

# Edge effects of conventional seismic lines in Northern Alberta peatlands

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## INTRODUCTION

- Seismic lines through boreal peatlands can have direct impacts on regional hydrology, soil thermal dynamics, vegetation, wildlife, and on critical ecosystem functions such as carbon accumulation.
- Seismic lines may exert substantial **edge effects**, which may greatly extend their overall footprint.

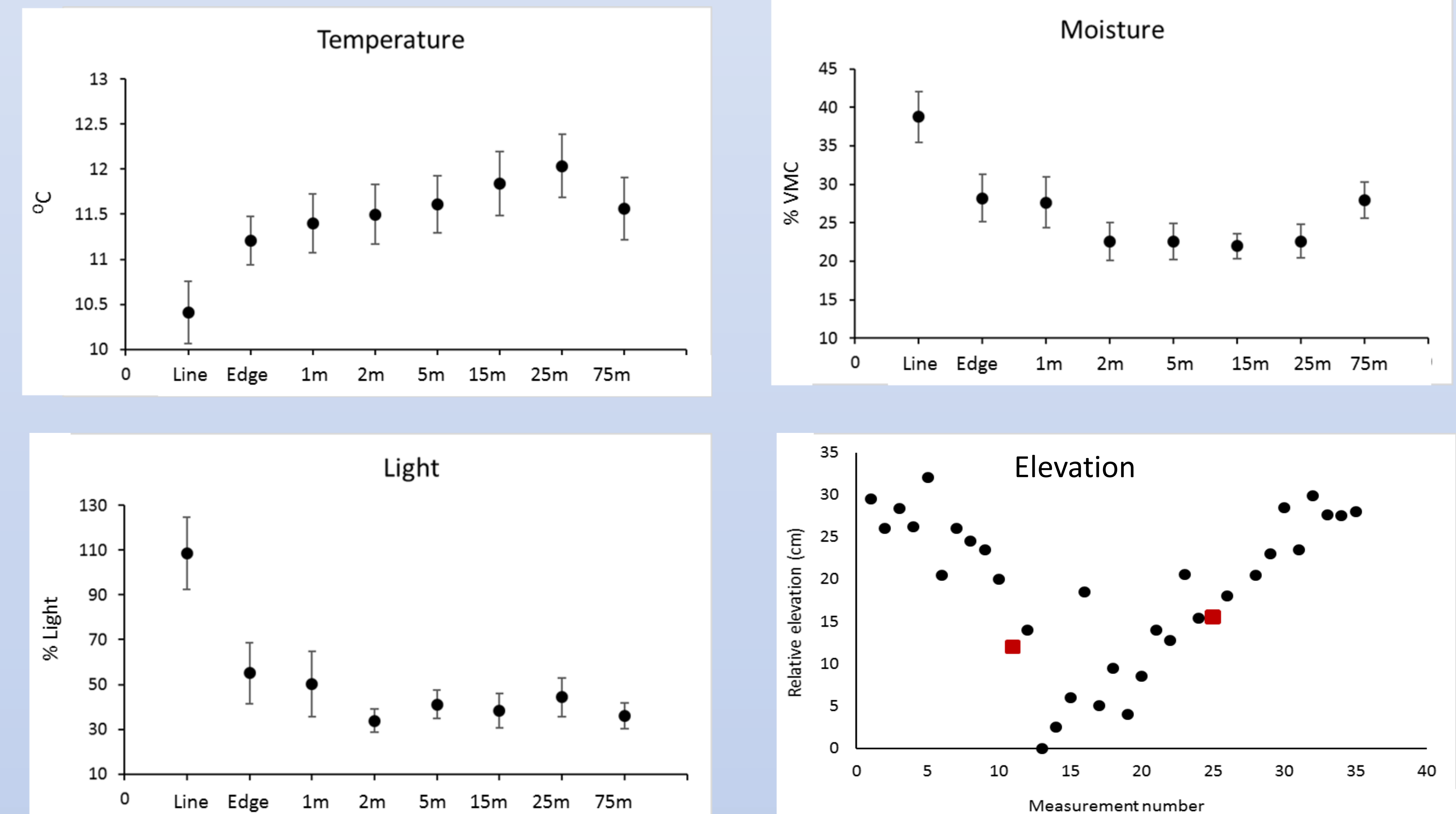
## OBJECTIVE

- Evaluate the extent and magnitude of the edge effects on plant communities and environmental factors relevant to plant growth.
- Assess if seismic line orientation (N-S vs. E-W) affects the extent of edge effects.

## METHODS

- We investigated the extent of influence of seismic lines along transects into adjacent treed peatland by examining:
  - Plant species diversity and abundance.
  - Environmental variables: soil temperature and moisture, light, ground substrates, microelevation, permafrost depth.
- Twenty-two transects perpendicular to the seismic lines; 11 N-S transects and 11 E-W transects.
- Along each transect: 1m<sup>2</sup> plots were sampled: on seismic line, edge, and 1, 2, 5, 15, 25 and 75 m away from edge.

## PRELIMINARY RESULTS



- Higher moisture on lines and near the edges: removal of vegetation on seismic lines reduces the source of water intake and decreases evapotranspiration.
- Lower soil temperature on lines.
- Lower microelevation on lines.
- Higher light levels on lines and near edges.

## IMPLICATIONS

- Degradation of permafrost below seismic lines can alter hydrological processes, with implications to the water balance locally and regionally.
- Development of talik, release of carbon.
- Changes in plant communities and successional trajectories.
- Changes in food resources for wildlife - > changes in wildlife dynamics.



Edge plot →



← Interior plot



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