CO2FIX - A Carbon Accounting Model

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CO2FIX simulates the stocks and fluxes of carbon for forest stands
-based on the growth rates of stem wood
*Yield tables
*Inventory results

Carbon Stocks estimates:
*Biomass (stem, braches, roots and foliage)
*Soil (litter and stable humus)
*Products (dead wood, sawn timber, paper, energy and particle board)

Biomass
-relative allocation in relation to stemwood volume increment
-turnover time

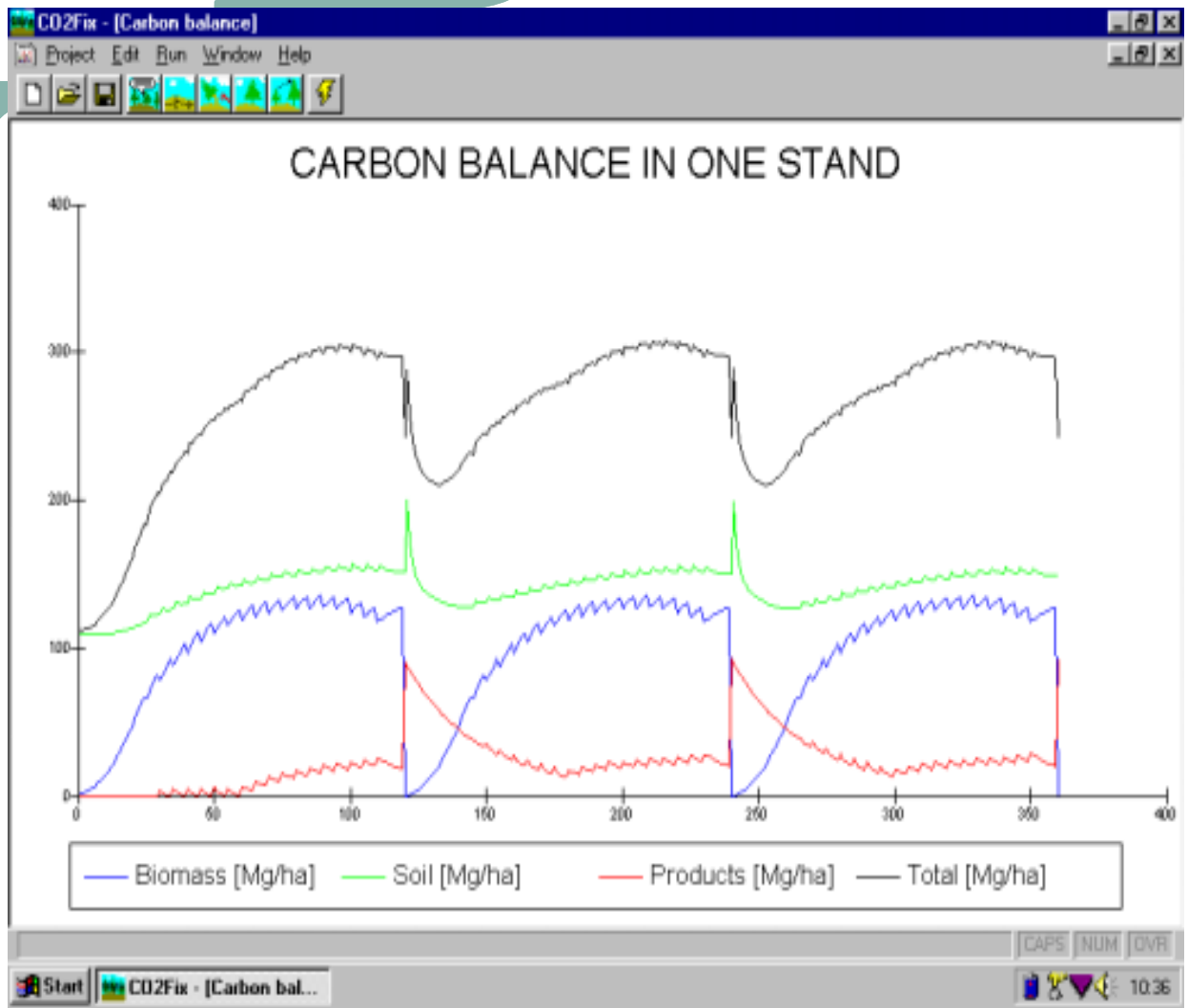
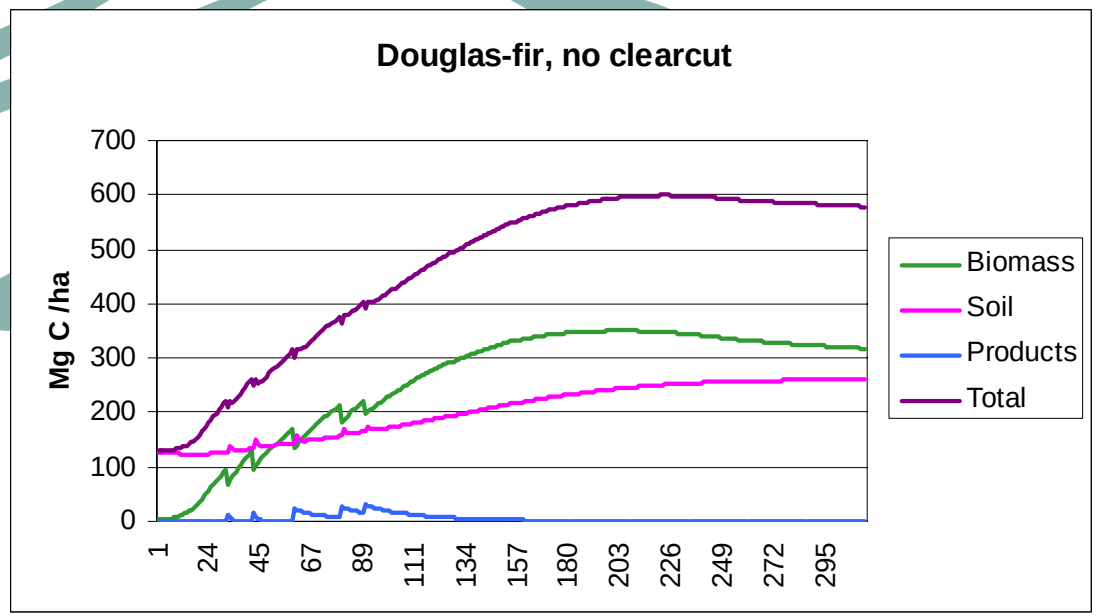


Fig 1. Example of results of managed Norway spruce stand. The rotation length is 120 years and the simulation is started from bare ground.



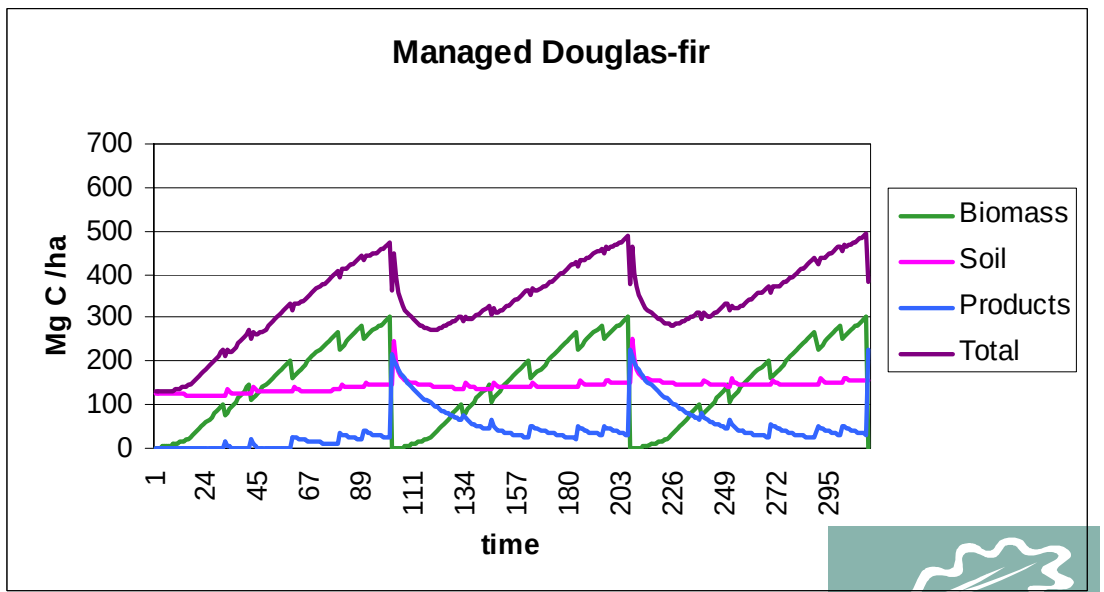


Fig 2. Comparison of the carbon stocks of a managed forest Douglas-fir forest (100 year rotation) in the Pacific Northwest of the USA and an unmanaged forest (some thinnings until year 90 after stand establishment) on the same site. The increase of soil organic matter in the unmanaged form is caused by the natural mortality, resulting in large amounts of coarse woody debris. In the managed form that stock is found in the products. The fact that the unmanaged forest results in a larger total C stock is specific for this site.

CASFOR project

http://www.efi.fi/projects/casfor/

The aim of the project is to develop further the CO2FIX model and dissemination of the model through the World Wide Web. registrations since CO2FIX was launched on 1 June 1999. The number registrations since CO2FIX was launched on 1 June 1999totalled 361 by 21st March 2000 and stem from 54 different countries.

The planned improvements of CO2FIX: FOREST

-The aim is to add new features to CO2FIX, a new "three cohort model" can simulate:

- *selective logging
  - -Pioneer species
  - -Intermediate species
  - -Climax species
- *Agro forestry systems
  - -Timber trees
  - -Service trees (N-fixing)
  - -Crop (coffee

SOIL (under work)

1)Second “box” to stable humus (more realistic dynamics of soil carbon)

OR

2)Integrate CO2FIX with more detailed soil model (e.g. ROTHC, CENTURY…)

Products

-more detailed model (See Pingoud et al 2000)

-take into account process release of carbon

Literature:
Kim Pingoud, Anna-Leena Perälä and Ari Pussinen. 2000. Inventorying and modelling of carbon dynamics in wood products. Proceegings of IEATask 25: Greenhouse Gas Balances of Bioenergy Systems Workshop. Bioenergy for mitigation of CO2 emissions: the power, transportation, and industrial sectors. 27-30 September 1999, Gatlinburg, Tennessee, USA. K. A. Robertson and B. Schlamadinger (eds.). 125-140.