Invest now, get paid later? Growth strategies to cope with environmental stress and benefit from extended growing seasons in a future climate

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1 1. Intro

1.1 Investment by trees

Why it matters with cc opening paragraph

1.2 Introduce seasonality

frost etc. investment in a risky environment

1.3 introduce soil moisture

can we forecast with CC from temp and moisture alone env. drivers of groth, but this is not enough instrinic programming matters

2 2. Introduce Concept of deerminism

history , old poplar in 70ies, many terms what is it? fig 1 sentense represented as dichotomous but intermediate examples exist

3 3. what controls/drivers of determinism

a)total physiology/envrironmental control 1-2 para warm, wet, ideal leads to indeterminate? but environment varies above/belowground R:S matters but this perspectives suggest you can flip species strategy completely and we do not see that. b) Genetically controlled /species variation see box/table/fig with list of species general overview of species vary c) these are fundamental trade-offs - both successful and co -occur in communities successional stage, ontogeny, life span
...but will both still be successful with CC?

4 4. CC

Figure explain. temp vs. moisture vs. who wins/ phenology C sequestration

5 5. future directions

Questions critical forcasting now to larger evolution questions
a) (1-2 paragraphfs) how much does dezerminism predict bufferin vs. exploitation of env. change? explain this in simple words experiment phaenoflex
b) How flexible are spp. in determinism? need an answer to get anywhere but must approach from several fields
bi) Physiology: universal across meristmes? linked to xylogenesis? universal across allocation? (reproduction, storage and growth?) gene/hormones (1-2 para) bii) Evol. history (end on metric fortshadowing)
c) better metricx opening....its treated dichotomy by 1 field, flexible by a different so clearly it has variability we need to understand to move forward
we propose several metrics from best to worse, dificult to easy. (1) nleaves EOS /n leaves in buds SOS (2) shoot elongation/dendrometers radial growth?
(3) "second flushes" in large databases? US national forest network NDVI second flushes?