

## **Permafrost loss and a new approach to the study of subarctic ecosystems in transition**

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**Abstract** This study uses remote sensing to demonstrate the rate and spatial pattern of land-cover change resulting from permafrost loss in a subarctic region that typifies the southern boundary of permafrost. Permafrost occupied 0.70 km<sup>2</sup> of a 1.0 km<sup>2</sup> area in 1947, but by 2008 occupied only 0.43 km<sup>2</sup>. This study also explains the need for an Earth Systems approach to properly examine the integrated mechanisms, interactions and feedbacks among physical, chemical and biological components of warming subarctic ecosystems.

**Key words** permafrost thaw; ecosystem change; subarctic; peatlands