Soil respiration on either side of the dyke across the Garden City Lands

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Introduction

- Soil respiration varies with vegetation type, soil conditions, and soil type
- Balance between photosynthesis and respiration determines whether soils are carbon sources or sinks
- A dyke bisects The Garden City Lands, providing an opportunity to study soil respiration across a heterogenous landscape:
  - Farmland (west side) covered in mineral fill, organic fill, or no fill
  - Peatland (east side) has mowed and unmowed areas

Methods

- Soil respiration was measured in pairs of matched samples within 30 m of the dyke on October 7, 2025 (Fig. 1)
- Rate of CO_2 accumulation in a closed chamber measured by infrared gas analyzer over 120 seconds per sample

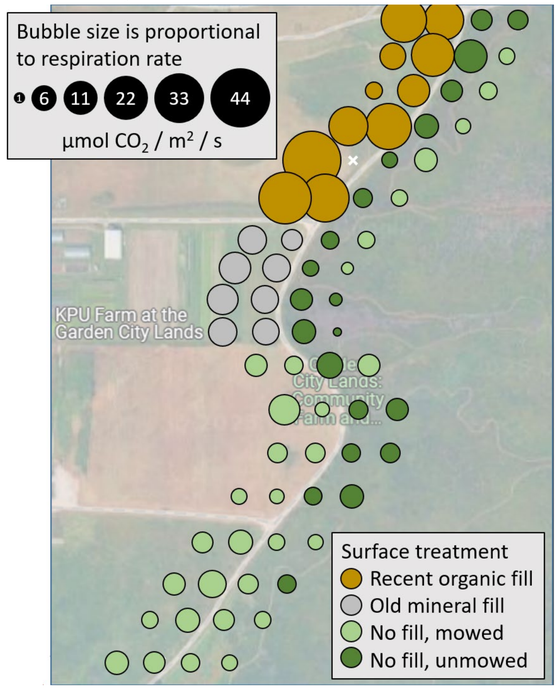

Figure 1. *Soil respiration rate by sample location on either side of the dyke at Garden City Lands*

Farm soil emits more carbon dioxide than bog soil at the Garden City Lands.

Results

- Soil respiration was highest from new organic fill on farmland (Fig. 2)
- Soil respiration from the mineral fill was higher than from the mowed bog
- There was no difference between unfilled areas on either side of the dyke
- Overall, respiration was higher on the agricultural side than on the bog side

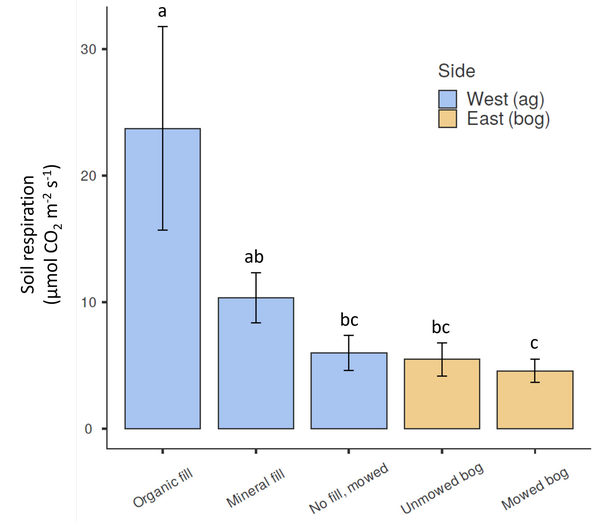

Figure 2. *Soil respiration from farmland (blue) covered in organic or mineral fill; and from mowed and unmowed peatland (beige).*

Conclusion

- Comparatively low soil respiration in the bog and on unfilled agricultural land suggests that carbon is being retained in peat
- Mowing has little effect on bog emissions
- Fill increased emissions
  - Combined effects of vegetation and organic matter loss
  - Most pronounced with organic fill

Acknowledgements

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