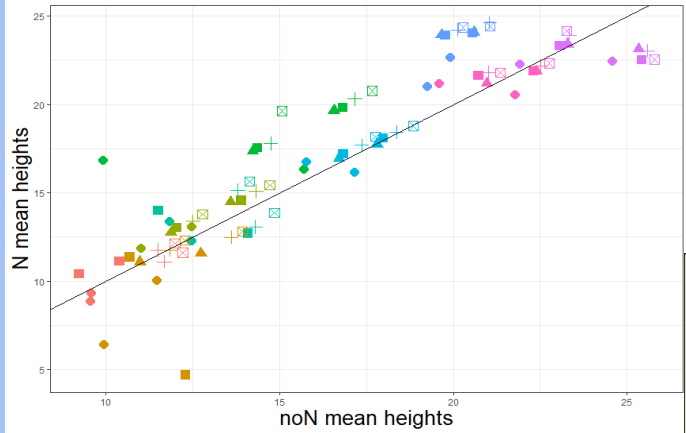
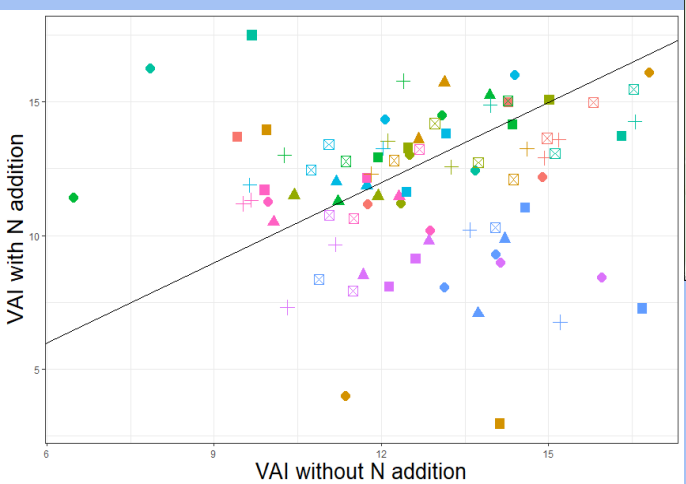


## N effect on Mean height of tree



**Mean height increases by 0.64m:  $p=0.01$**

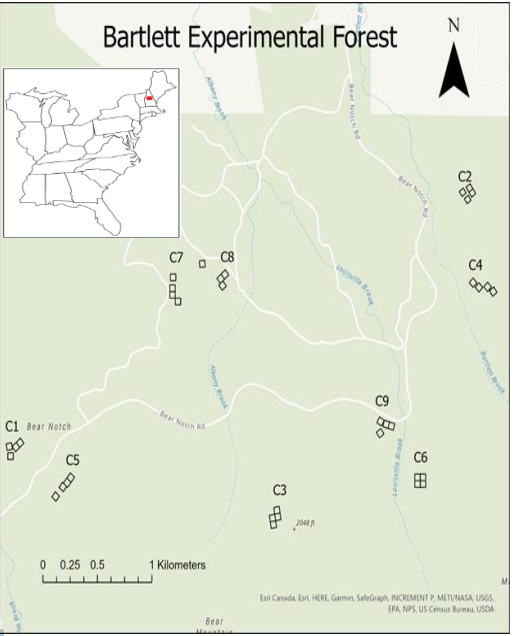
## N effect on VAI



**Decrease VAI by 5%:  $p=0.03$**   
Vegetative Area index (VAI) is the ratio of the vegetative part of trees to the ground area

### Introduction

Light Detection and Ranging (LiDAR) dataset is helpful to explore the canopy structure of Bartlett Experimental Forest where the full factorial experiment of N\*P is going on since 2011. LiDAR data was collected from 2014 to 2019 except for 2015.



### Methods

Data was acquired from National Ecological Observatory Network (NEON).

The LiDAR data generated 13 canopies structural parameters which were further analyzed using a linear mixed model with age and treatment as fixed effects and stand as a random effect.

Out of 13 parameters investigated, 4 responded significantly to treatment:

1. Mean height of tree across plots
2. Vegetative Area Index (VAI)
3. Rumple
4. Vegetation Complexity Index (VCI).

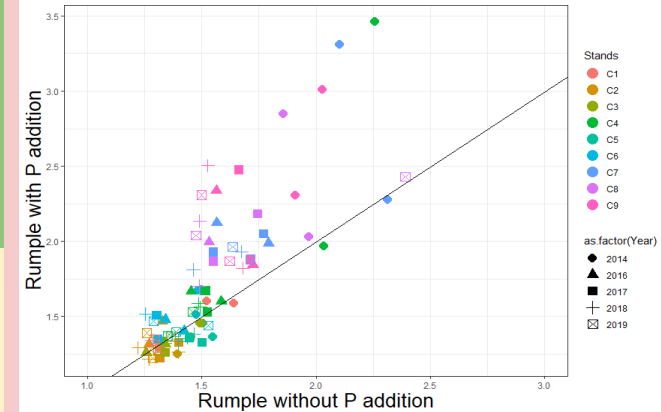
### Discussion

LiDAR can be a promising tool for improved forest management. This remote sensing approach can detect the effect of N and P addition on tree canopy structure.

### Acknowledgement

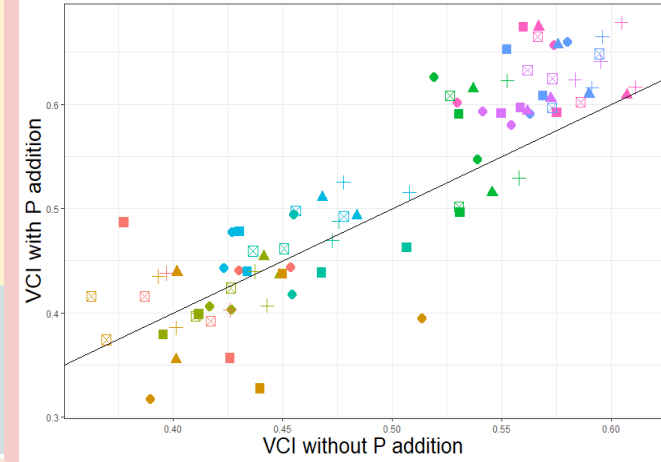
I would like to thank my advisor Ruth Yanai, labmates and Alex Young for their continuous support and guidance. And thanks to US Department of State and US Agency for International Development for financially supporting QUERCA project.

## P effect on Rumple



**Rumple index increases by 8%:  $p=0.04$**   
Rumple is the canopy roughness

## P effect on VCI



**VCI increases by 4%:  $p=0.01$**   
Vegetation Complexity Index (VCI) is the vertical distribution of the foliage.