

# Calibration Report: Low N Basalt Site

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## Soil Solution Results

Table 1: Average Soil Solution Concentrations of Reliable Months (2005-2006)

Soil Layer	$\mu\text{mol/L}$															
	Ca	Mg	K	Na	NO3	NH4	SO4	Cl	PO4	DOC	Al	Si	H+	pH	R	HR
Layer 1	31.4	29.6	12.4	35.4	3.256	1.582	26.6	59.4	1.946	635	0.8598	28.4	12.24	4.91	69.1	21.5
Layer 2	40.2	39.9	15.4	18.4	1.798	0.467	27.4	64.6	2.421	993	2.3579	76.3	22.11	4.66	100.0	41.8
Layer 3	48.1	49.7	15.4	36.7	1.182	0.307	27.5	70.6	1.156	1173	4.5655	83.1	7.39	5.13	134.3	33.4
Layer 4	46.2	22.8	15.4	46.7	1.082	0.466	14.2	63.7	0.592	916	0.2608	72.3	4.12	5.39	109.7	21.2
Layer 5	32.9	33.5	13.2	49.3	0.986	0.535	13.2	63.0	0.307	843	1.2208	68.7	2.14	5.67	106.6	13.9
Layer 6	33.9	20.4	12.8	44.5	0.822	1.127	13.0	66.1	0.394	732	0.0679	69.1	8.72	5.06	81.6	23.0
Layer 7	20.9	33.0	10.0	53.8	0.760	1.528	13.0	70.4	0.371	683	0.3396	70.6	5.36	5.27	79.9	17.8
Layer 8	17.7	33.0	12.1	60.0	0.725	1.550	13.1	72.9	0.284	628	0.2126	72.1	3.59	5.45	76.6	13.0

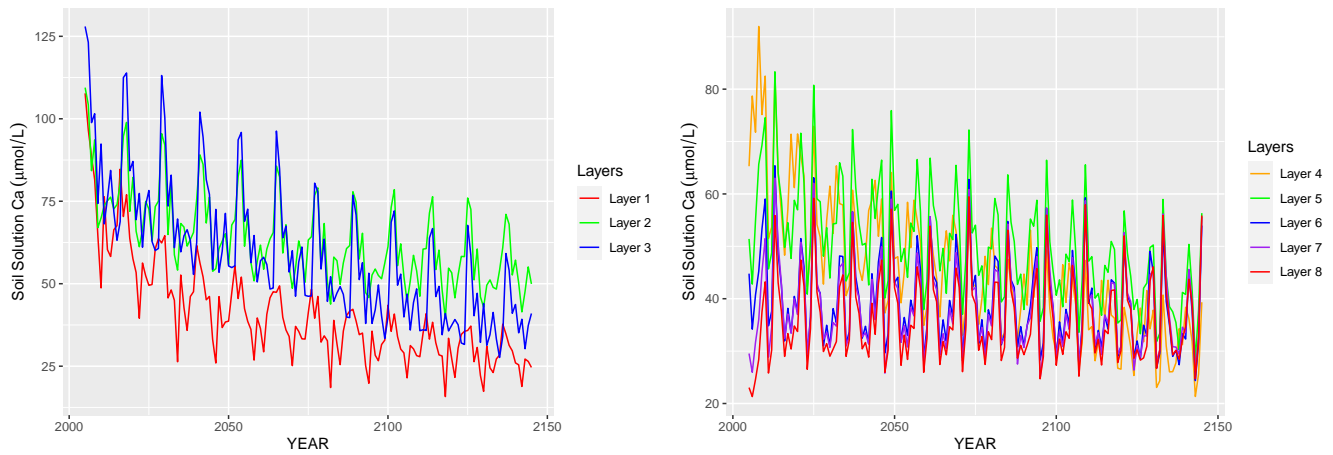


Figure 1: Figure 1: Monthly Calcium Concentrations by Soil Layer

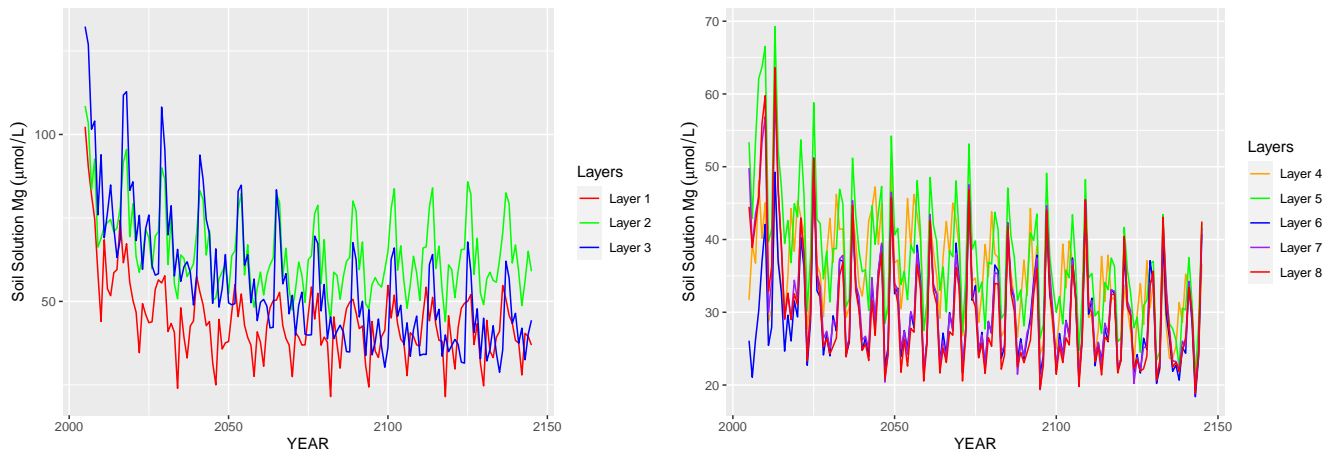


Figure 2: Figure 2: Monthly Magnesium Concentrations by Soil Layer

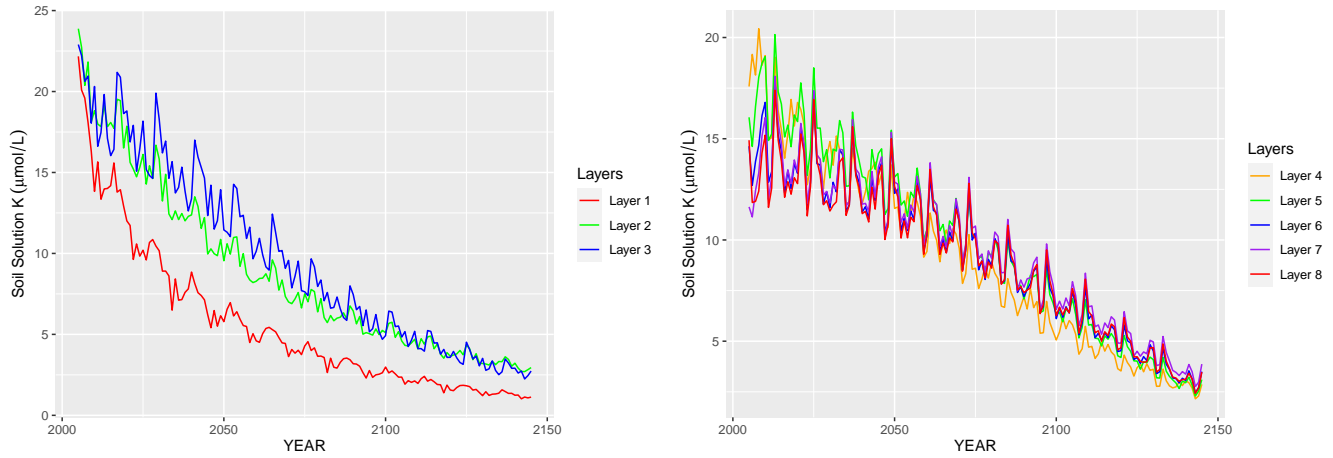


Figure 3: Figure 3: Monthly Potassium Concentrations by Soil Layer

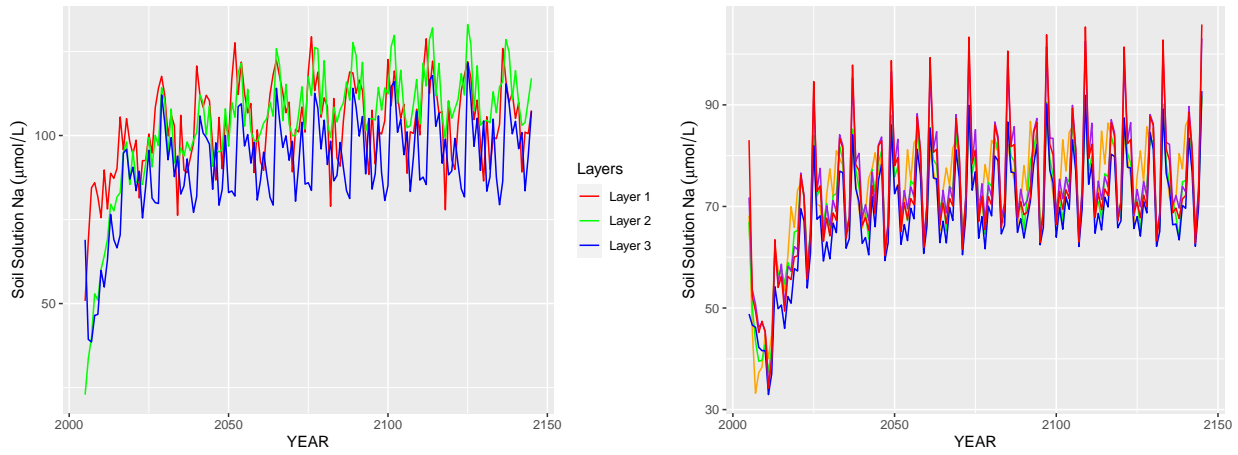


Figure 4: Figure 4: Monthly Sodium Concentrations by Soil Layer

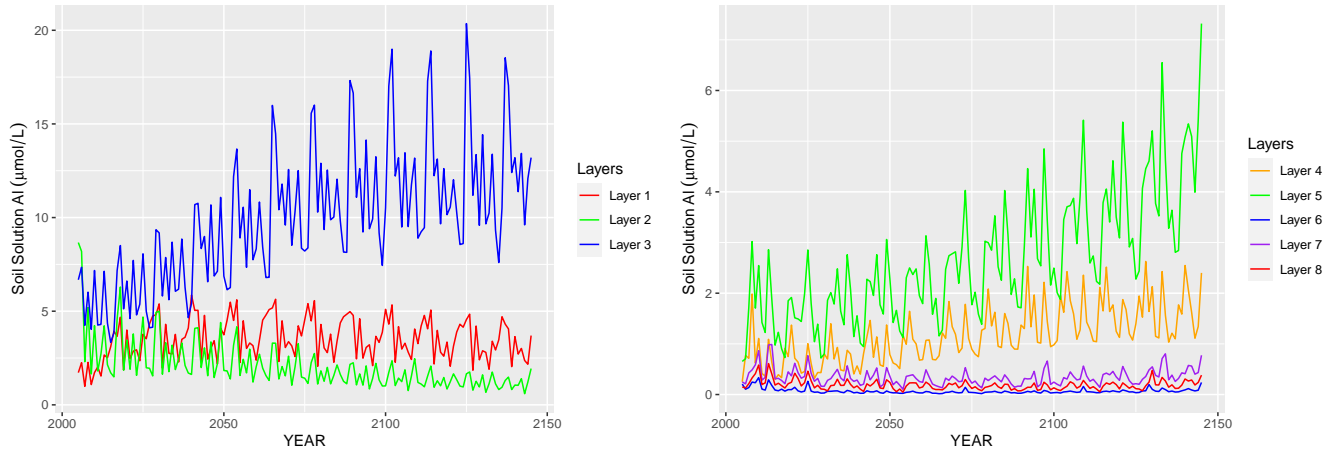


Figure 5: Figure 5: Monthly Aluminum Concentrations by Soil Layer

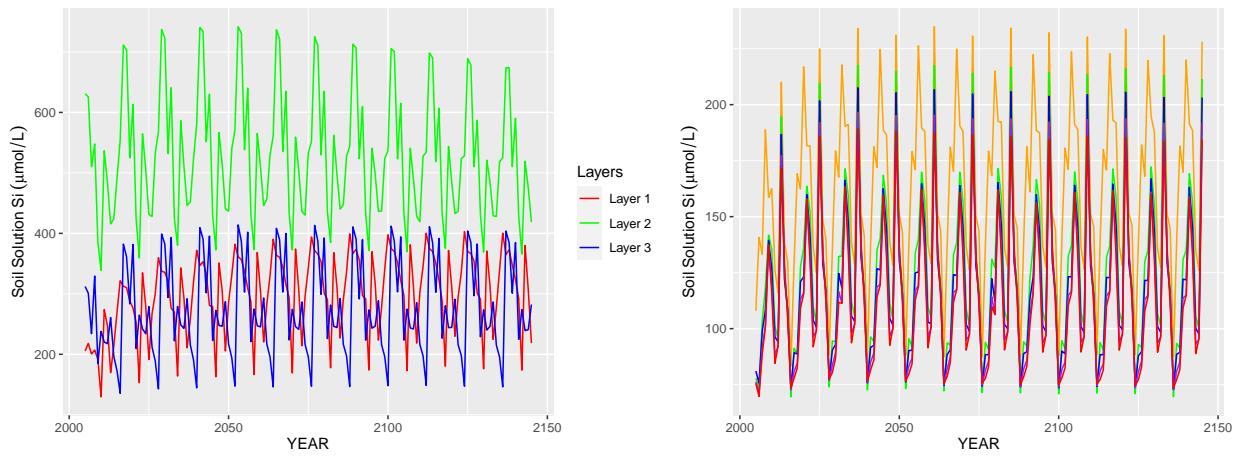


Figure 6: Figure 6: Monthly SiO<sub>2</sub> Concentrations by Soil Layer

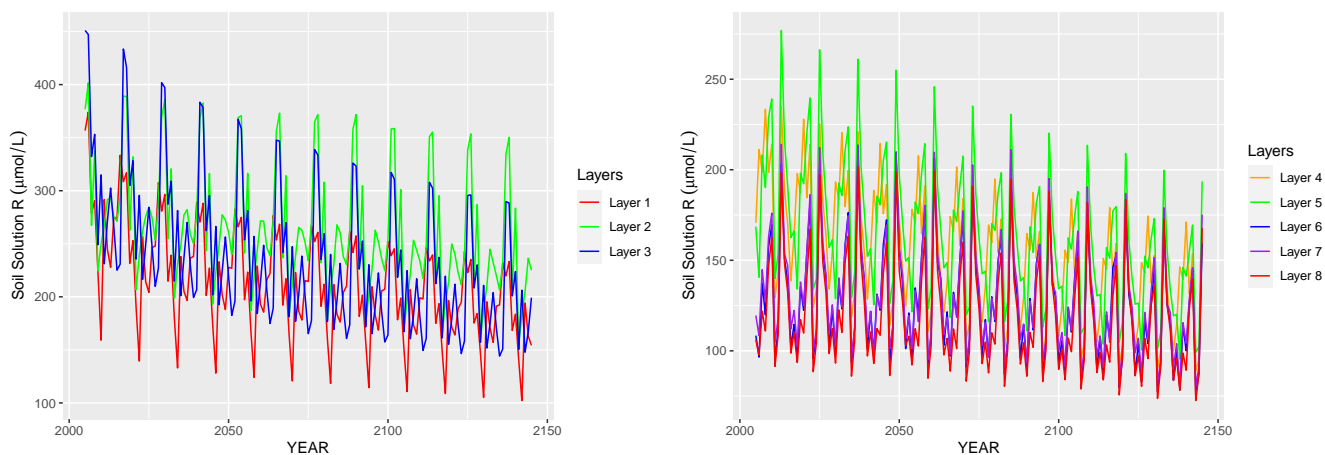


Figure 7: Figure 7: Monthly Organic Acid Base (R-) Concentrations by Soil Layer

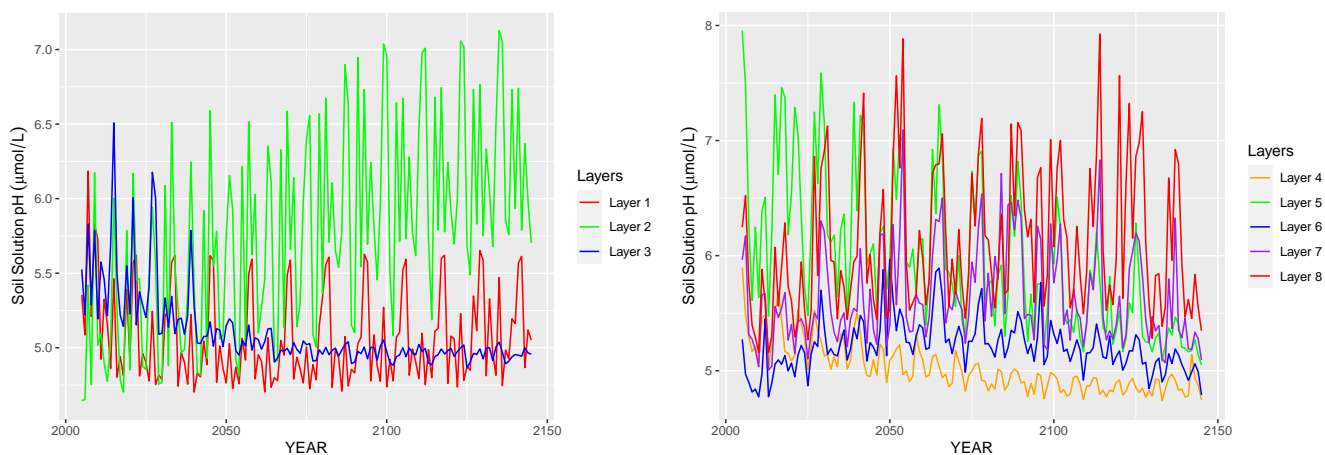


Figure 8: Figure 8: Monthly pH by Soil Layer

## Weathering Results

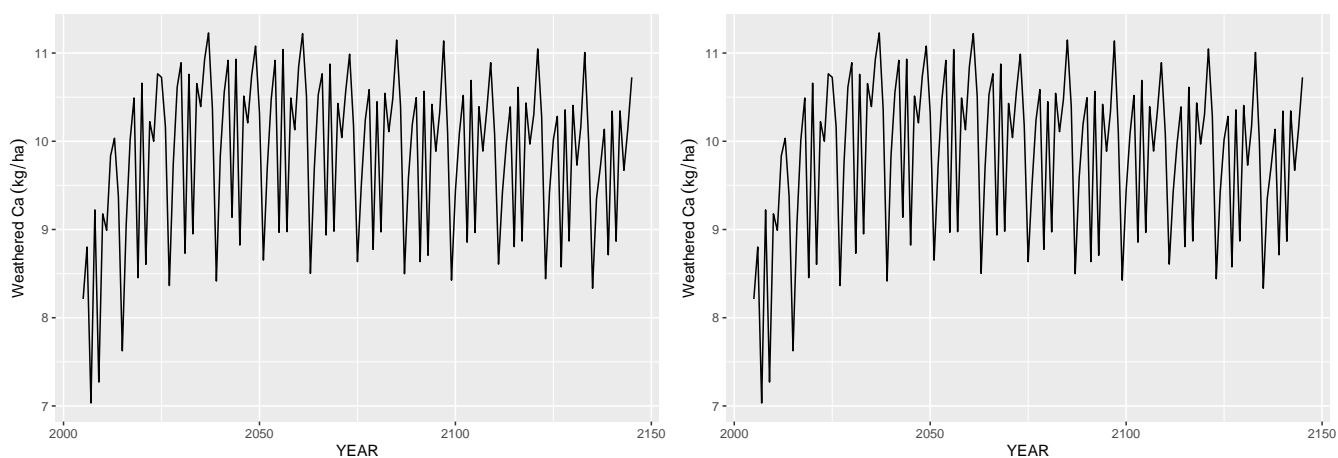


Figure 9: Figure 9: Calcium Weathering by Layer

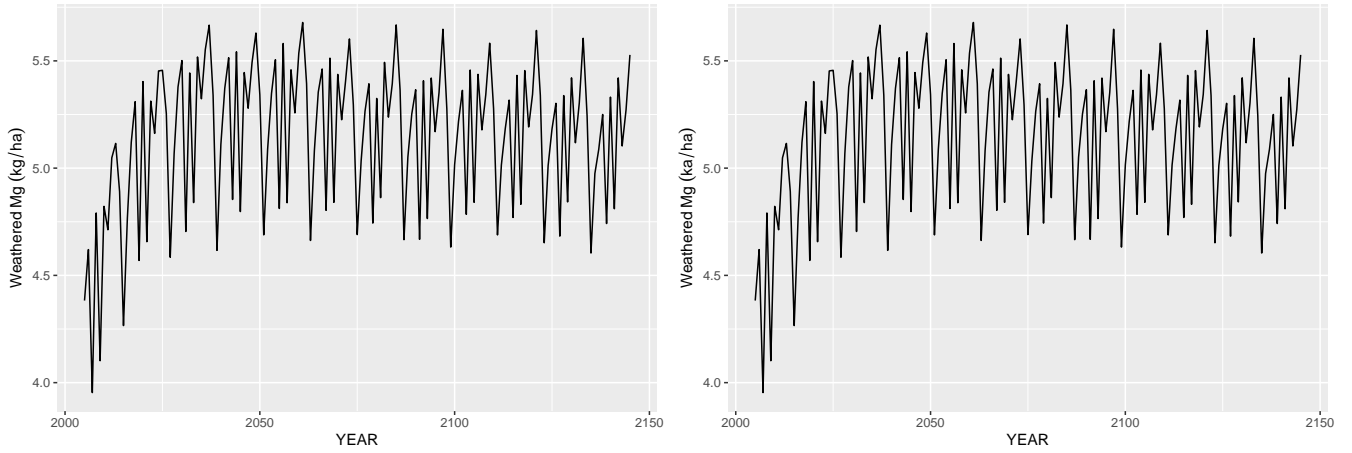


Figure 10: Figure 10: Magnesium Weathering by Layer

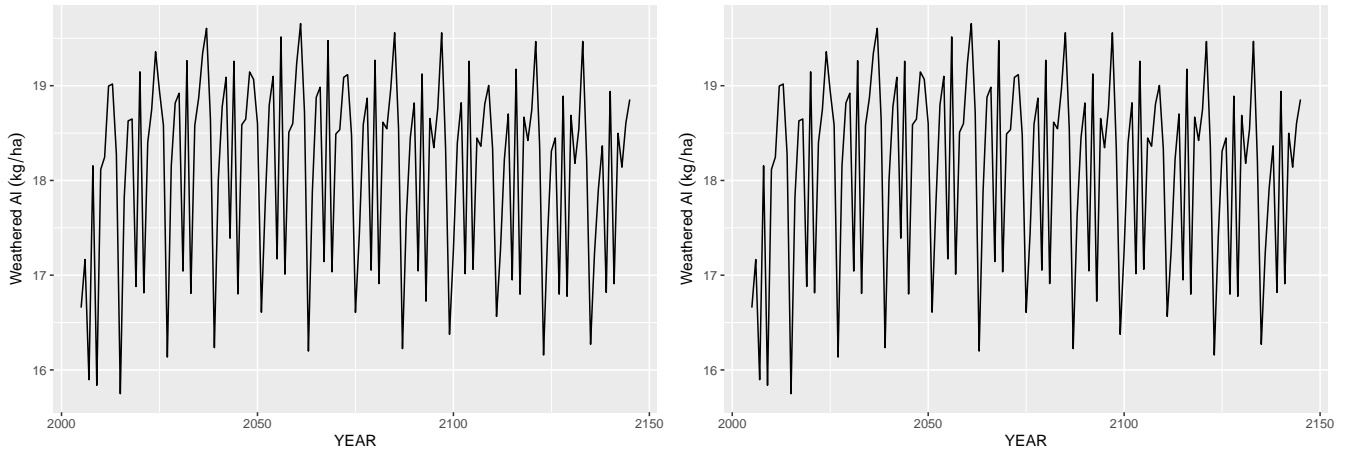


Figure 11: Figure 12: Aluminum Weathering by Layer

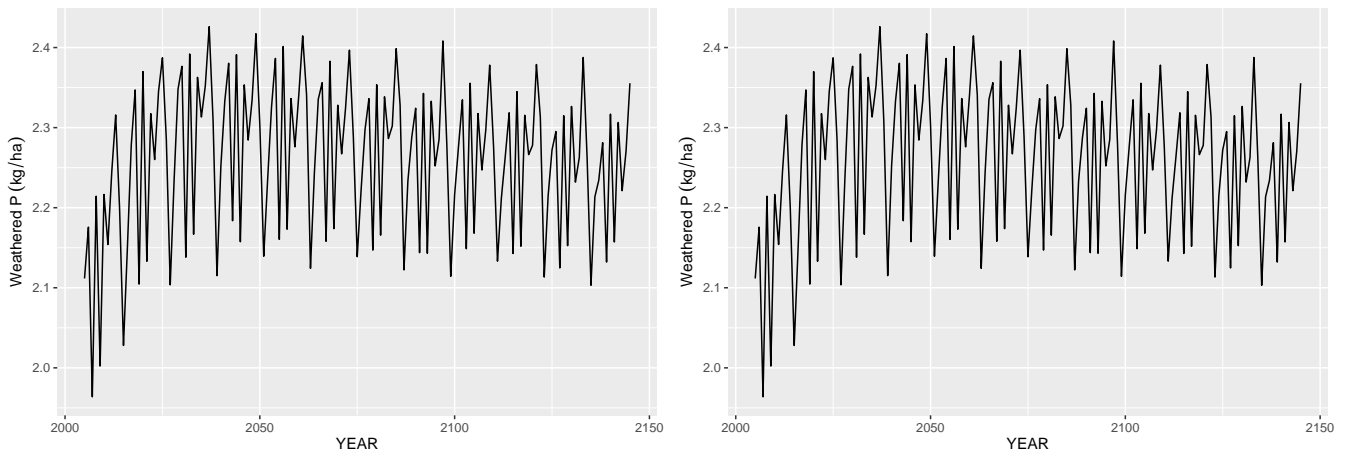


Figure 12: Figure 13: Phosphate Weathering by Layer

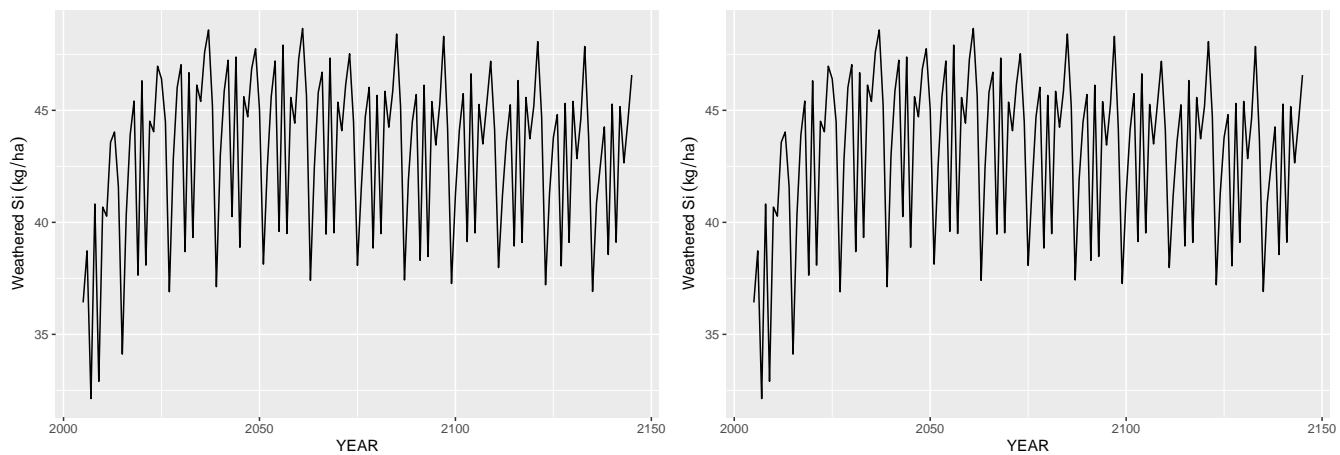


Figure 13: Figure 14: Silica Weathering by Layer

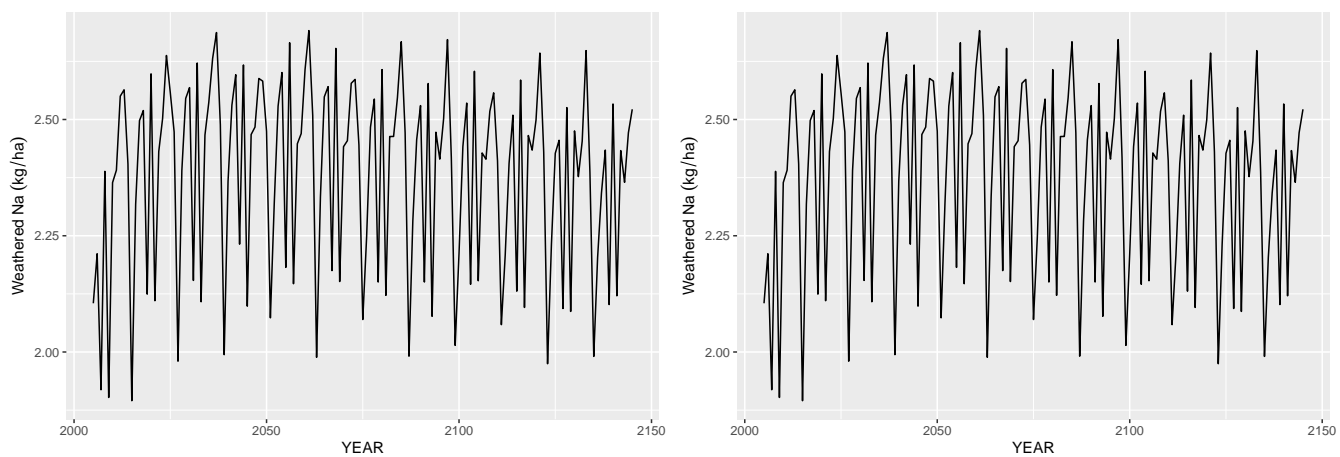


Figure 14: Figure 15: Sodium Weathering by Layer

## Figures

## Soil Organic Matter (SOM) Results

### Litter Pool Results

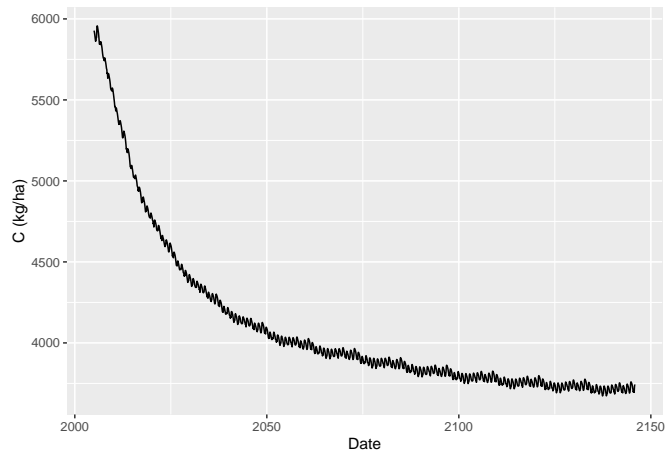


Figure 15: Figure 17: Litter Pool Carbon Content Over Simulation Period

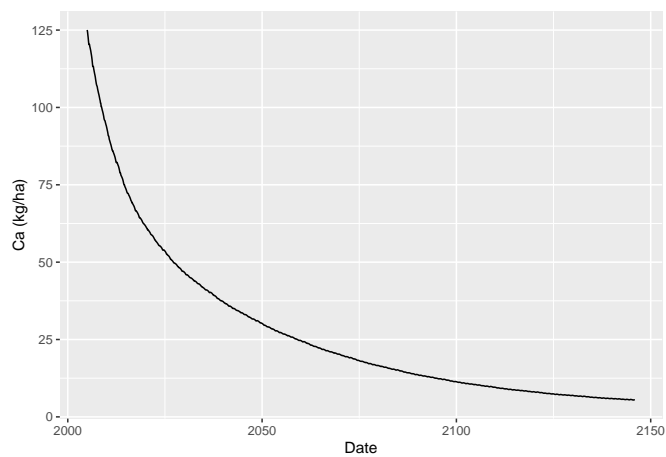


Figure 16: Figure 18: Litter Pool Ca Content Over Simulation Period

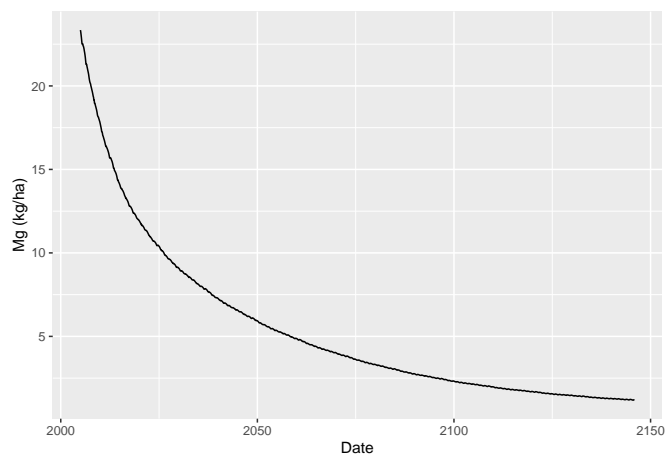


Figure 17: Figure 19: Litter Pool Mg Content Over Simulation Period

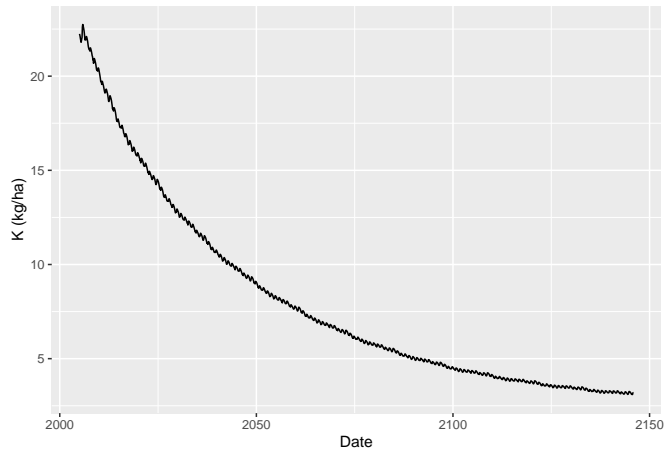


Figure 18: Figure 20: Litter Pool K Content Over Simulation Period

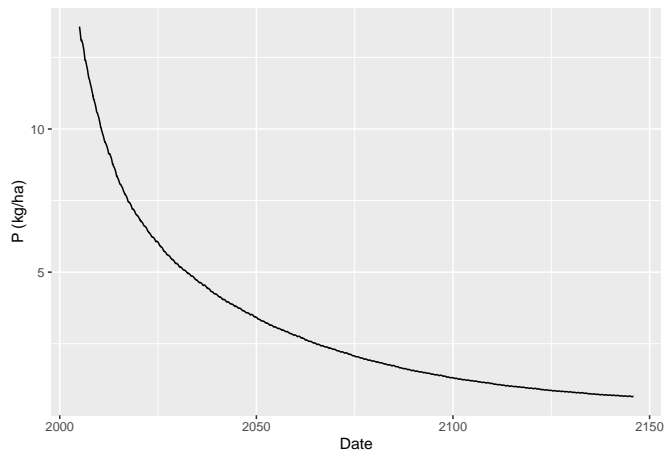


Figure 19: Figure 21: Litter Pool P Content Over Simulation Period

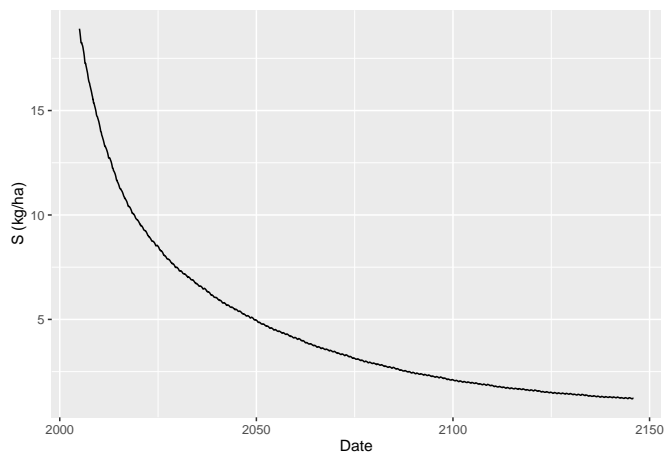


Figure 20: Figure 22: Litter Pool S Content Over Simulation Period



Tree Nutrient Content

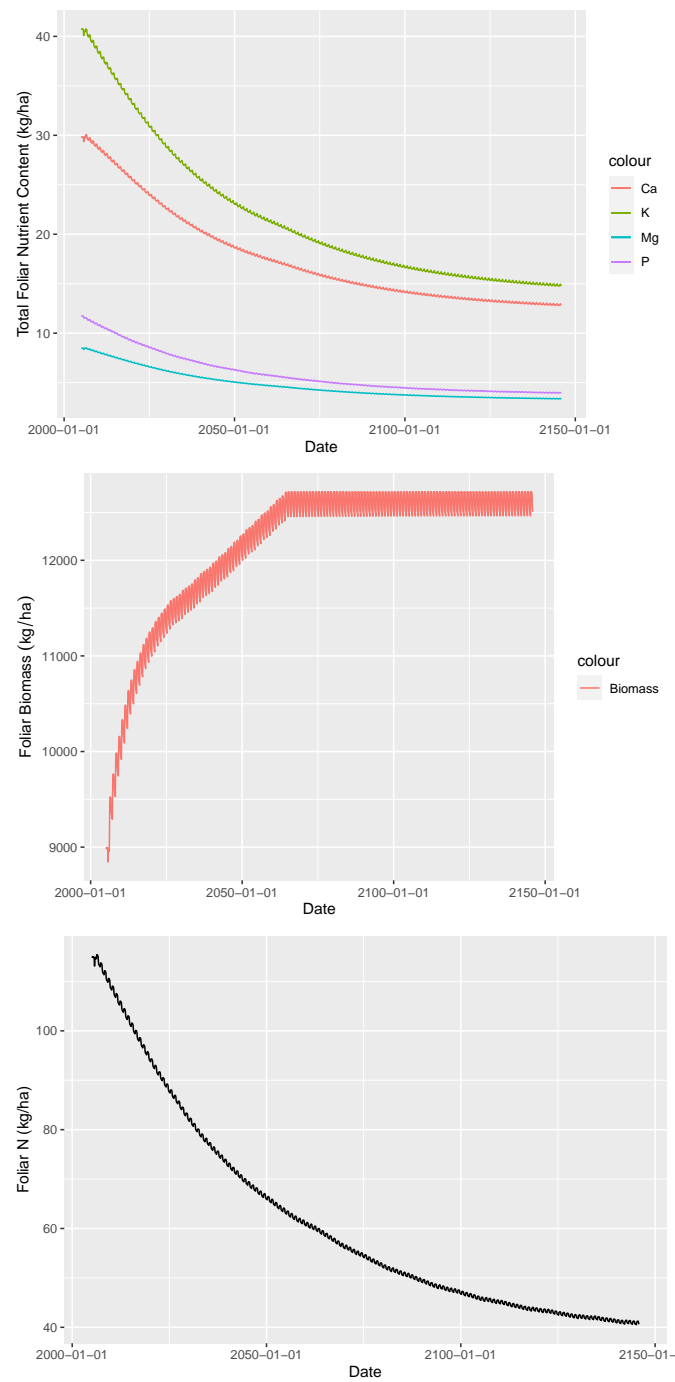


Figure 21: Figure 23: Tree Nutrient Content (kg/ha) in the Foliage

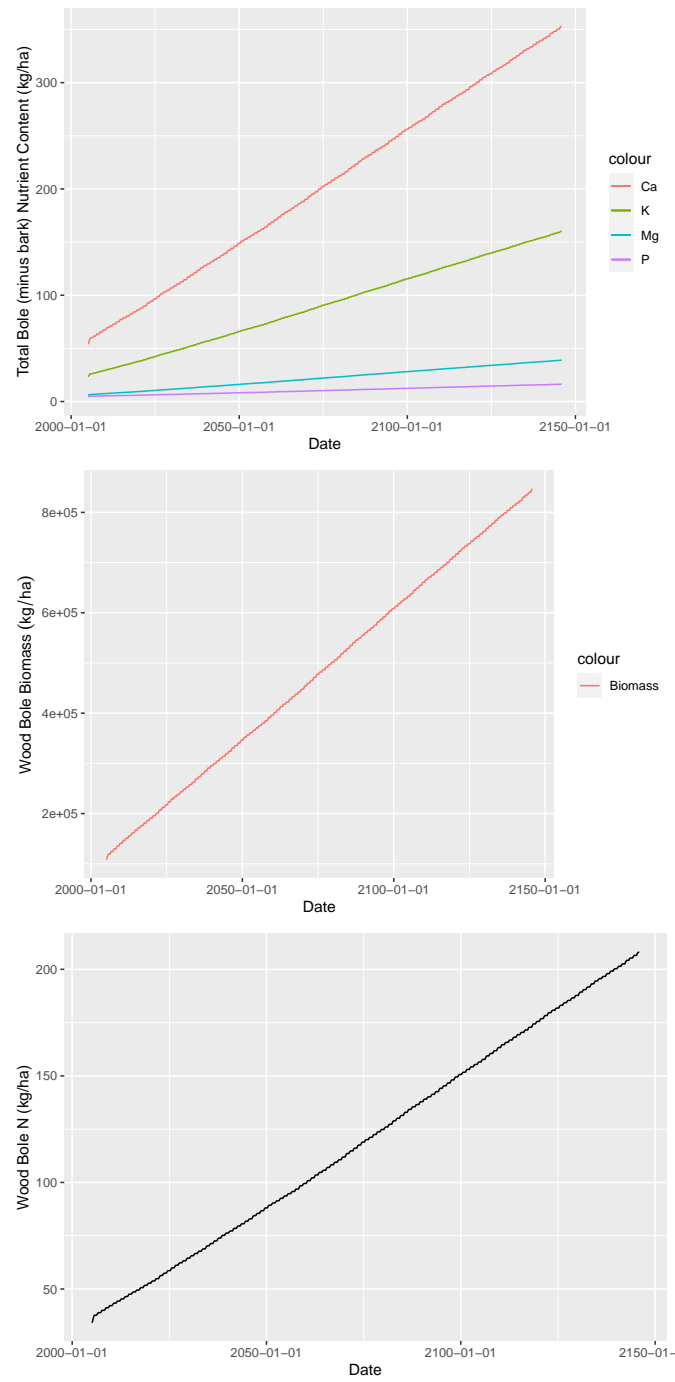


Figure 22: Figure 24: Tree Nutrient Content (kg/ha) in the Bole. Exlcudes Bark

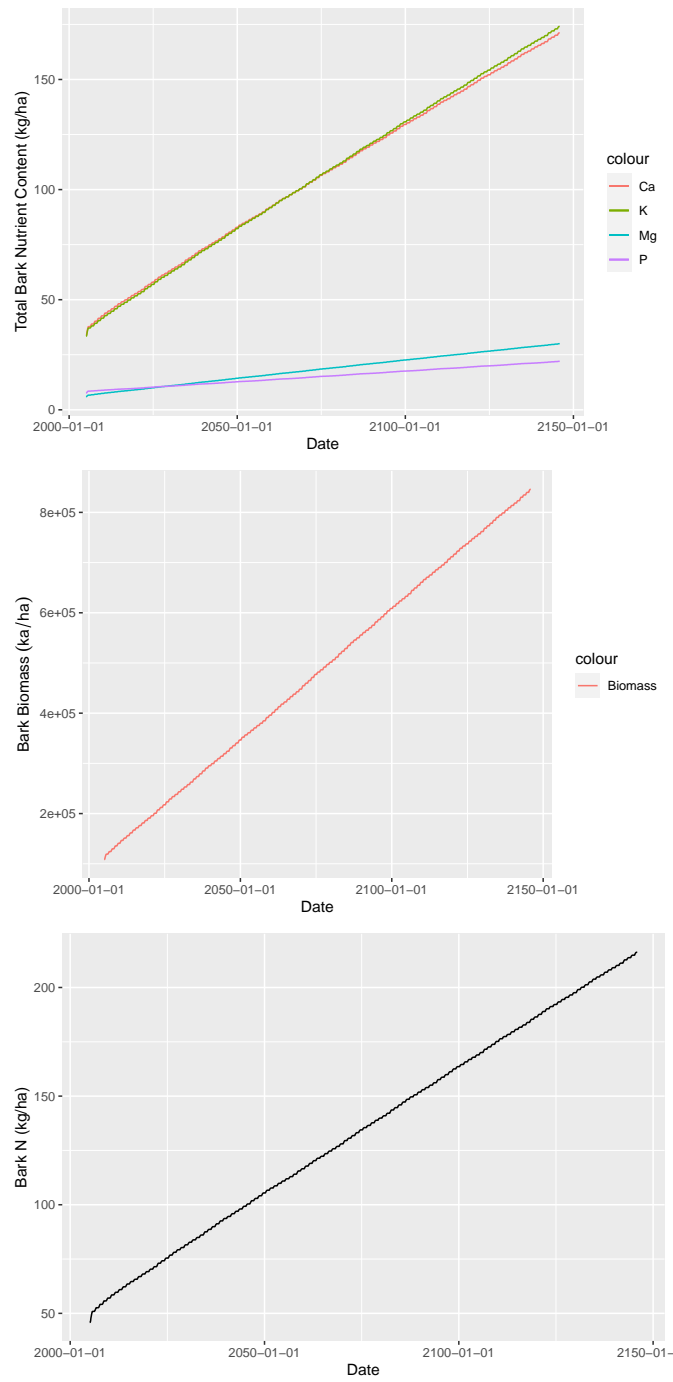


Figure 23: Figure 25: Tree Nutrient Content (kg/ha) in the Bark

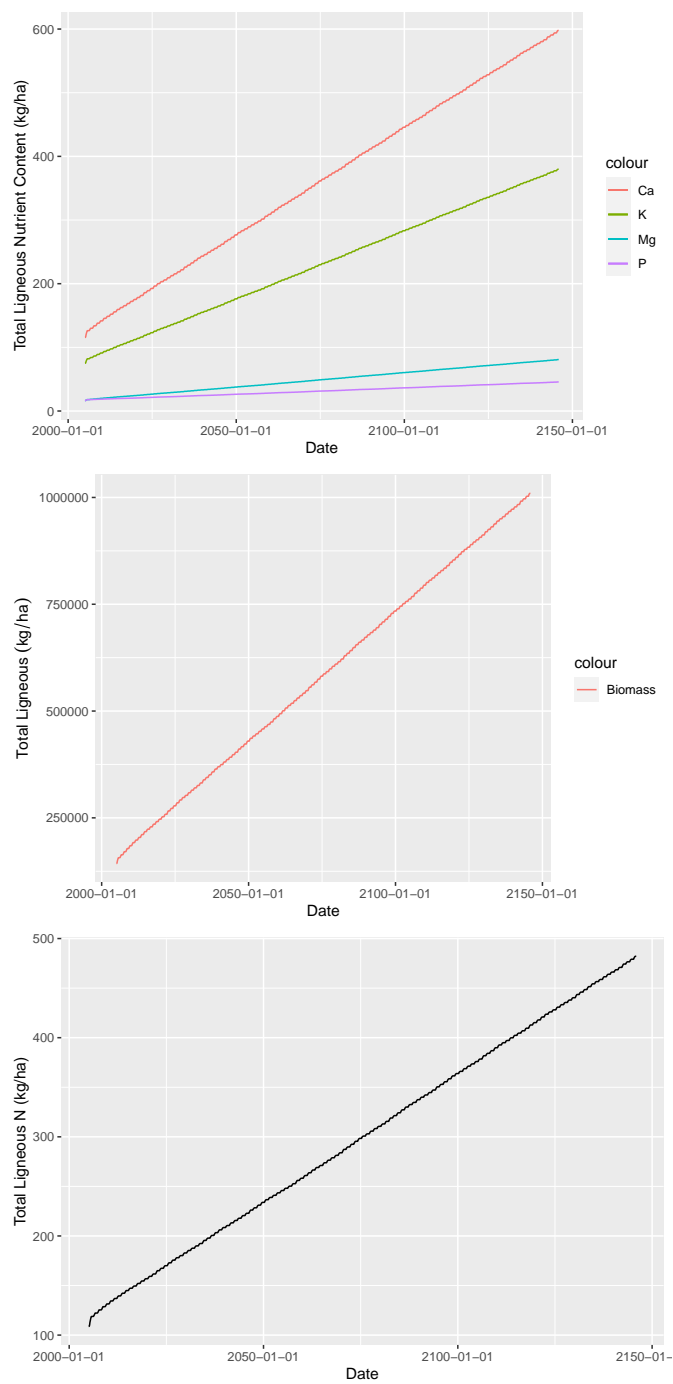


Figure 24: Figure 26: Tree Nutrient Content and Biomass (kg/ha) in all Ligneous Material

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

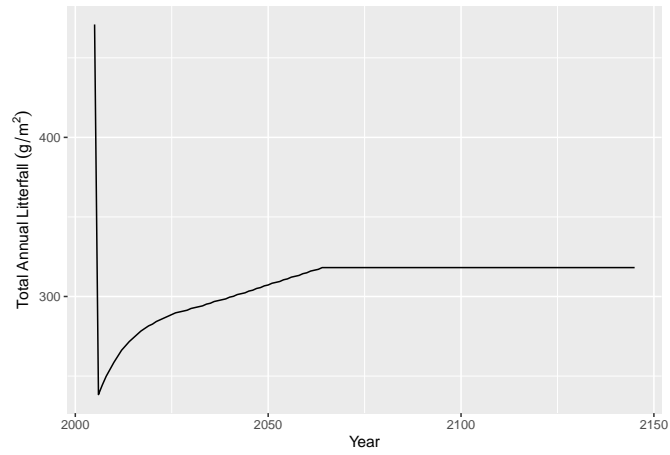


Figure 25: Litterfall quantity

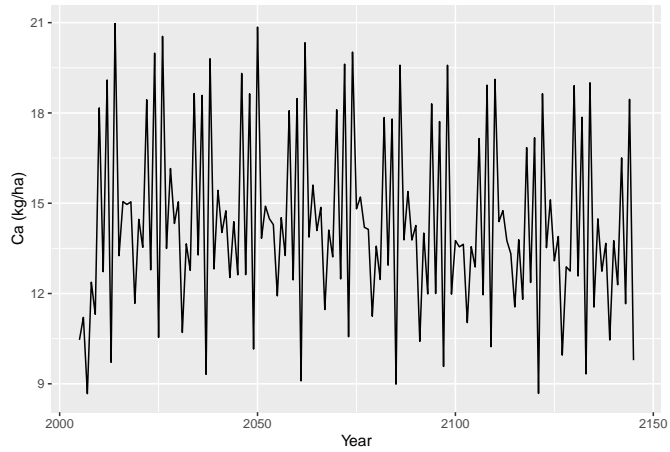
### Cation Exchange Capacity

Not yet complete

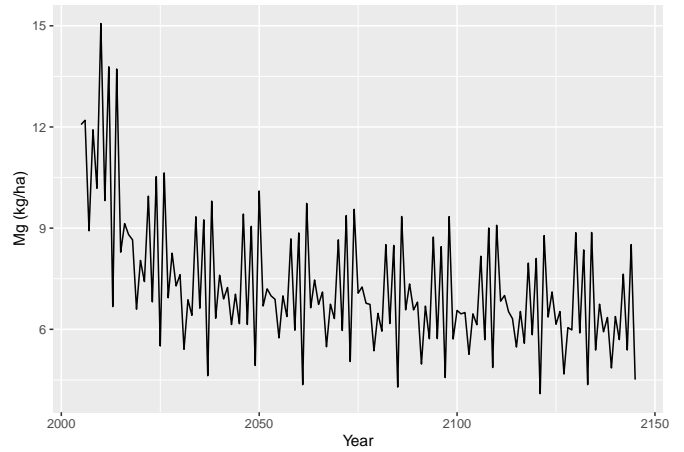
### Anion Exchange Capacity

Not yet complete

### Leaching Losses

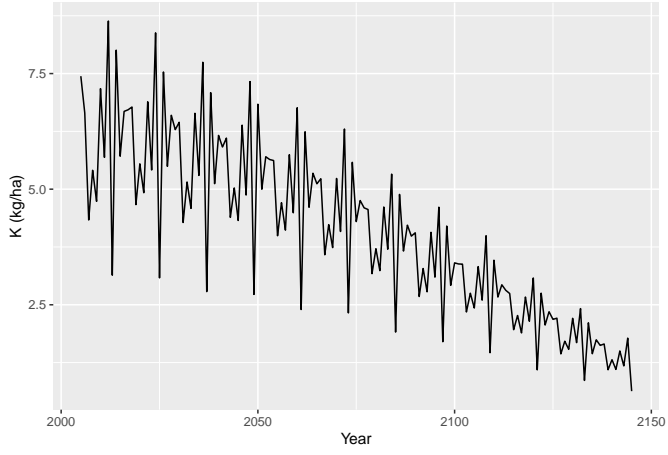


(a) Ca Leaching Losses

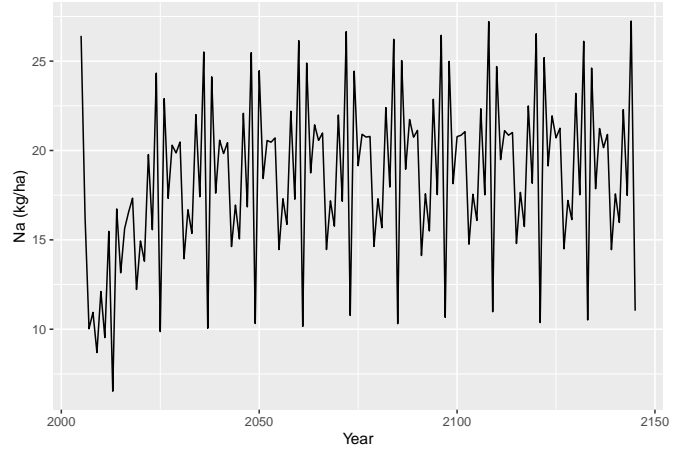


(b) Mg Leaching Losses

Figure 26: Annual Leaching Losses of Divalent Base Cations

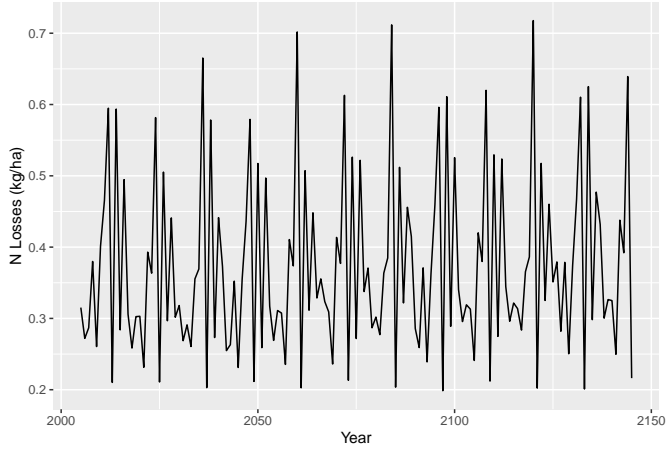


(a) K Leaching Losses

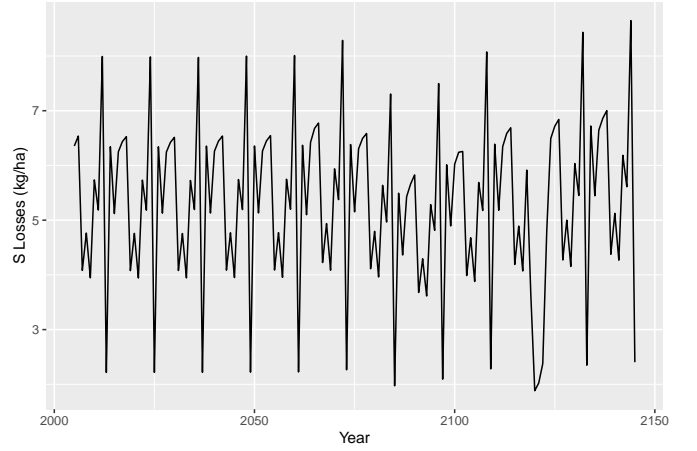


(b) Na Leaching Losses

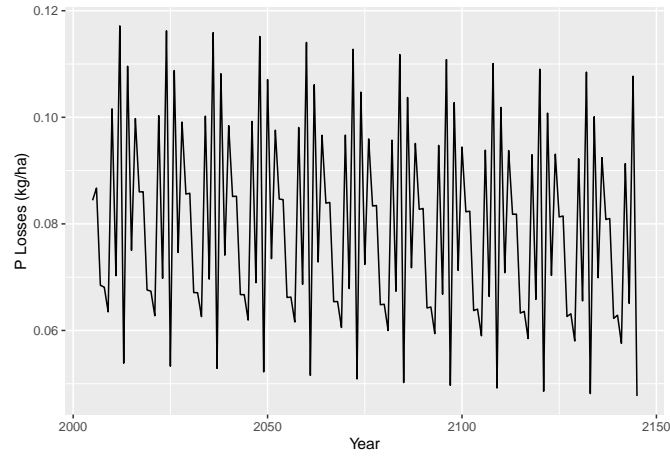
Figure 27: Annual Leaching Losses of Monovalent Base Cations



(a) N Leaching Losses



(b) S Leaching Losses



(c) P Leaching Losses

Figure 28: Annual Leaching Losses of N, P, and S

Not yet complete

## Analysis 1

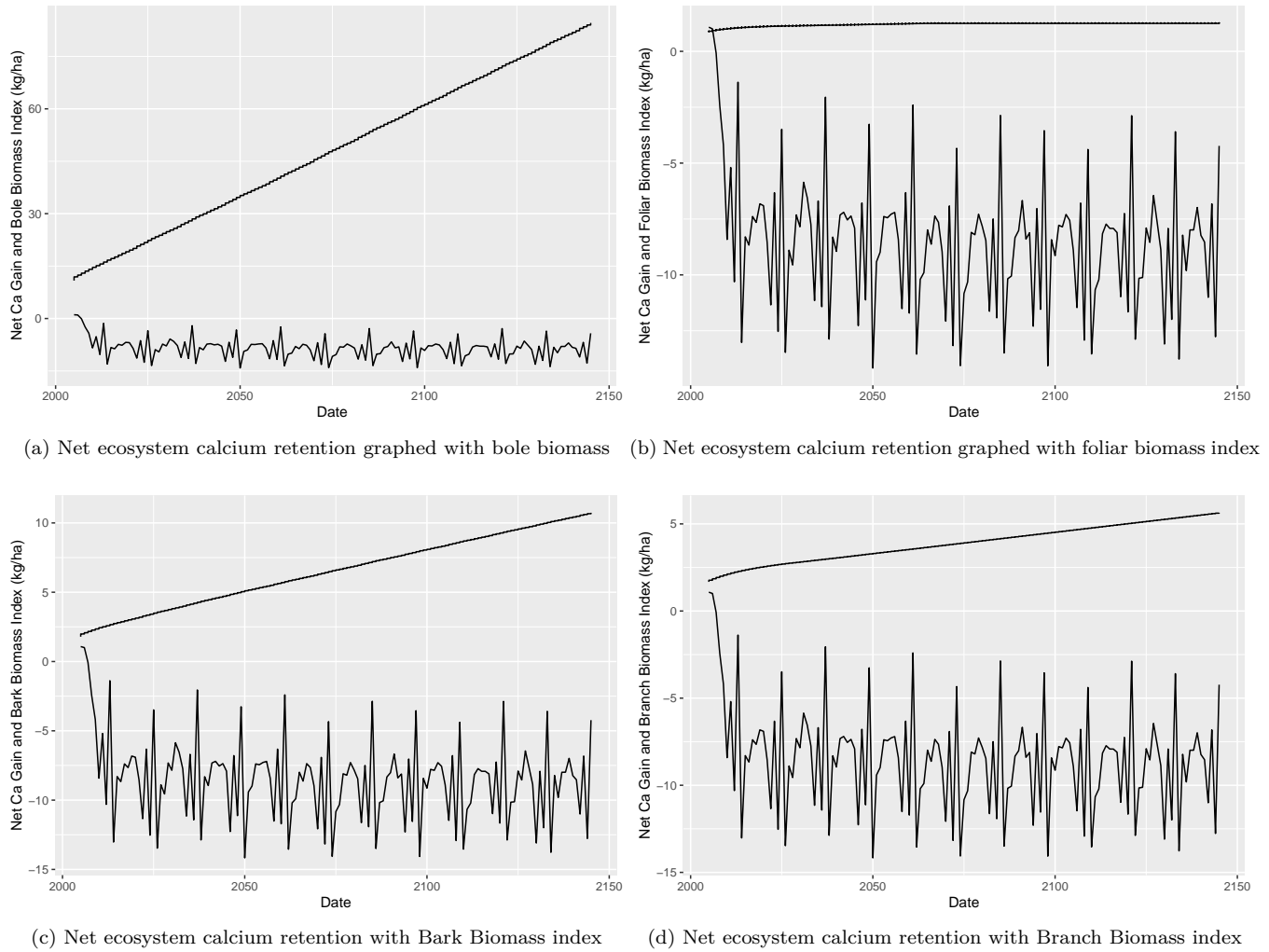


Figure 29: Fuck all!

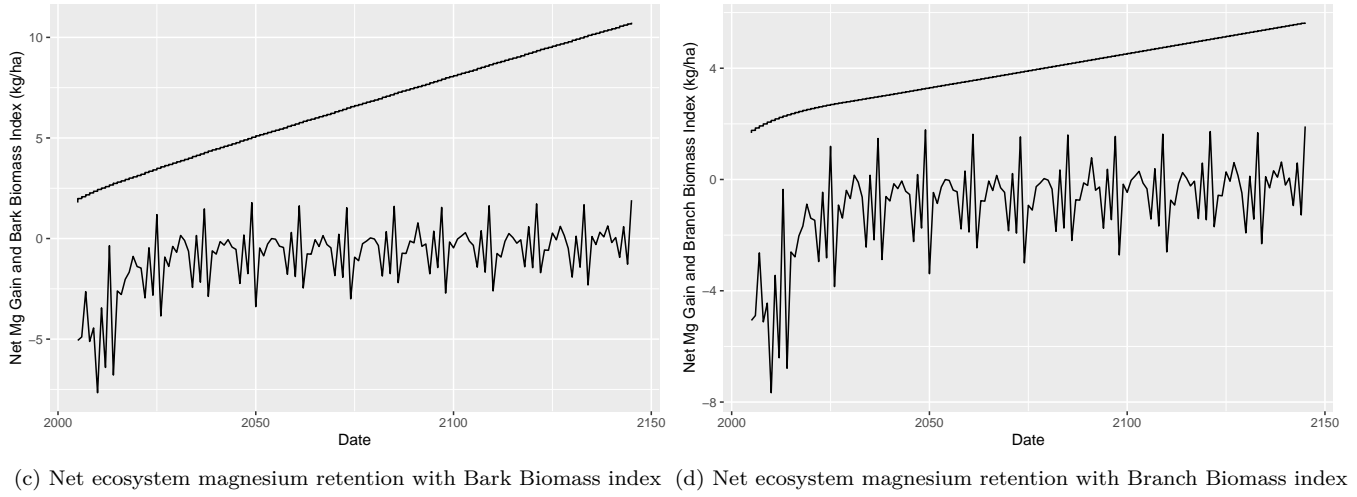
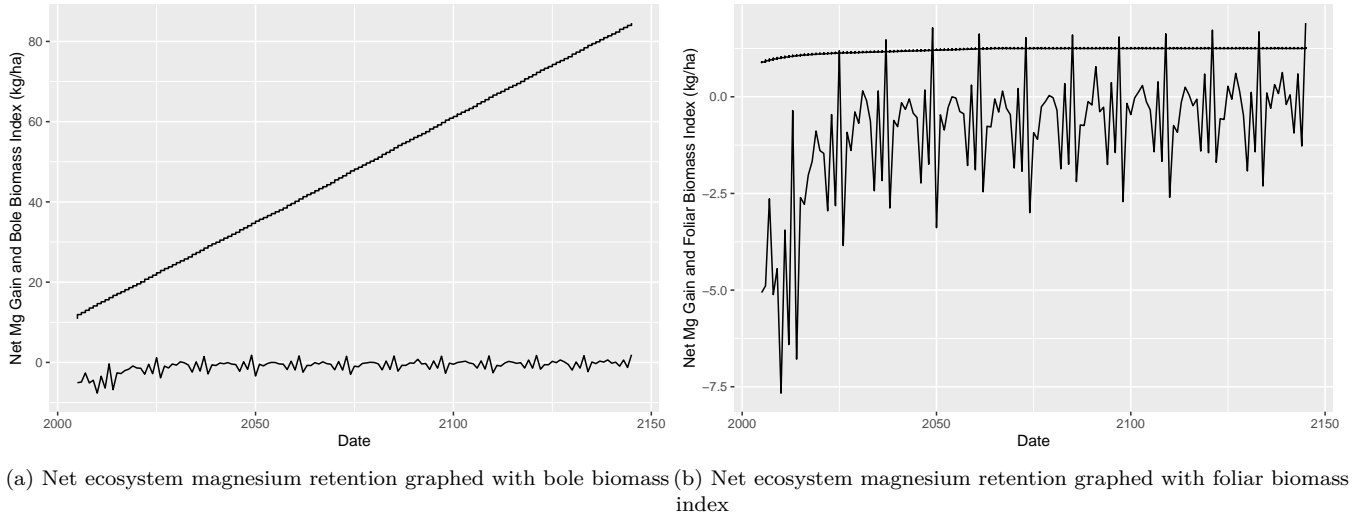


Figure 30: Net ecosystem Magnesium retention plotted against biomass indeces (kg/ha biomass/10,000)



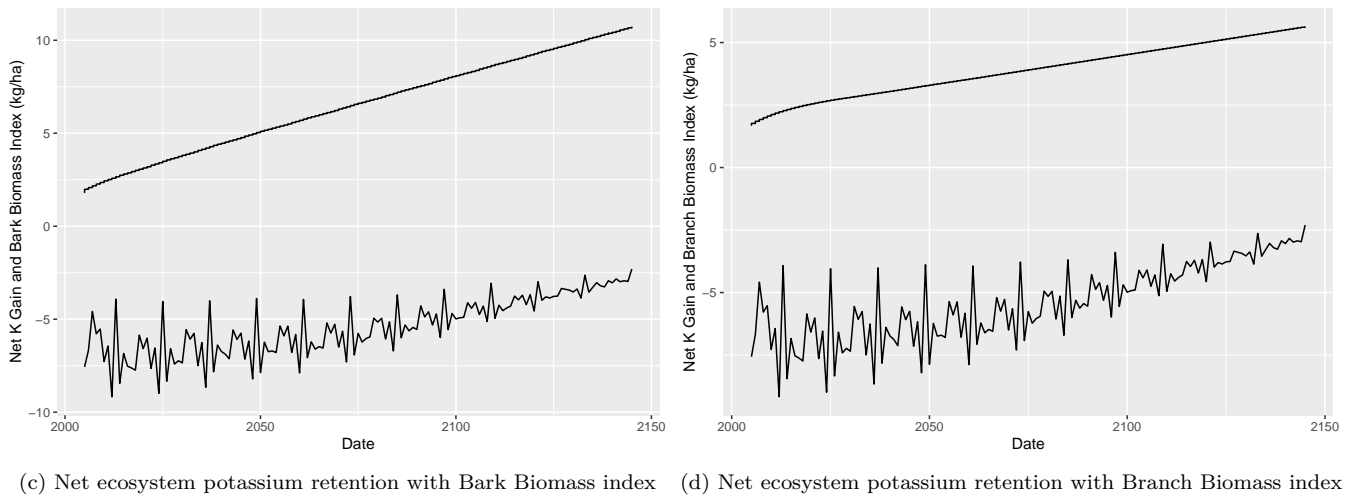
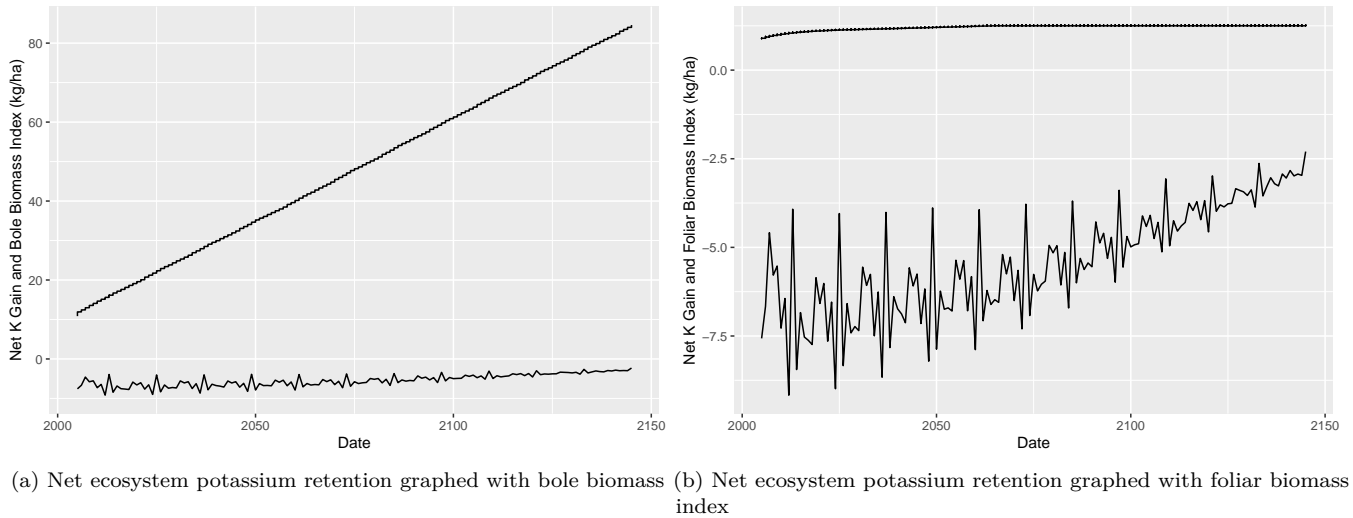


Figure 31: Net ecosystem potassium retention plotted against biomass indeces (kg/ha biomass/10,000)

Nutrient depletion as a condition is being analyzed using the following metric:

$(\text{Uptake Rate} + (\text{neg SOM Mineralization}) + \text{Leaching Loss Rate} + \text{Net Uptake}) = \text{Ecosystem Output Rate}$

$\text{Atmospheric Deposition Rate} + \text{Mineral Weathering Rate} + \text{Foliar Leaching (K only)} = \text{Input Rate}$

Graph rate of

$\text{Input-Output} = \text{Net nutrient gain Rate (- is loss, + is gain) vs. Biomass Acquisition of each compartment}$

## Analysis 2

Percent biomass reduction from 1st harvest  $(\text{Biomass at Current Harvest} / \text{Biomass achieved 1st harvest}) * 100 = \% \text{ Reduction/month}$

## Analysis 3

Nutrient buildup in layers over time (Ca should buildup in top layers)

## Analysis 4

Fraction of whole ecosystem nutrients lost with harvest

$$\frac{(\text{Frac Stand Harvest} * (\text{Fract. Bole} + \text{Fract. Branch} + \text{Frac. Foliar} + \text{Frac. Bark}))}{(\text{Soil CEC} + \text{Litter} + \text{SOM pool} + \text{Mineral Pool?} + \text{Tree})}$$