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Spatially Enabling Australia and New Zealand

P4.12 | Ultrahigh dimensional variable selection for interpolation of point referenced soil carbon data

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Project Participants Queensland University of Technology and University of New England

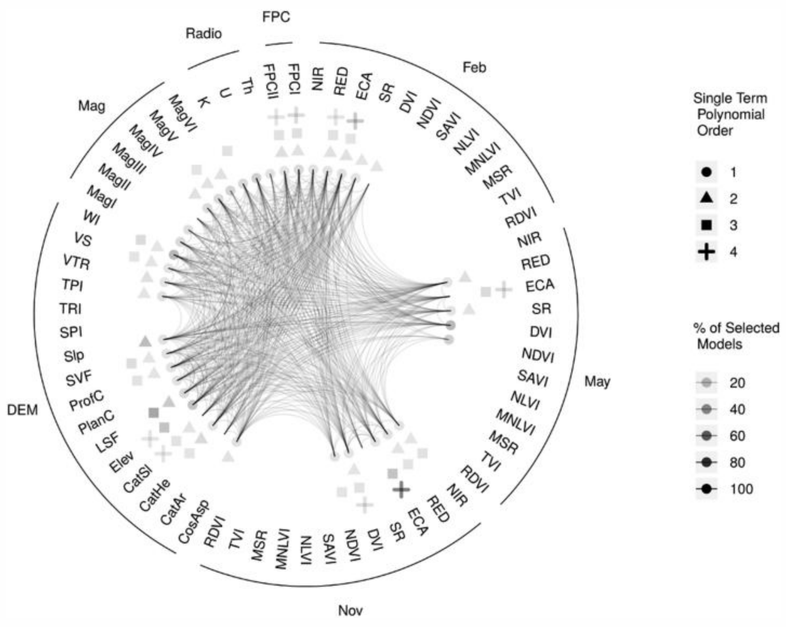
Objectives Leveraging a rich ensemble of environmental variables to aid the spatial interpolation of sparse, point referenced soil carbon observations.

Outcomes

- Laboratory analysis of soil samples is time and resource intensive but large numbers of potentially useful environmental observations are available to aid the interpolation of these soil samples
- We demonstrate the application of LASSO Regularized Multiple Linear Regression to select covariates from a rich feature spaceof potentially relevant environmental variables for inclusion in a model to conduct a covariate based interpolation of soil carbon
- Project outputs to date include a peer reviewed journal article, an example analysis published as a GitHub repository and a second manuscript currently under peer review.

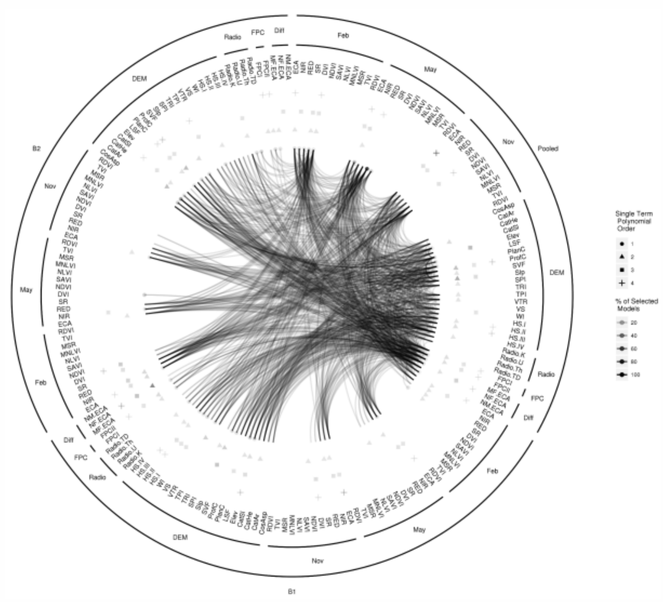
Interpolation of Point Referenced Spatial Data

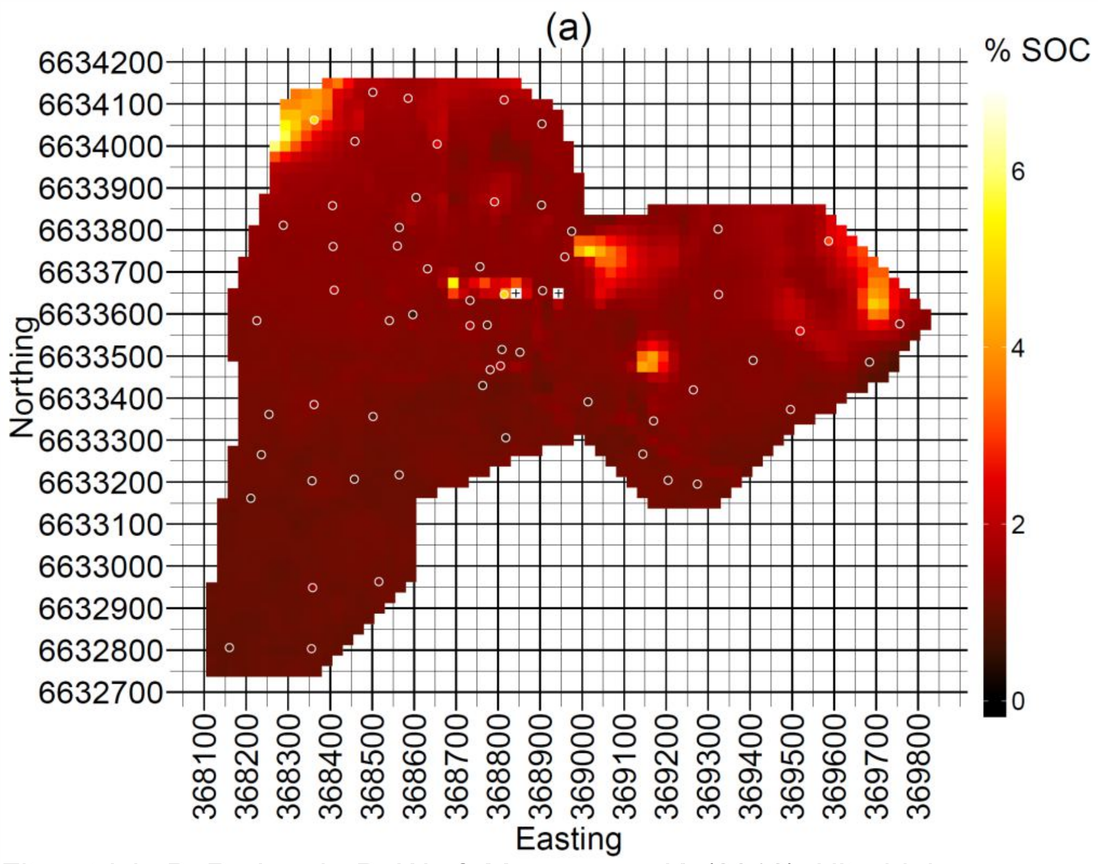
A rich ensemble of environmental variables is used to build a model for soil carbon which is used to spatially interpolate point referenced soil carbon observations.



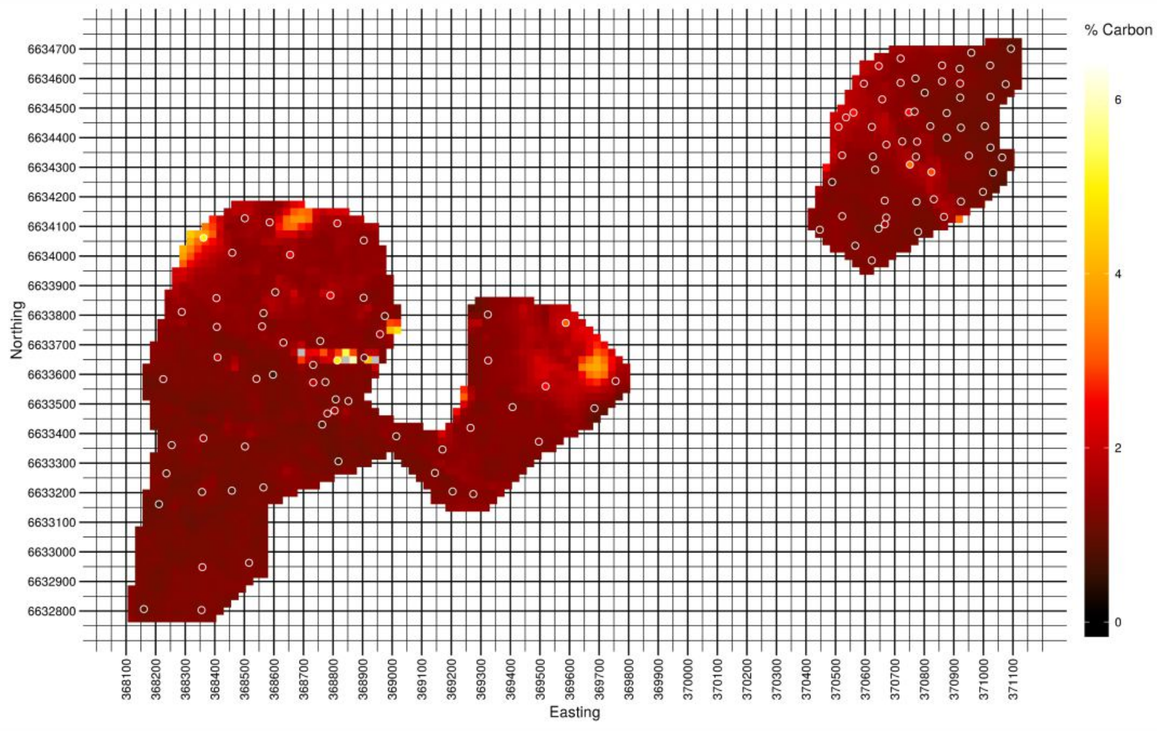
Site Effect & Geographic Transferability

The approach is extended to interpolate data from multiple sites considering global and site specific effects of covariates.





Fitzpatrick, B. R., Lamb, D. W., & Mengersen, K. (2016). Ultrahigh Dimensional Variable Selection for Interpolation of Point Referenced Spatial Data: A Digital Soil Mapping Case Study. PLoS ONE, 11(9): e0162489. https://github.com/brfitzpatrick/larc



Fitzpatrick, B. R., Lamb, D. W., & Mengersen, K. (2016). Assessing Site Effects and Geographic Transferability when Interpolating Point Referenced Spatial Data: A Digital Soil Mapping Case Study. PLoS ONE, Under Review. Pre-print: http://arxiv.org/abs/1608.00086

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