

Continuing Project

Variation in productivity, wood quality and soil carbon of ten conifer species across a gradient in water deficit

CAFS.21.85

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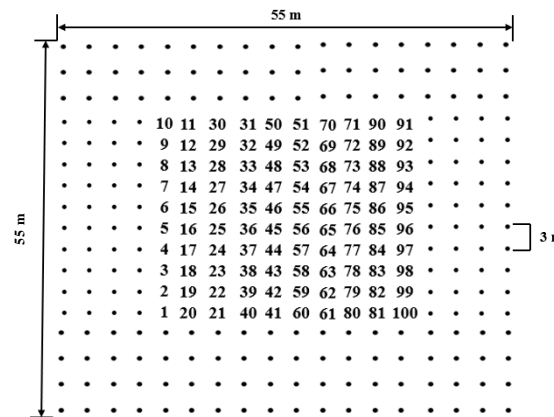


Project Overview

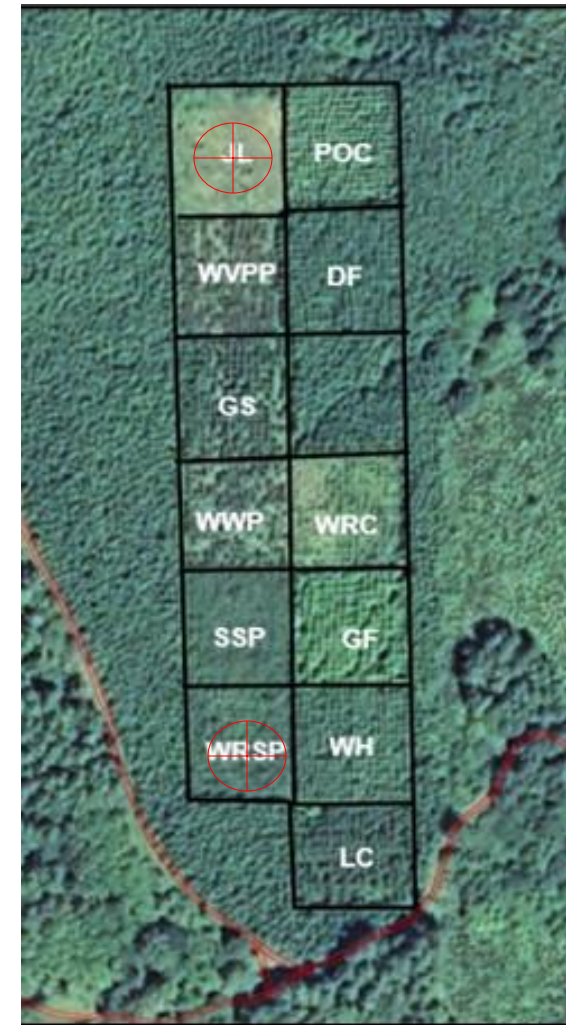
A species comparison study was installed in 1996 by Starker Forests in western Oregon.

10 native and non-native conifer species were planted in three sites along a water deficit gradient from the western Coast Range to the Willamette Valley.

	Species
DF	Douglas-fir
POC	Port-Orford-Cedar
JL	Japanese Larch
WVPP	Willamette Valley Ponderosa Pine
GS	Giant Sequoia
WWP	Western White Pine (Blister Rust Resistant)
SSP	Sitka Spruce
WRC	Western Red-Cedar
WH	Western Hemlock
LC	Leland Cypress
GR	Grand Fir
WRSP	Sitka Spruce (Weevil Resistant)



• = Buffer trees
1-100 = Measurement trees



Objectives

1. Measure and compare the cumulative, annual, and intra-annual growth rate of 10 species across a water deficit gradient in western Oregon.
2. Determine how each species' growth responded to seasonal climate variability and drought conditions through dendrochronology.
3. Measure and compare aboveground biomass stock, NPP, soil organic matter, and nutrient pools of the 10 conifer species across a water deficit gradient in western Oregon.
4. Correlate environmental factors with NPP, intercepted radiation, litterfall, LAI, and soil OM

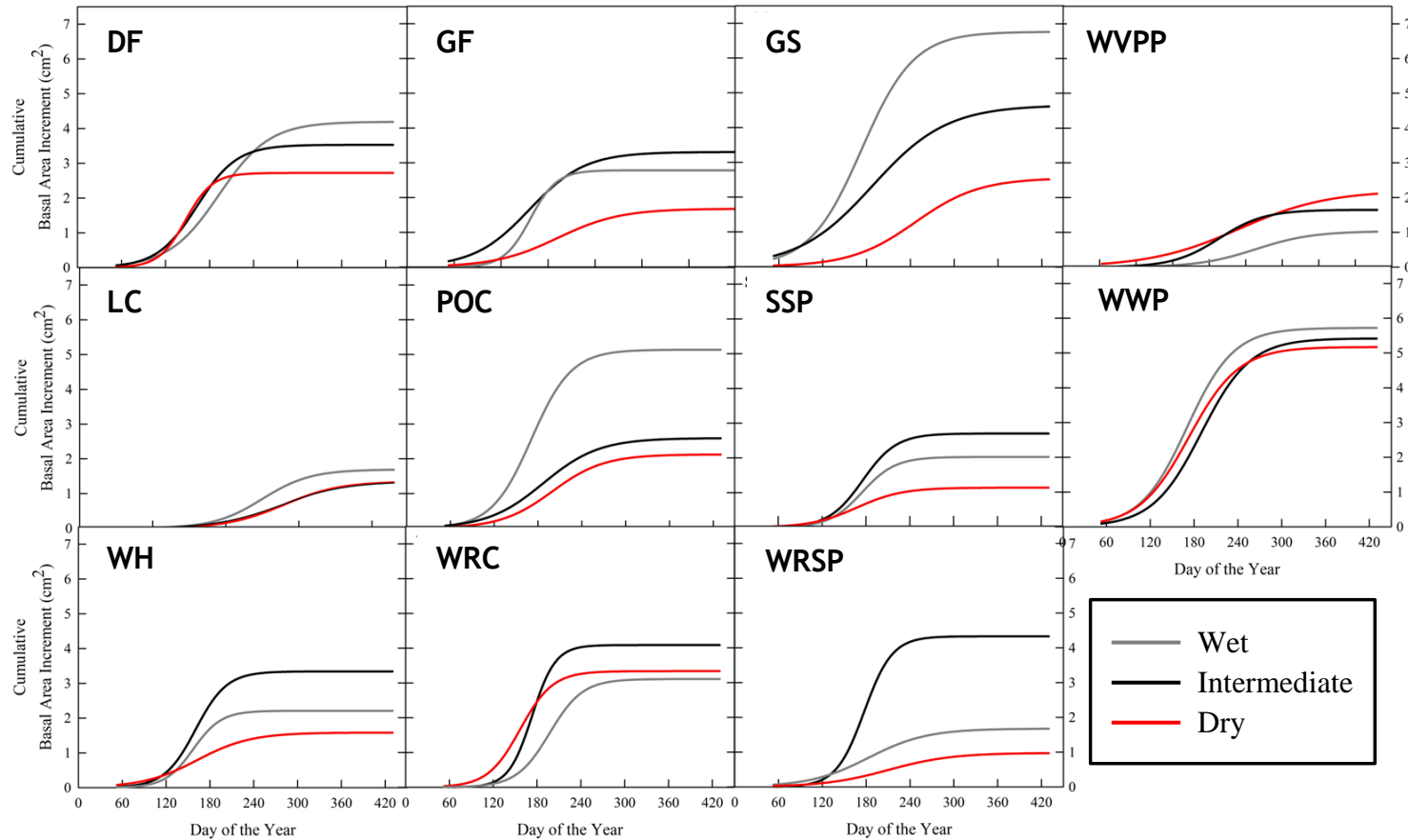


Current Progress

	2021				2022				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
Plot Layouts & Weather Station Installation	✓								
Tree Inventory	✓				✓				
Diameter Growth Measurements	✓	✓	✓	✓	✓	✓	✓	✓	
Litterfall & LAI	✓	✓	✓	✓	✓	✓	✓	✓	
Midstory & Understory Sampling			✓				✓		
Soil Sampling (forest floor, mineral soil, PRS)							✓		
Tree Core Collection					✓				
Tree Ring Measurements						✓			
Data Analysis						✓	✓	✓	



2021 Growing Season Phenology

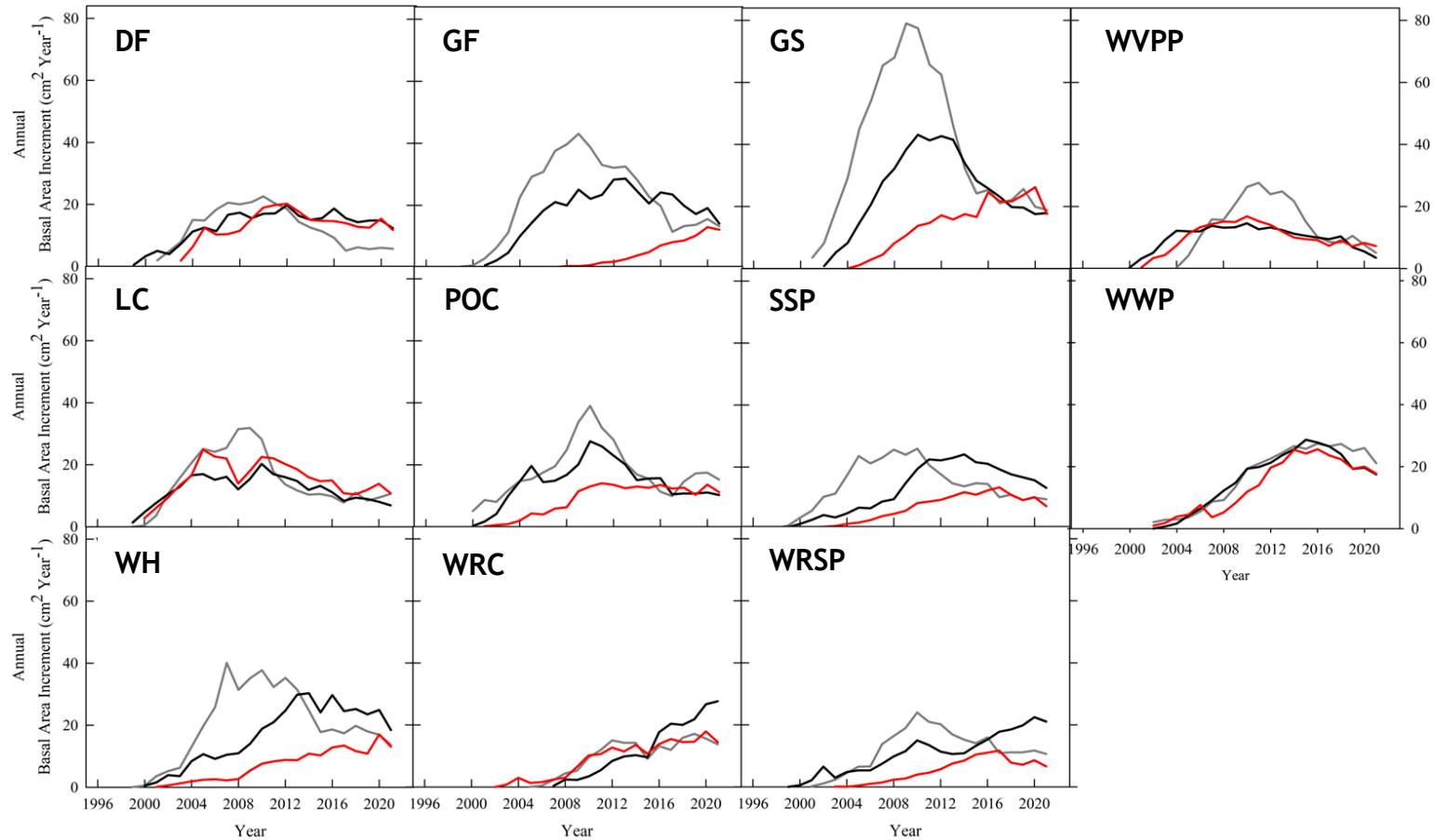


Source	Growing Season Length	Timing of Growth Initiation	Timing of Growth Cessation	Cumulative BAI
Species	<0.0001	<0.0001	<0.0001	0.00728
Site	0.4236	0.3489	0.149964	<0.0001
Species by Site	0.0917	0.0387	0.000102	0.00103



Wood Increment Core Measurements

Current Progress



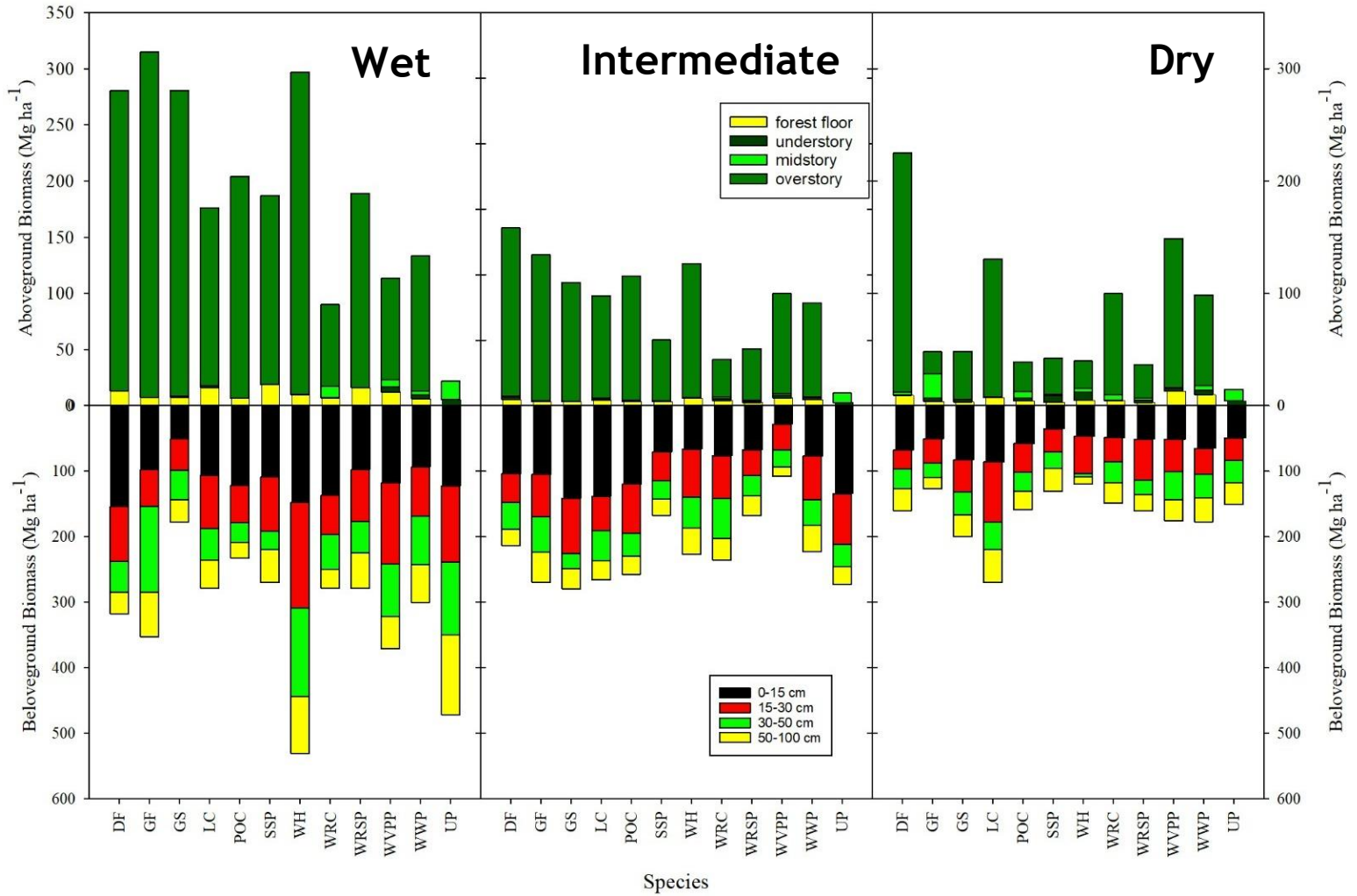
Source	Annual BAI	Annual Latewood BAI	Annual Latewood Percentage	Wood Basic Density
Species	<0.0001	<0.0001	<0.0001	<0.0001
Site	<0.0001	<0.0001	0.2886	<0.0001
Species by Site	<0.0001	0.0008	0.0063	<0.0001
Species by Site by Year	<0.0001	<0.0001	<0.0001	



Above and Belowground Biomass

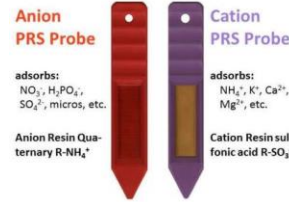
Current Progress

- Age: 26 Years

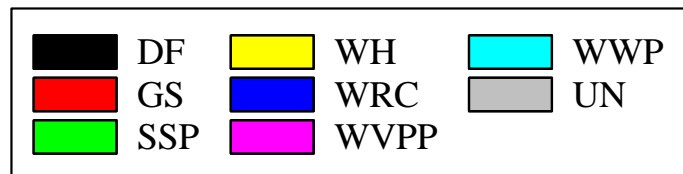
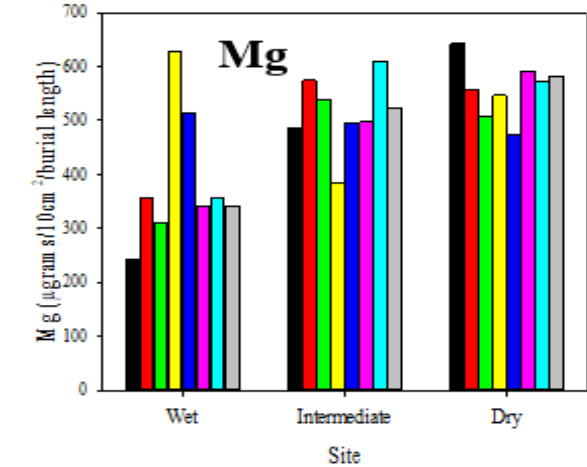
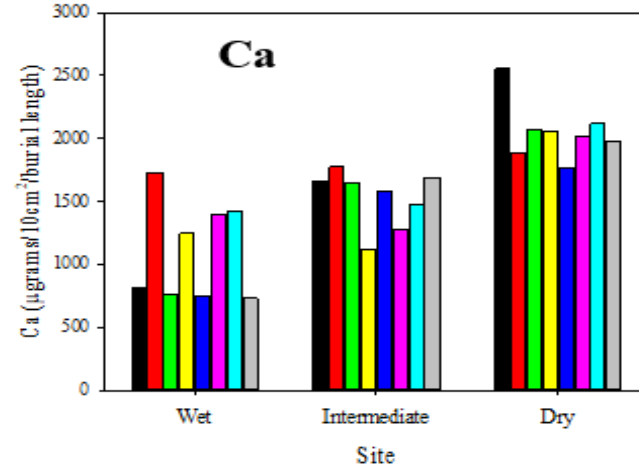
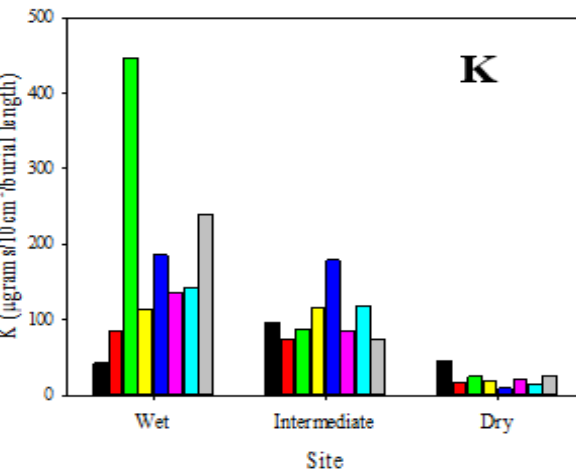
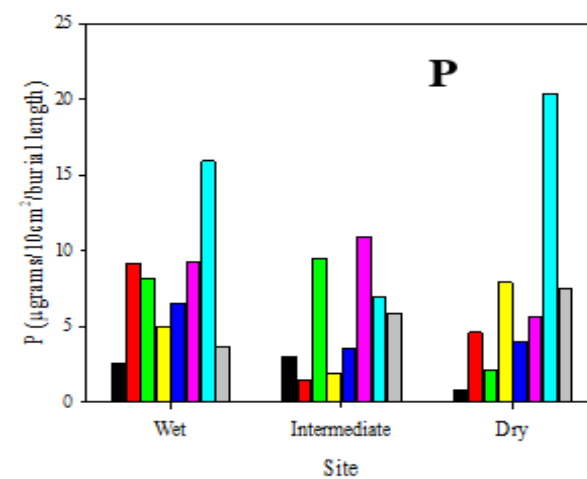
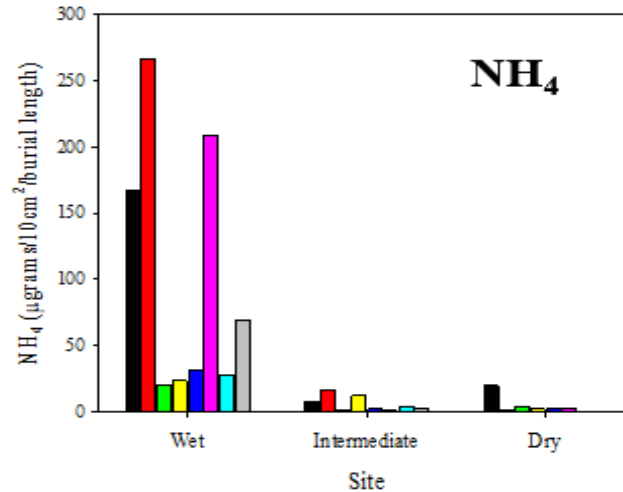
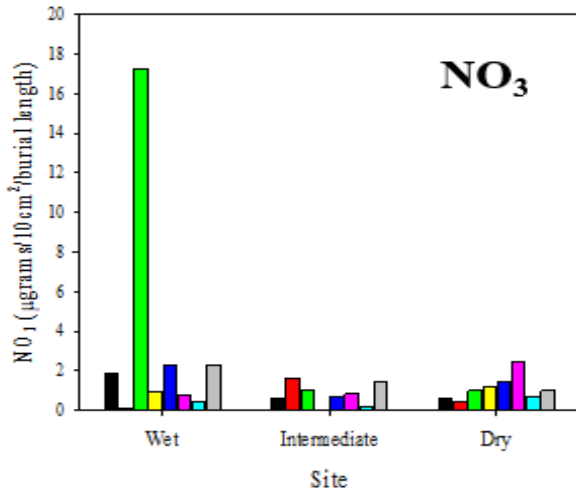


Soil Nutrients Availability

- Age: 26 Years
- Collected using soil PRS probes



Current Progress



Future Plans

- Litterfall collection
 - Continuing bi-monthly
- Measuring LAI and Light Interception with LAI-2200c and Ceptometer
 - Continuing bi-monthly
- Monthly diameter growth with dendrometer bands
 - Continuing monthly
- Inventory of tree survival, heights, and diameter
 - Will be conducted in the winter of 2022-2023

