

Research and monitoring activities and needs related to ABoVE and POLAR activities

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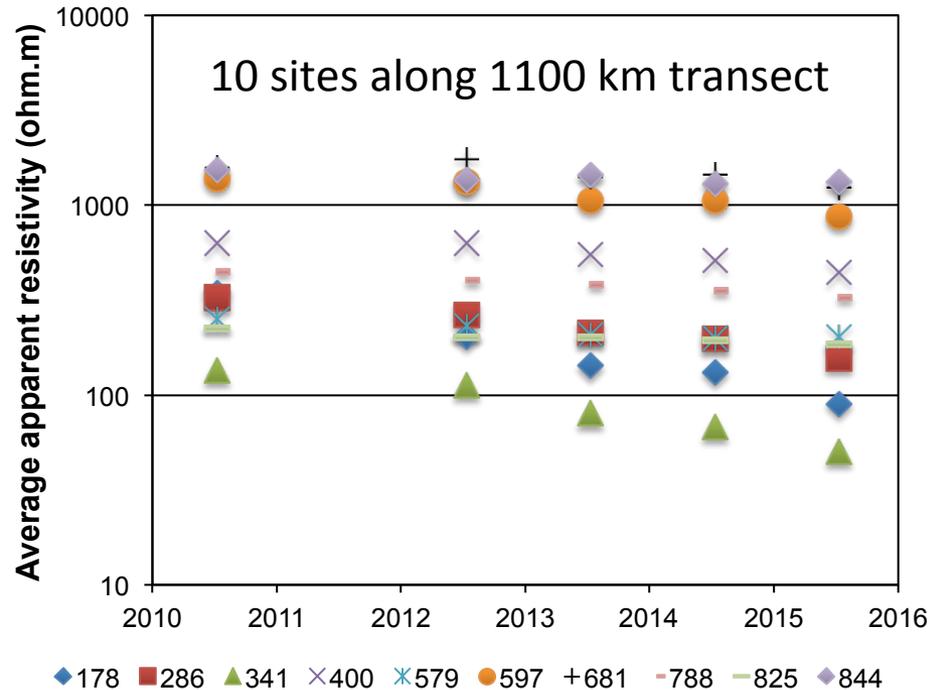
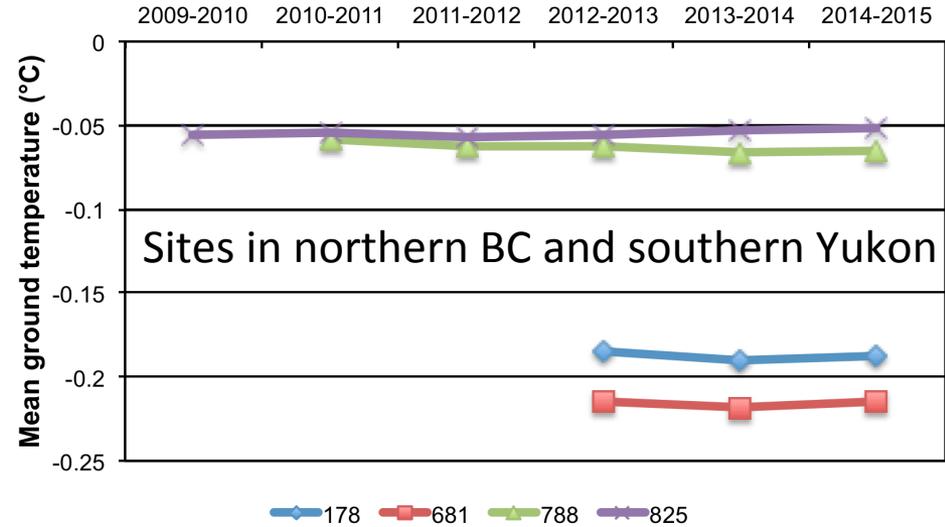
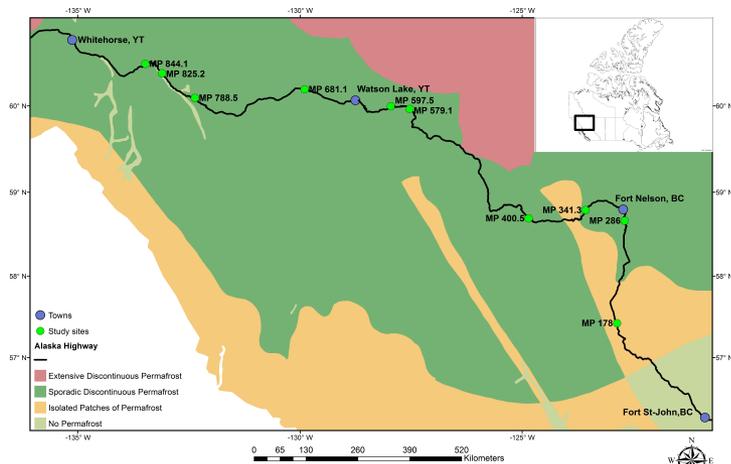
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Ongoing research and monitoring *Related to ABoVe and POLAR activities*

- *Network of about 50 climate stations in southern Yukon and northern BC monitoring in the forest and above treeline:*
 - *Air temperature*
 - *Ground surface temperature*
 - *Temperature at the top of permafrost (if present)*
 - *Snow depths (using an array of iButtons)*
 - *Borehole temperatures at some sites (described by Sharon Smith)*
- *Monitoring began in 2006 (and at a few sites in 2001 or 2004) but there are gaps in records at many sites.*
- *Up to 100 sites were operating in 2006-2009.*

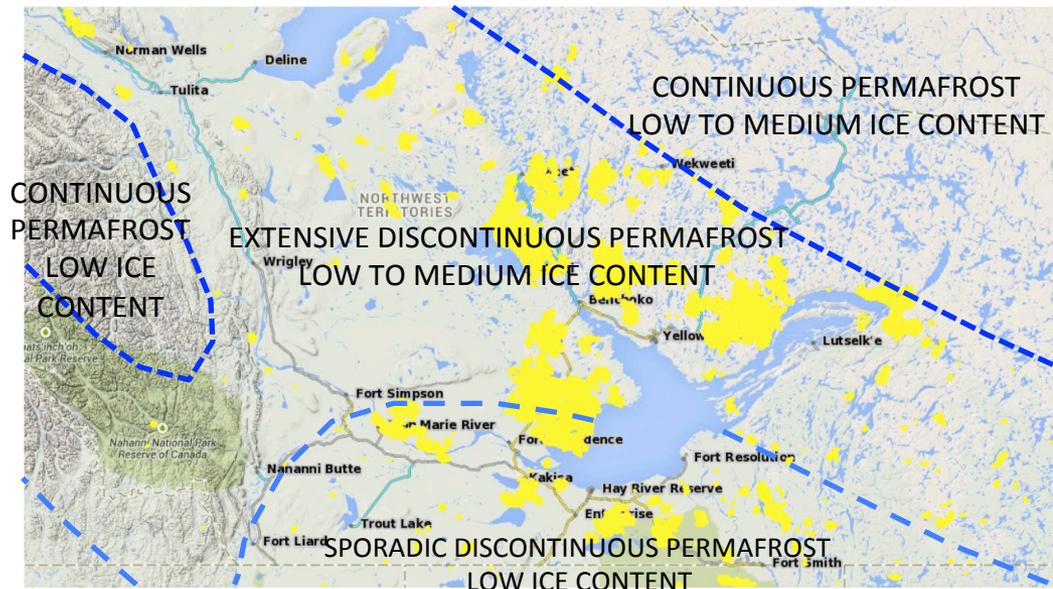
Ongoing research and monitoring

- 10 forested sites along 1200 km of the Alaska Highway from Whitehorse (YT) to Fort St. John (BC):
 - All sites are equipped with climate stations and permanent electrode arrays for Electrical Resistivity Tomography profiling.
 - Annual surveys since 2010 show thawing permafrost (reductions in resistivity).
 - Four sites with boreholes show very little change in ground temperatures indicating that ERT is more sensitive to thaw phase than borehole temperatures.



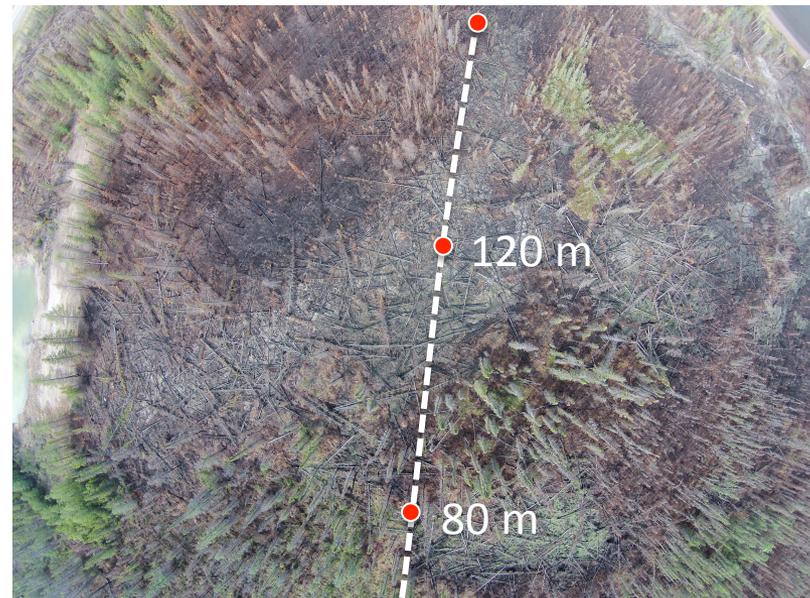
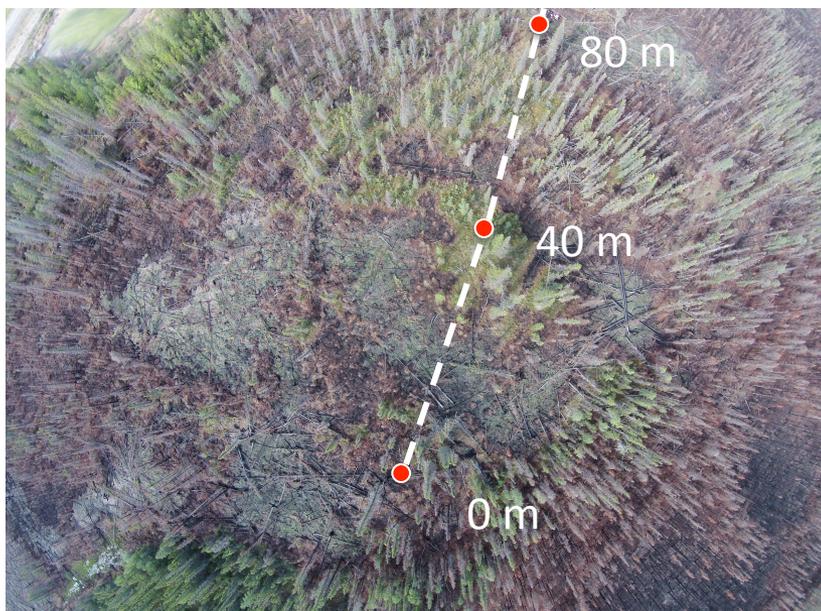
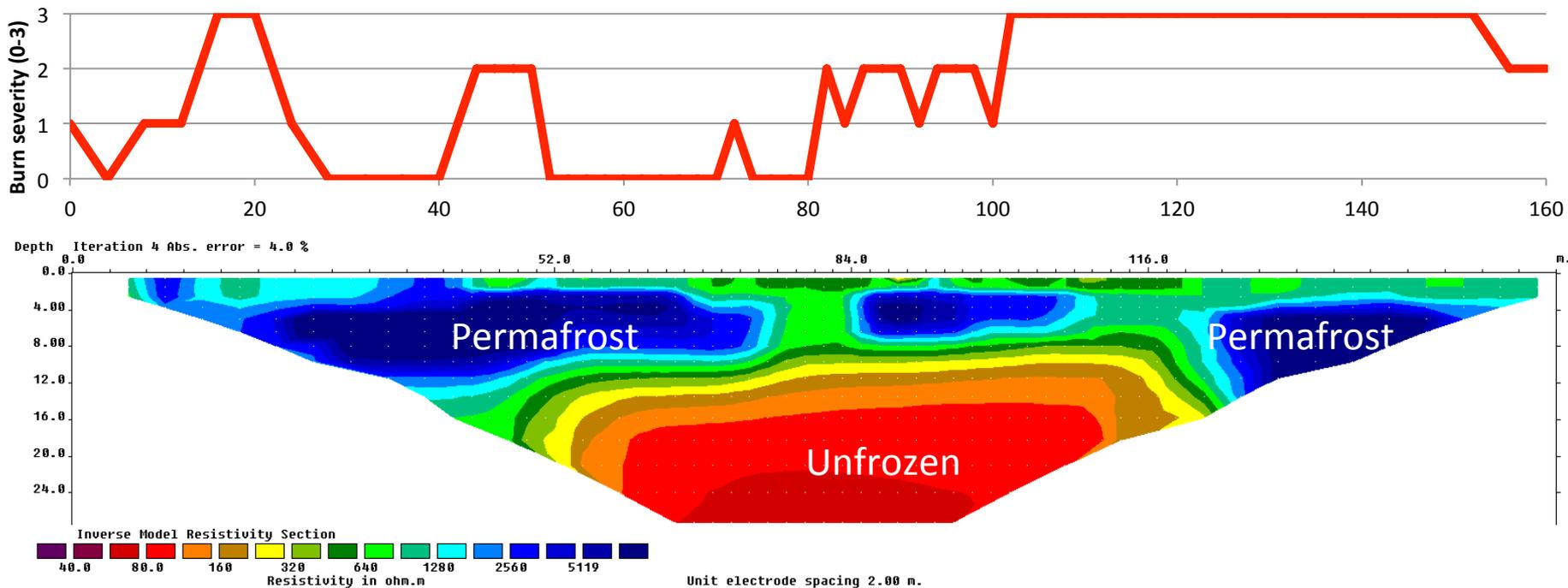
Ongoing research and monitoring

- *Effect of 2014 forest fires on permafrost, southern NWT*
 - *goal is to examine the impact of fire on a transect across permafrost with varying antecedent ground temperatures.*
 - *15 sites established in 2015*
 - *Each site is equipped with a permanent electrode array for repeated ERT measurements*
 - *Most sites have air and ground temperature monitoring stations and iButton stakes to measure snow depths.*
 - *A few sites have shallow boreholes equipped with temperature loggers*

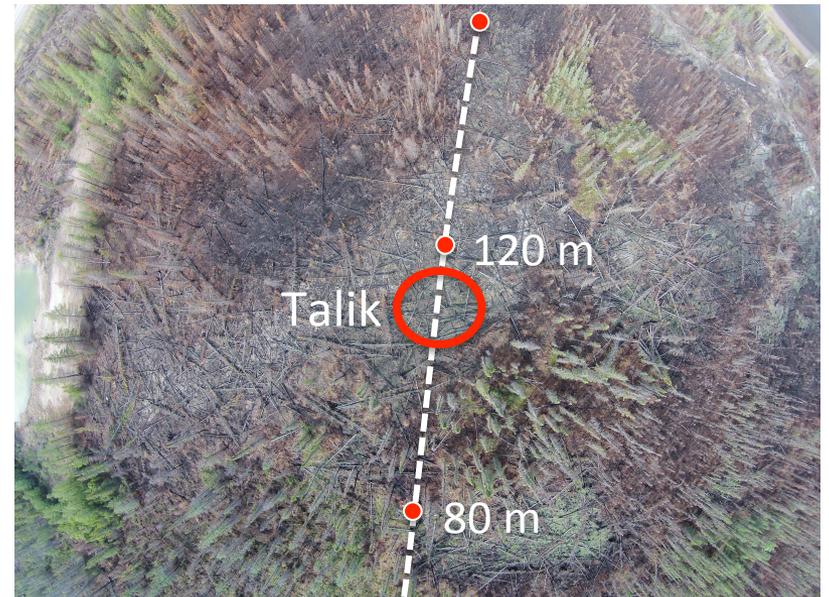
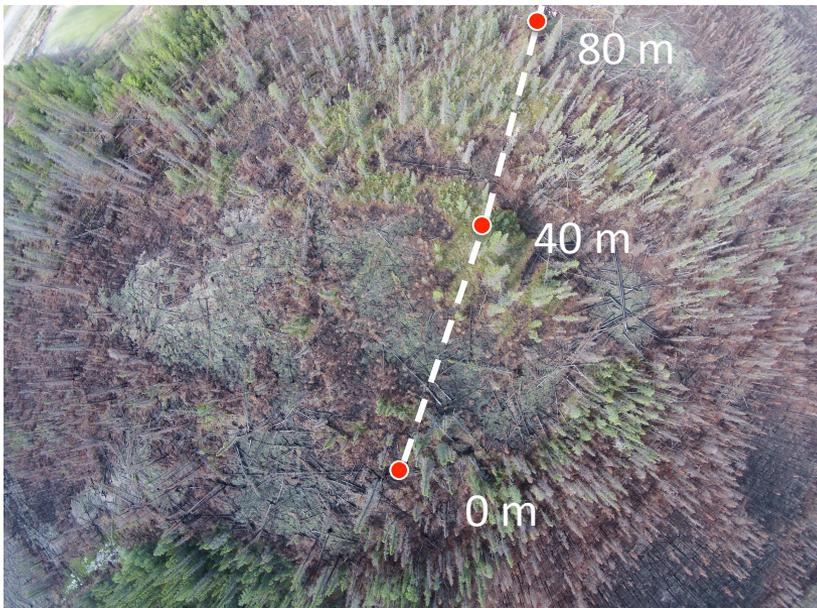
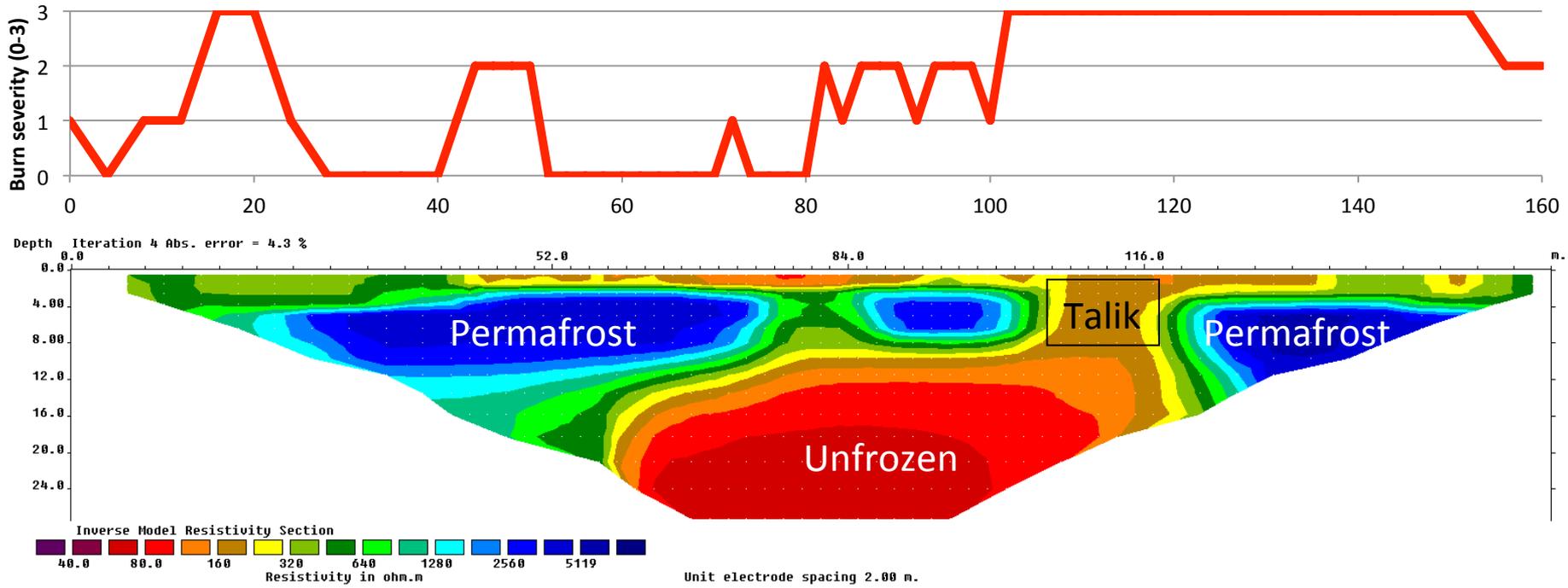


Yellow areas are fires from 2014. 13 sites are distributed from Kakisa to Yellowknife with two further north.

ERT profile at ZF20-4A, June 3, 2015



ERT profile at ZF20-4A, August 17, 2015



Planned research and monitoring *Related to ABoVe and POLAR activities*

- *The monitoring above will continue for a few more years, as long as I am able to support it. Funding is possible only if it relates directly to research projects as professors do not have mandates for monitoring per se. More than 15 sites were shut down in 2015 to reduce costs. We have moved to a 2-year schedule of site visits which means that we collect snow data only every second year.*
- *I will be working with Phil Bonnaventure (University of Lethbridge) in 2016 to start monitoring of air and ground temperatures in the Macmillan Pass area on the border between Yukon and NWT.*

Management related research & monitoring needs *Related to ABoVe and POLAR activities*

- *Funding (1) to keep the network operational and (2) to compile data are the main needs.*

Opportunities for ABoVE/POLAR for engagement, education, outreach

- *11th International Conference on Permafrost, Potsdam, Germany, June 19-24, 2016*

Recommendations for ABoVE/POLAR for engagement, education, outreach

- *Work closely with Yukon Research Centre and Yukon Water Resources as well as with First Nations.*