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Forest Management Scenario Study with BiomeBGC at nine ICP Forests Plots



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Presentation

Objectives

FM Scenarios with BIOME-BGC (Vers. ZALF)

Nine ICP Forests plots

Climate Scenarios

Results of Sensitivity Study

Main Results of Long Term Simulation



Main objectives

Are the level II plots suitable to investigate the carbon budget of forests?

How much carbon is stored and turned over in forests of level II plots?

Do the investigated forests react as a carbon sources or as **sinks**?

How does the carbon source-sink relationship develop under expected future
climate conditions and FM scenarios?



FM Scenarios with BIOME-BGC (Vers. ZALF)

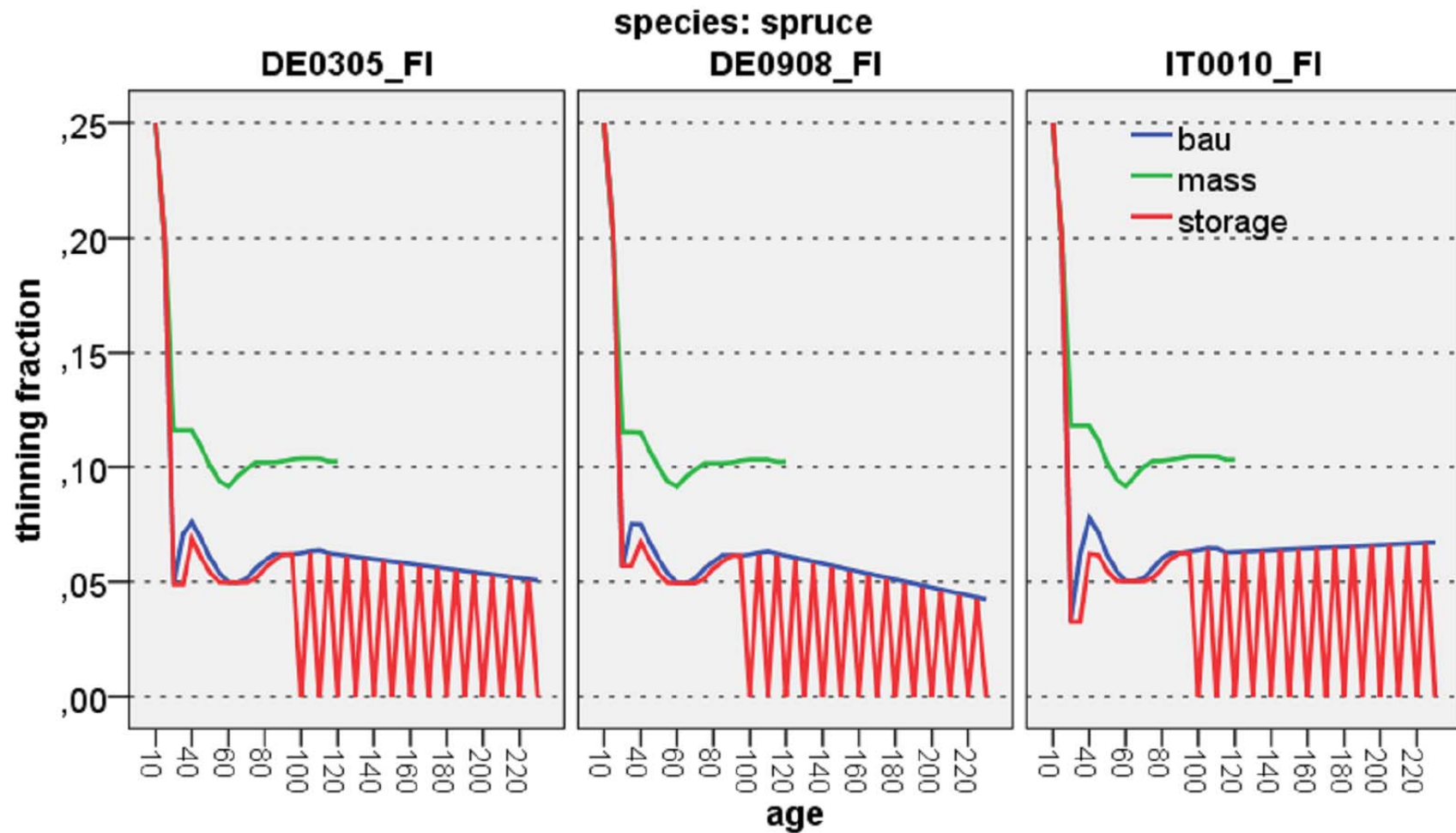
Forest Management Scenarios:

	Rotation Period	Thinning Strength	Harvest Fraction
bau	standard 120/180	standard (yield tbl)	standard
mass	shortened 90/120	earlier, increased	increased 110
storage	prolong 180/240	later, decreased	decreased 84

Biome BGC (Vers. ZALF)

Parameterization available from previous studies under FUTMON

Selected ICP Forests plots





Nine ICP Forests plots

High variation in elevation, less pronounced in continentality!

Parameterization available (FUTMON)

High level of data availability

Selection of paired/neighbouring plots in order to allow for simulation runs with tree species parameterization at similar sites (not presented):

plot	species	age	elev	lon	lat	temp	prec	Ndep	water
DE0304	Fagus_sylvatica	163	504	9,58	51,76	7,1	1134	33,2	80
DE0305	Picea_abies	128	508	9,58	51,77	7,1	1134	43,7	128
DE0307	Pinus_sylvestris	66	30	7,86	52,91	9,2	830	35,5	113
DE0308	Quercus_robur	128	109	9,91	53,18	8,5	826	23,1	72
DE0901	Pinus_sylvestris	108	406	11,32	49,41	7,7	832	17,1	56
DE0908	Picea_abies	92	840	12,40	49,76	6,0	911	21,5	81
DE0919	Fagus_sylvatica	158	508	11,66	48,41	8,1	790	21,0	89
IT0010	Picea_abies	103	1175	9,35	46,23	6,9	1395	9,7	42
IT0012	Fagus_sylvatica	83	1125	8,07	45,68	7,2	1448	17,5	56



Nine ICP Forests plots

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Climate Scenarios

Scenarios known from FutMon climate scenarios:

	_2030	_2100
A1B	2001 - 2030	2071 - 2100
B1	2001 - 2030	2071 - 2100

Not presented in detail:

A1B_prec	precipitation increased
A1B_temp	temperature of A1B_2100 increased by 2°C
A1B_const	one average year



Results

FM:

Carbon pools of vegetation dominated by rotation period and thinning intensity mass: -28% (13% total C), harvest +24%; storage +23%(+11), harv.-24%

Carbon in deadwood and soil mainly influenced by harvest fraction extracted

Climate variation shows lower influence on carbon in vegetation and in total (but: for A1B_temp reduction in soil carbon observed)

GPP increased by climate change ($B1_{2100} < A1B_{2100} < A1B_{temp}$) but not so NPP and NEP as AR (autotrophic respiration) increased as well



Results

BUT: Case studies don't allow for generalization of results!

butbut:

- plausible results on basis of process based modelling

- this neighborhood test was positive on robustness of parameterization files



Thanks for your attention

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