



SOILN

Eckersten et al. 1998

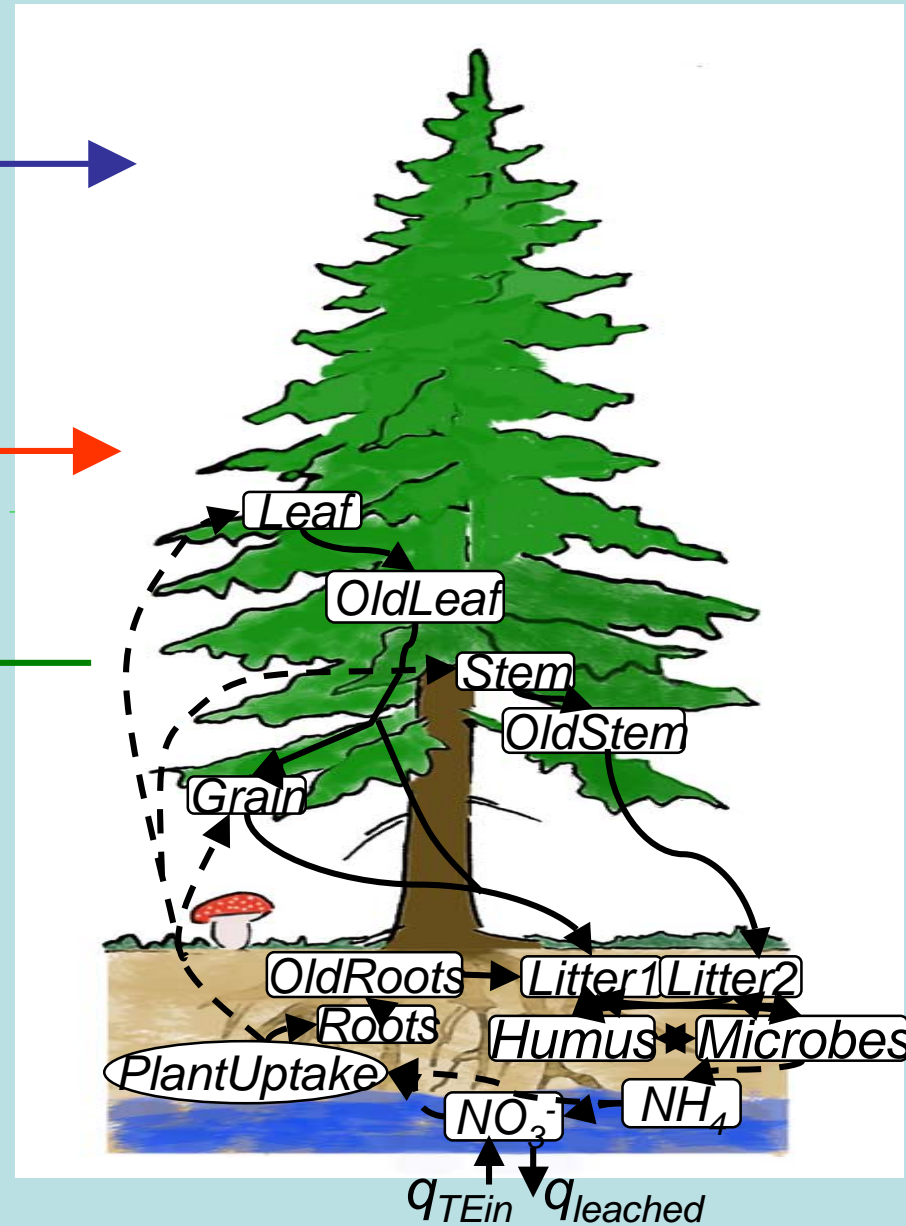
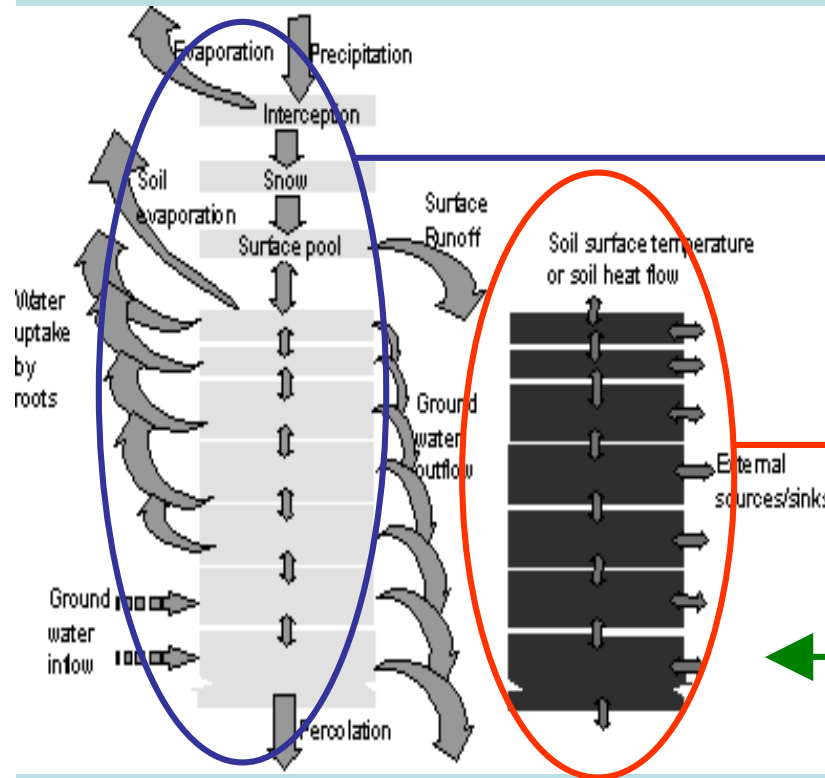
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Models

Water and Heat

Carbon and Nitrogen



CoupModel
(Jansson & Karlberg, 2004)

SOILN
(Eckersten et al, 1998)

Photosynthesis & growth

Plant & soil respiration

N fertilization & deposition

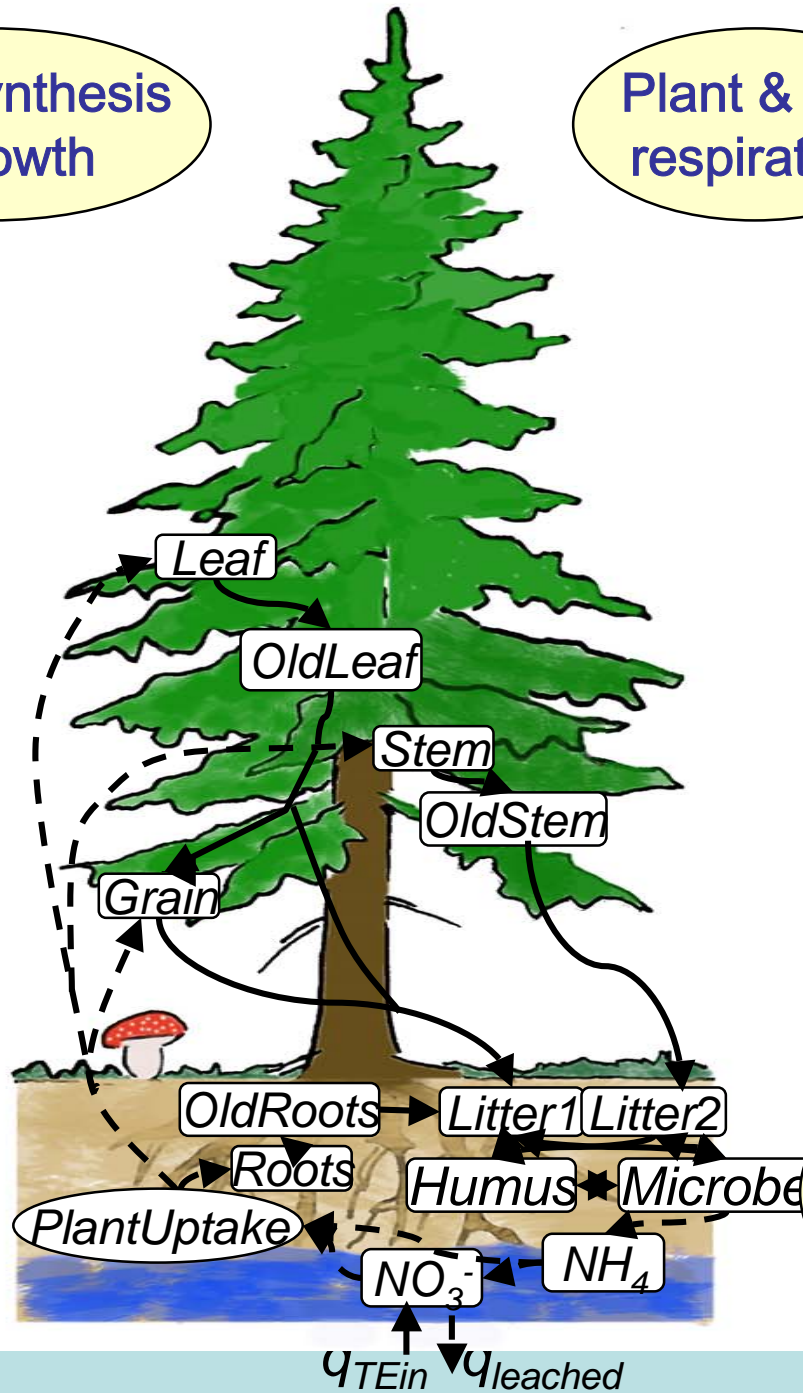
Harvest

Plant uptake & allocation

Mortality & litterfall

Decomposition, immobilization & mineralization

Nitrification, denitrification & N leaching



Assumptions of processes

- Photosynthesis & growth = $f(N, \text{radiation}, E_{TA}/E_{TP})$
- Decomposition, immobilization & mineralization = $f(\text{SOM}, C/N_{\text{SOM}}, \text{Microbial biomass \& activity}, T_{\text{soil}} \text{ and } \theta)$
- Plant uptake; organic N uptake = $f(\text{Plant biomass \& opt. } C/N_{\text{plant}}, \text{ N deficit}, \text{ SOM})$

INPUTS

- Driving variables: Infiltration rates, Water flow between soil layers, T_{soil} and θ , radiation, $E_{\text{TA}}/E_{\text{TP}}$, (LAI, height)
- Parameters: Optimum radiation use, allocation pattern, litter production and decomposition rate, soil porosity
- Initial C and N content of all plant & soil pools

Strength & Weakness

- Process oriented
- Dynamically coupled to water and heat balances
- Well tested and calibrated
- Needs much information, parameters
- One-dimensional
- Process level:
 - No respiration costs for organic N uptake
 - All N deposition wet

Regional modeling:

Detailed process oriented model

Meta model produced by neural networks