

Forest Soil Respiration Under Climate Change

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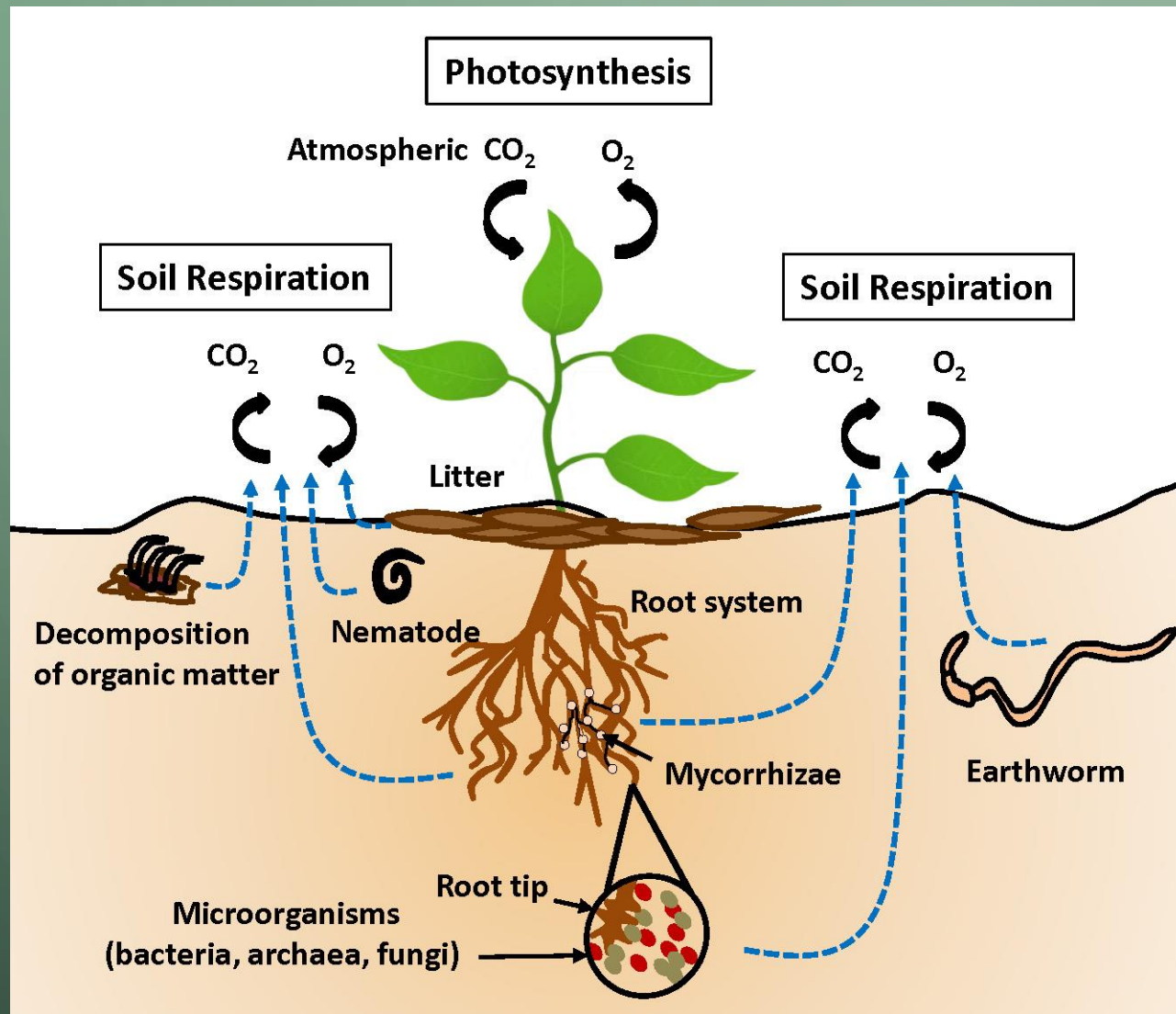
January 2019

Why do we care about forest soil?

- Forests stock ~ 861 Gt C
- Carbon sink ~ 2.4 Gt C per year
- Soil respiration ~ 70 Gt C per year



Soil Respiration

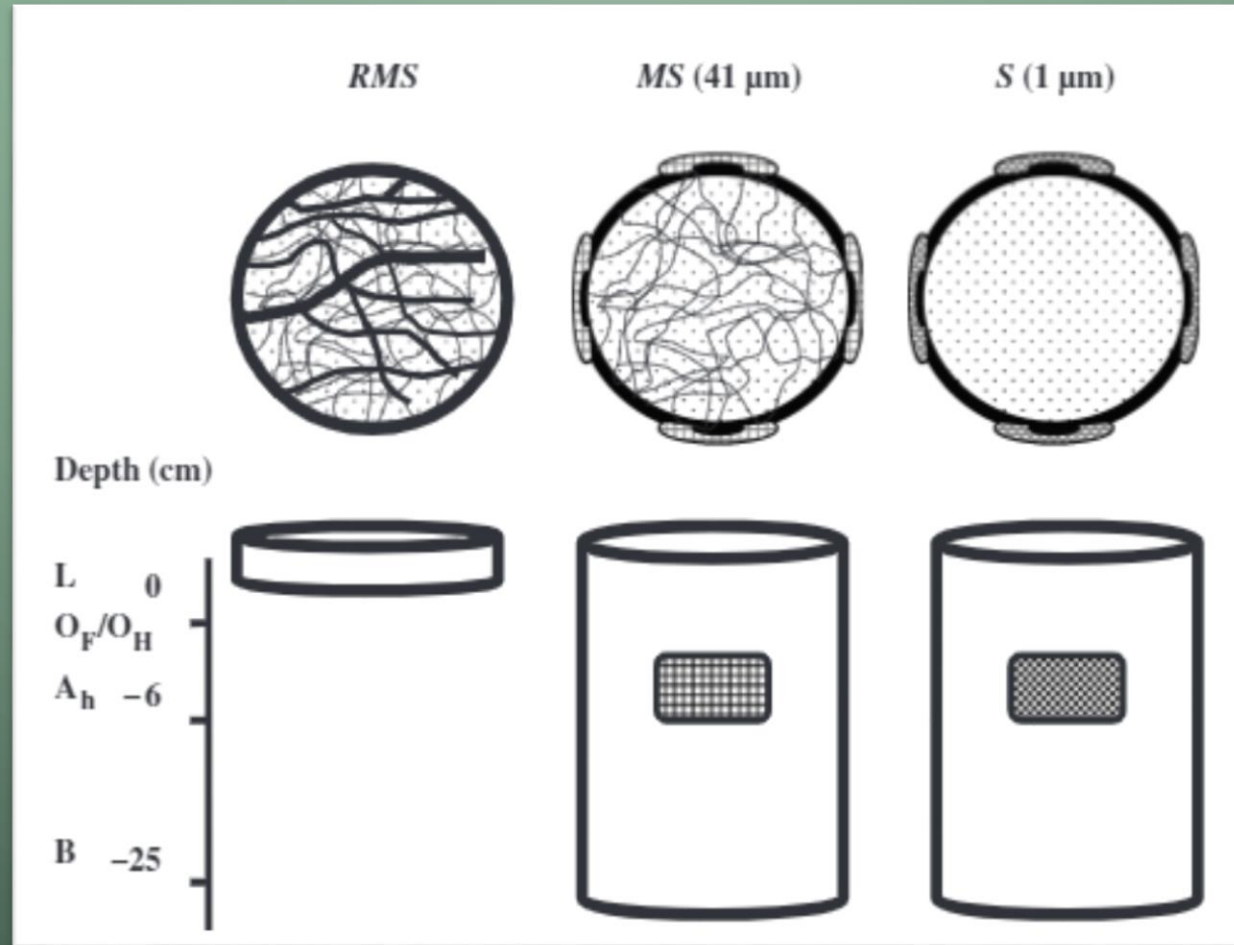


- Autotrophic respiration
- Heterotrophic respiration

Materials & Methods

RMS collar

- Roots
- Ectomycorrhizal extraradical hyphae
- Soil heterotrophs



Heinemeyer A., et al., 2007

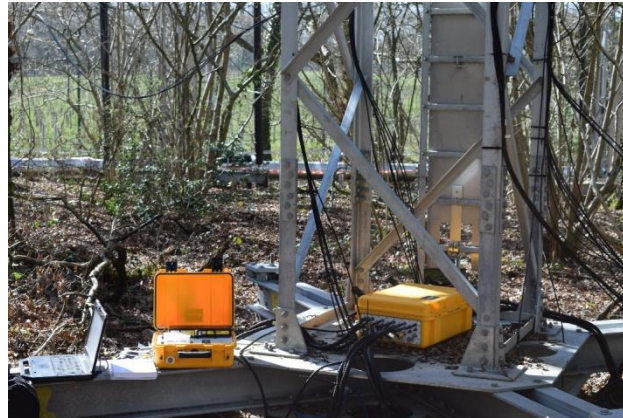
MS collar

- Ectomycorrhizal extraradical hyphae
- Soil heterotrophs

S collar

- Soil heterotrophs

Materials & Methods



- 2 LICOR multiplexers
- 2 LICOR control units
- 18 chambers
- 2 rings measuring simultaneously

Surface collars

Baseline

1st year

2nd year

umol CO₂ m⁻² s⁻¹

2016-10

2017-01

2017-05

2017-09

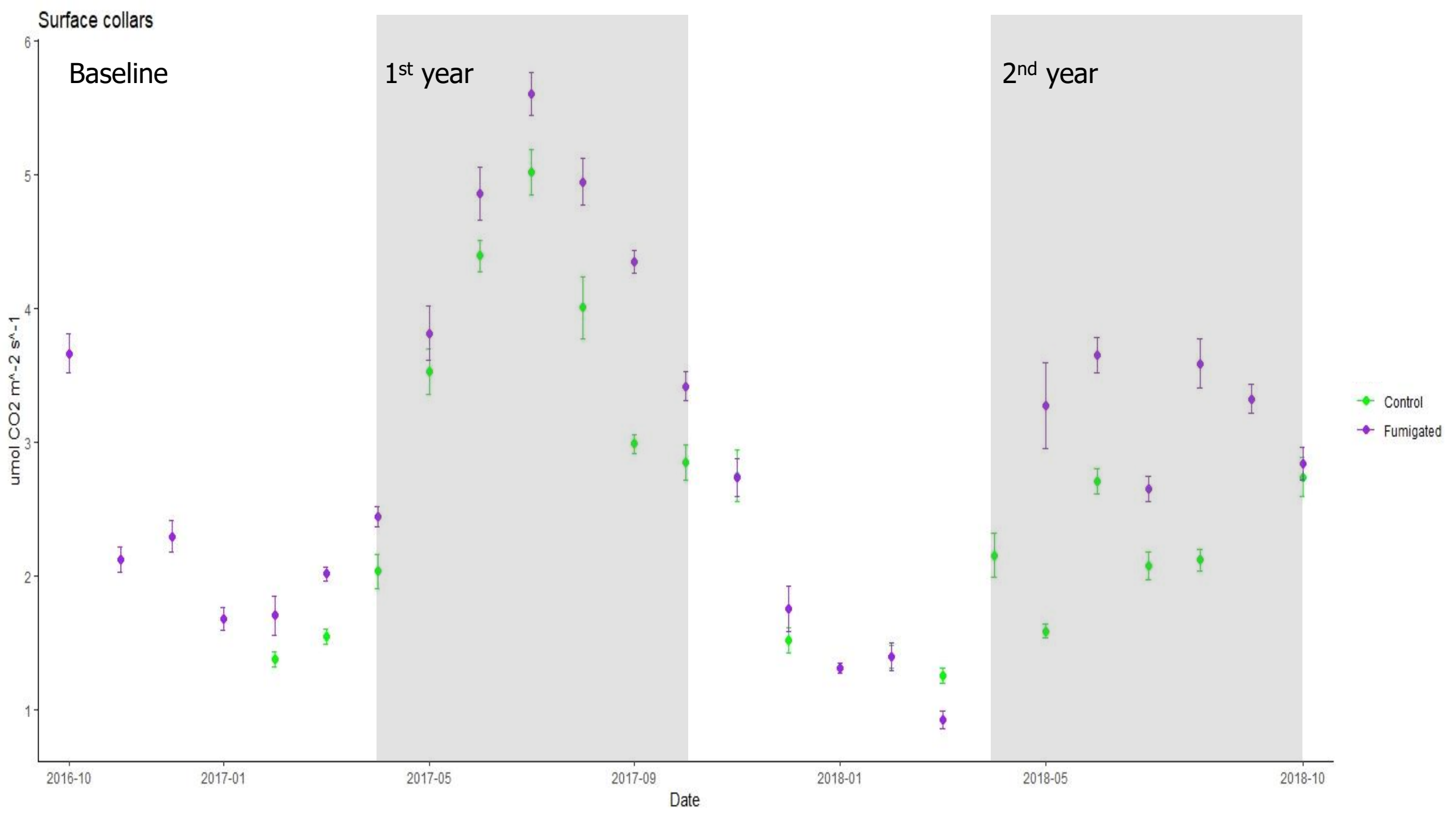
Date

2018-01

2018-05

2018-10

Control
Fumigated



Medium collars

Baseline

1st year

2nd year

umol CO₂ m⁻² s⁻¹

Control
Fumigated

2016-10

2017-01

2017-05

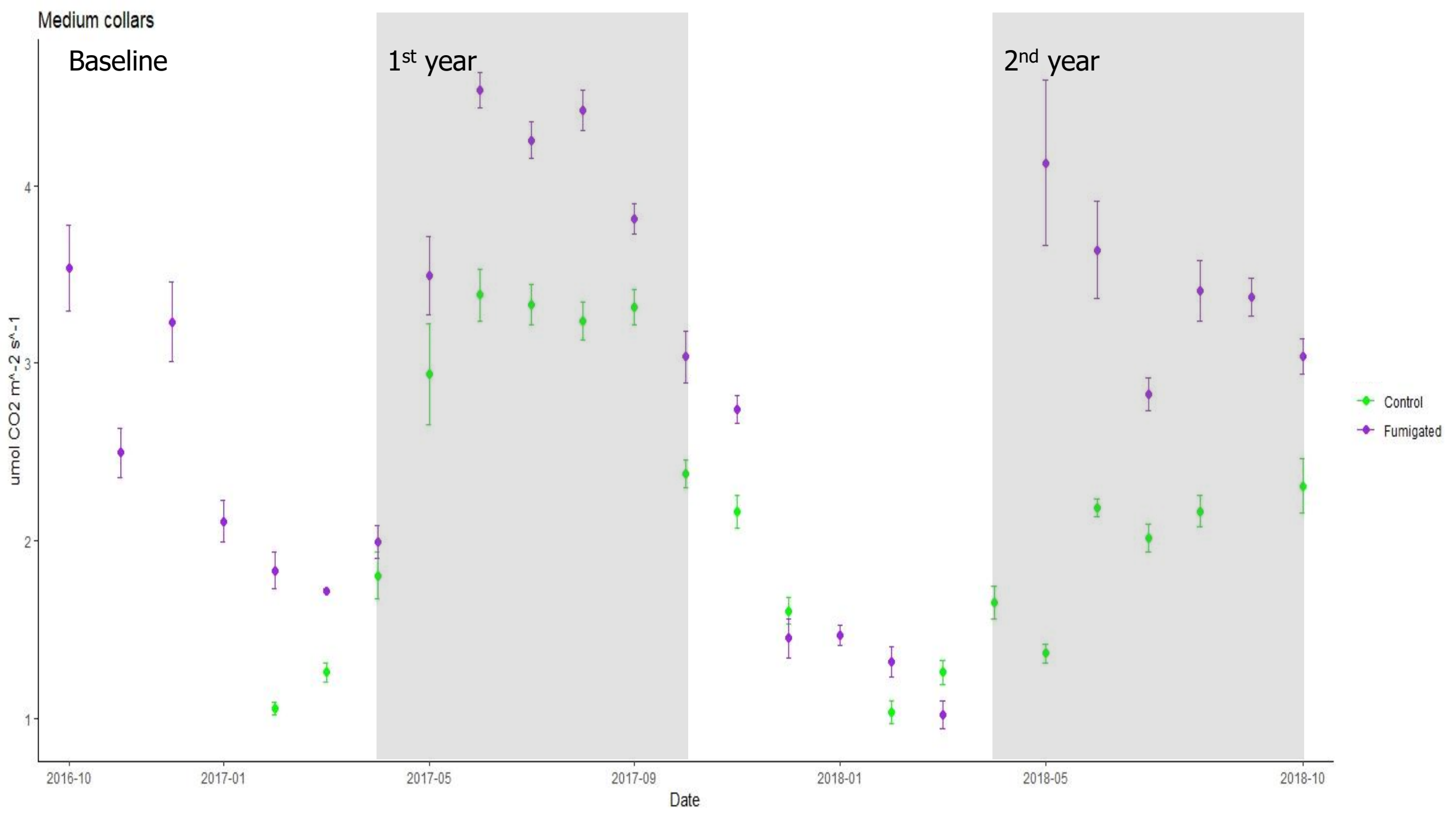
2017-09

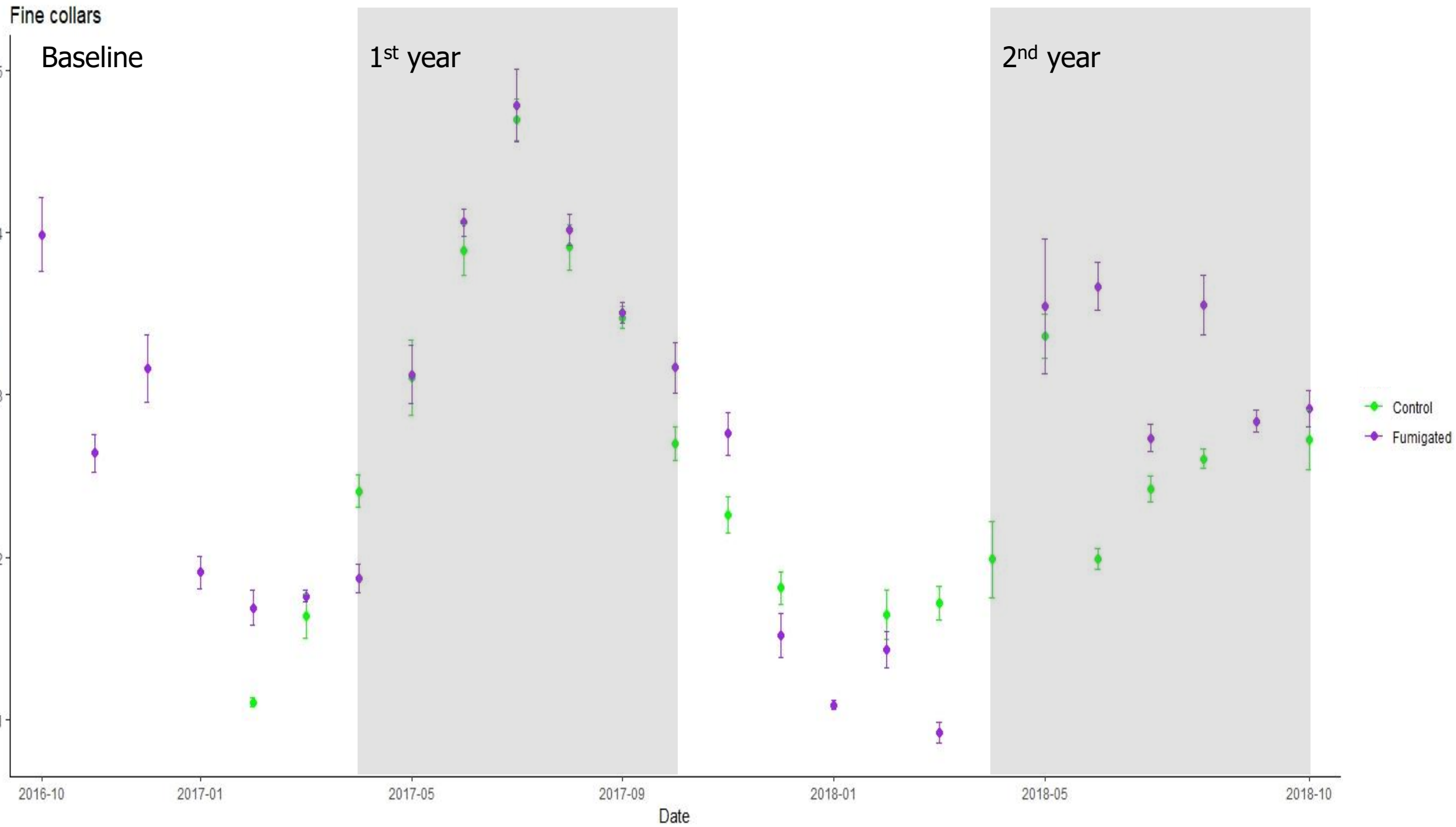
2018-01

2018-05

2018-10

Date





Preliminary Results

- Soil respiration was higher after the fumigation started.
- Soil respiration higher in fumigated plots for all different collar treatments.
- 1st year fumigation was higher than 2nd year fumigation.



Acknowledgments

- Dr Liz Hamilton
- My supervisors
- Horseman Trust
- JABBS
- Kris, Peter & Nick
- Aileen & Anna
- BIFoR volunteers