
Soil as the missing link in prairie restoration & ecological education

— Overview and update of
student research project —

A little bit about me...

- Biological systems engineering & Environmental studies
 - active Slow Food UW intern
- In my free time I like to run, crochet, cook, travel, and play board games
- I'm passionate about applying a multidisciplinary approach to areas of study that interest me, and I'm curious about the world around me.



Overview for today

- Background of the project
- Research and field work
- Results and conclusions

Project Background: the larger picture

Understanding soil properties is essential to the process of establishing functional plant communities

- How can we quantify these characteristics for prairie restorations?
- Subsequently, how can we integrate this into the management and assessment of prairie restoration progress?



<http://www.sustainabilitylabs.org/ecosystem-restoration/learning-modules/is-there-one-optimal-ecosystem-design-for-maximal-efficiency-of-precipitation-use/>



Research goals

- Enhance restoration efforts by providing detailed soil analysis of the Biocore Prairie.
 - Analyze two sections of the prairie with observably different plant responses
 - Provide accessible research techniques and data
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Soil properties we quantified:

Physical



Soil texture
Bulk density
Penetrative resistance

Fertility



Soil organic matter (SOM)
NPK
Soil pH

Hydrological



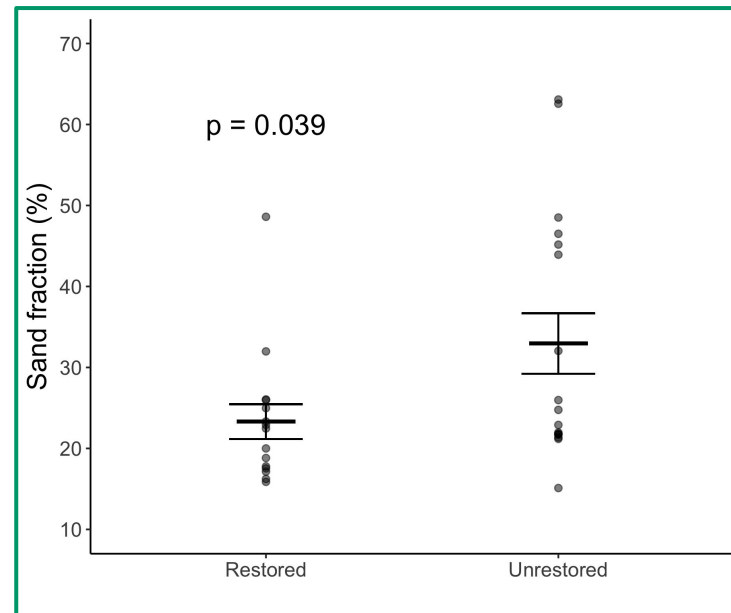
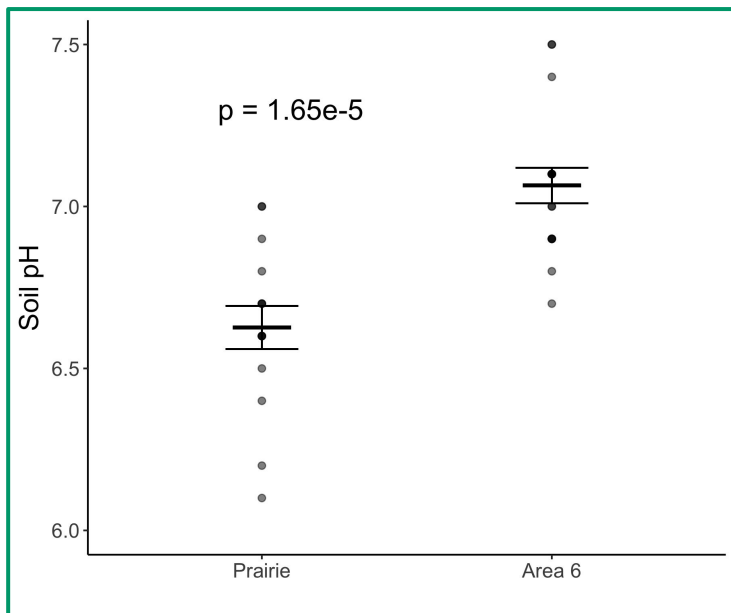
Volumetric water content

Fieldwork:



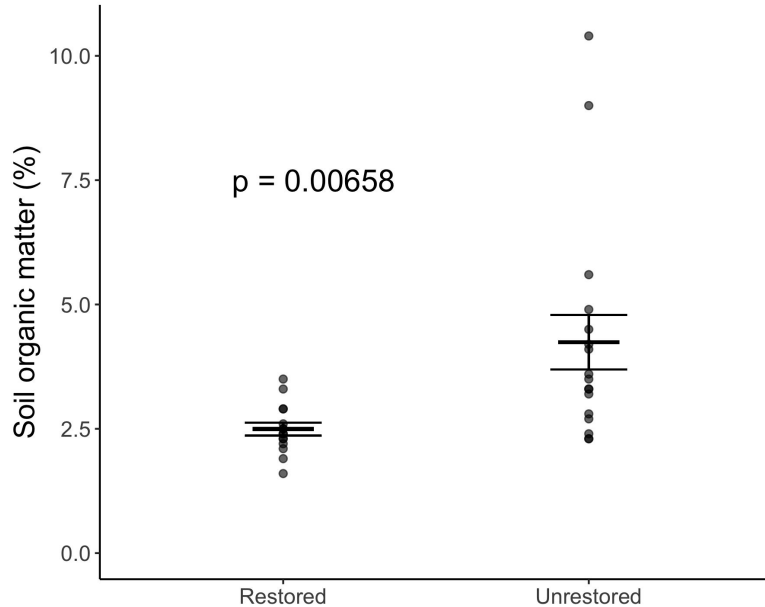


- Highly correlated soil properties:
 - SOM and total N
 - Sand and silt



- Significantly different soil properties:
 - Soil pH
 - SOM
 - Sand fraction

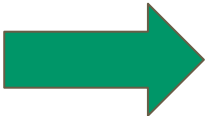
Unexpected Results



- Bulk density was not significantly different
 - But had different rates of increasing bulk density with depth
- Soil organic matter was significantly lower in the restored prairie

These findings contradict commonly observed trends in the literature

Conclusions and future questions

- Unexpected results lead me to believe:
 - that other processes outside of land use changes are influencing restoration progress.
 - results (i.e. literature trends) of restoration may not be so definitive
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- How do the aboveground observations correspond with differences, or lack thereof, in soil properties?
 - Can we use these results to even better tailor the management techniques employed?

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Questions?