

Building a Canadian database of geoelectrical surveys of permafrost: Initial time-lapse results

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Keywords: electrical resistivity tomography, permafrost, monitoring

Electrical resistivity tomography (ERT) is increasingly being used by scientists and engineers in Canada to investigate permafrost distribution and characteristics, since frozen/ice-rich ground tends to be highly resistive. Although ERT surveys are now commonly performed, there has been no framework for data sharing, making it difficult or impossible to find and view existing datasets.

Our goal is to create a database of ERT surveys of permafrost so that the data are easily findable. We are also designing a web interface that can easily search for and plot the surveys. Making this data easily accessible will enable a deeper understanding of permafrost conditions in Canada. Additionally, we hope its existence will promote repetitions of historical surveys in order to better understand how permafrost conditions are changing over time in response to climate warming.

Here, we present the database-in-progress and explore examples of repeat ERT surveys. Some repeat surveys (like those in the figure below) show a reduction in permafrost resistivity and spatial extent, indicating warming and thawing of permafrost. Case studies like this illustrate how repeat measurements can be used to understand permafrost change and demonstrate the usefulness of a centralized database to store these surveys.

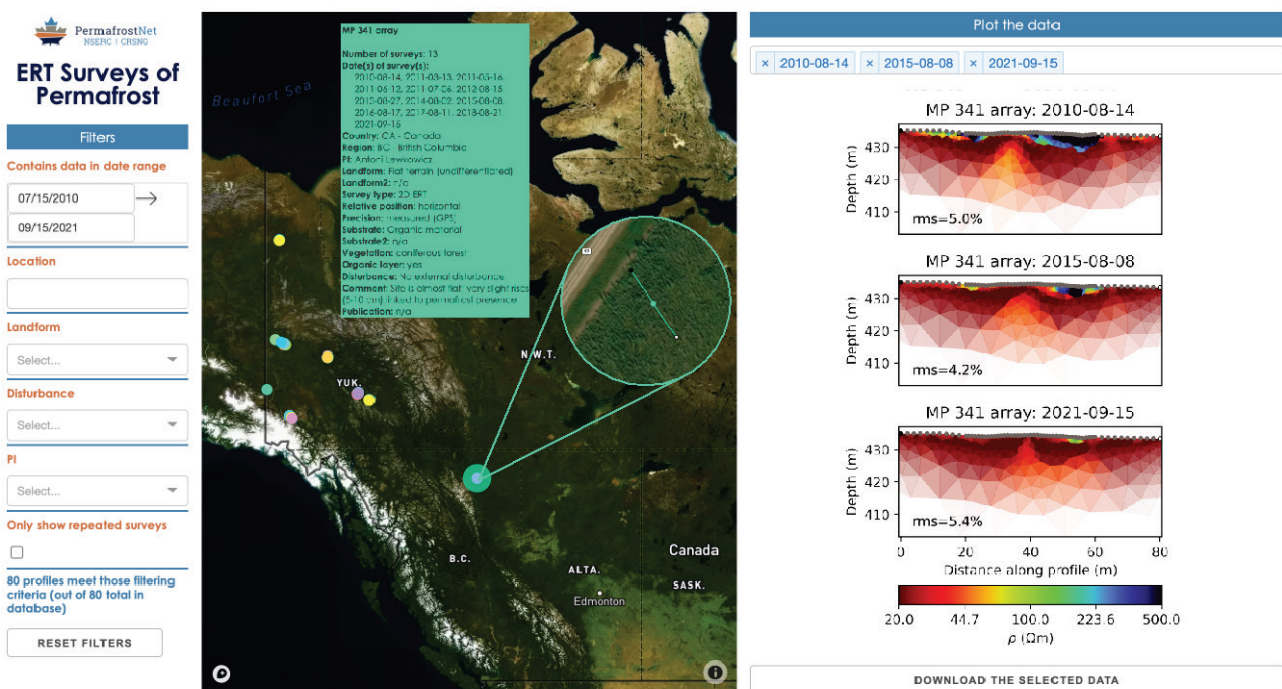


Figure: Screenshot of interactive database showing time-lapse ERT results from a monitoring site along the Alaska Highway.