Berner Fachhochschule
Haute école spécialisée bernoise

Recovery of the forest's protective effect after stand-replacing wind disturbances

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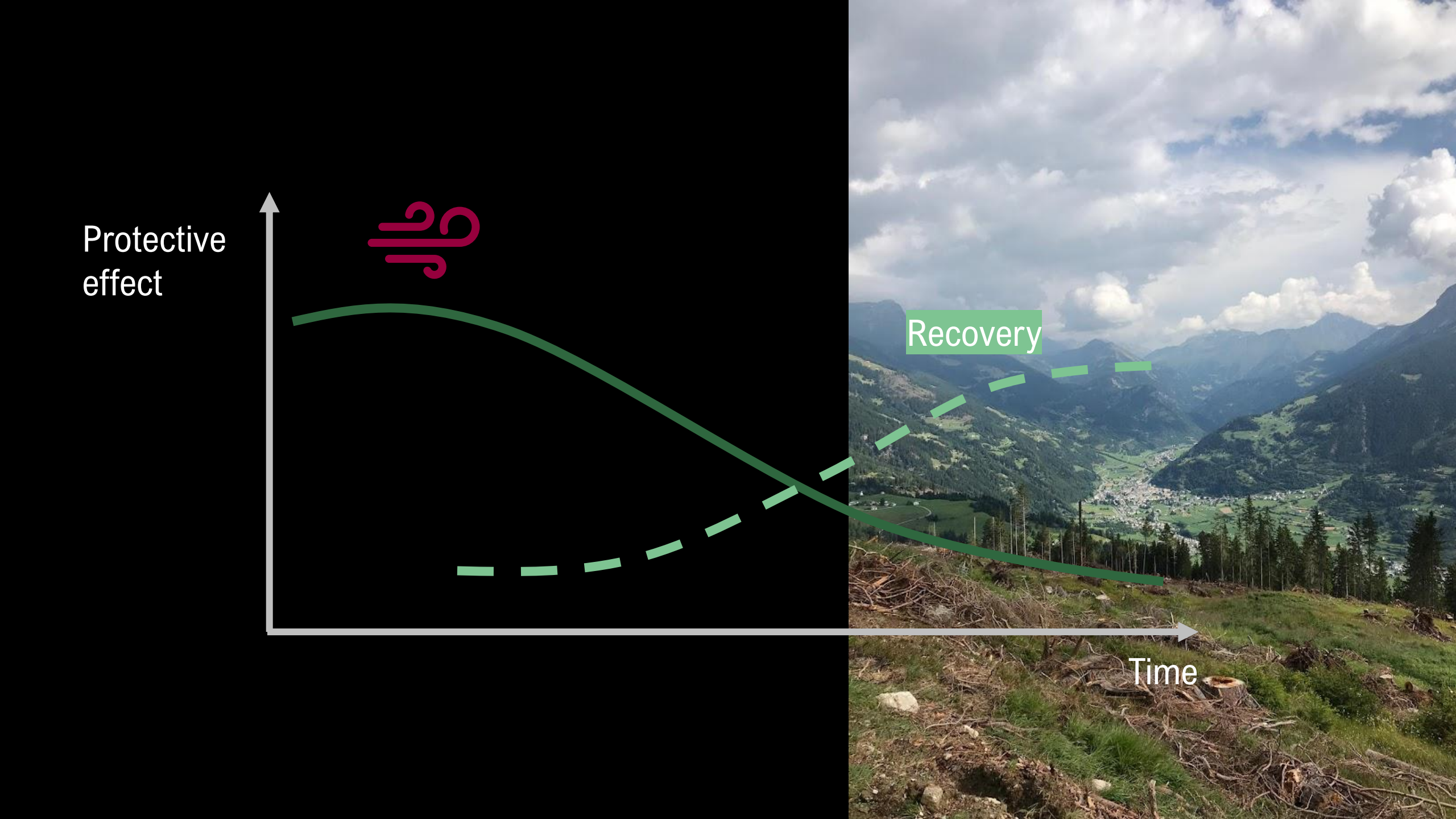

Protective effect
Recovery
Time

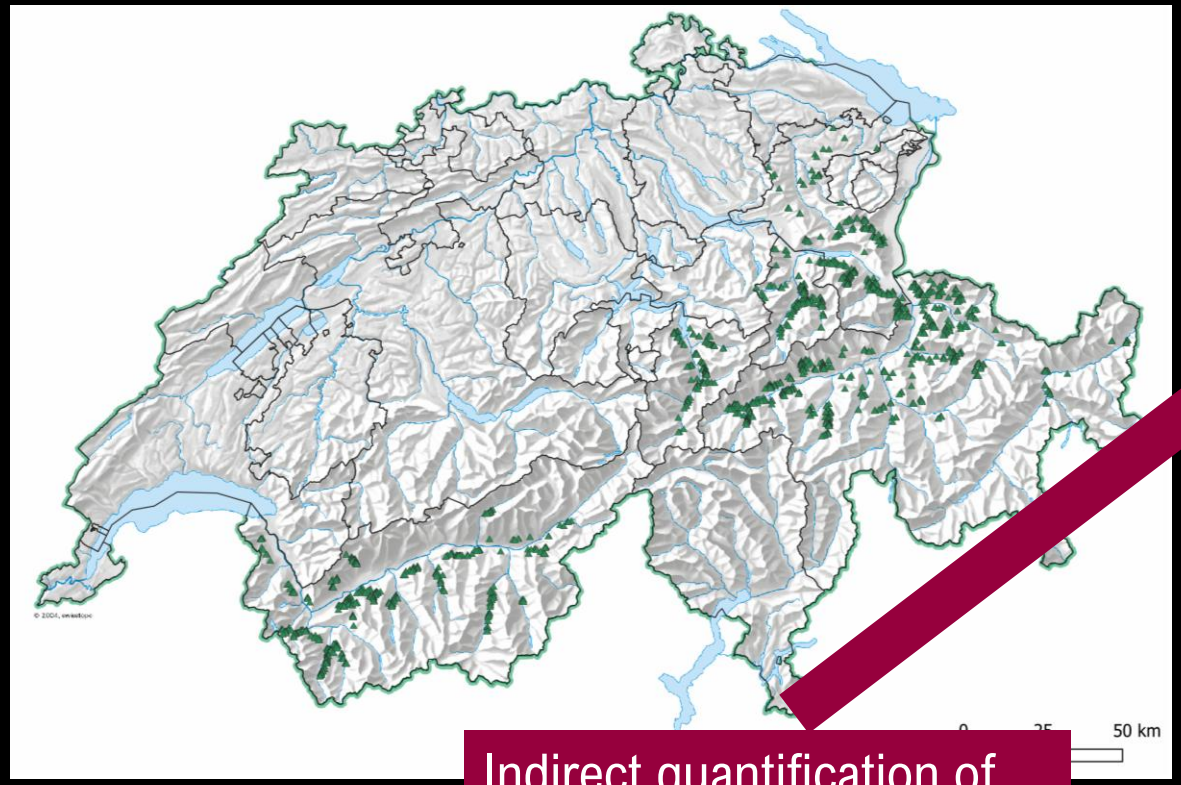
Recovery of the protective effect

- How well did the protective effect recover 13 and 31 after storm Vivian?
- Which are the main drivers influencing the recovery rate of the protective effect?

Moos et al. 2025: Recovery of the forest's protective effect after stand-replacing wind disturbances. https://www.nature.com/articles/s41598-025-03090-9

www.sturmarchiv.ch

Methods

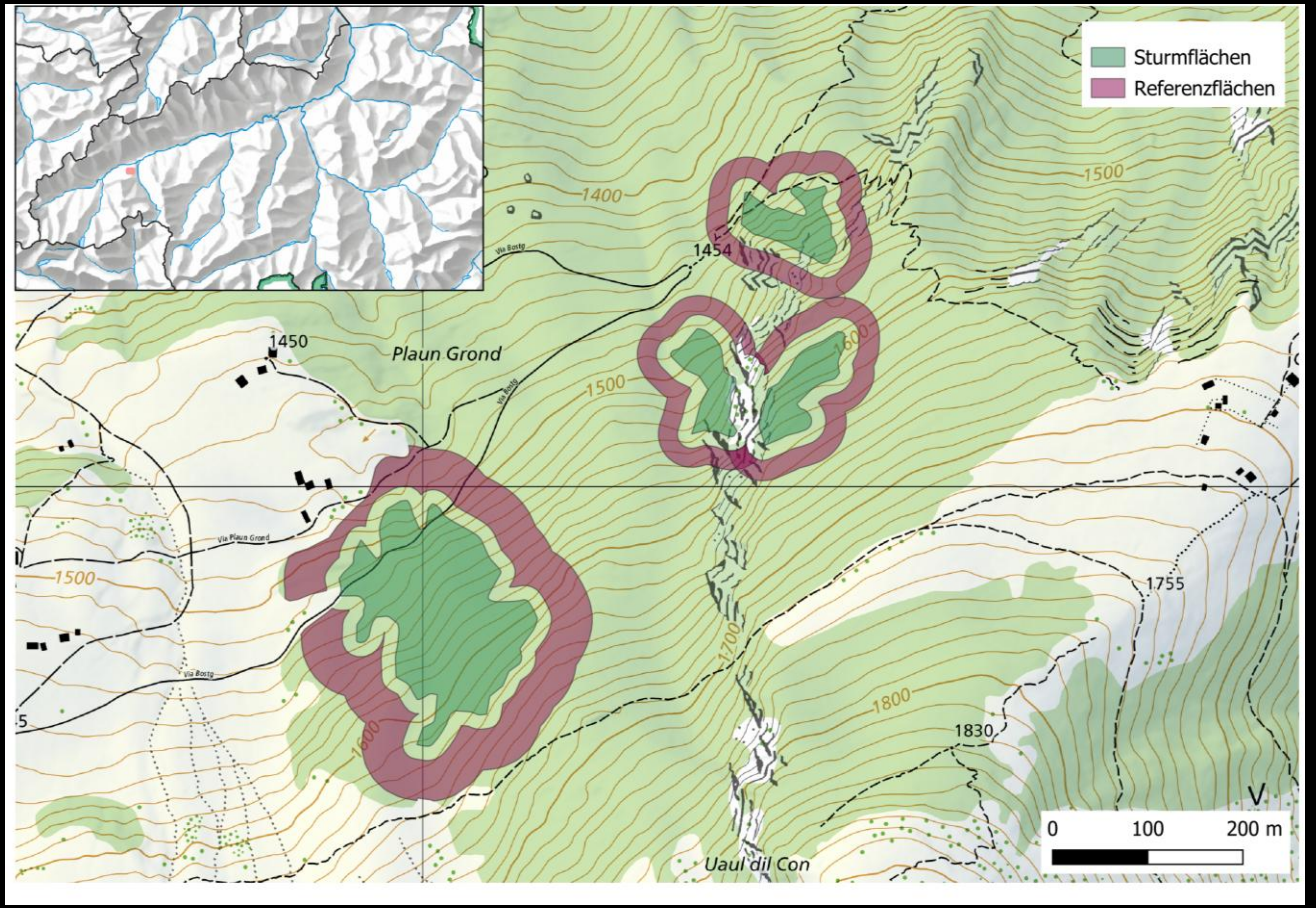


- 1740 windthrow areas in protective forests in Switzerland
- Extraction of forest characteristics based on canopy height model (CHM) and single tree detection

Indirect quantification of protective effect based on forest structure

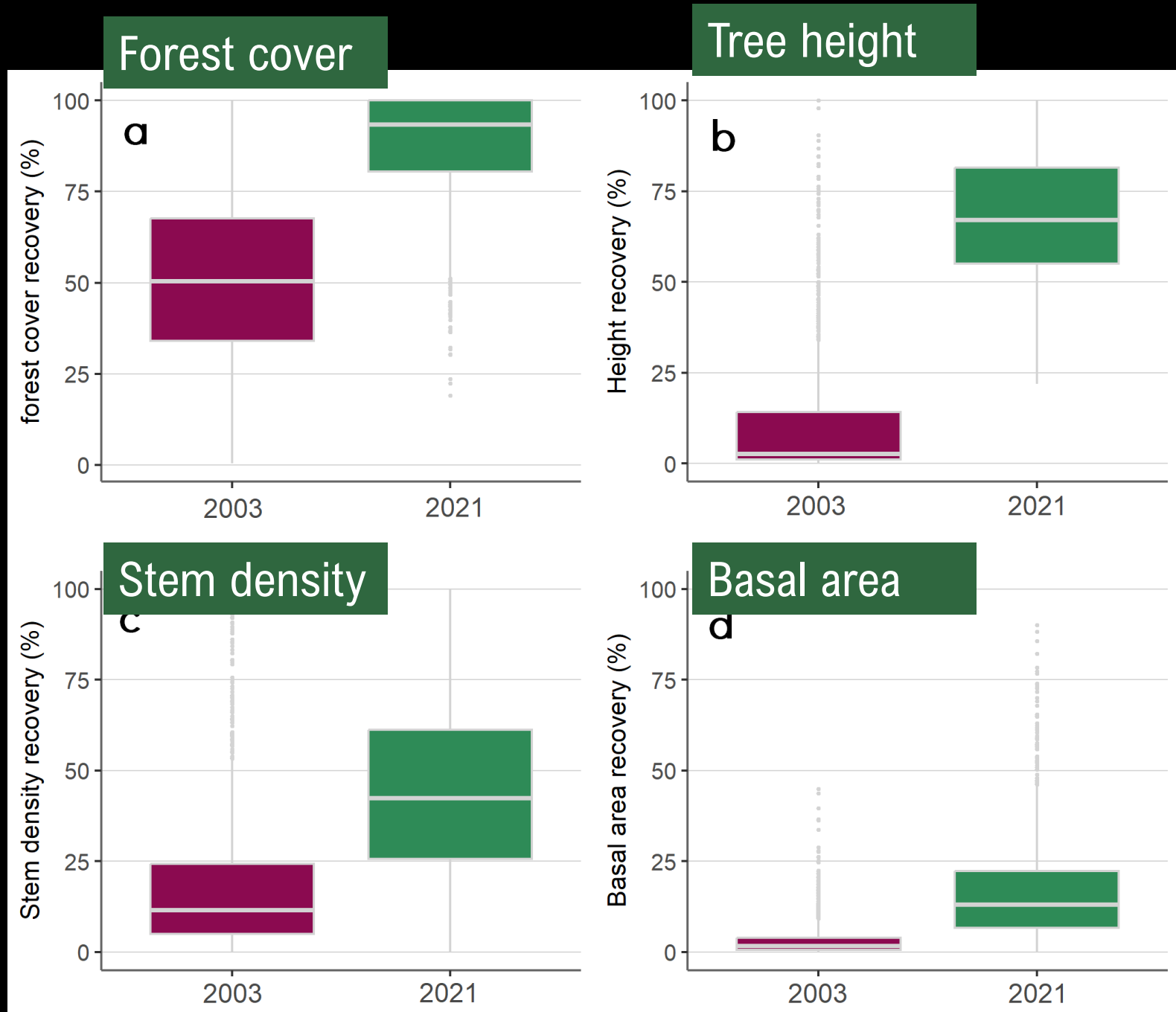
Methods

- Recovery of protective effect in comparison to undisturbed “reference areas”
- Statistical analysis of recovery as a function of environmental variables



Results

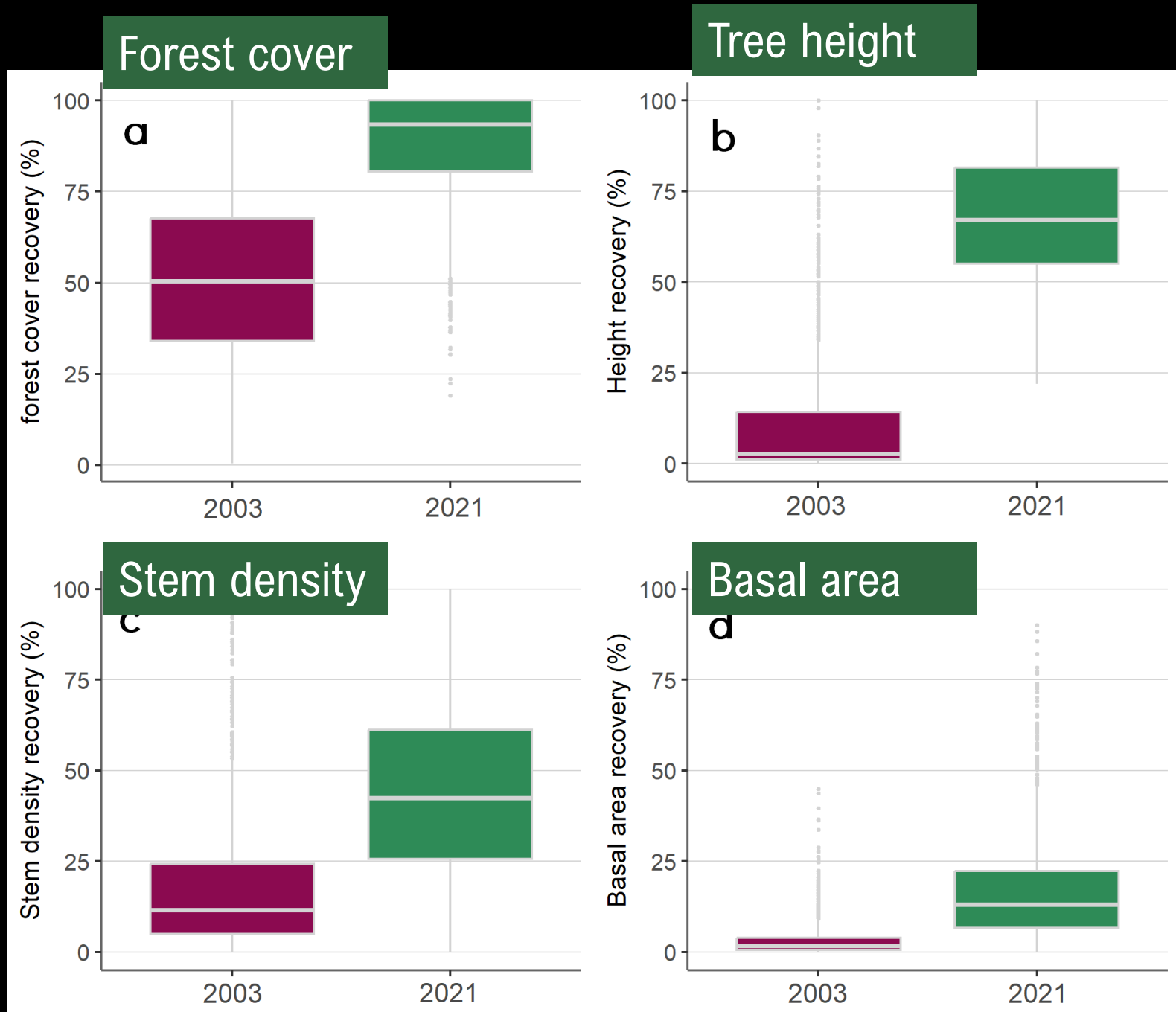
- Significant recovery after 30 yr
- Recovery of basal area critically slower
- Recovery of basal area < 6% in ~25% of the areas



Results

Snow avalanches

Rockfall
Landslides



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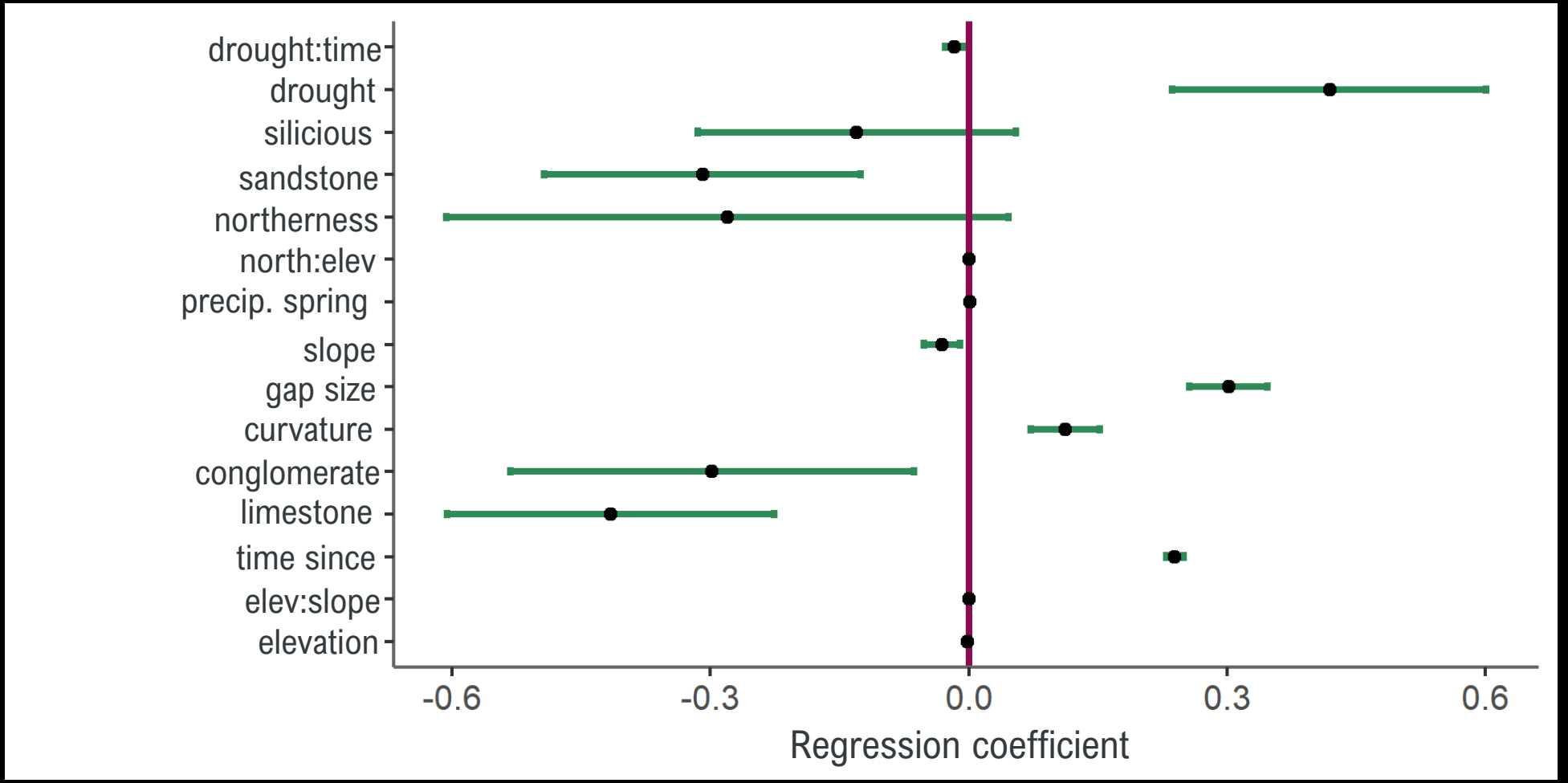
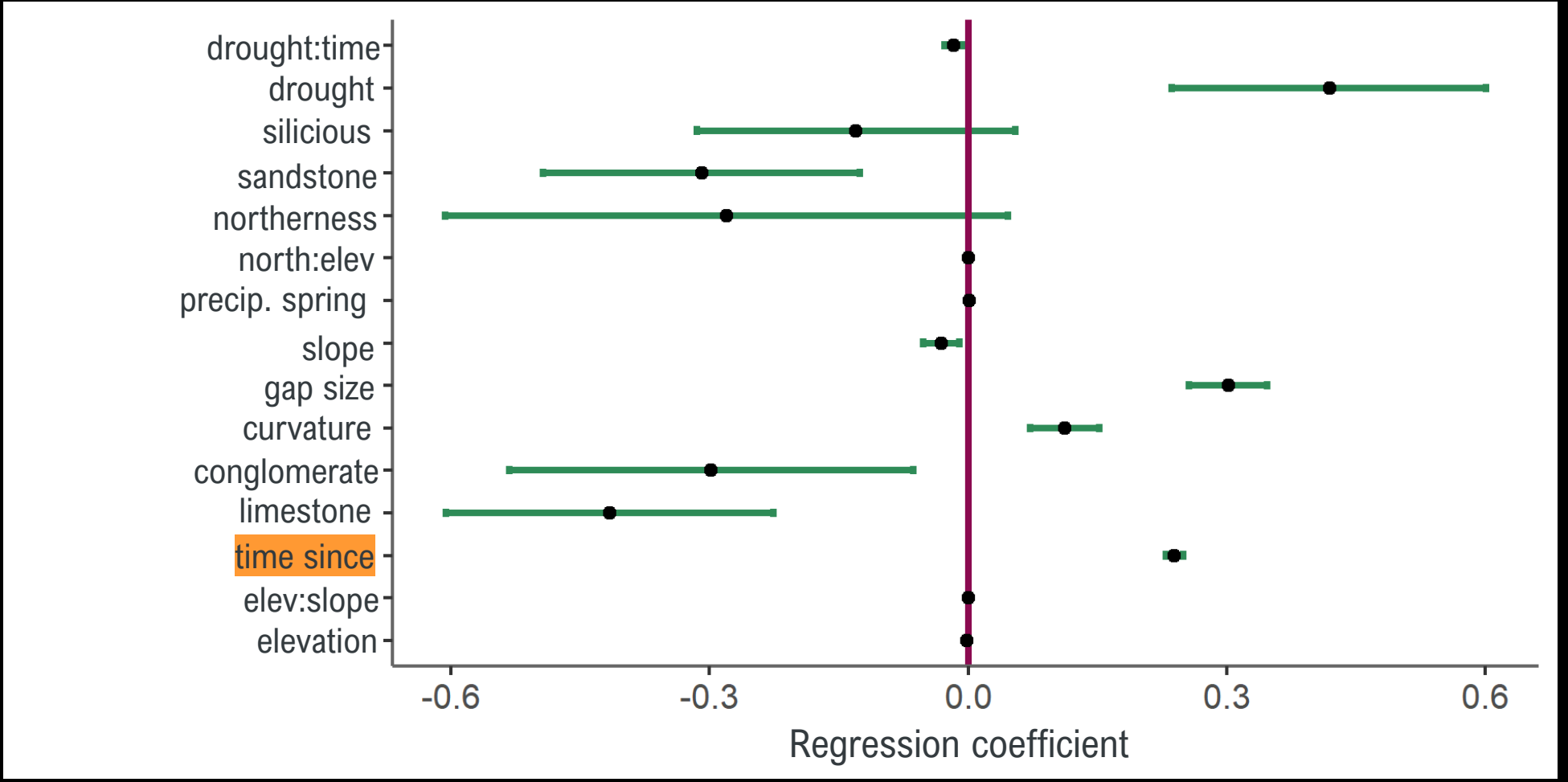


*Coefficients with standard deviation of the multivariate model (GLM) of the recovery of the basal area. * p value ≤ 0.05; (*) p value ≤ 0.1*

Results



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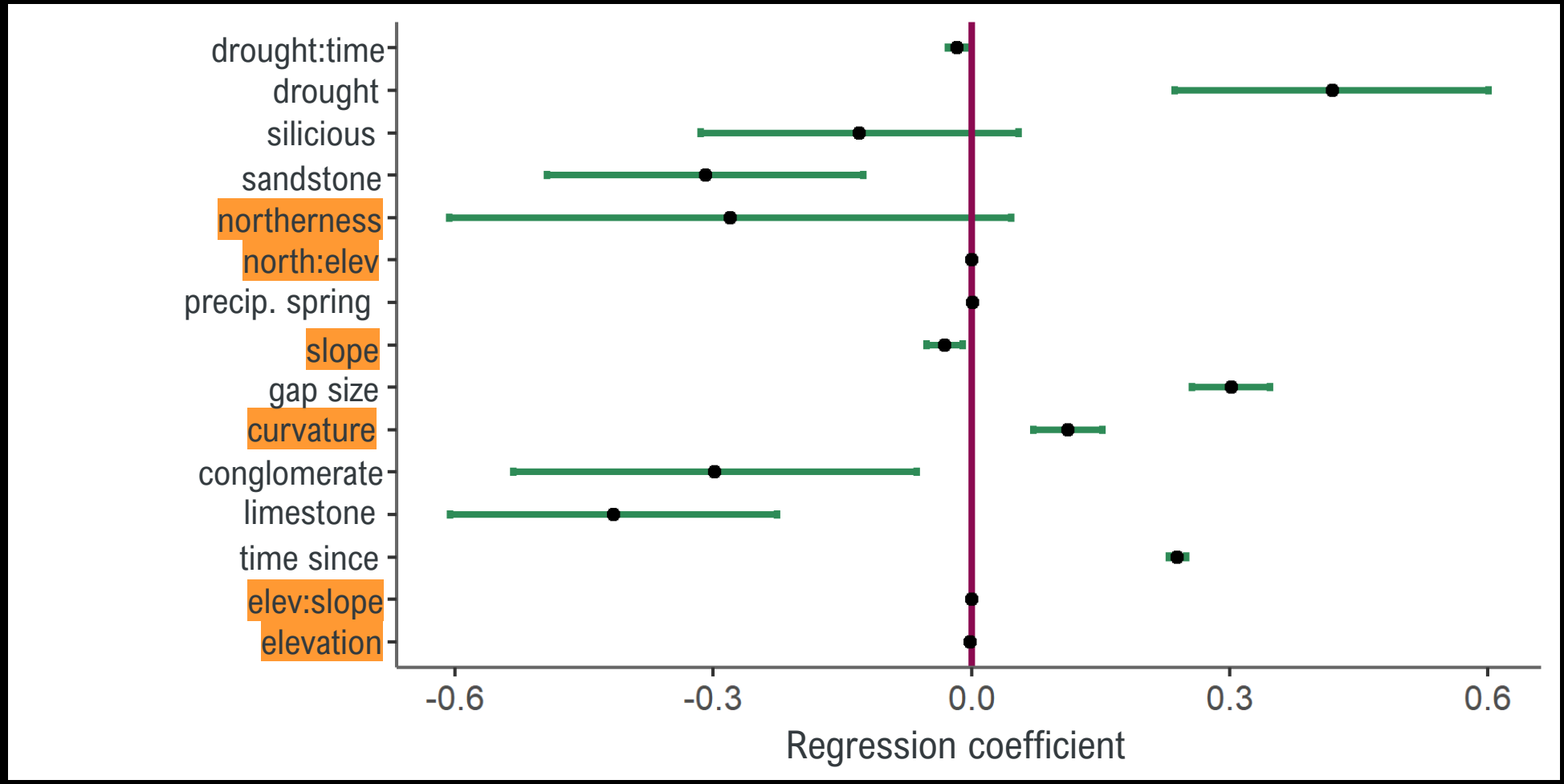

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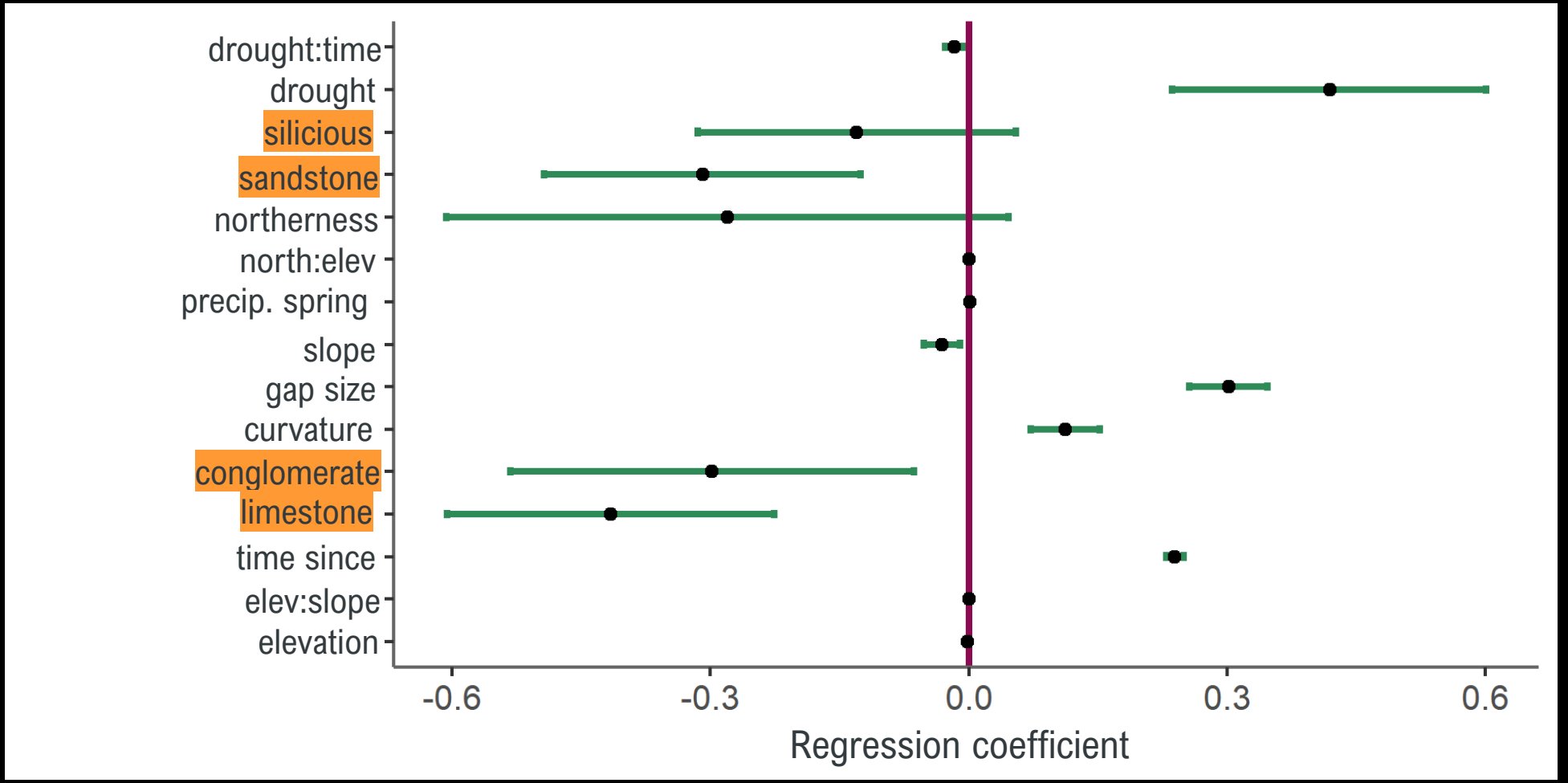

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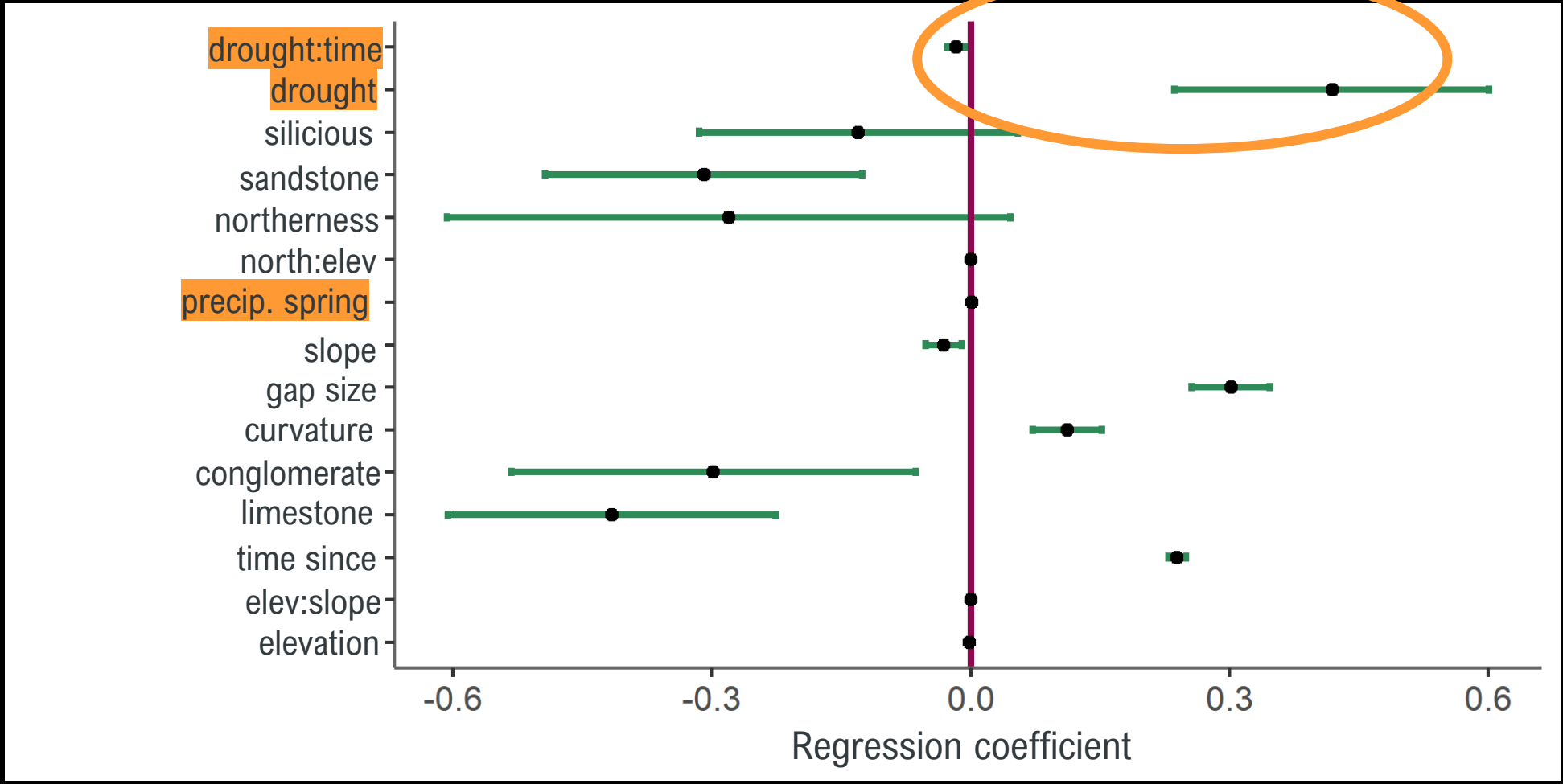

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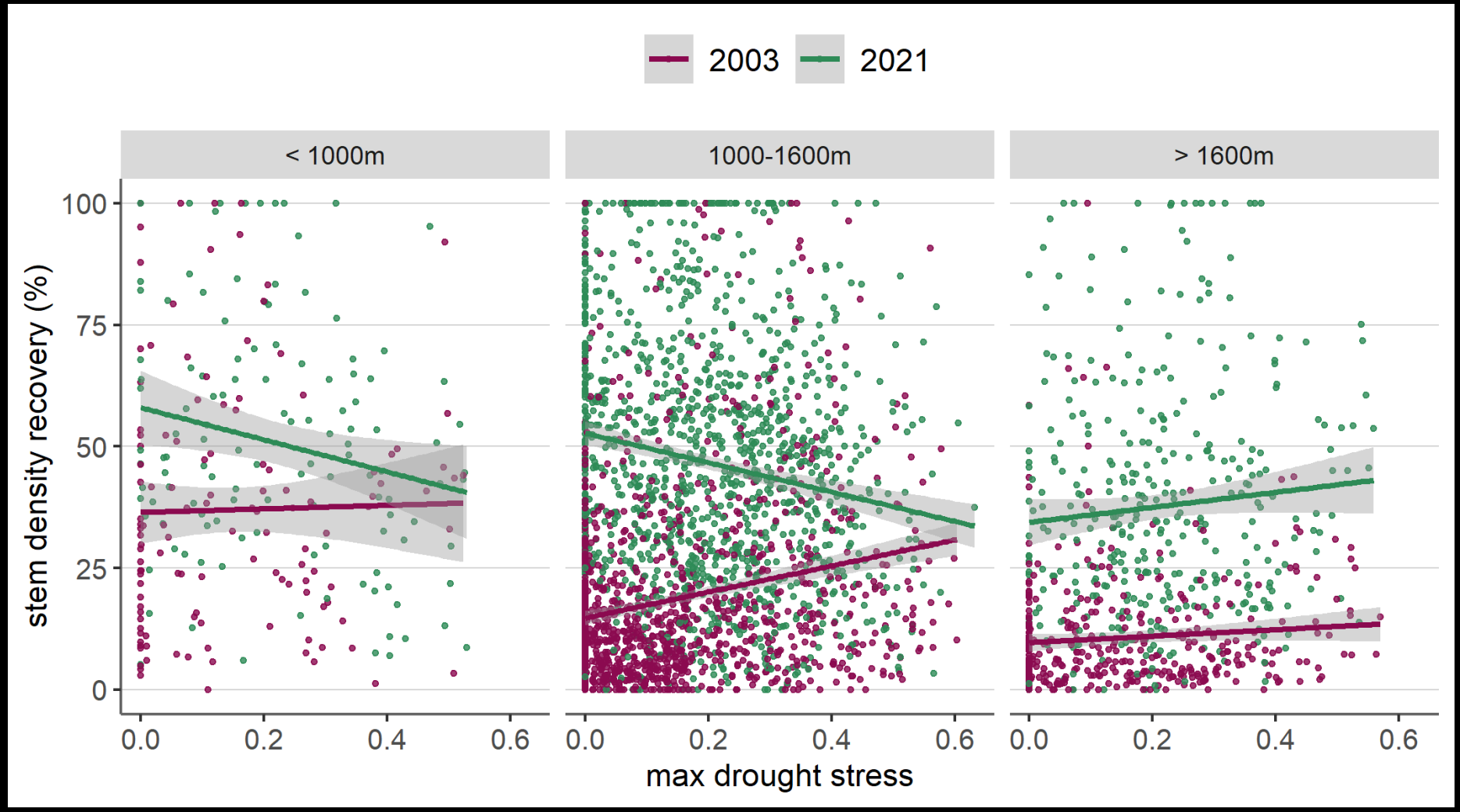

Drought has increasingly negative effect on recovery for elevations < 1600 m.

Conclusions

- Protective effect against snow avalanches significantly recovered after 30 yr (forest cover, tree height)
- Protective effect against rockfall & landslides recovered on average 16 % (basal area)
- Faster recovery at lower elevation (< 1000 m)
- Limiting effect of drought on recovery could increase at higher elevation and on limestone

Thank you for the attention!

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