the field work has been provided by OMNR and De Beers Canada.

