



Riparian Repairing: Effects of conservation efforts on microbial communities and soil characteristics

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Riparian buffer zones are diverse ecosystems

- Provide water filtration
- Reduce erosion and compaction
- Sequester heavy metals
- Create different microbial communities



Nova Scotia Environmental Farm Plan

Mowing can be detrimental to:

- Biodiversity
- Soil compaction & infiltration
- Stream health
(eutrophication)



Cuyahoga Soil & Water

Site Map

- Blue – University of Kentucky
- Red – Sites



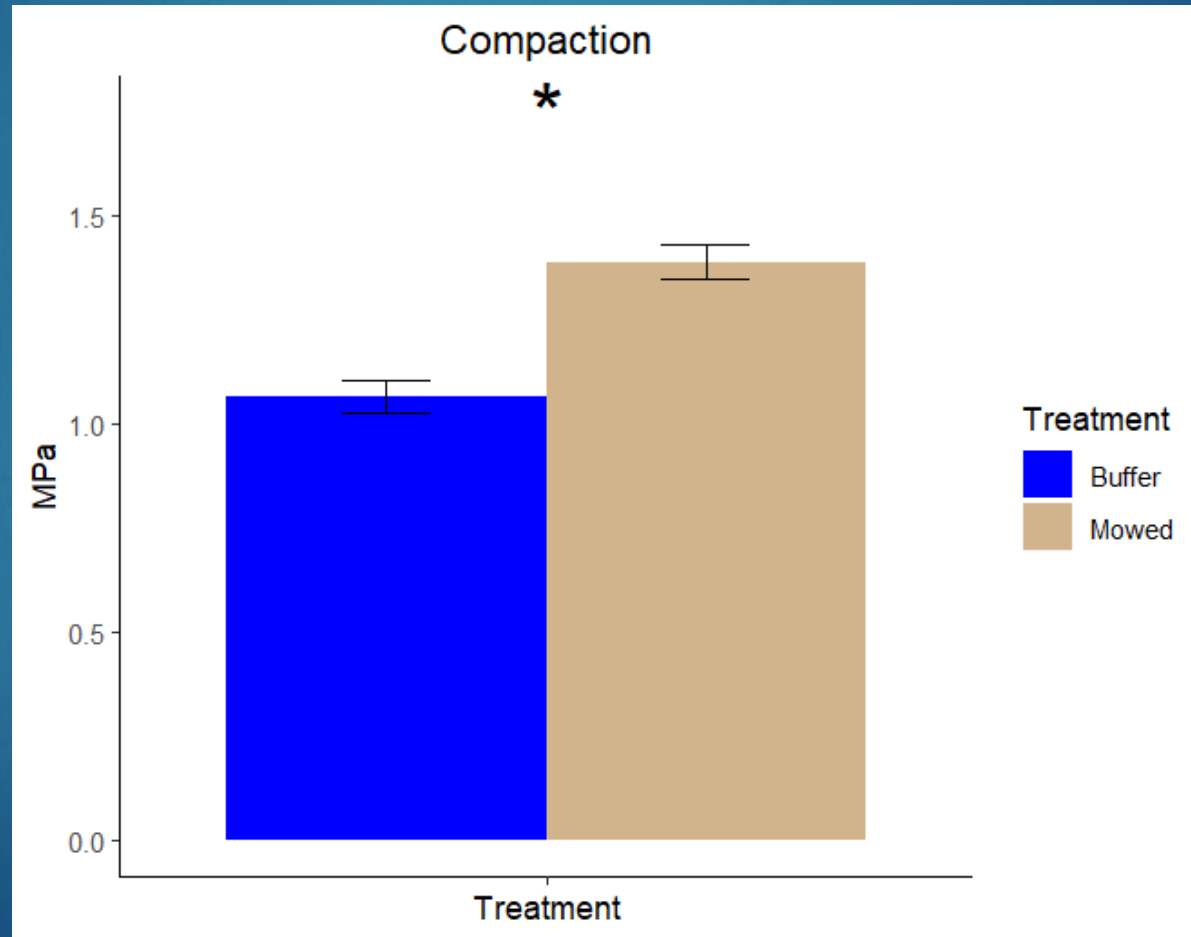
Methods Overview

- Compaction measured with penetrometer
- Infiltration measured with double-ring infiltrometer
- Soil chemistry analyzed by UK Regulatory Services
- Soil microbial taxonomy from sequencing V4 subregion of 16s rRNA gene

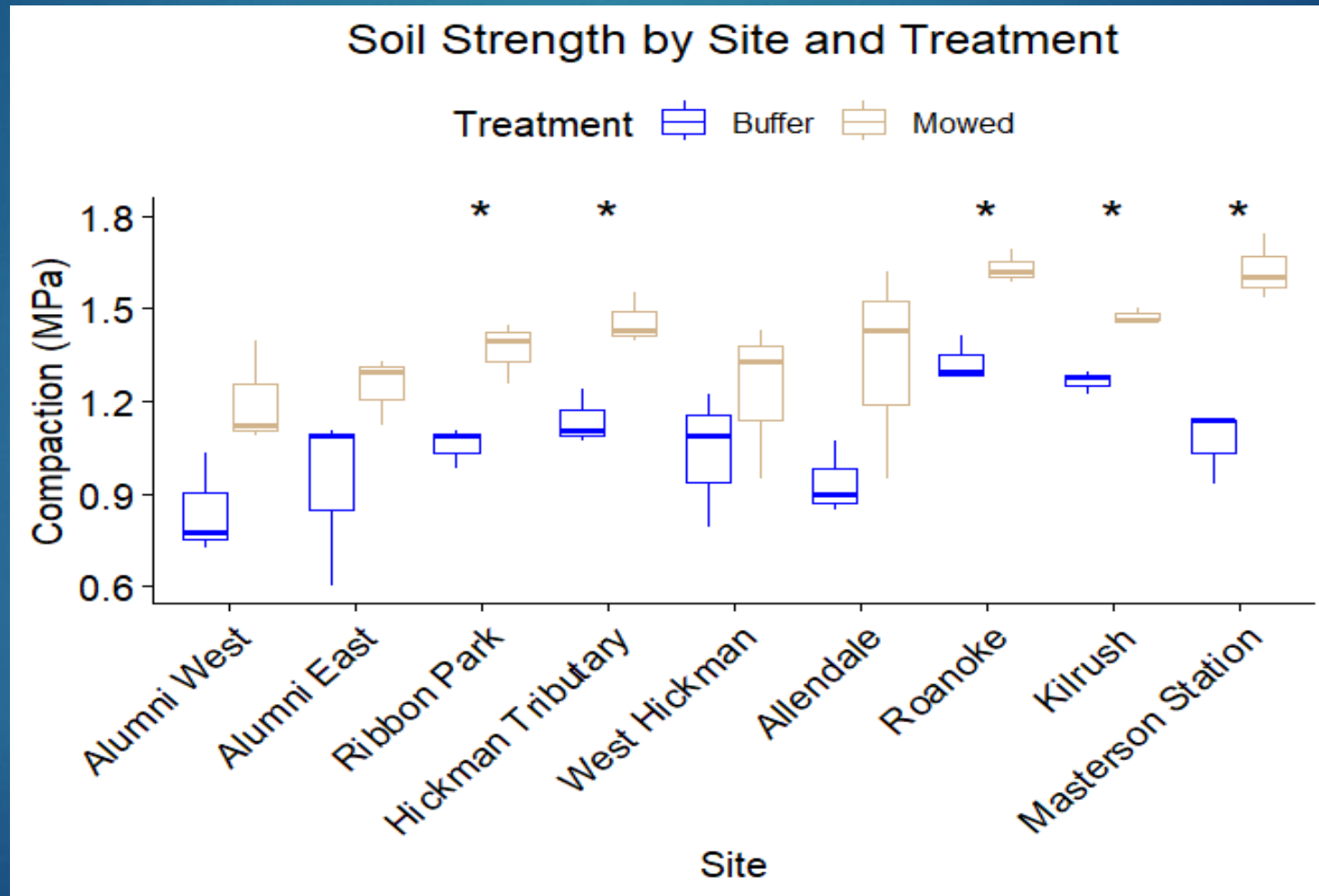
Hypotheses

- Compaction lower in buffer zones
- Infiltration greater in buffer zones
- Nutrients more abundant in buffer zones
- Heavy metal contamination lower in buffer zones
- Microbial diversity greater in buffer zones
- Age will have beneficial effect on variables

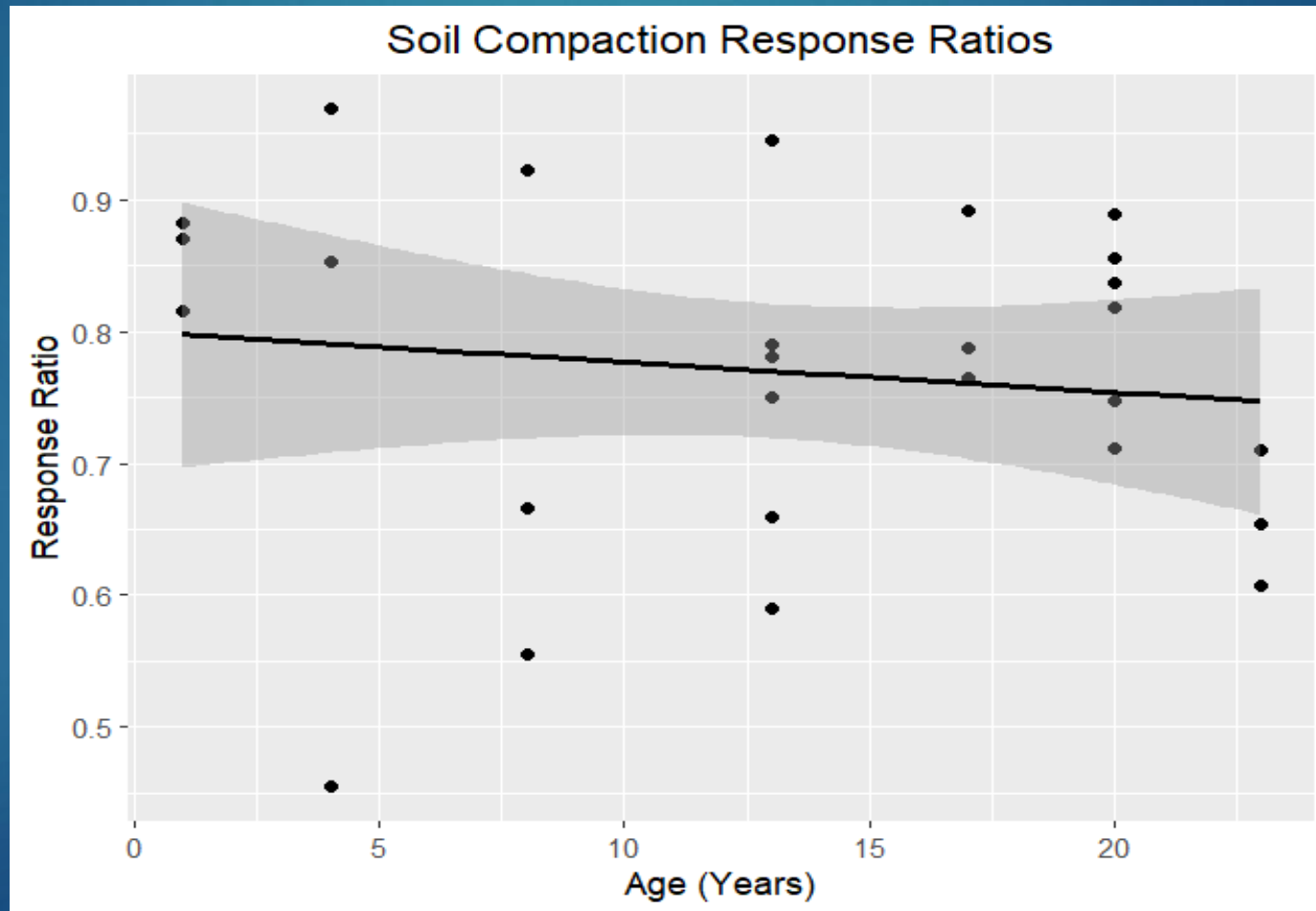
Compaction was improved in the buffer zones



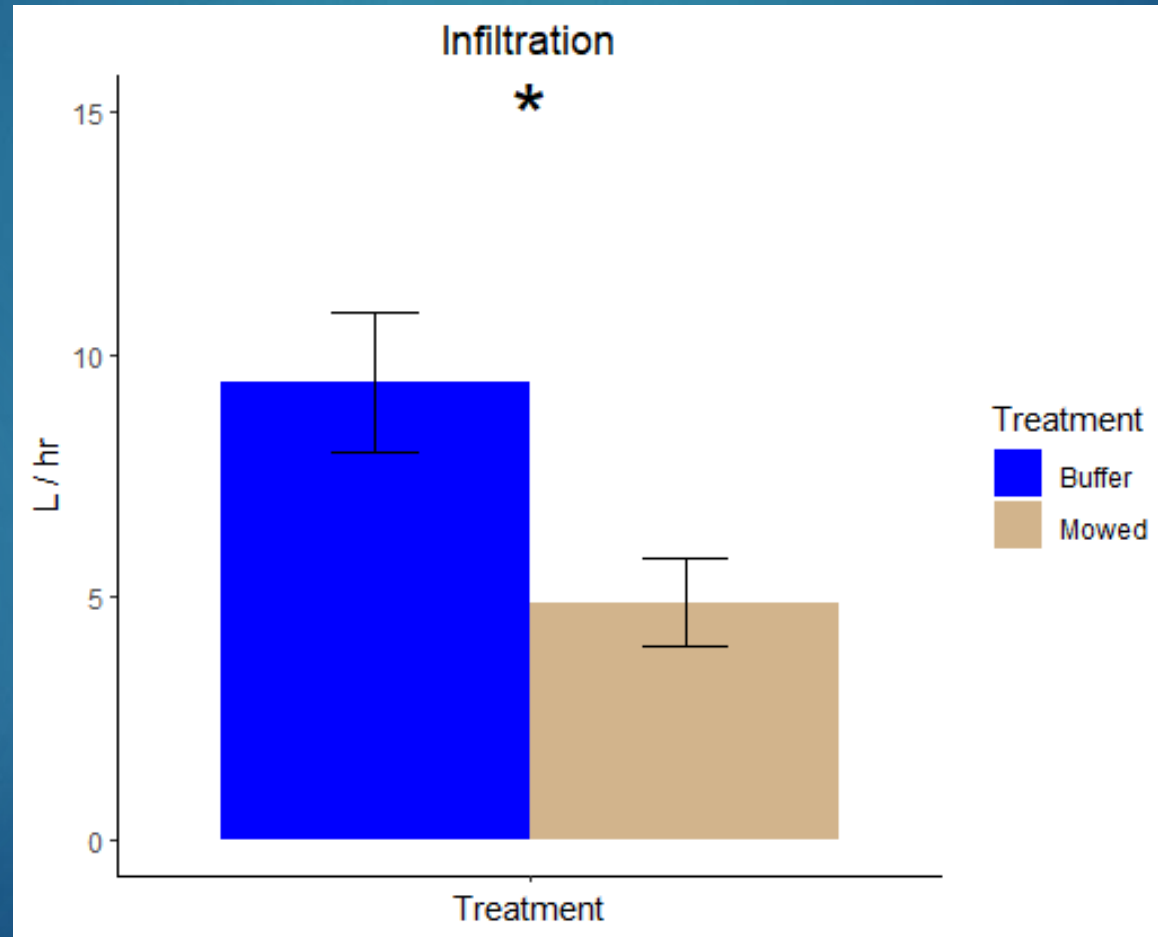
Compaction varied between sites



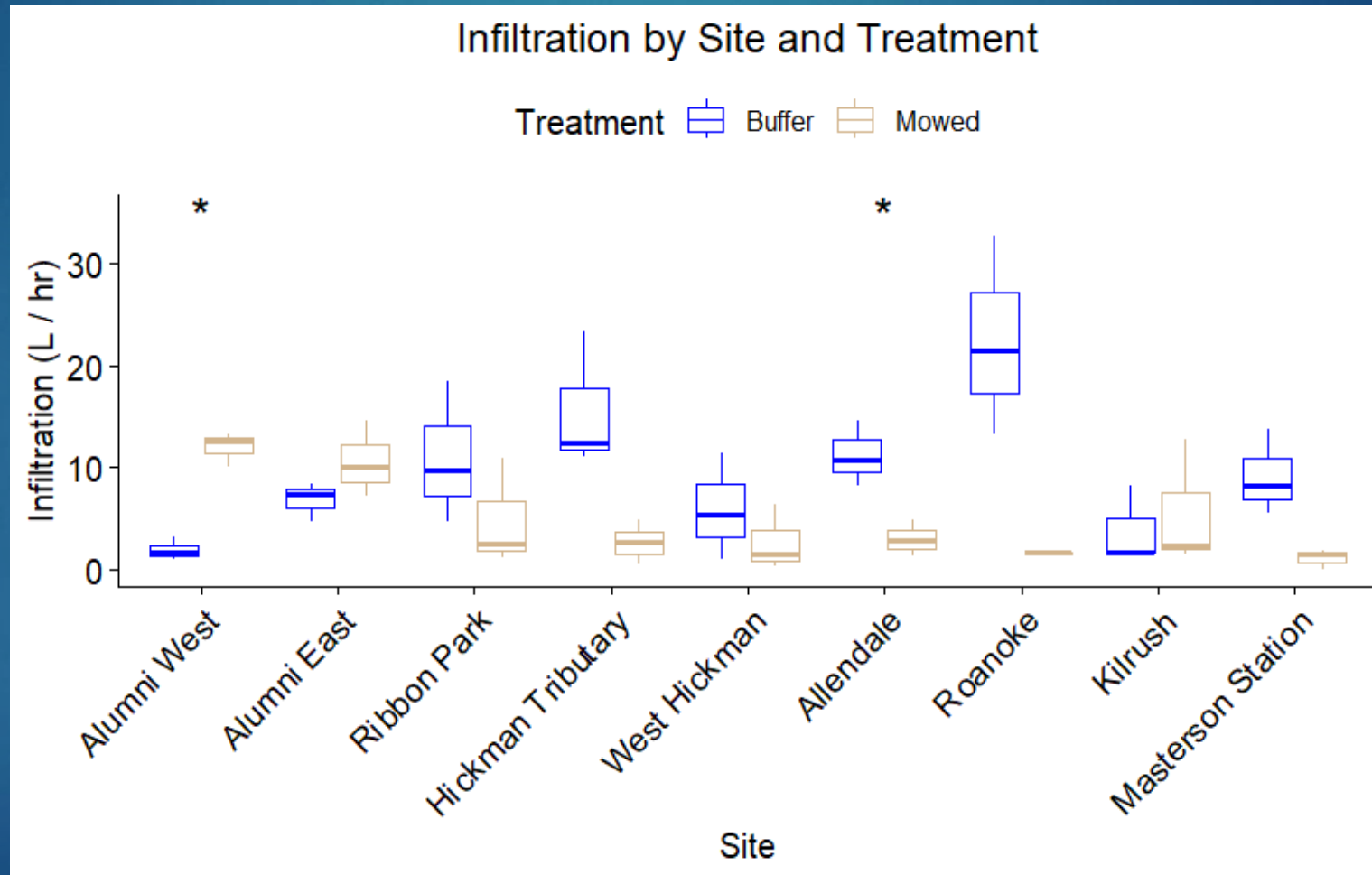
There is a downward trend in compaction over time



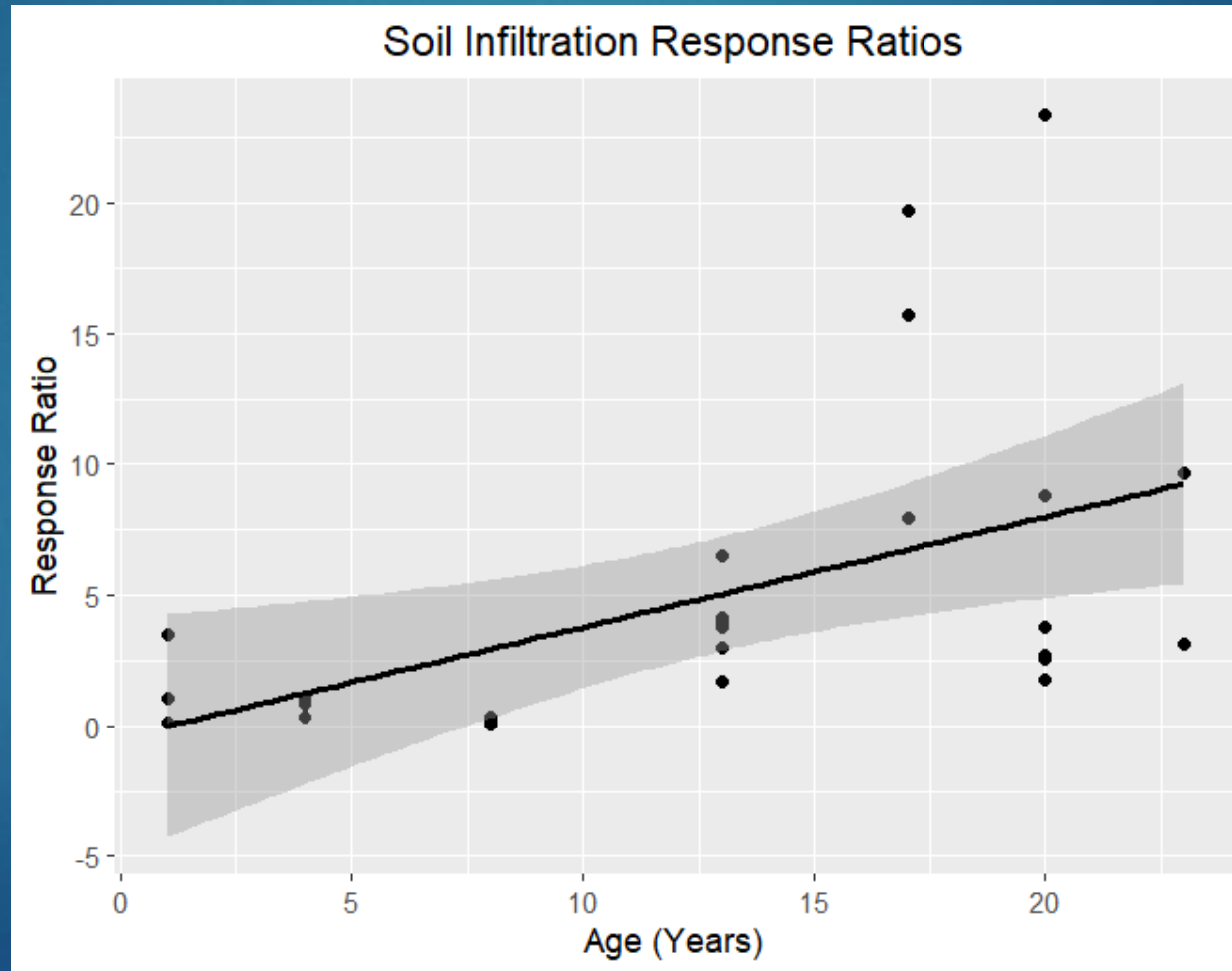
Infiltration was also improved in the buffer zones



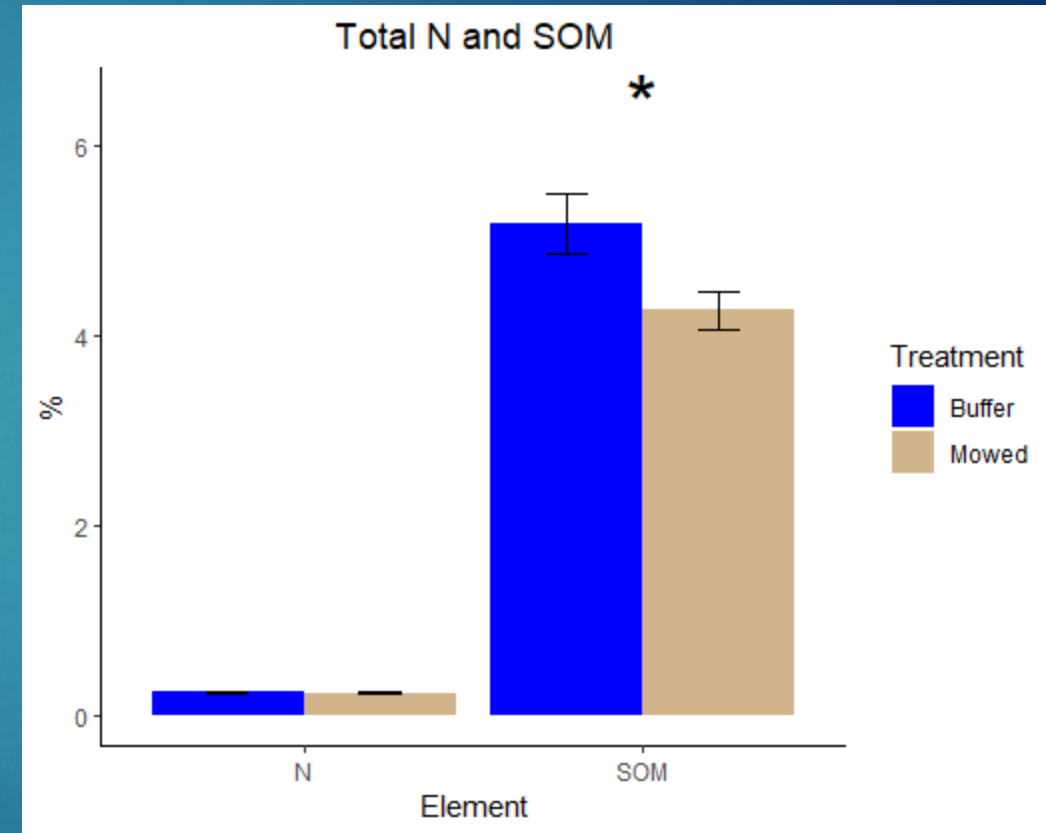
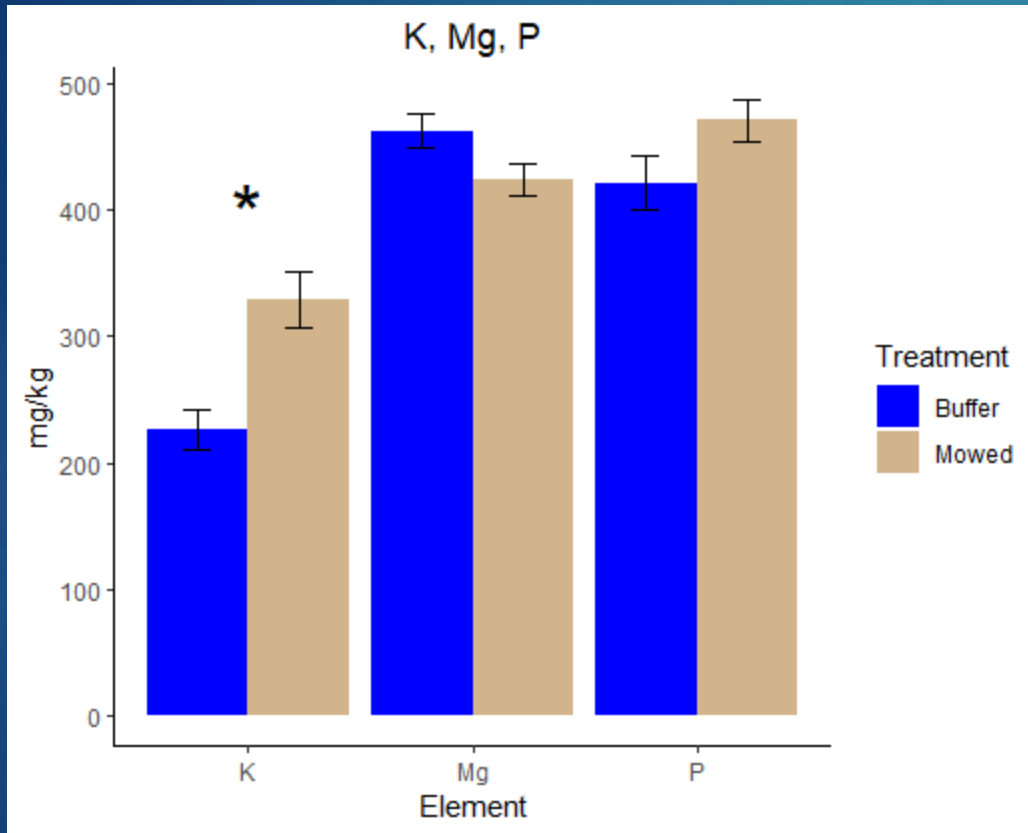
Infiltration varied between sites



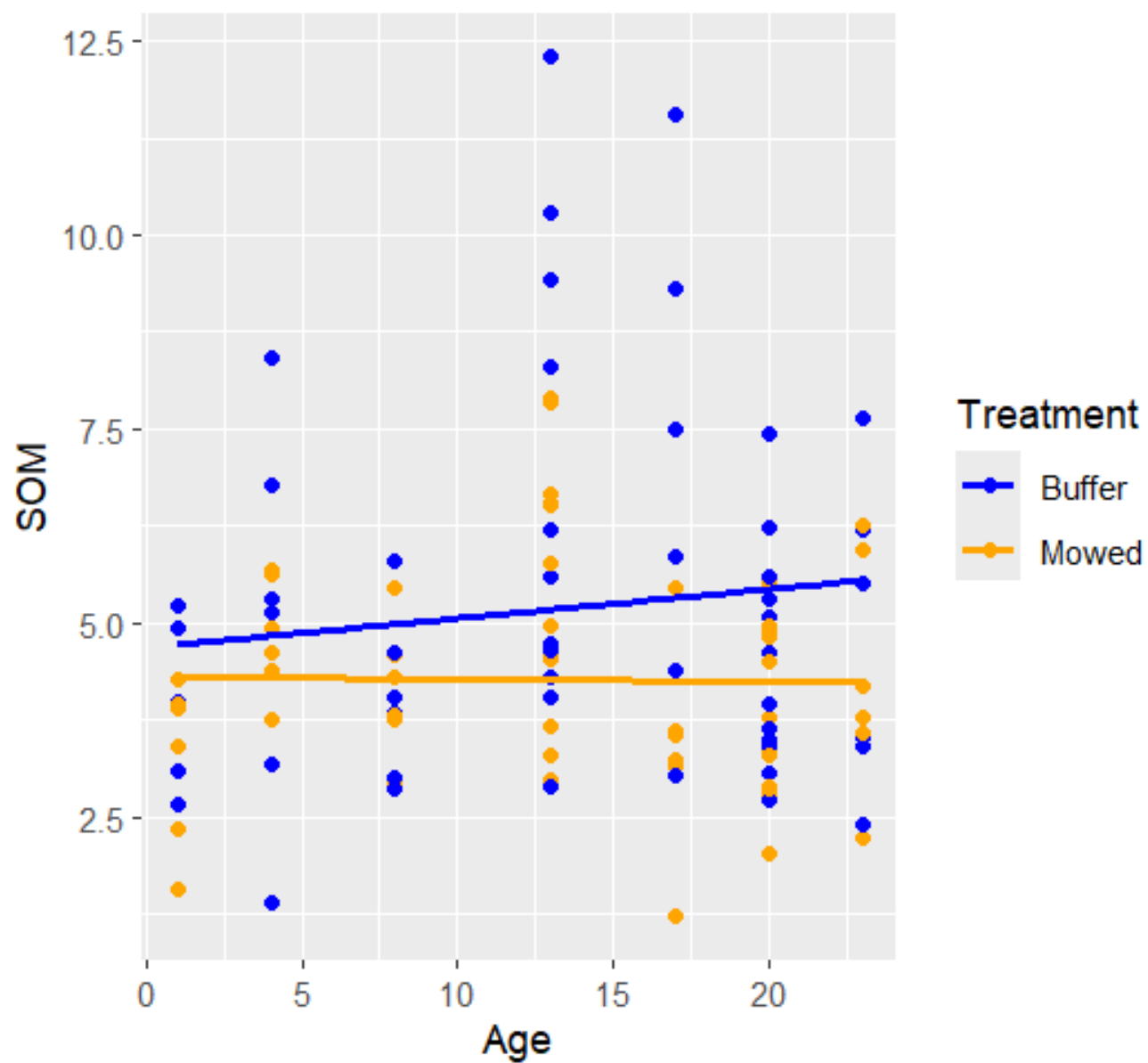
There was a positive trend of infiltration over time



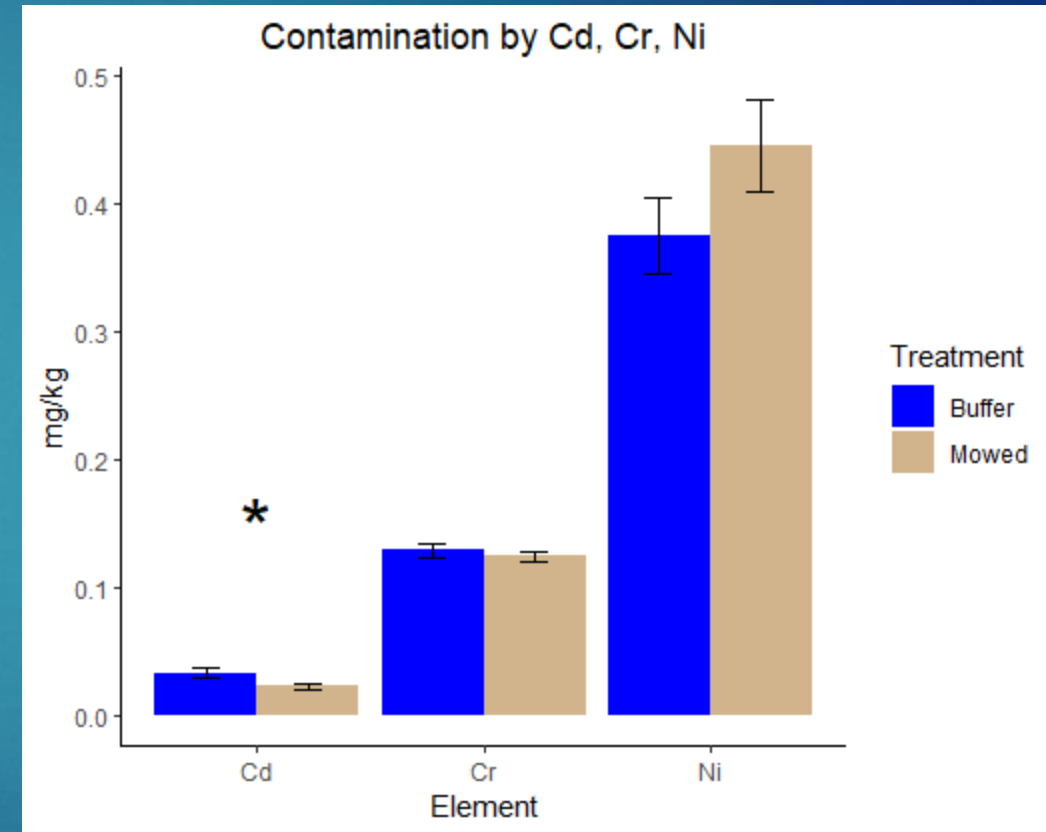
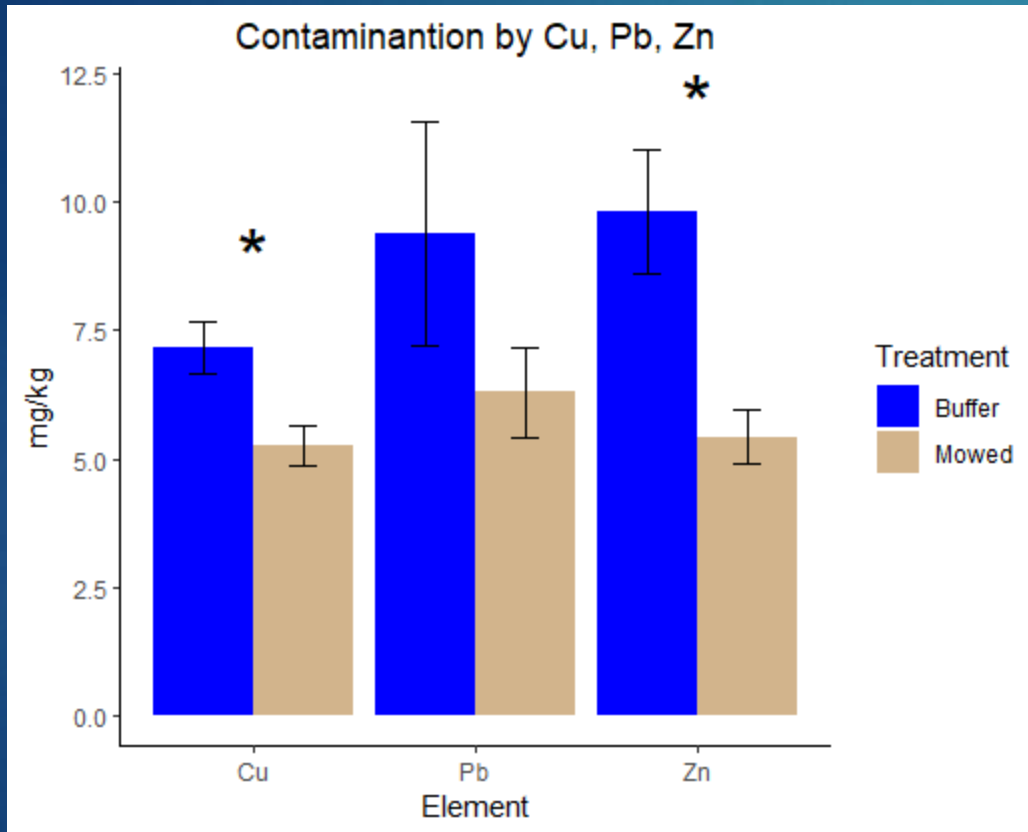
Nutrients vary from site to site



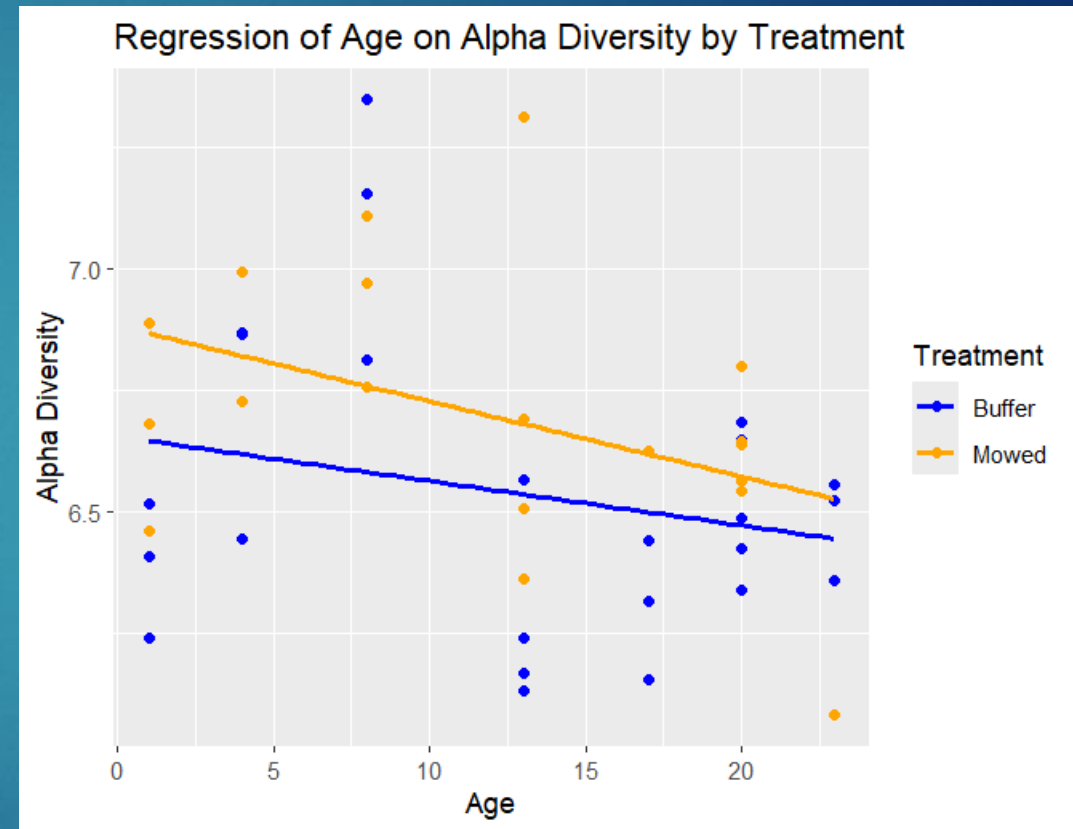
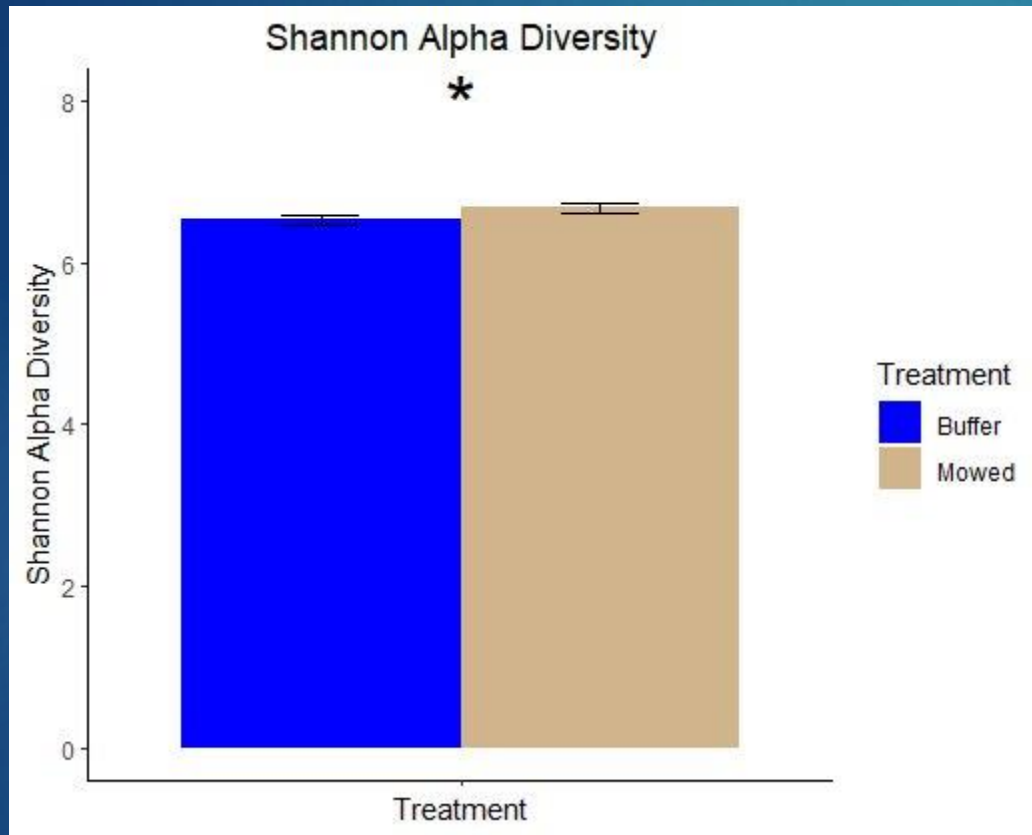
Regression of Age on SOM by Treatment



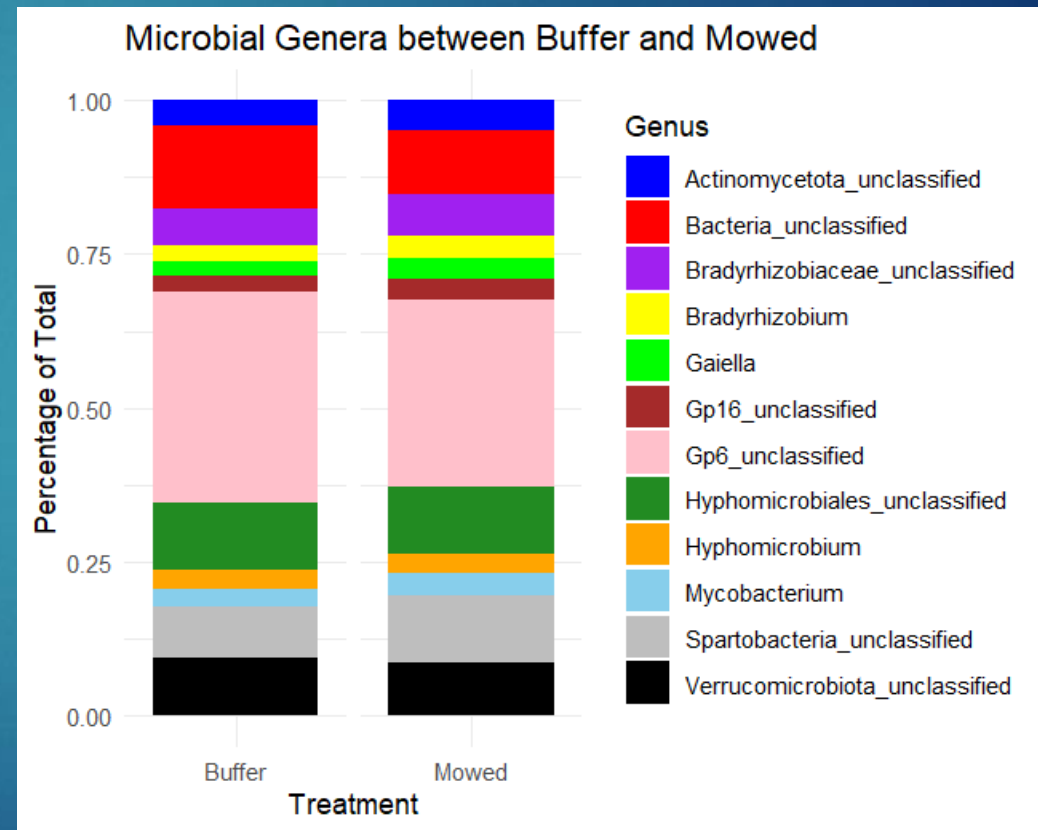
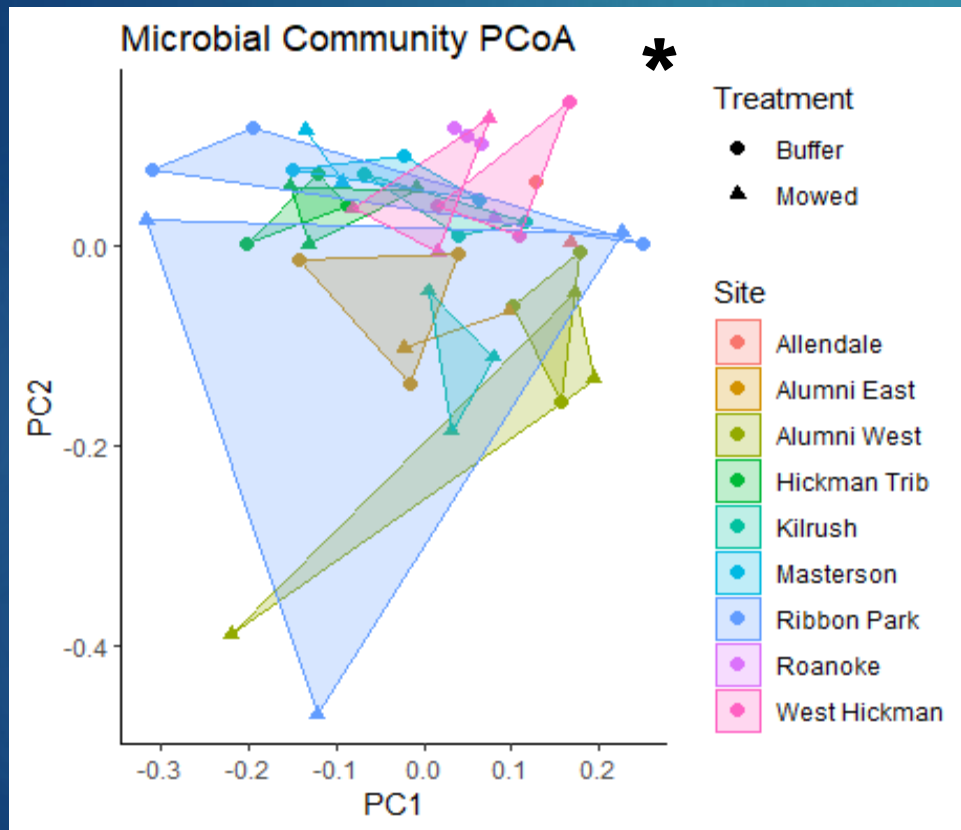
Contaminants vary from site to site



Alpha diversity differs



Bacterial communities differ between treatments



Preliminary Conclusions

- ▶ Riparian buffer zones likely improve soil physics
- ▶ Increase in metal contaminants could be from better ability to handle it
- ▶ Nutrient levels could vary based on plants present
- ▶ Alpha and Beta Diversity could be from transition into new riparian buffer microbial profile
- ▶ Age is likely an impact, but not as strong on most variables

Acknowledgements

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