

4C (FORESEE)

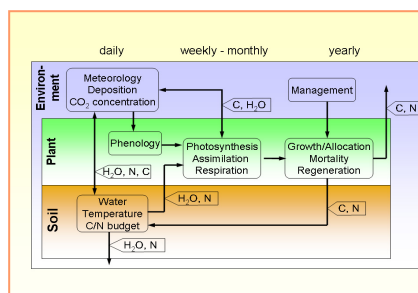
A PROCESS-BASED FOREST DYNAMICS MODEL APPLIED FOR CLIMATE IMPACT AND ADAPTATION STUDIES

FIELDS OF APPLICATION

The model 4C is used to

- Analyse carbon budget of forest stands and soils (ForestFocus)
- Develop adapted management strategies under climate change (OakChain)
- Estimate biomass yield of SRC plantations (BVVG)
- Provide impact analyses for CLIMREG, INKA-BB
- Derive climate impact functions for efficient investigation of climate impacts on European tree species (UBA-FISKA)

MODEL SCHEME



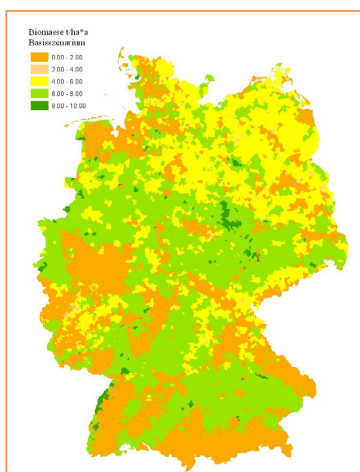
ASPEN SRC PLANTATIONS UNDER CLIMATE CHANGE

Goal

Estimation of biomass potential by short rotation coppice (SRC) plantations with Aspen as renewable energy source

Method

- 12.5 M ha arable land available
- Soil data BÜK 1000
- Climate scenarios (STAR II 0.5 K trend scenarios)
- Implementation of SRC and species Aspen (*Populus tremula*) in 4C
- Simulation of SRC on 7010 patches



Results

- 4 M ha were selected as suitable for SRC plantations
- 5.9 t DW ha⁻¹ a⁻¹ biomass yield under current climate (1987-2006), see Figure (left)
- Increasing annual biomass yields under climate change (2041-2060), see Table (below)

STAR Sc.	0 K	1 K	2 K	3 K
Yield [t DW ha ⁻¹ a ⁻¹]	5.9	6.5	6.9	6.7

ADAPTED MANAGEMENT OF PINE – OAK STANDS : PROJECT OAKCHAIN



Project goal

- Sustainable management of mixed oak-pine forests in the subcontinental Northeastern lowlands
- Quantifying the yield of mixed oak-pine forests under combined impact of climate change and varying management strategies by means of the forest growth model 4C

Method

Analysing the impact of contrasting management strategies (YO, CS) and three STAR climate scenarios (I-III) on carbon budget and timber yield of two mixed pine-oak stands (2007 – 2036).

Results

- Climate change has slight effect on carbon budget and timber yield
- Yield oriented management (YO) leads to lower carbon storage in the forest, especially for the younger stand (left Fig.)
- For older stands carbon storage strategy (CS) results in less significant carbon storage compared to the YO strategy (right Fig.)

