Outline paper 1

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Abstract

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1. Introduction

2. The model

The active-structural allocation trade-off, base of multi-dimensional strategy space.

Spatially explicit light and water competition (with spatial heterogeneity for water).

Phenotypic plasticity in allocation: objective functions and plastic dimensions and momery.

[☆]Fully documented templates are available in the elsarticle package on CTAN.

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3. Results

3.1. Calibration

3.2. Basic plasticity allocation behaviour

(here or in the Thesis, needed anyway). Evolution of carbon pools and eventually traits between the different algorithms.

3.3. Response to a gradient

Hypothesis: More conservative strategies will have better 20*20 root strategies, along 20 water gradient

Show the ability of the model to have different optimum depending on the resource availability. Needed for heterogeneity to have a positive impact on functional diversity. The effect is a bit weak, but should be enough.

Phenotypic plasticity doesn't change a lot (but already caped for gradient high part).

Water availability memory is need for equilibrium, check if there is a good alignment between memory and water availability.

there is a little offset toward higher $w_i ni, probablybecauseinvestmoreinshoottissueswithhigherorganeffici$

3.4. Study of a parameter space

strategy space $(15^3 strategies) * 20 parameters * 2 conditions (highresourcesandlowresources$: 1/4)

$Doesplasticitywork? Coulditimprovecoexistenceandlimitinvasion?$

$isthereanoverlappingbetweenthebestperformerstrategies(foragivenpositioninthe2Dspace, within0.9-1relativeperf)betweenthetwoconditions. Doesthatchangewithplasticity? - plasticitymaketheplantexploreless$

$Lookatoverlappingof"equivalentstrategies".$

3.5. Response to variable environment

No particular benefit of plasticity but going to a better strategy sub-space. Even between best strategies, plastic plant should have advantage over the non plastic ones.

Hyp: the time variability of the resource may lead to different optimum phenotype despite the same average because of evaporation and feedback on resource: the average realised water availability may change.This effect should be reduced by plasticity that will promote tissue efficiency over equilibrium.

Hyp: plasticity advantage is better perceived in variable environment. Increasing temporal variability of water resource should increase the advantage of plastic plants over best non plastic plant.