

# Seasonality of soil respiration partitioning coefficient at different Tier II sites



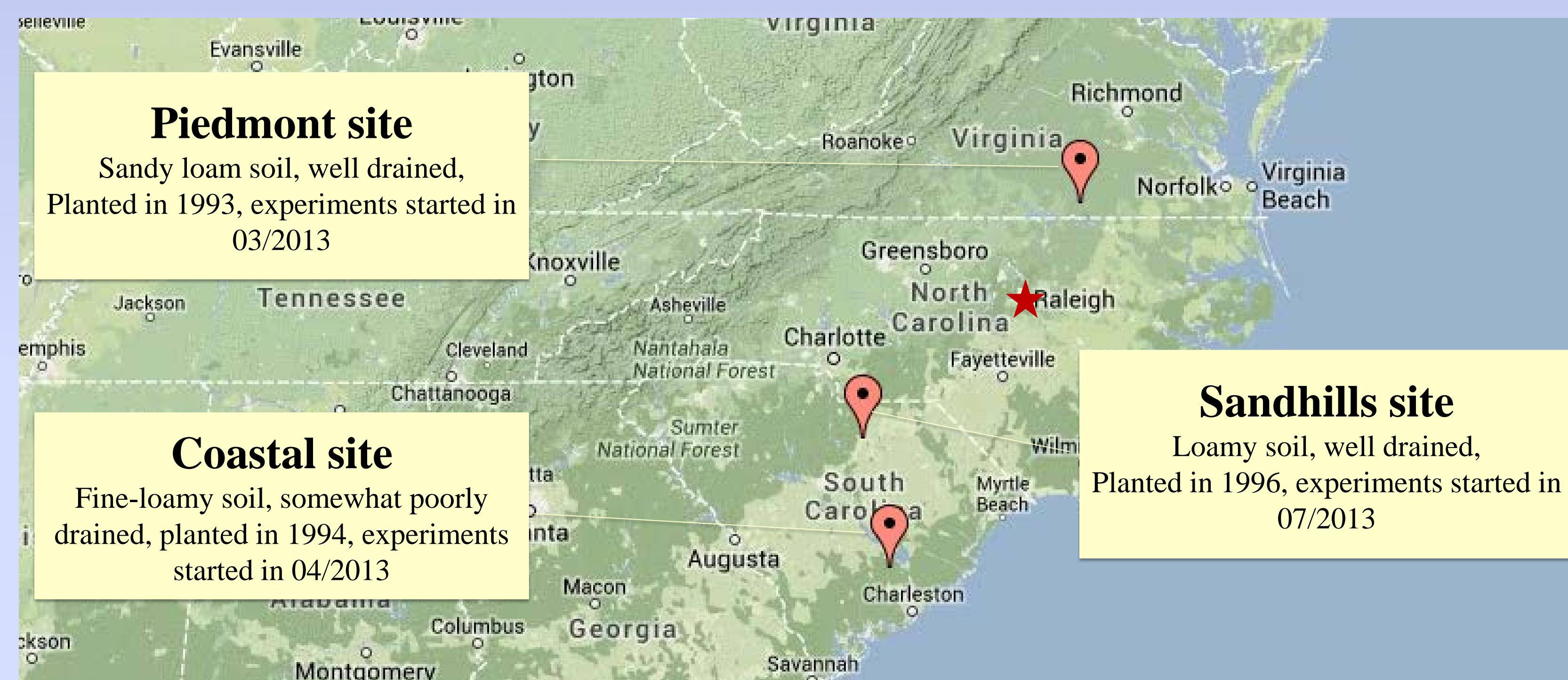
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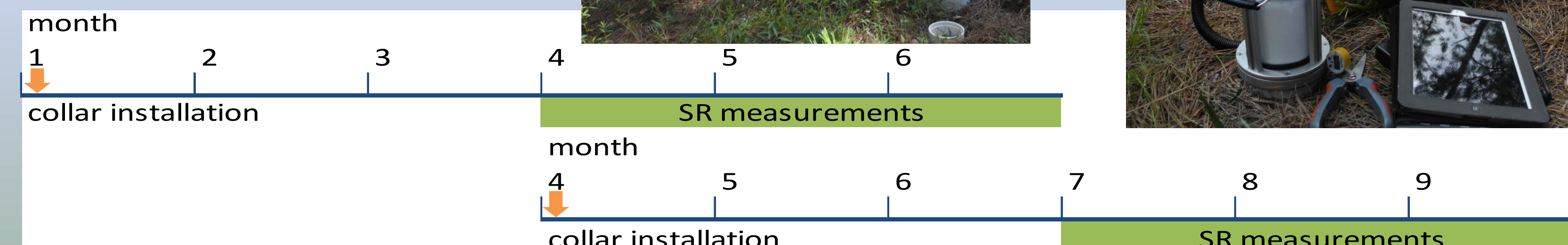
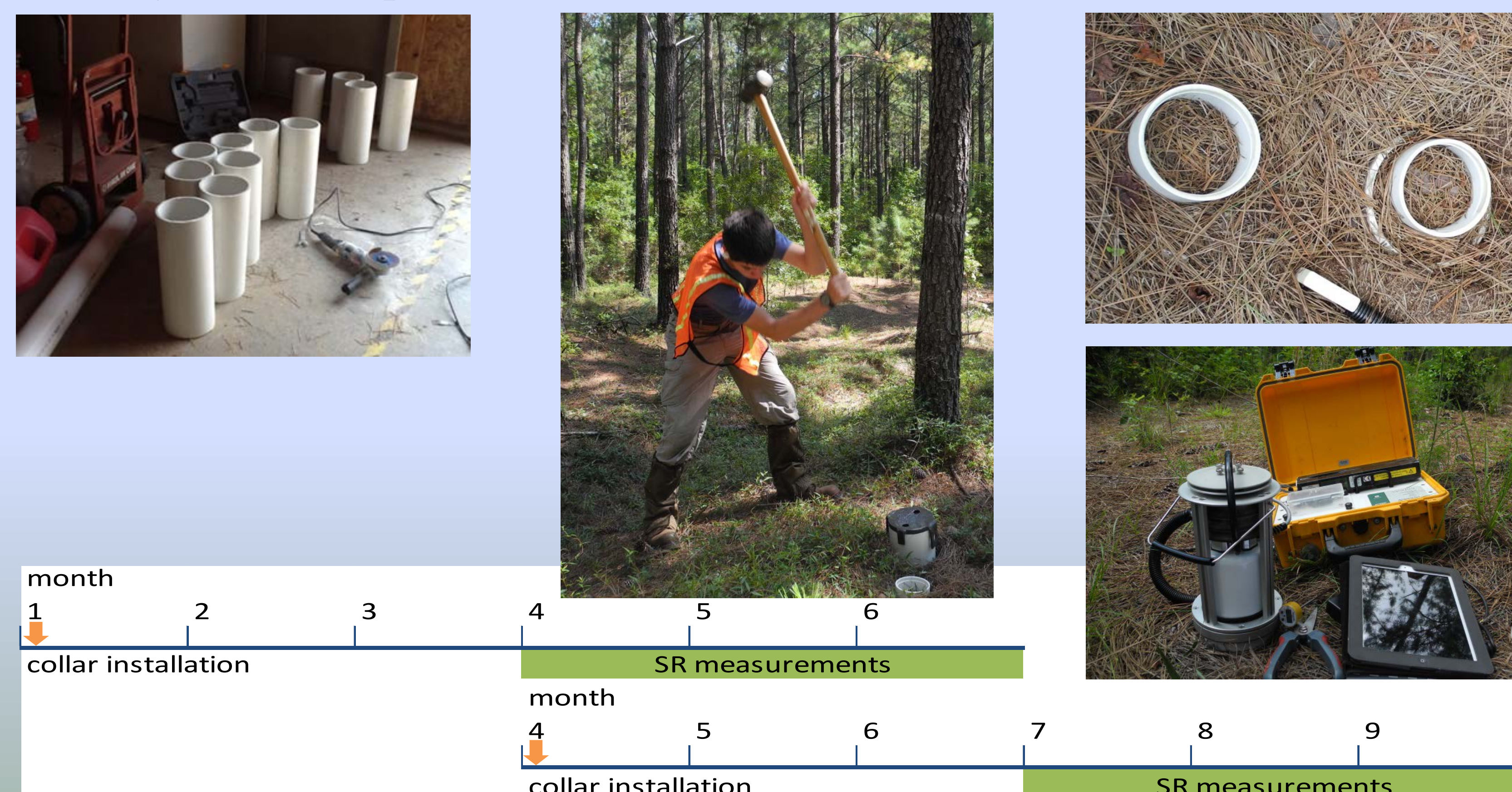
## Introduction

The magnitude and temporal variability of the balance between autotrophic and heterotrophic respiration ( $R_h$ ) in total soil  $CO_2$  efflux ( $R_s$ ) is one of the key parameters required for estimating ecosystem net carbon balance (NEE) for PINEMAP. Yet, information on the partitioning constant is scarce, making any estimates of NEE subject to large uncertainties. There is evidence of temporal and spatial structure in the data from Tier III sites, varying about the global mean of  $R_h:R_s=0.84\pm0.03$ . However, due to the small sample size, such results need verification over a wide geographic range. Thus the objective of this study is to use the same partitioning methods to three Tier II sites as those to Tier III sites, and estimate the partition coefficients at those sites.

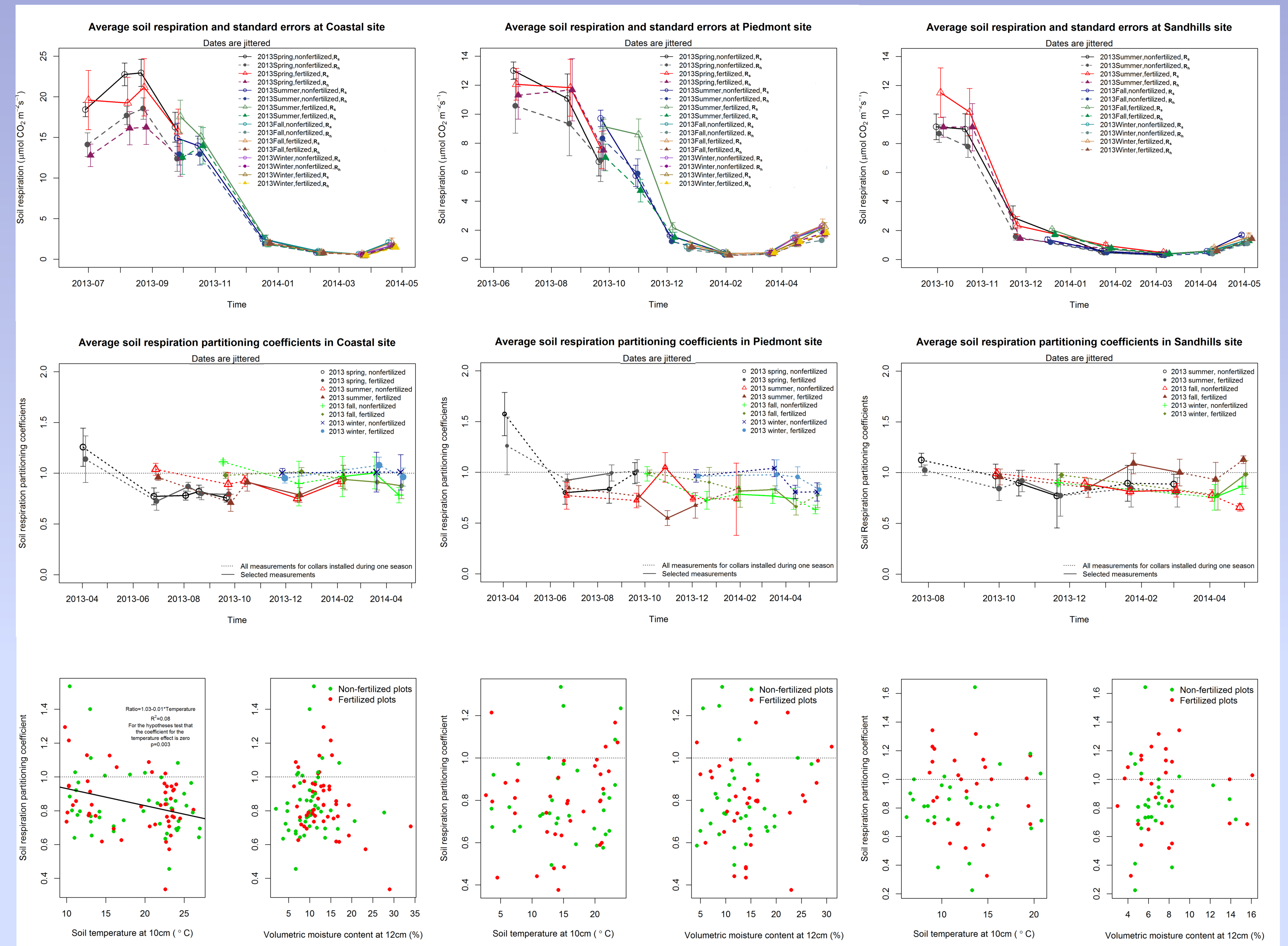
## Site descriptions and methods



At each site, fertilized plots with 180 lbs of N every 4 years and control plots were selected. Four pairs of shallow collars inside and outside root exclusion collars were installed at each fertilization treatment every time. The sites were visited monthly for soil respiration measurements with Licor-8100.



## Results and discussion



The seasonal installations of new sets of deep root exclusion collars show increased contribution of  $R_h$  in winter particularly at coastal plain site, where the ratio changed from  $79\pm2\%$  (mean $\pm$ se) in June to September to  $91\pm5\%$  from January to April. The effect was similar in both the control and fertilized treatments. The seasonality was not apparent at the Sandhills and Piedmont sites. The Piedmont site exhibited  $R_h:R_s > 1$  in October 2013, which requires further investigation. It is clear that accumulating data will allow us to better elucidate the spatial and temporal controls of the partitioning constant, and tighten the confidence bounds on estimates of NEE.

## ACKNOWLEDGEMENT

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