

Estimates of Peatland Carbon Stocks Are Derived With Ground Penetrating Radar

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Objective

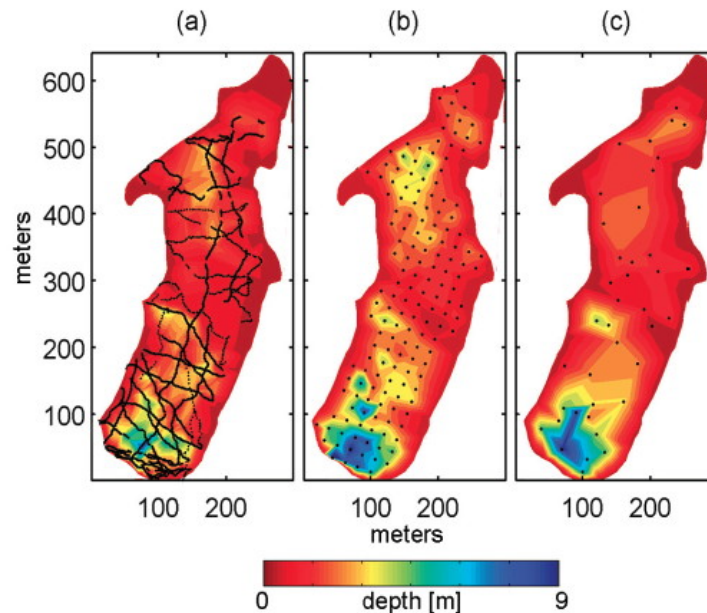
- Demonstrate that ground penetrating radar can be used to characterize peatland carbon stocks.

New Science

- We evaluated peat volume using high-resolution data to resolve the three dimensional structure of a peat basin based on direct (push probes) and indirect geophysical measurements (i.e., ground-penetrating radar; GPR).
- Uncertainty of 14 to 23% was detected, and uncertainty of the C pool doubled when incorporating peat properties.
- Final C stock values are based on the uncertainty of the basin volumes and the variability in the peat properties and range between 31 and 38%.

Significance

- The results indicate the GPR technique is scalable to larger peatlands and can thus be used to obtain estimates of peat basin volumes at uncertainty levels similar to those for invasive direct probe surveys. Application of this method would reduce effort in future survey designed to capture these uncertain C stocks.



Contour plots of GPR data (left) manual peat probes right (center) and a derived subset of data used to estimate sampling uncertainty.

Citation: Parsekian AD, Slater L, Ntarlagiannis D, Nolan J, Sebestyen SD, Kolka RK, Hanson PJ (2012) Uncertainty in peat volume and soil carbon estimated using ground-penetrating radar and probing. Soil Science Society of America Journal 76:1911-1918, doi: 10.2136/sssaj2012.0040.