



## **Investigations of discontinuous permafrost using electrical resistivity tomography**

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We have used electrical resistivity tomography (ERT) extensively over the past five years to examine frozen ground characteristics at natural and disturbed sites within the discontinuous permafrost zones of northern Canada. Examples of pure research include investigations to delimit permafrost patch size, to examine changes in permafrost conditions at altitudinal treeline, and to assess permafrost thickness in palsas bogs. Applied research has included hazard mapping where ERT, in association with boreholes, has been used to characterize permafrost conditions in different terrain units at Yukon communities as part of planning for climate change adaptation. ERT has also been used to examine temporal change through repeated surveys at sites equipped with permanent arrays. Rapid change is occurring at sites which were subject to recent forest fire in the Northwest Territories. Gradual reductions in average resistivity at sites along the Alaska Highway in Yukon and northern British Columbia indicate progressive increases in unfrozen moisture while ground temperatures at the same sites have increased only very slightly. We conclude that ERT should become a standard technique for the investigation of discontinuous permafrost sites and should be incorporated as a monitoring technique within international programs such as the Global Terrestrial Network for Permafrost.