

Calibration Report: Low N Sedimentary 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	14.13	18.7	17.5	46.0	2.750	2.634	24.4	55.8	1.139	397	0.14172	12.0	16.74	4.78	41.4	15.3
Layer 2	16.72	22.9	19.3	54.9	1.780	1.376	25.4	64.2	1.038	634	0.27814	27.3	24.12	4.62	62.8	27.7
Layer 3	23.31	27.5	22.5	49.8	1.349	0.999	25.4	71.1	0.946	694	0.18260	39.6	19.07	4.72	71.0	28.2
Layer 4	9.71	16.8	15.0	48.6	0.896	1.162	13.5	71.2	0.506	423	0.02871	48.6	22.89	4.64	41.7	18.7
Layer 5	13.38	22.1	15.3	51.6	0.835	2.301	12.8	76.1	0.283	422	0.00618	50.5	9.11	5.04	46.7	13.7
Layer 6	12.48	19.9	17.3	54.1	0.828	2.696	12.8	81.7	0.347	385	0.00784	54.0	10.87	4.96	41.9	13.1
Layer 7	15.81	21.6	16.2	60.8	0.827	3.575	12.8	88.0	0.348	428	0.00475	58.3	7.39	5.13	48.4	12.8
Layer 8	15.56	20.0	18.5	68.3	0.828	4.110	12.8	92.6	0.286	425	0.00368	60.5	6.00	5.22	49.1	11.7

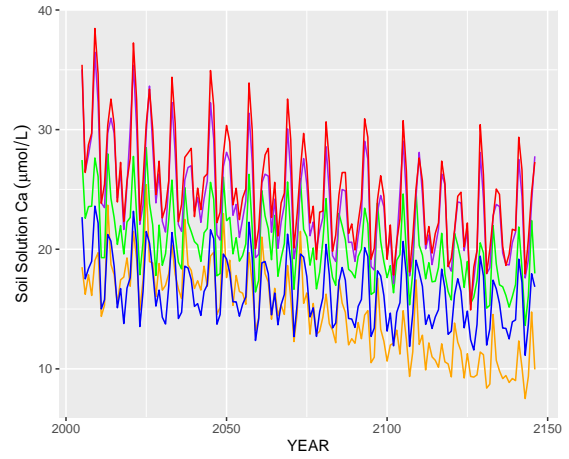
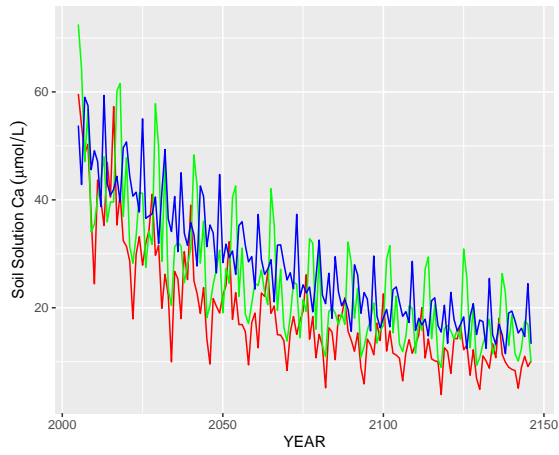


Figure 1: Figure 1: Monthly Calcium Concentrations by Soil Layer

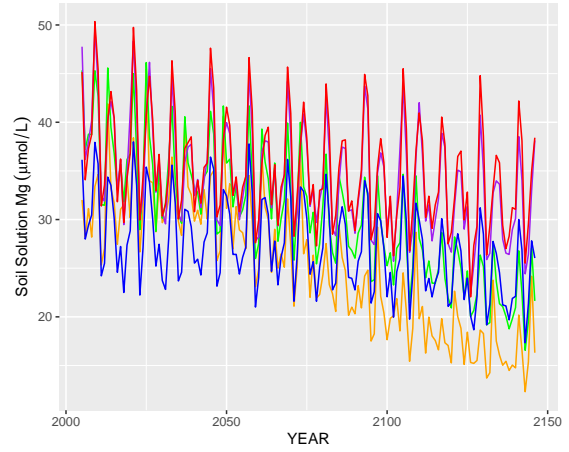
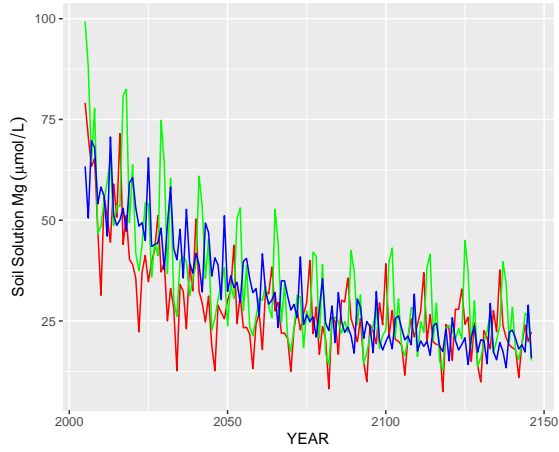


Figure 2: Figure 2: Monthly Magnesium Concentrations by Soil Layer

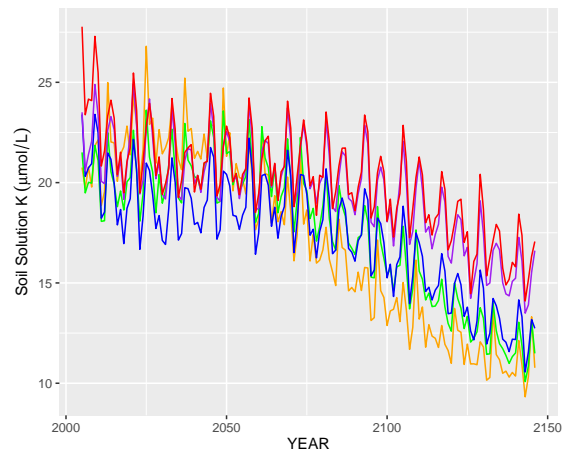
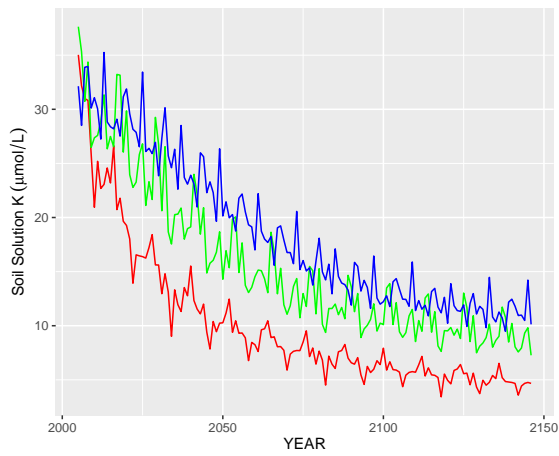


Figure 3: Figure 3: Monthly Potassium Concentrations by Soil Layer

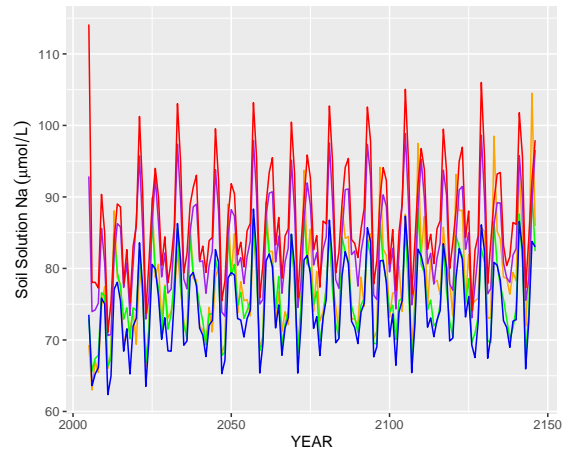
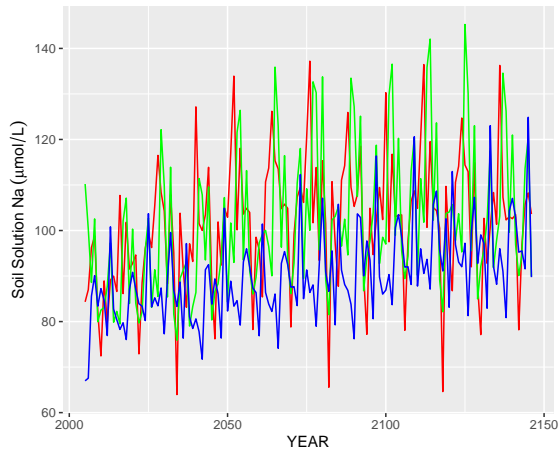


Figure 4: Figure 4: Monthly Sodium Concentrations by Soil Layer

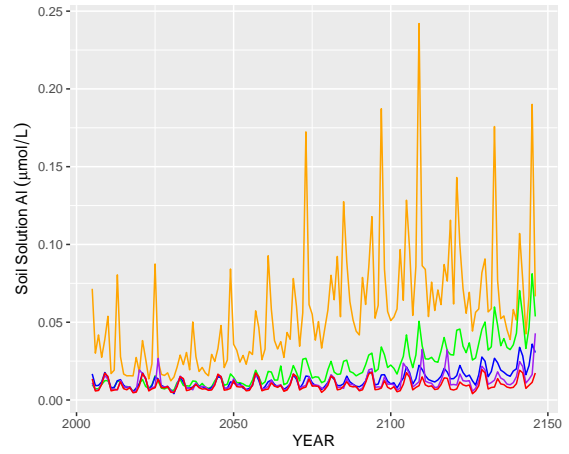
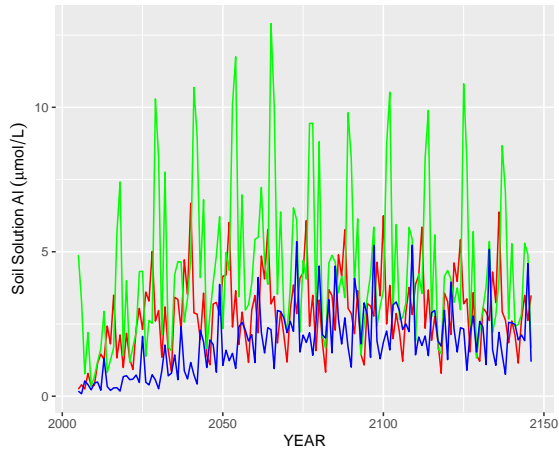


Figure 5: Figure 5: Monthly Aluminum Concentrations by Soil Layer

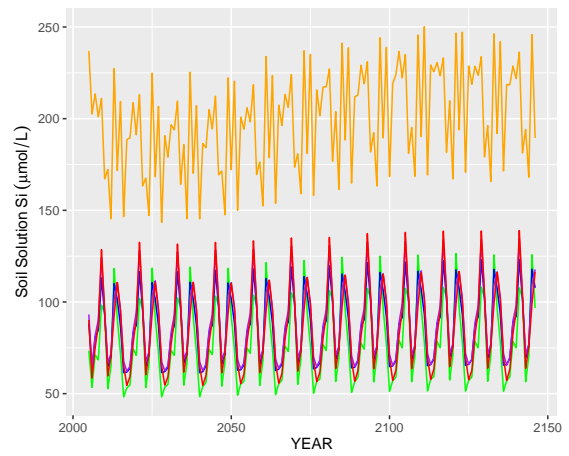
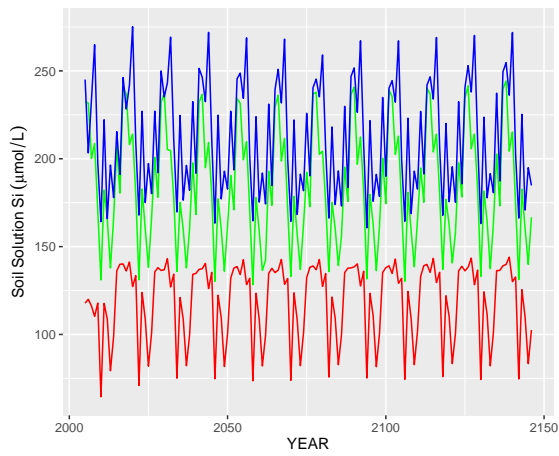


Figure 6: Figure 6: Monthly SiO₂ Concentrations by Soil Layer

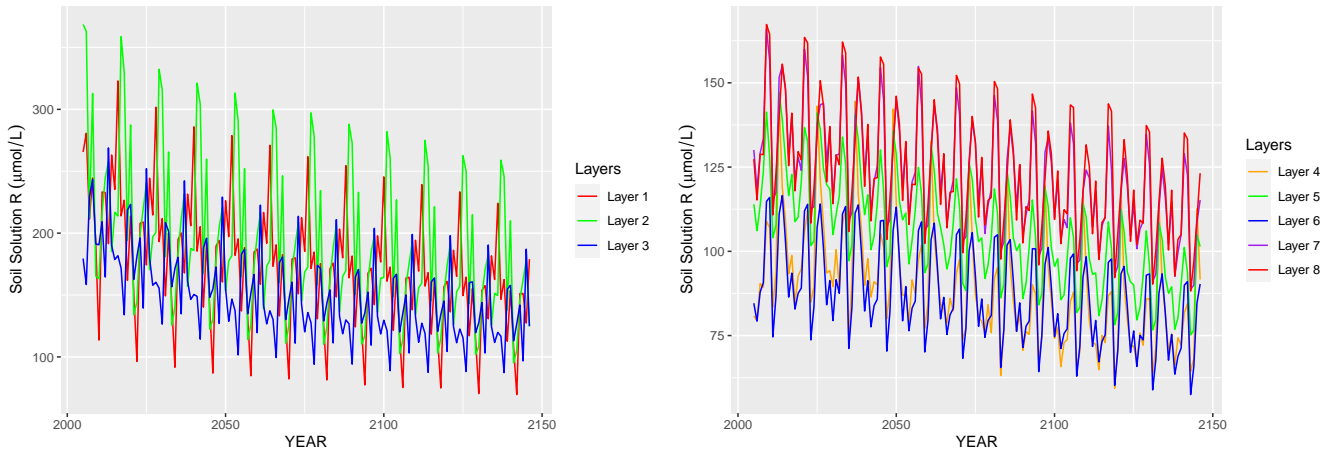


Figure 7: Figure 7: Monthly Organic Acid Base (R-) Concentrations by Soil Layer

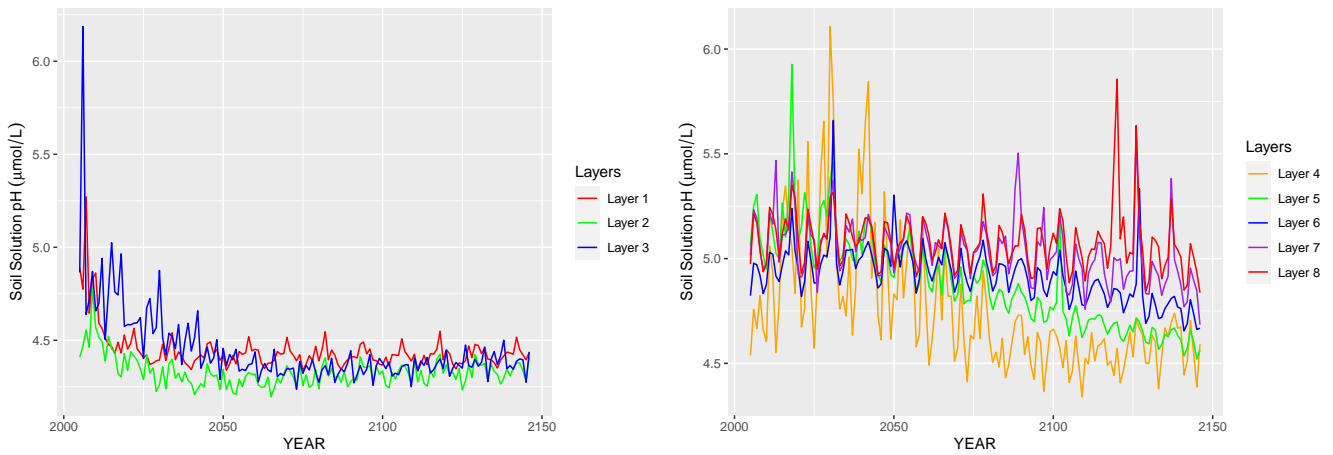


Figure 8: Figure 8: Monthly pH by Soil Layer

Weathering Results

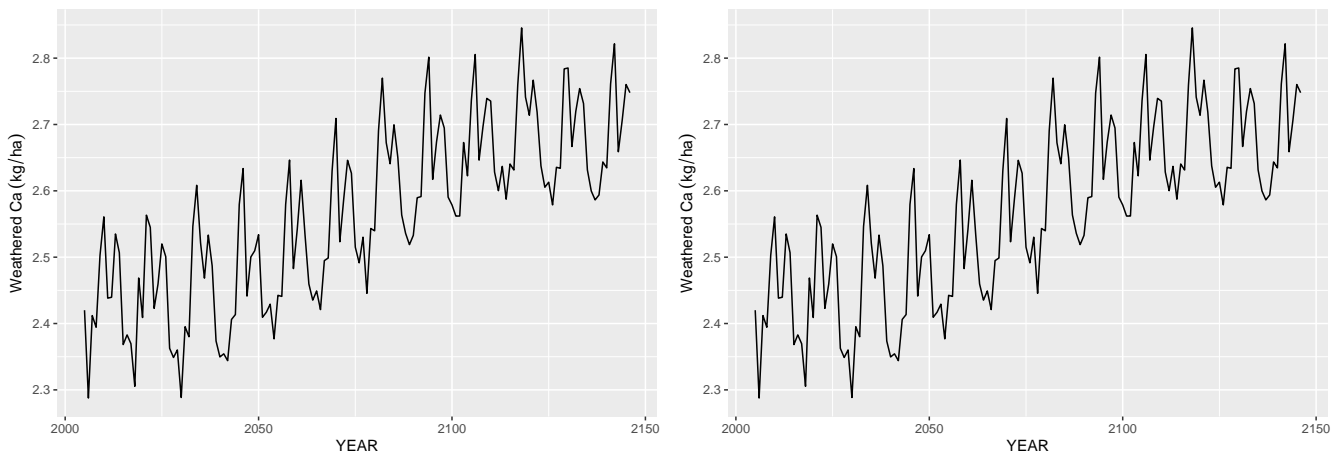


Figure 9: Figure 9: Calcium Weathering by Layer

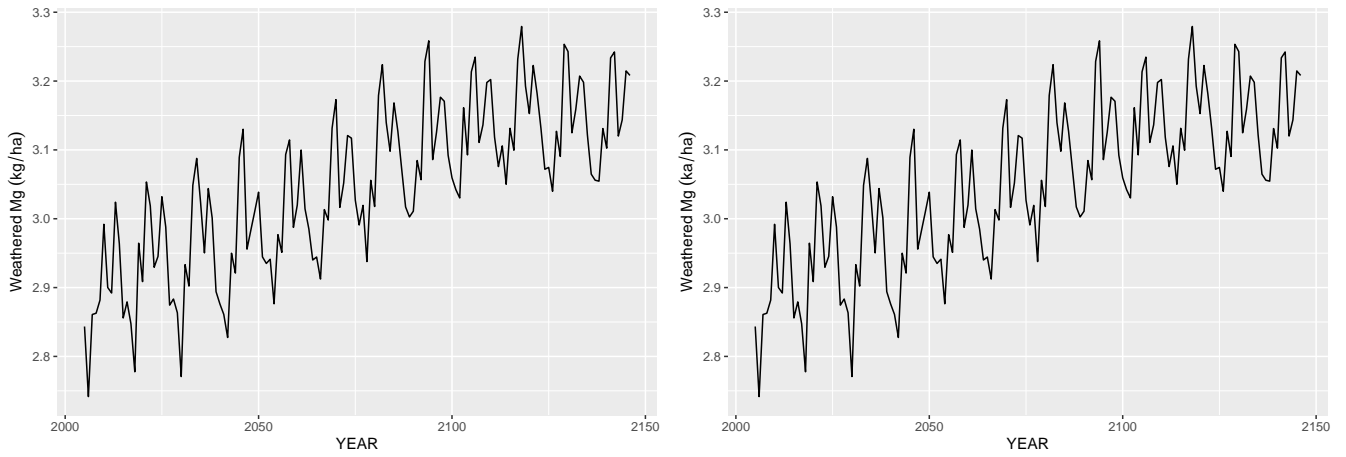


Figure 10: Figure 10: Magnesium Weathering by Layer

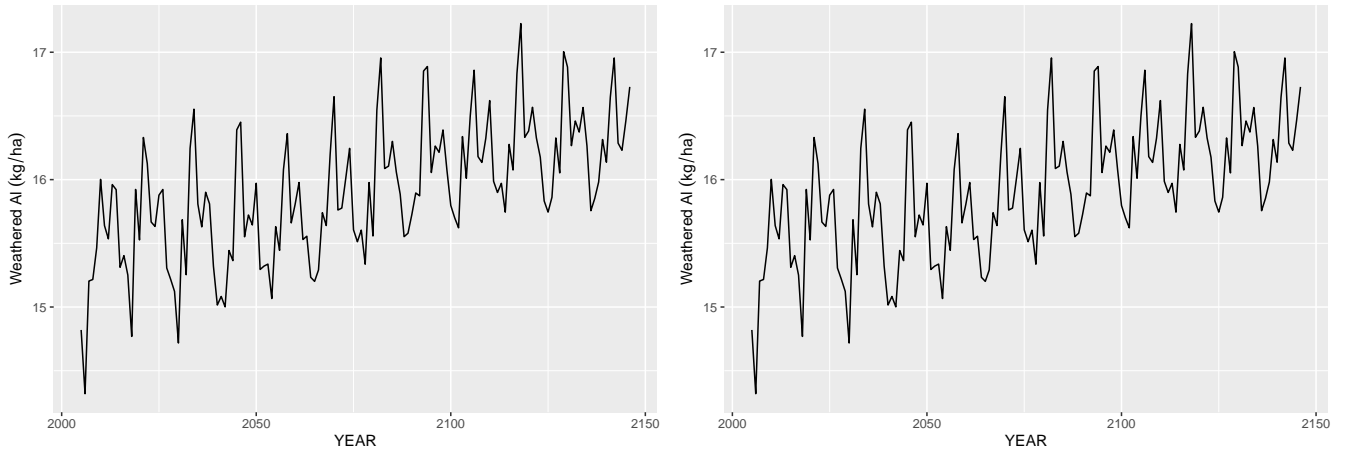


Figure 11: Figure 12: Aluminum Weathering by Layer

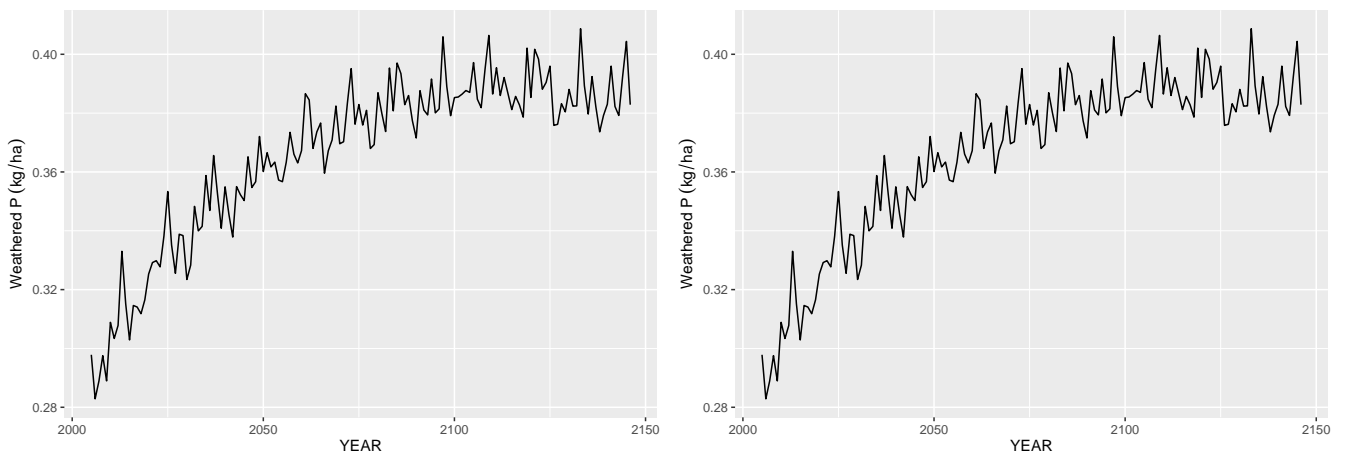


Figure 12: Figure 13: Phosphate Weathering by Layer

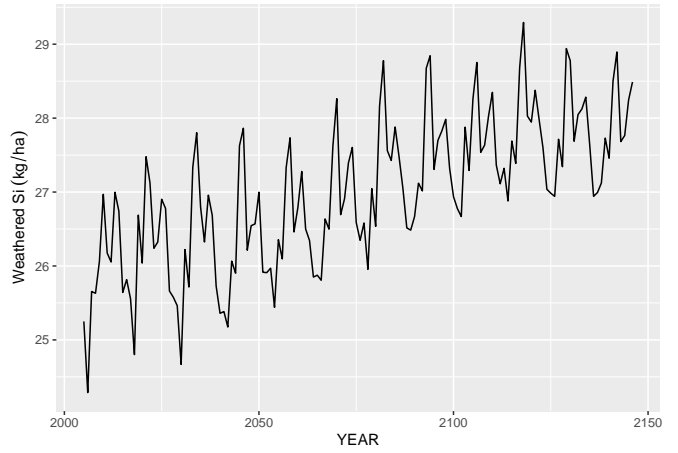
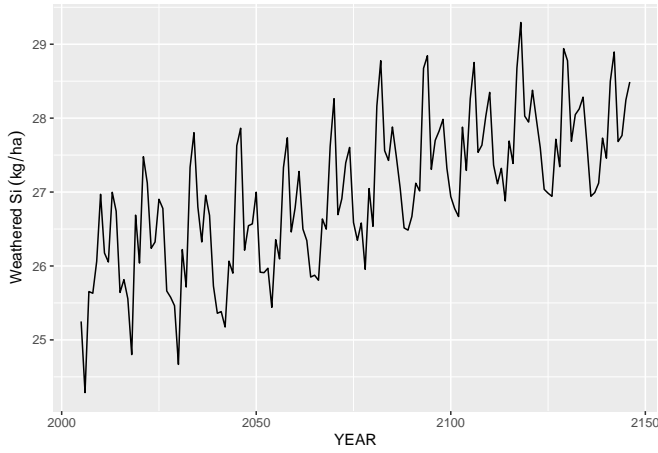


Figure 13: Figure 14: Silica Weathering by Layer

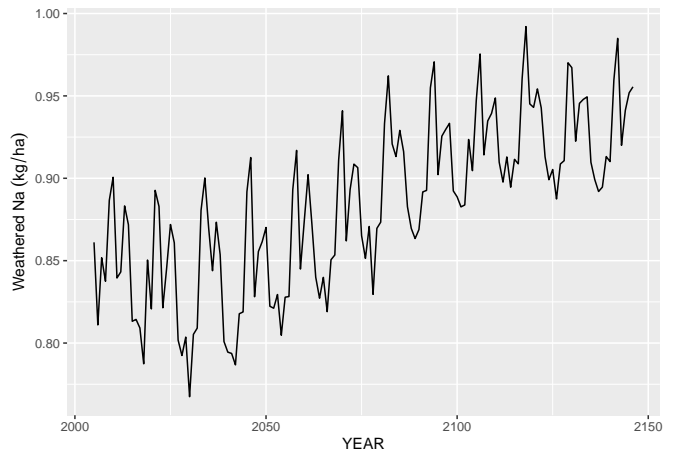
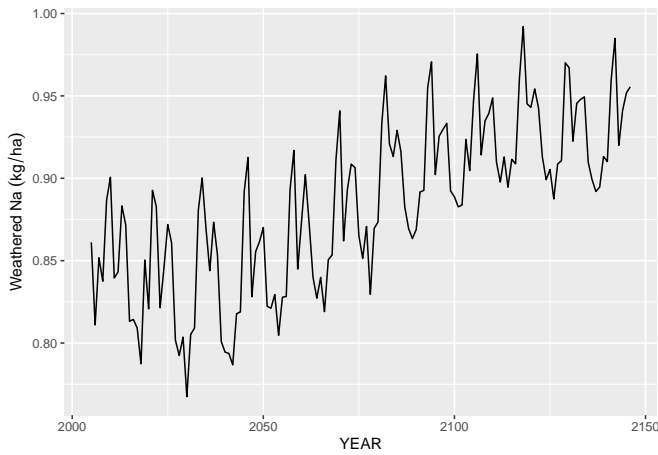


Figure 14: Figure 15: Sodium Weathering by Layer

Figures

Soil Organic Matter (SOM) Results

Litter Pool Results

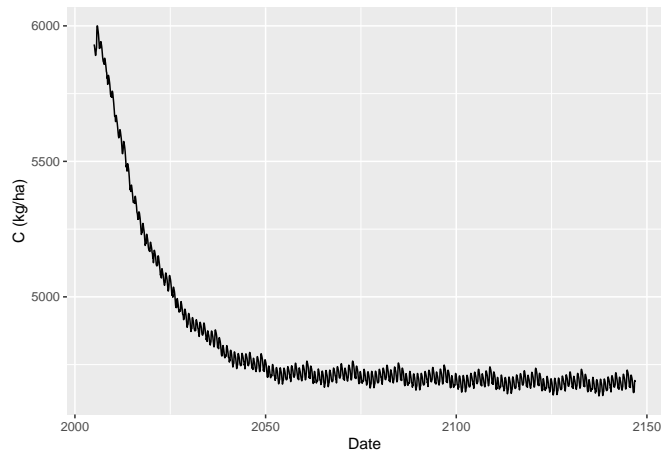


Figure 15: Figure 17: Litter Pool Carbon Content Over Simulation Period

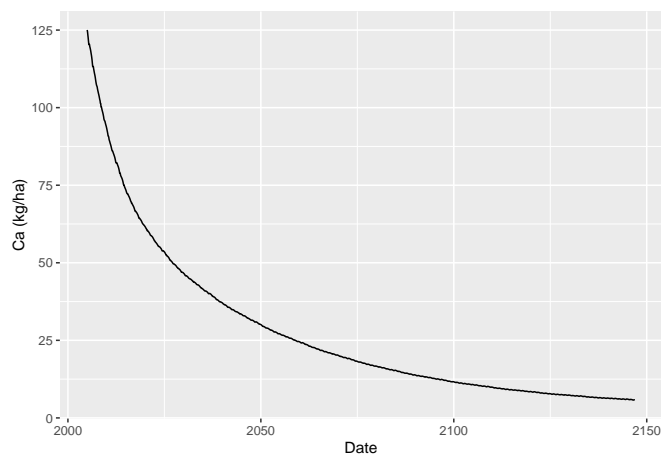


Figure 16: Figure 18: Litter Pool Ca Content Over Simulation Period

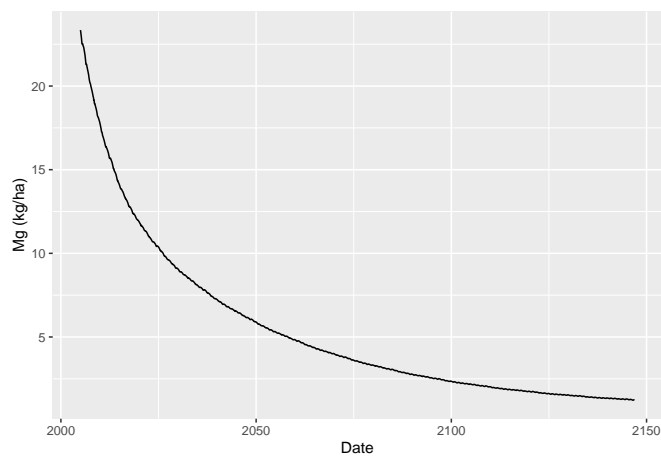


Figure 17: Figure 19: Litter Pool Mg Content Over Simulation Period

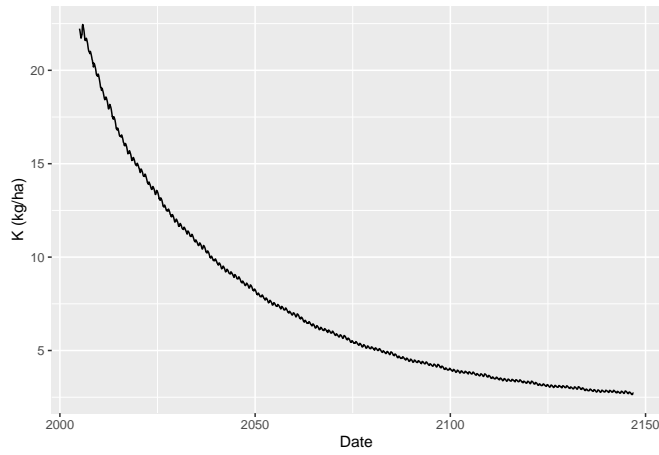


Figure 18: Figure 20: Litter Pool K Content Over Simulation Period

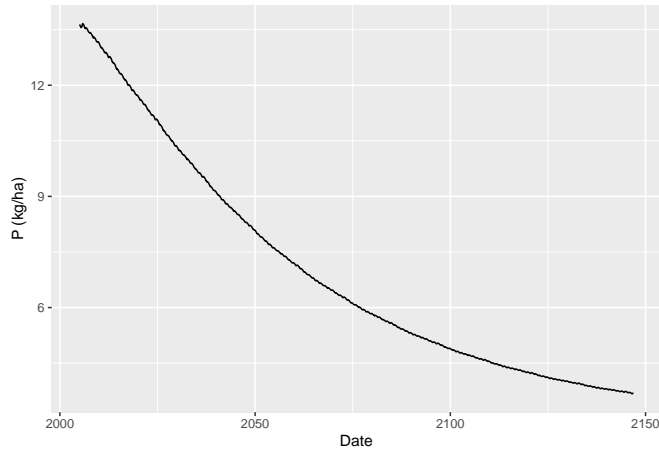


Figure 19: Figure 21: Litter Pool P Content Over Simulation Period

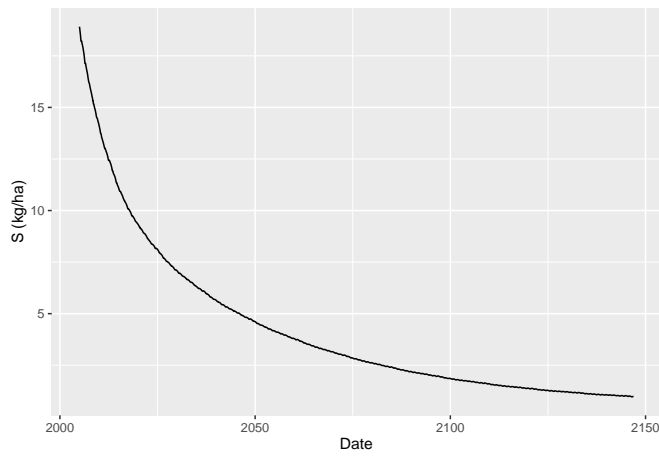


Figure 20: Figure 22: Litter Pool S Content Over Simulation Period

Tree Nutrient Content

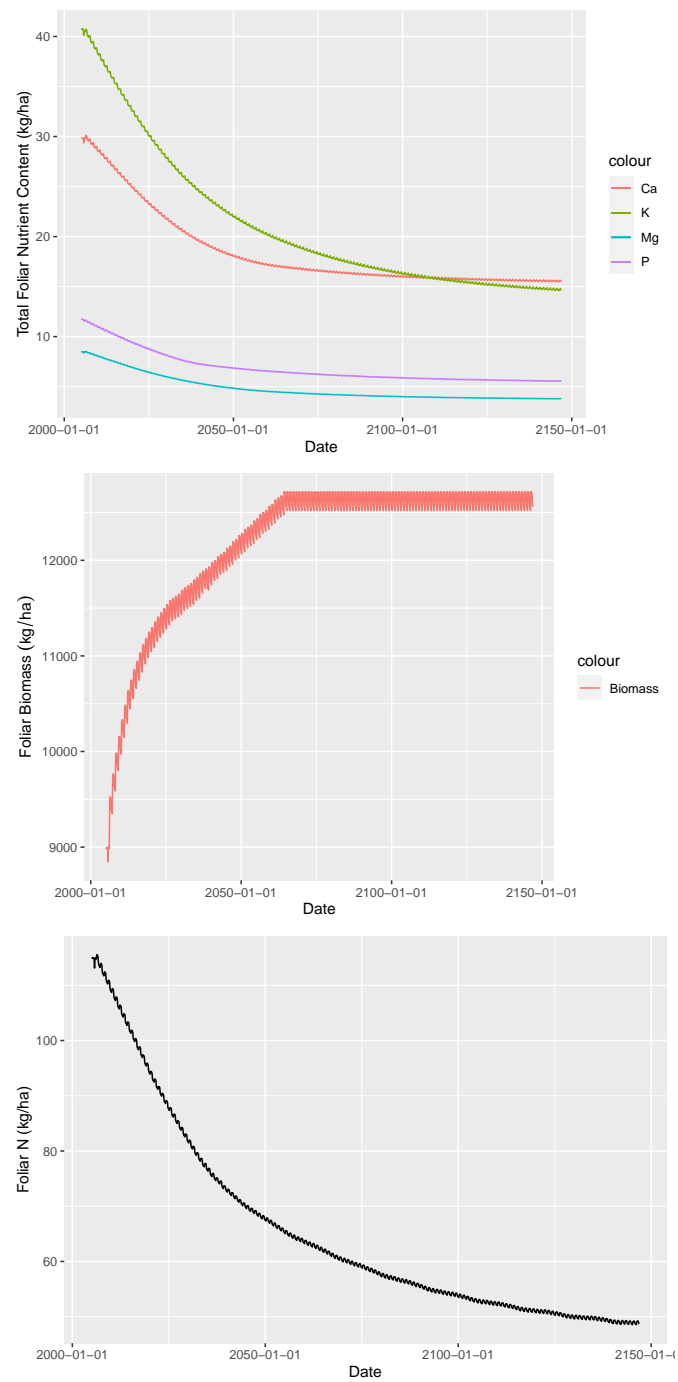


Figure 21: Figure 23: Tree Nutrient Content (kg/ha) in the Foliage

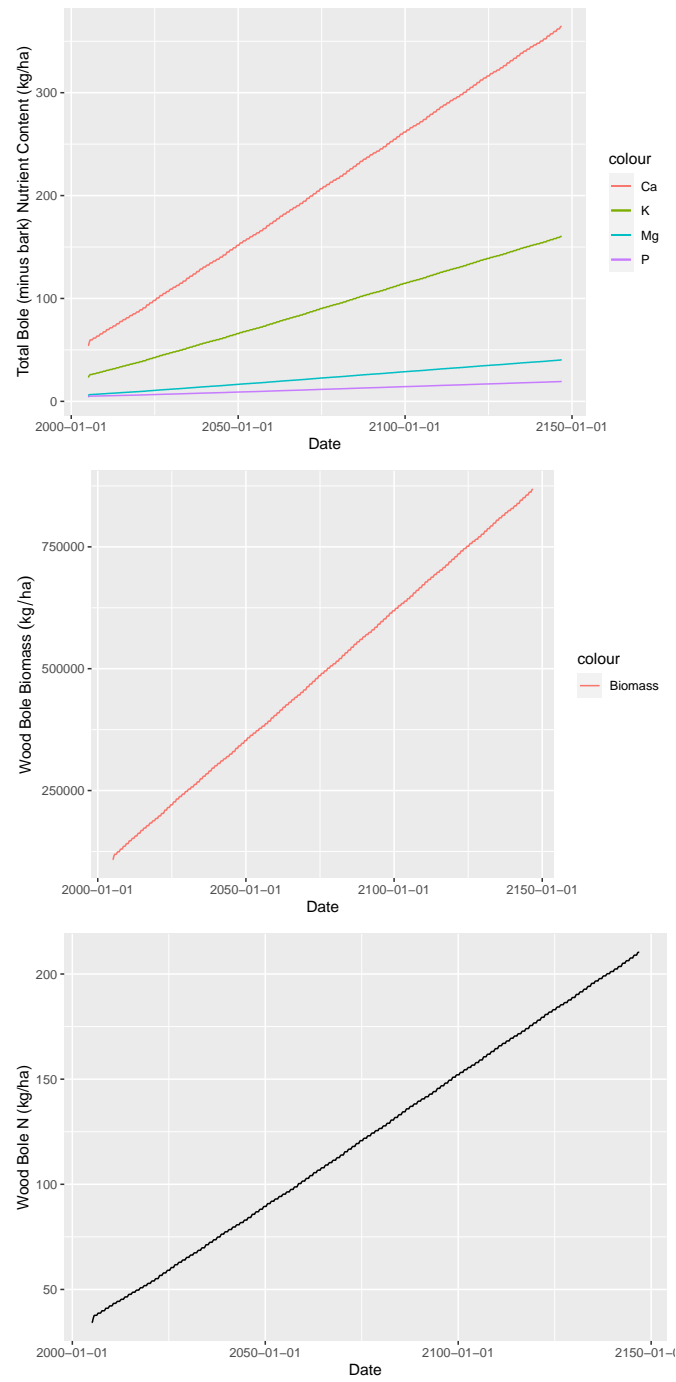


Figure 22: Figure 24: Tree Nutrient Content (kg/ha) in the Bole. Excludes Bark

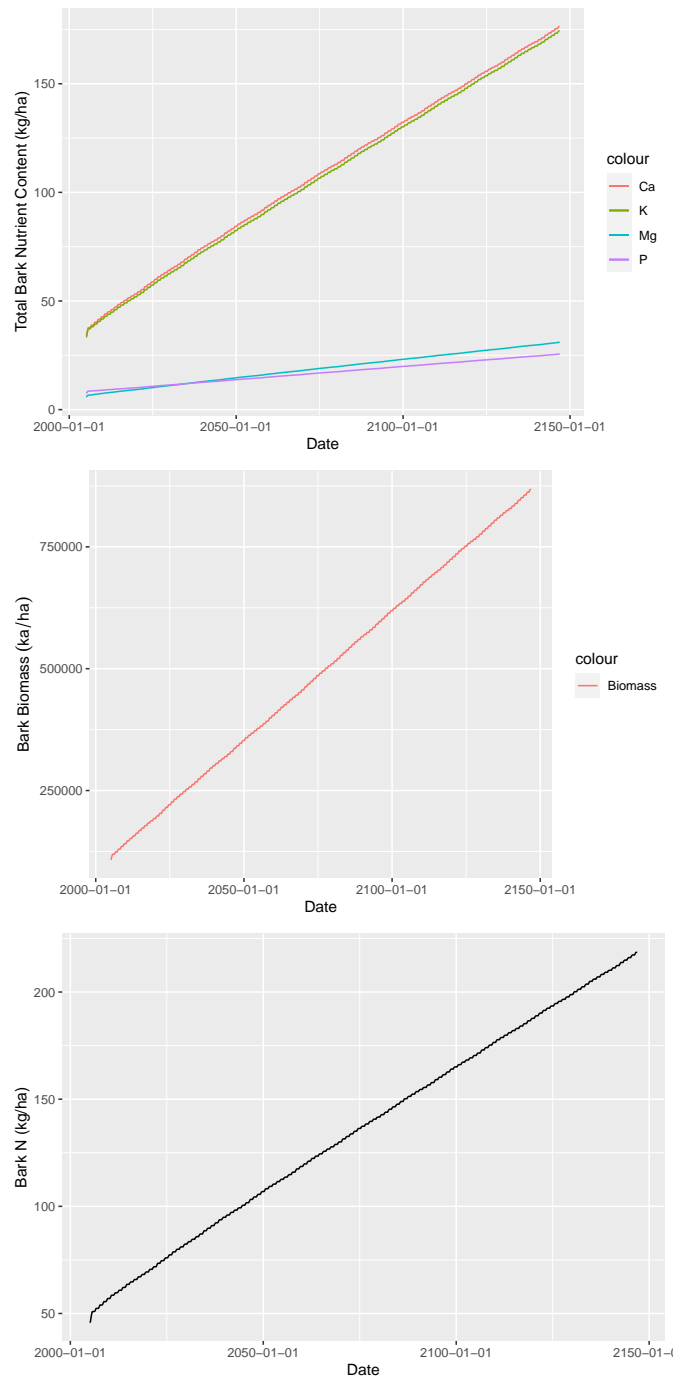


Figure 23: Figure 25: Tree Nutrient Content (kg/ha) in the Bark

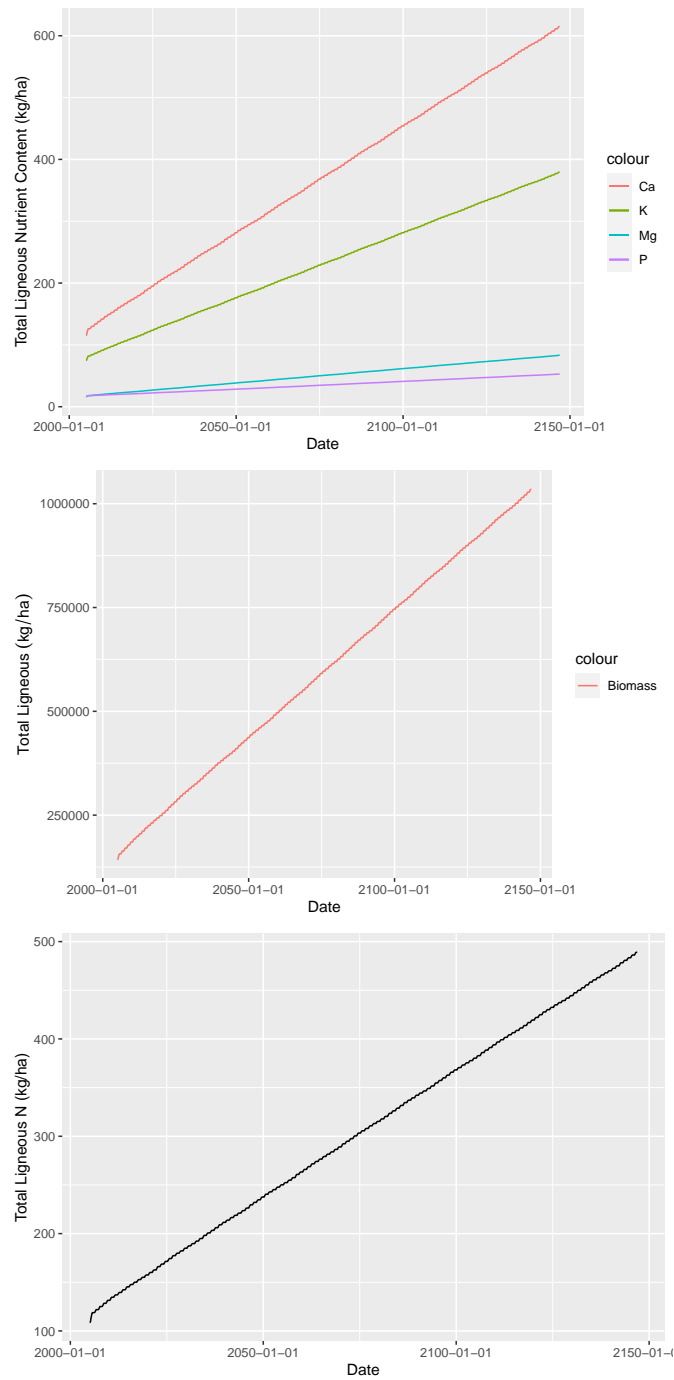


Figure 24: Figure 26: Tree Nutrient Content and Biomass (kg/ha) in all Ligneous Material

```
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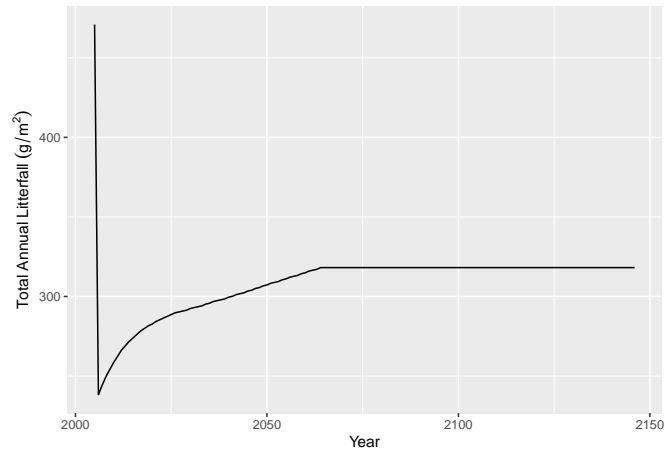


Figure 25: Litterfall quantity

Cation Exchange Capacity

Not yet complete

Anion Exchange Capacity

Not yet complete

Leaching Losses

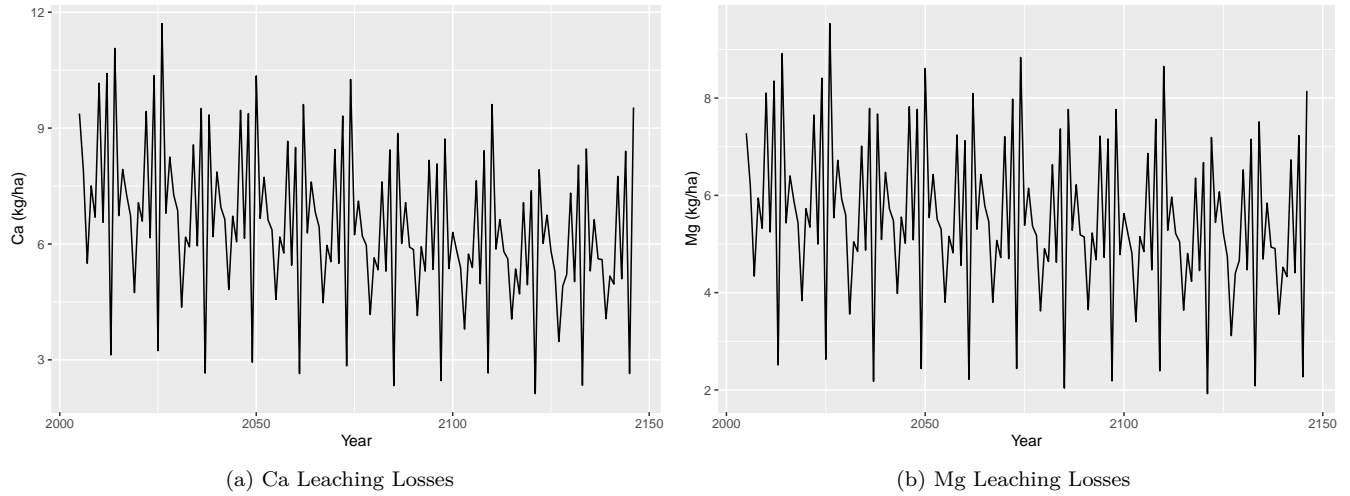
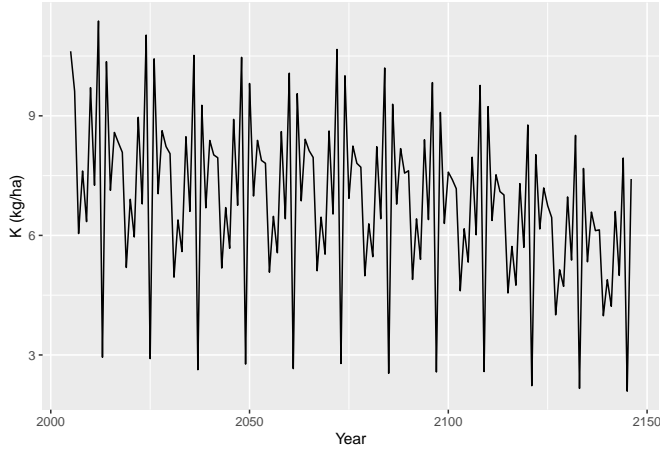
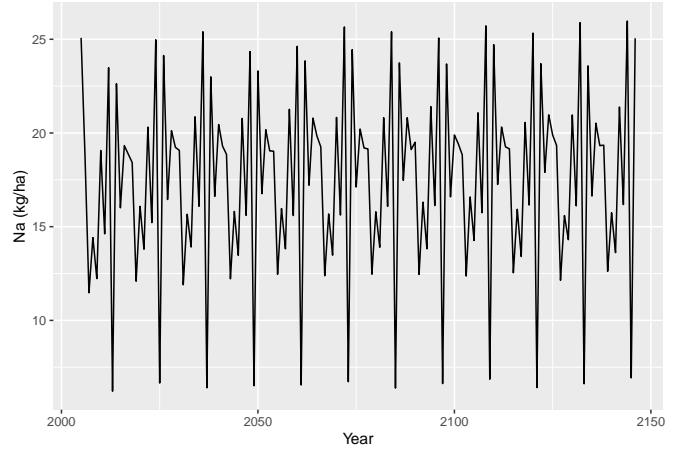


Figure 26: Annual Leaching Losses of Divalent Base Cations

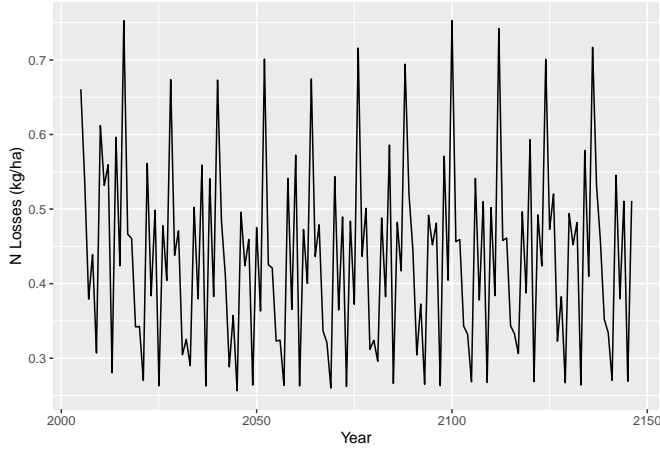


(a) K Leaching Losses

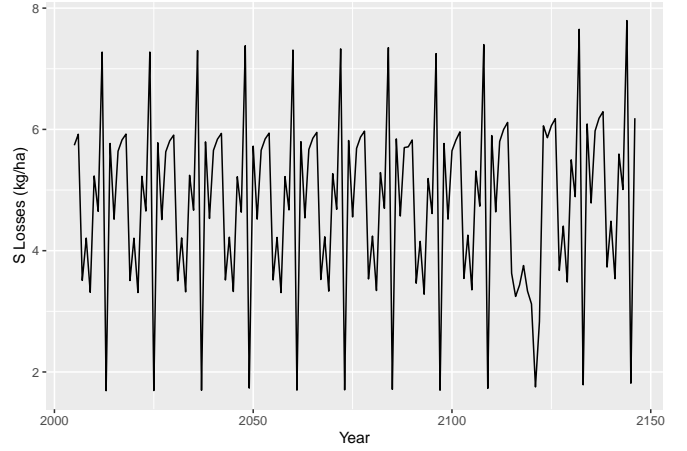


(b) Na Leaching Losses

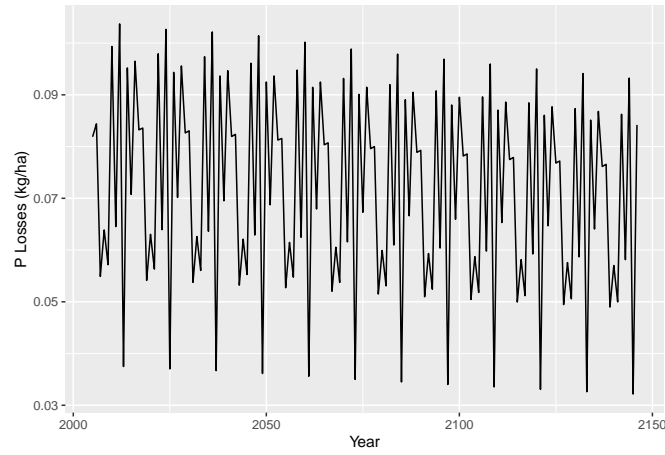
Figure 27: Annual Leaching Losses of Monovalent Base Cations



(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

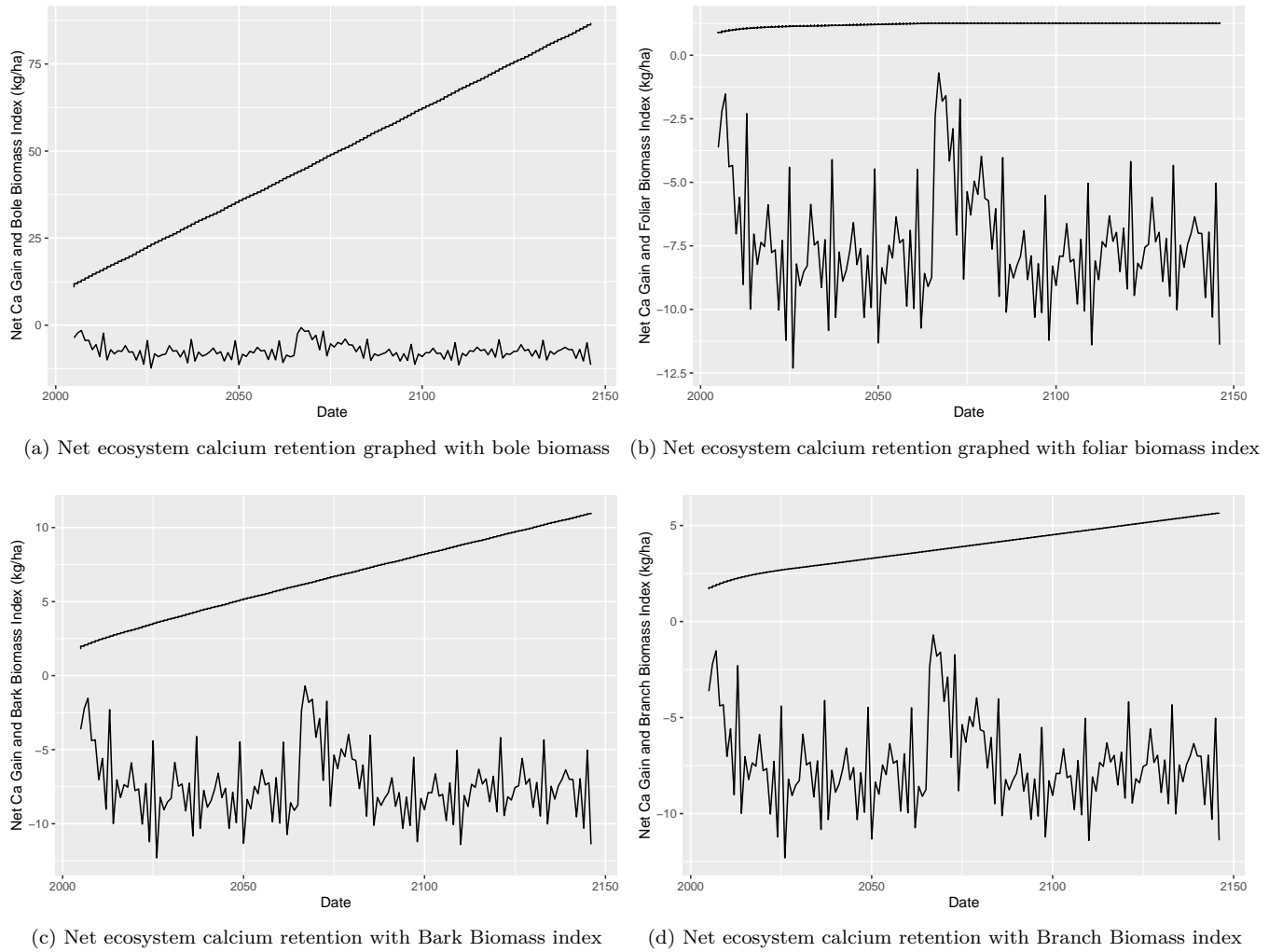
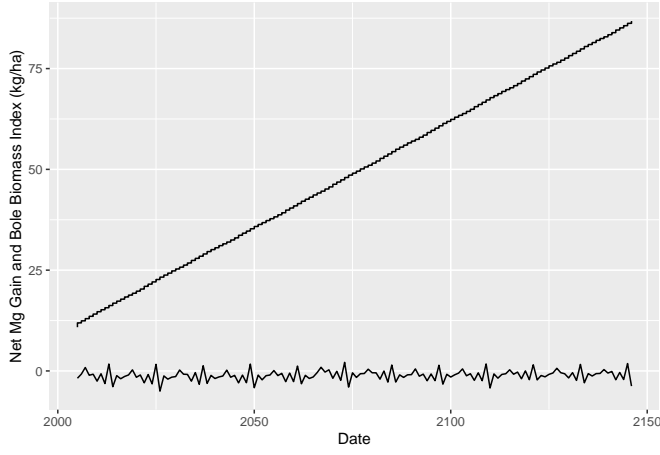
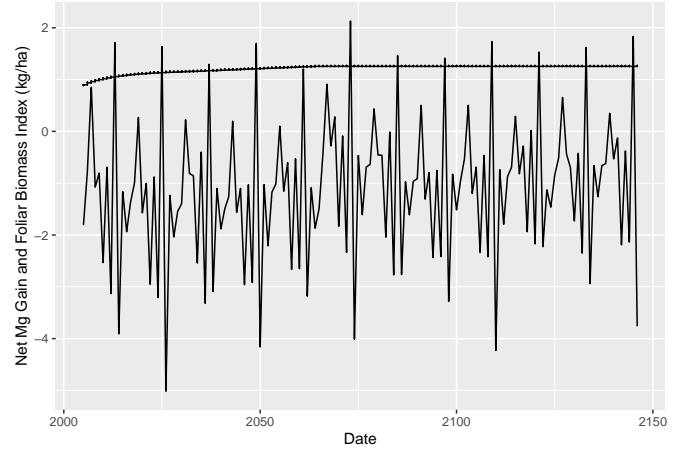


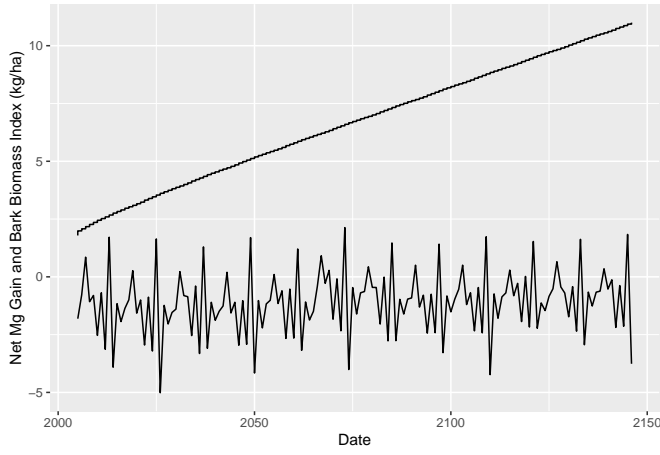
Figure 29: Fuck all!



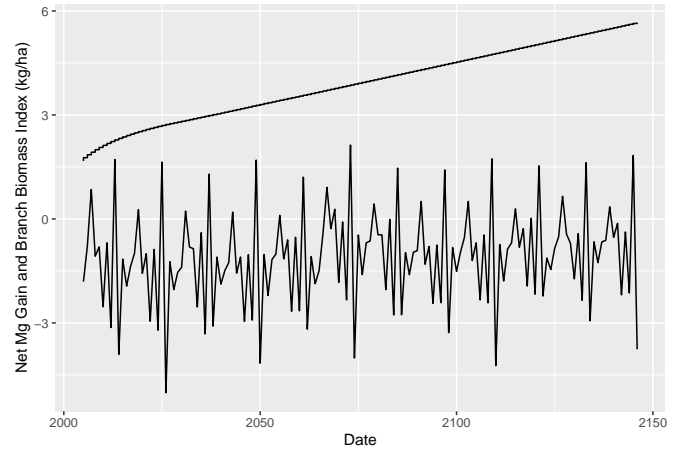
(a) Net ecosystem magnesium retention graphed with bole biomass



(b) Net ecosystem magnesium retention graphed with foliar biomass index

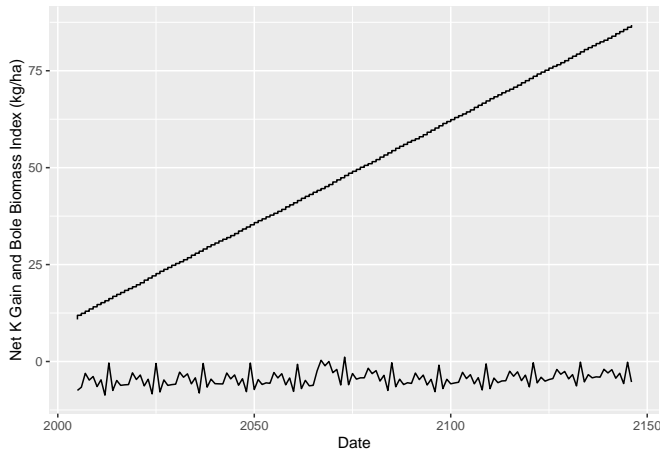


(c) Net ecosystem magnesium retention with Bark Biomass index

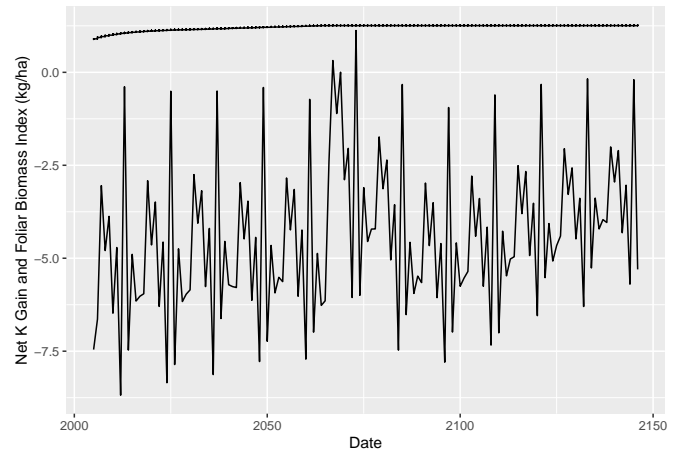


(d) Net ecosystem magnesium retention with Branch Biomass index

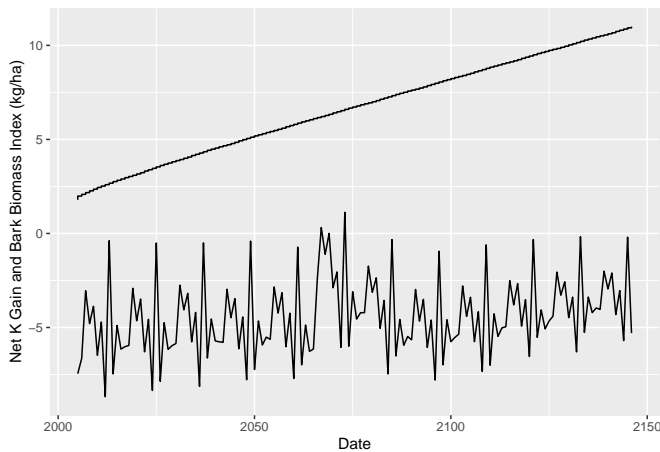
Figure 30: Net ecosystem Magnesium retention plotted against biomass indeces (kg/ha biomass/10,000)



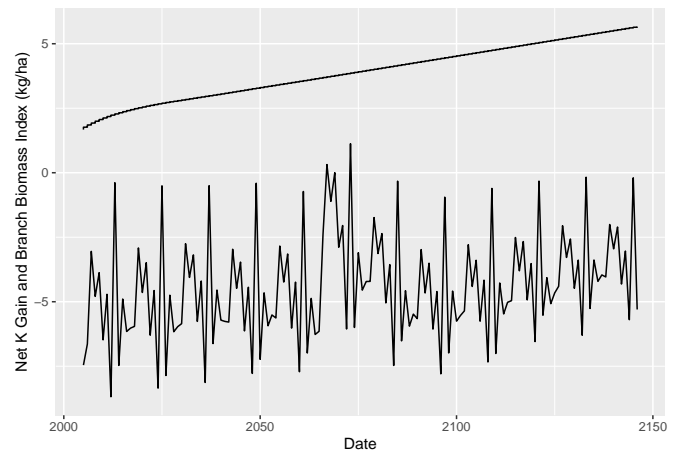
(a) Net ecosystem potassium retention graphed with bole biomass



(b) Net ecosystem potassium retention graphed with foliar biomass index



(c) Net ecosystem potassium retention with Bark Biomass index



(d) Net ecosystem potassium retention with Branch Biomass index

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

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