

From branch to forest to globe: how do tree choices regarding growth change forest response to eCO₂?

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Background

Fate of carbon (C) following increased photosynthetic activity under eCO₂ uncertain in mature forests [1]. Models predict fraction of C to be stored in wood [2], underlining the importance of global forest sink. Branch and fine wood compartments are neglected in forest research. This project will break open black box of woody carbon dynamics.



Methods

Analysing data from two second-generation FACE experiments.




A. BIFoR FACE - mature Oak-dominated forest in Staffordshire, United Kingdom.

B. EucFACE – mature native Eucalyptus-dominated forest in Sydney, Australia.

Implications

Understanding how trees and forests will react to future CO₂ levels. More accurate global carbon budget models. Further insight in hydraulic properties and protentional changes in turnover rates.



-  Fine wood = poorly understood
-  Branches = poorly understood
-  Stem = well studied

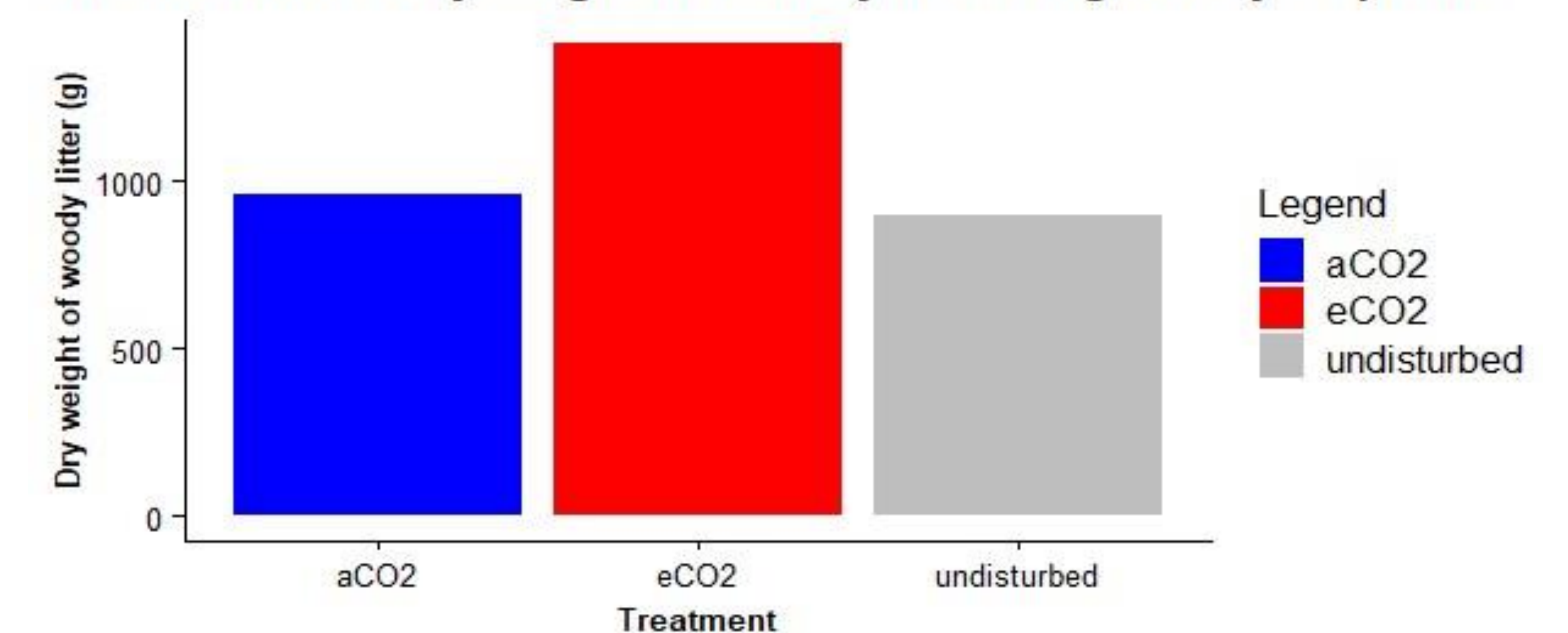
What is the effect of eCO₂ on biomass distribution among woody compartments?

What is the effect of eCO₂ on turnover of woody compartments?

Is there change in hydraulic function of woody compartments under eCO₂?

Do chemical properties of wood change under eCO₂ and does this affect decomposition rate?

The total sum of dry weight fine woody litter caught in 3 year period



!! Caution !! Very preliminary data, work in progress !! Data from BiFoR FACE (2017-2019)

Literature cited

- Jiang et al (2020).
- Walker et al (2019).

Figures created with Biorender.com

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