SOILN

Eckersten et al. 1998

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Water and Heat

CoupModel
(Jansson & Karlberg, 2004)

Carbon and Nitrogen

SOILN
(Eckersten et al, 1998)
Assumptions of processes

- Photosynthesis & growth
  
- Decomposition, immobilization & mineralization

- Plant uptake; organic N uptake

\[ f(N, \text{radiation}, E_{TA}/E_{TP}) \]

\[ f(\text{SOM}, C/N_{\text{SOM}}, \text{Microbial biomass \\ activity, } T_{\text{soil}} \text{ and } \theta) \]

\[ f(\text{Plant biomass \\ opt. } C/N_{\text{plant}}, N \text{ deficit, } \text{SOM}) \]
INPUTS

• Driving variables: Infiltration rates, Water flow between soil layers, $T_{soil}$ and $\theta$, radiation, $E_{TA}/E_{TP}$, (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