

# The dependence of evaporative efficiency of vegetated surfaces on ground cover weight fractions in mesic ecosystems

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Acknowledgements



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So difficult to model actual evaporation.

Modelling evaporative efficiency (SEE) instead?

But SEE models were developed for bare, mineral soil conditions.

Maybe not for me...

Peat-bryophyte-litter-ground vegetation column

You can consider us as hypothetical soils. In fact, SEE models can work for peat-bryophyte-litter soil columns!

Litters and bryophytes

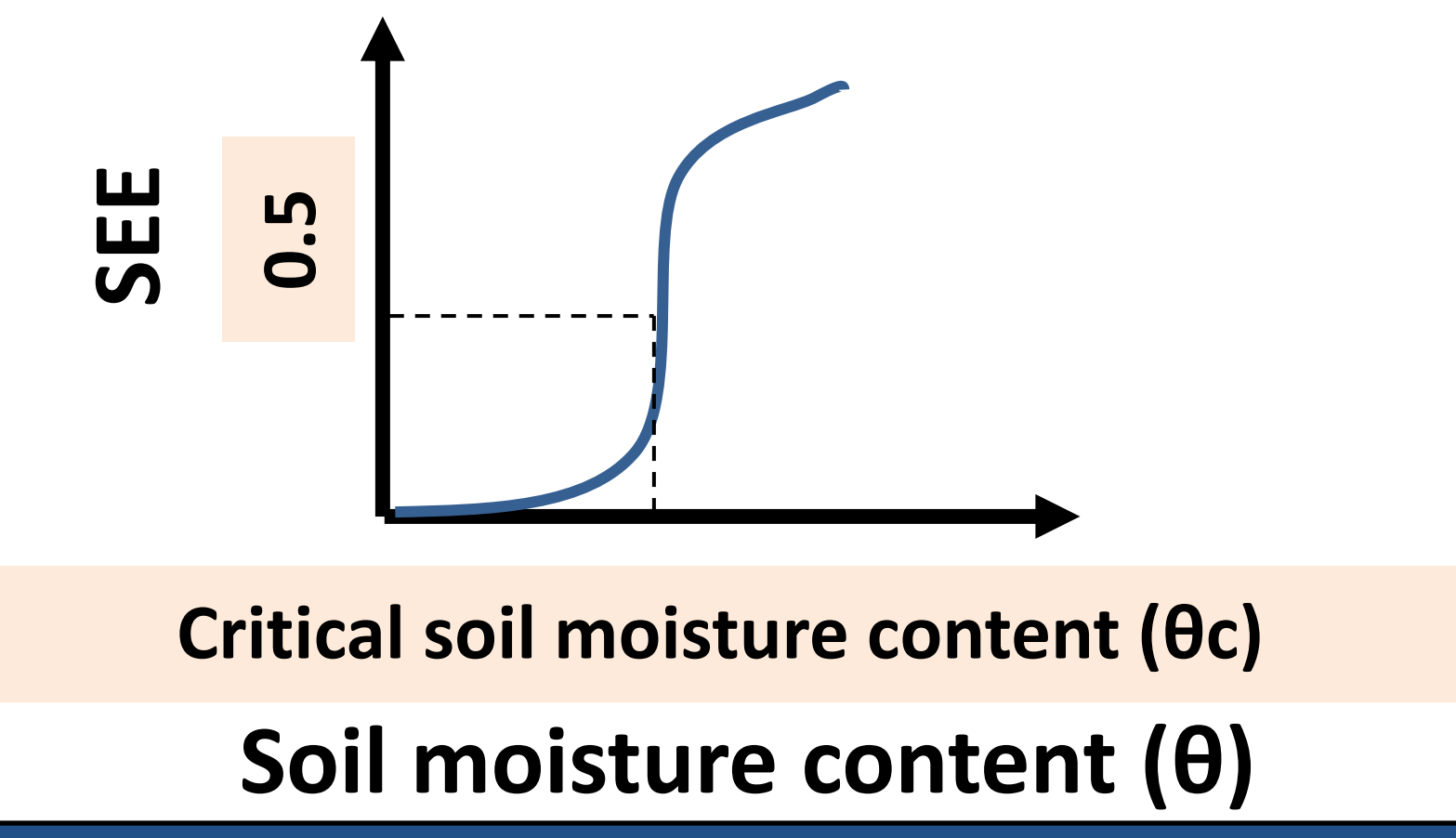
But I may affect the modelling results.

We can use bryophytes and litters weight fractions to model SEE of vegetated surfaces!

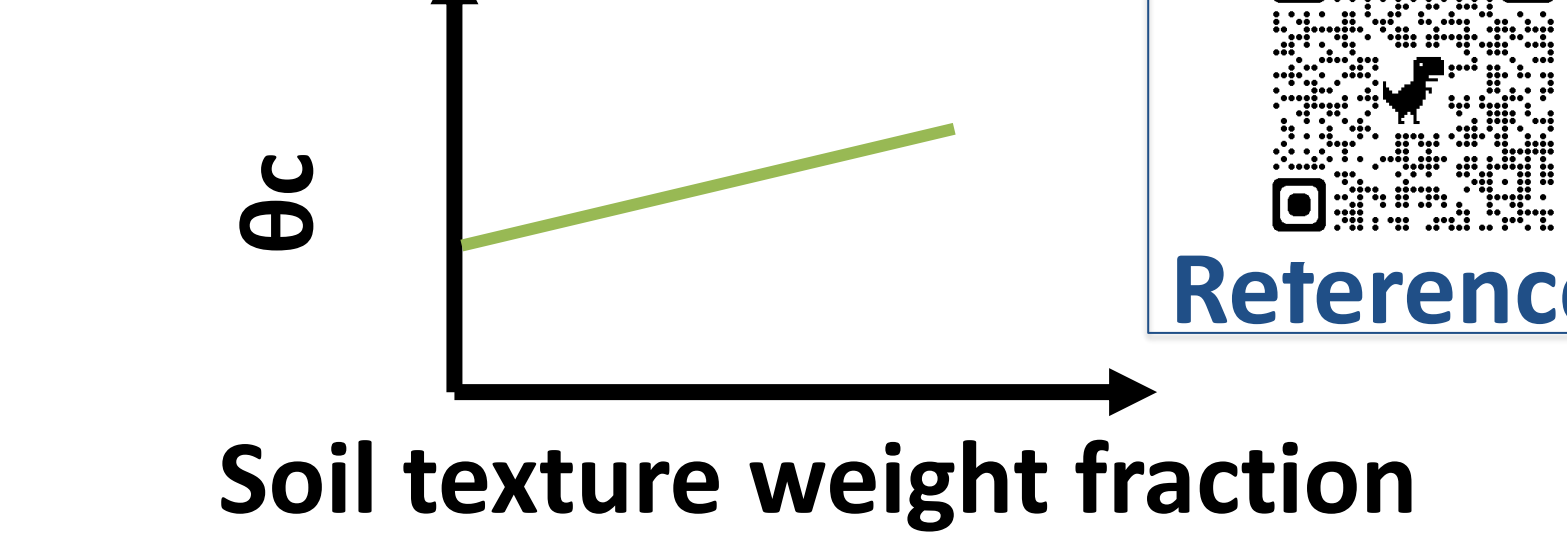
That also works for below-canopy conditions!

### Background and methods

$SEE = \frac{\text{Actual Evaporation } (E_a)}{\text{Potential Evaporation } (E_0)}$  (Eq.1)

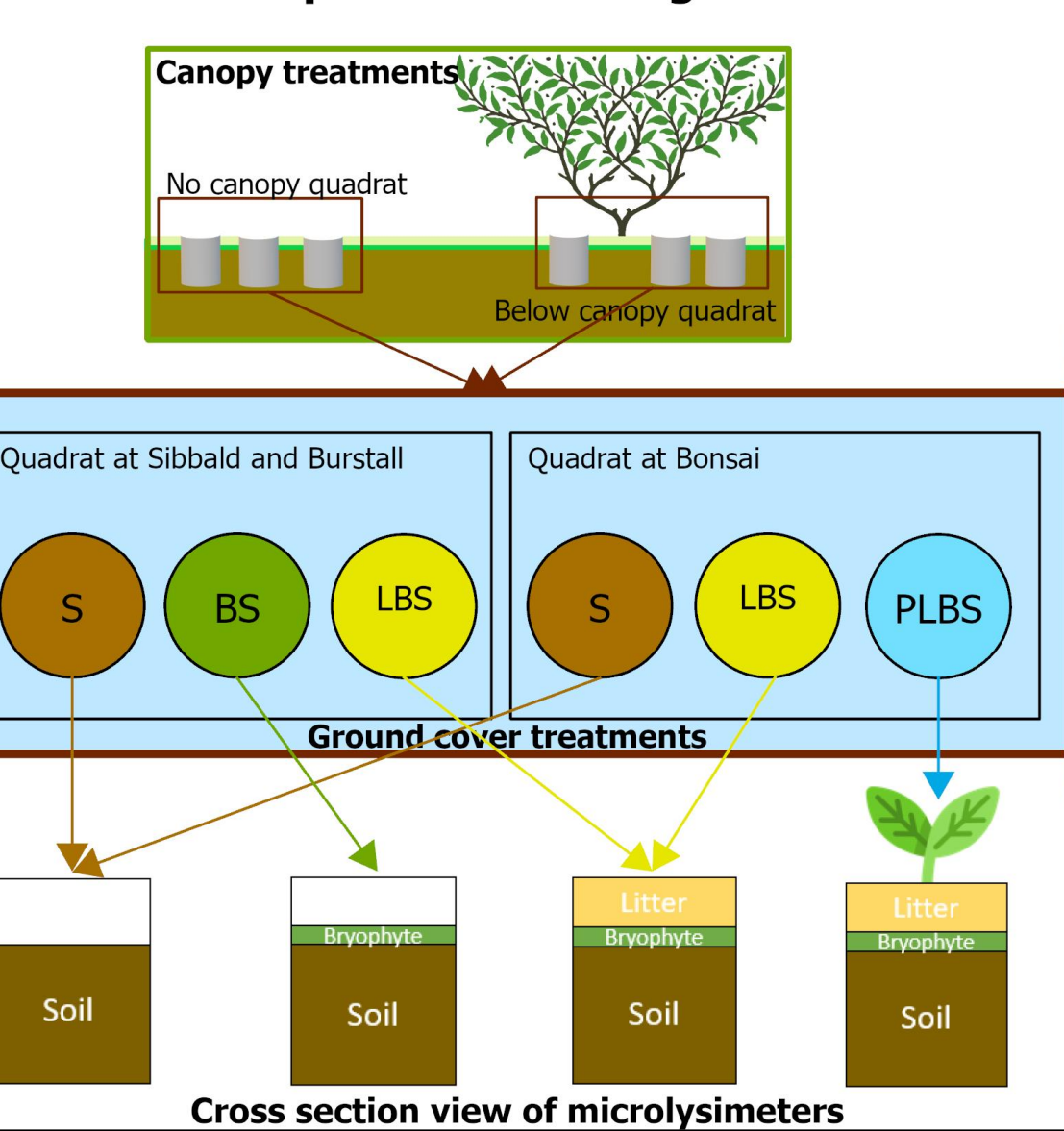


Critical soil moisture content ( $\theta_c$ )  
Soil moisture content ( $\theta$ )




Soil texture weight fraction

Experimental Design



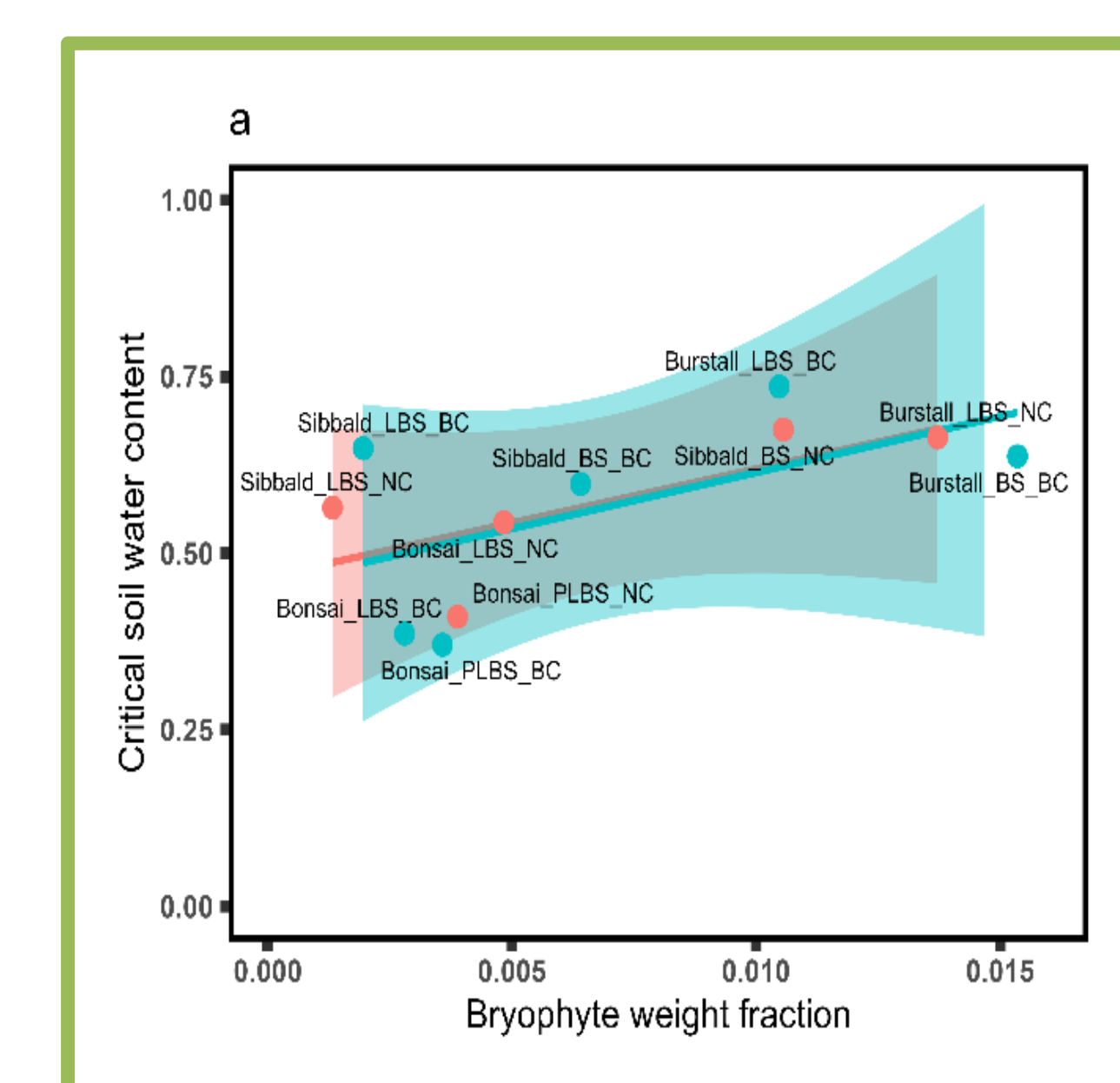
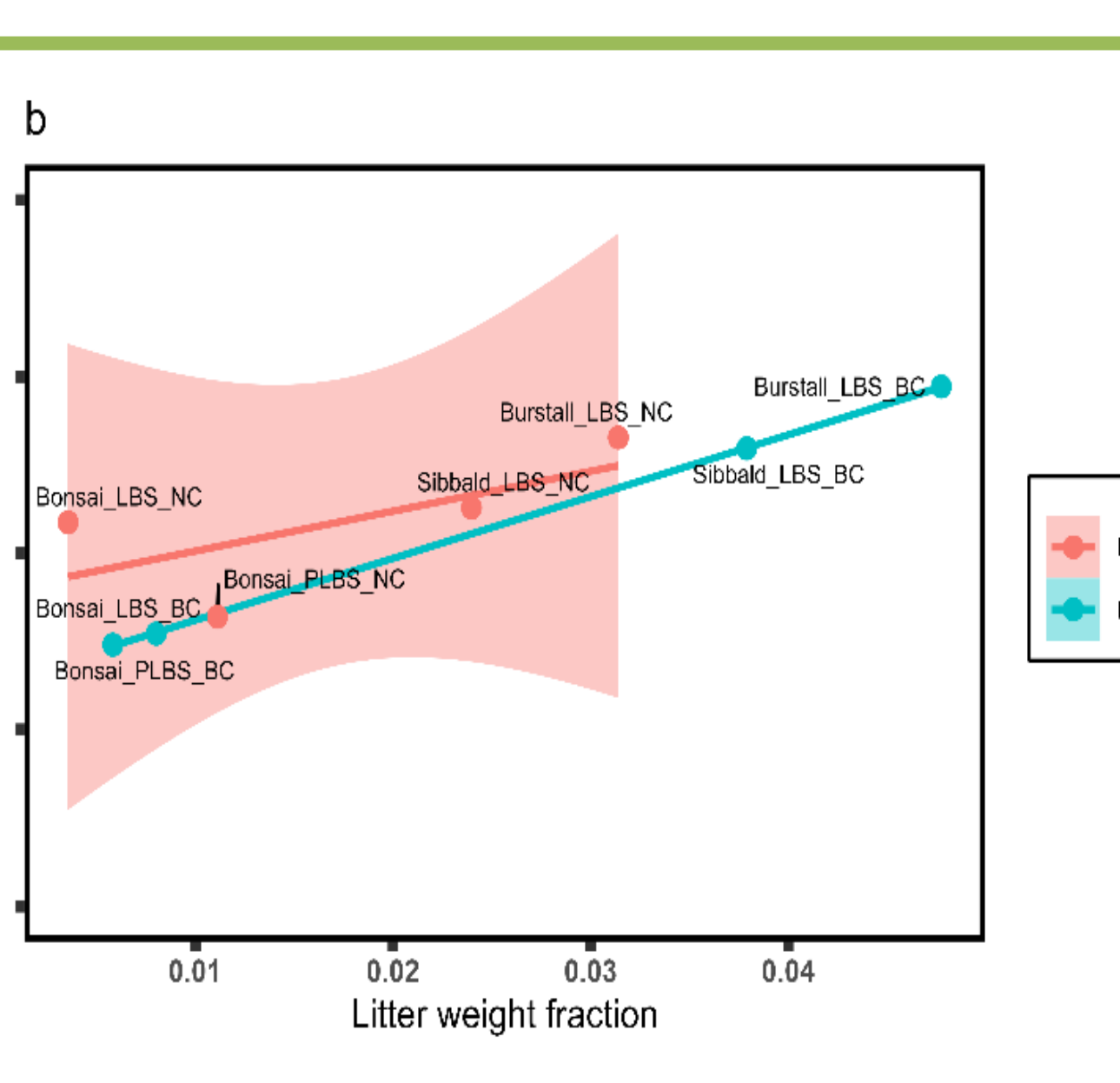
Cross section view of microlysimeters

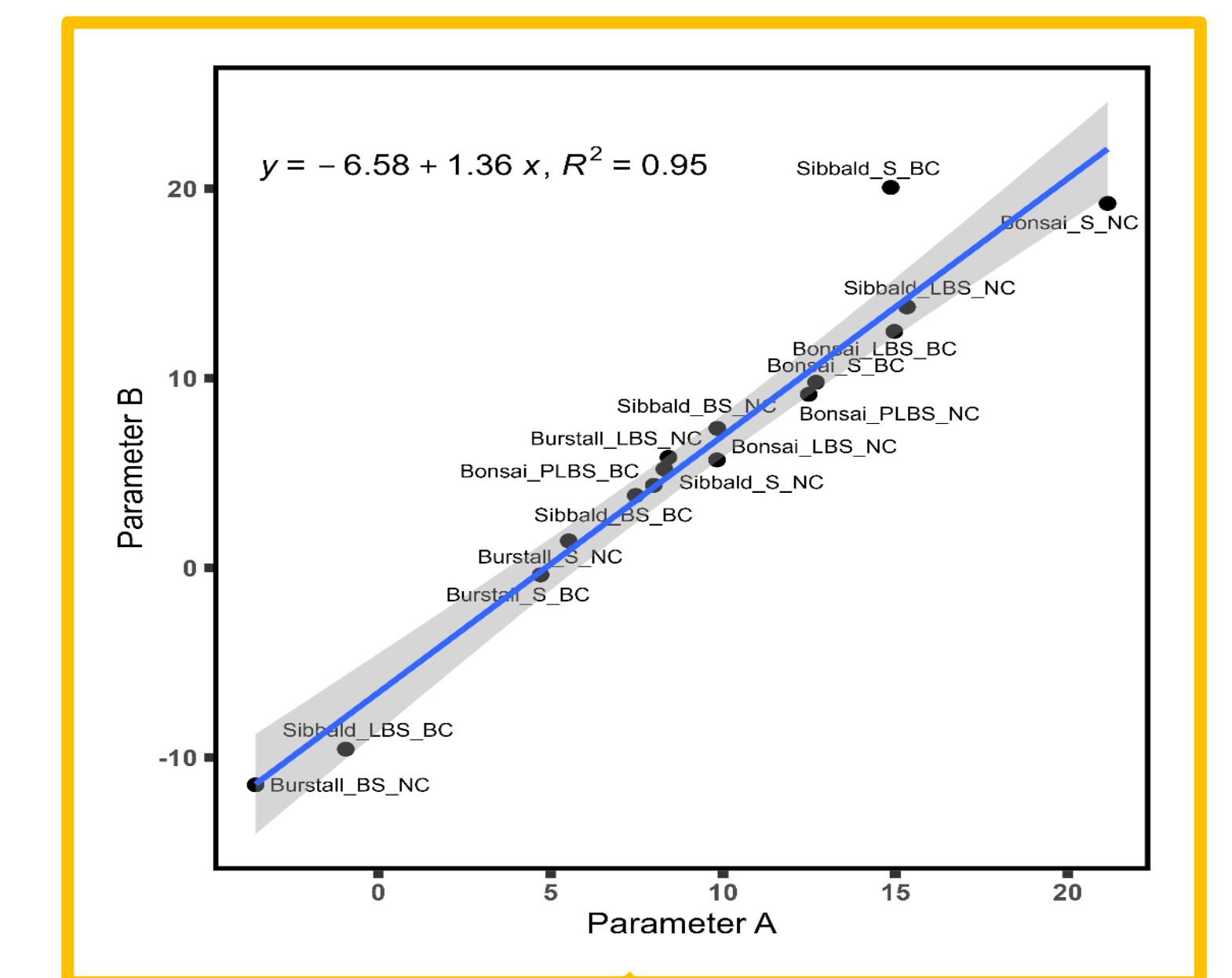
Field photos



References

### Overview of the modelling approach



$y = -6.58 + 1.36x, R^2 = 0.95$

Ground cover weight fractions

Saturated soil moisture

Meteorological observations

Soil moisture

$\theta_{1/2} = 15.82f_B + 3.45f_L + 0.40$  (Eq. 2)

$r_s = \exp[A - (B\theta/\theta_{sat})]$  (Eq. 3)

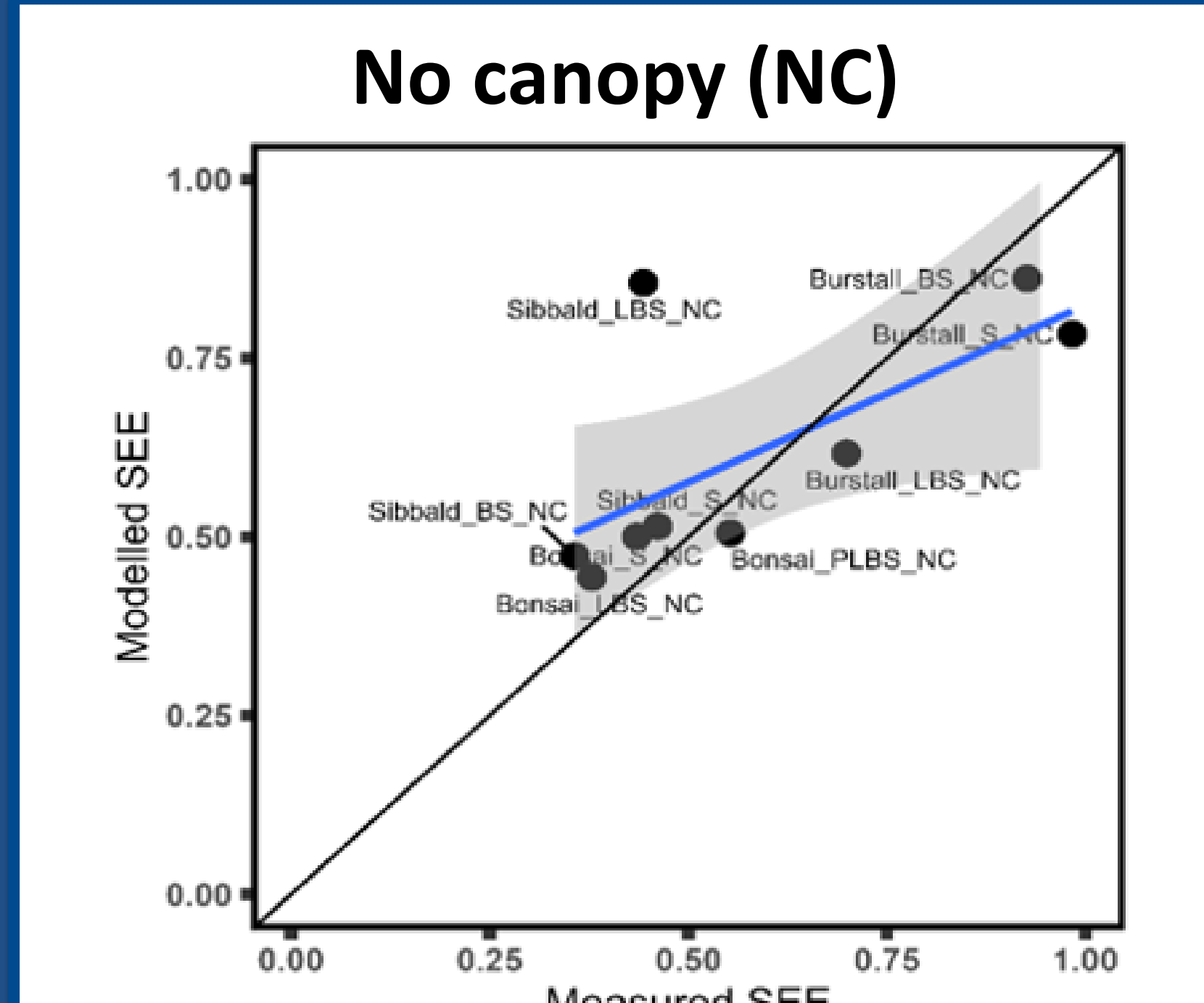
$B = -6.58 + 1.36A$  (Eq. 4)

$SEE = \frac{r_a}{r_a + r_s}$  (Eq. 5)

SEE

### Modelling results

No canopy (NC)



Below canopy (BC)

$SEE_{BC\_corrected\_i} = \frac{SEE_{BC\_i}}{(1 - \frac{E_{0BC\_i}}{E_{0NC\_i}})}$  (Eq. 6)

