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Swiss Confederation

Federal Department of the Environment,
Transport, Energy and Communications DETEC

Federal Office for the Environment FOEN
Division **Forest**

Swiss Experience with KP-reporting

Dr. Nele Rogiers, FOEN



Kyoto Protokoll Art.3.3 & 3.4

- Art. 3.4: Forest Management
- 15 Geographical locations
- three-year averaging
- 3 National Forest Inventories and NFI4 yearly cycles



	NFI 1	NFI 2	NFI 3
Inventory Cycle	1983-1985	1993-1995	2004-2006
Grid size	1x1 km	1.4 x1.4 km	1.4 x1.4 km
Terrestrial sample points	10'000	5'000	5'000



Discussion Items



Changes in SOC, litter and dead wood with Yasso07



Dynamics Soil-C after afforestation

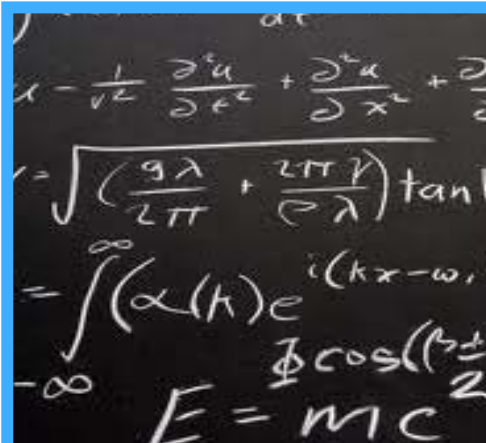




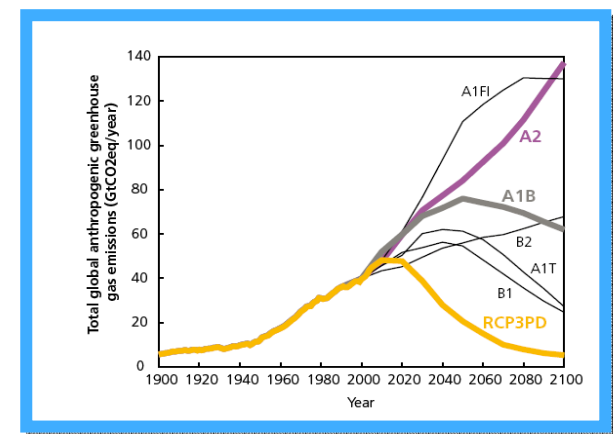
Changes in SOC, litter and dead wood with Yasso07



- Until Submission 2011: Tier 1-Approach
 - Forest floor is not source; Changes = 0
- In country Review LULUCF and EPR -> provide evidence and use model or measurements
- Yasso07-Modelling experiment
 - Results will be used for CP1 and FMRL
 - Yasso07-Seminar (October 4th, WSL Switzerland)



- Parameter
- Initialization
- Scenarios
- Validation
- Uncertainty
- Application





Changes in SOC, litter and dead wood with Yasso07



Yasso07-output = SOC + litter + dead wood

-> Seperate pools: necessary and how?

- Separate model-output into different pools
 - different litter fractions: NWLa/b, FWL, CWLSa/b, CWLL
 - chemical composition: A+W+E ~ DW + litter; N+H ~ SOC
- Report model-output under mineral soils; litter and dead wood = “IE”



Dynamics Soil-C after Afforestation

EQUATION 3.2.31

ANNUAL CHANGE IN CARBON STOCKS IN MINERAL SOILS IN LAND CONVERTED TO FOREST LAND¹

$$\Delta C_{LF_{\text{Mineral}}} = \Delta C_{LF_{\text{Ext Forest}}} + \Delta C_{LF_{\text{Int Forest}}}$$

Where,

$$\Delta C_{LF_{\text{Ext Forest}}} = [(SOC_{\text{Ext Forest}} - SOC_{\text{Non Forest Land}}) \bullet A_{\text{Ext Forest}}] / T_{\text{Ext Forest}}$$

$$\Delta C_{LF_{\text{Int Forest}}} = [(SOC_{\text{Int Forest}} - SOC_{\text{Non Forest Land}}) \bullet A_{\text{Int Forest}}] / T_{\text{Int Forest}}$$

and

$$SOC_{\text{Int, Ext Forest}} = SOC_{\text{ref}} \bullet f_{\text{forest type}} \bullet f_{\text{man intensity}} \bullet f_{\text{dist regime}}$$

Lineare increase over 20 years

e.g. Grassland -> Forest Land

$$SOC_{\text{Forest}} = 75 \text{ t C ha}^{-1}$$

$$SOC_{\text{Grassl}} = 62 \text{ t C ha}^{-1}$$

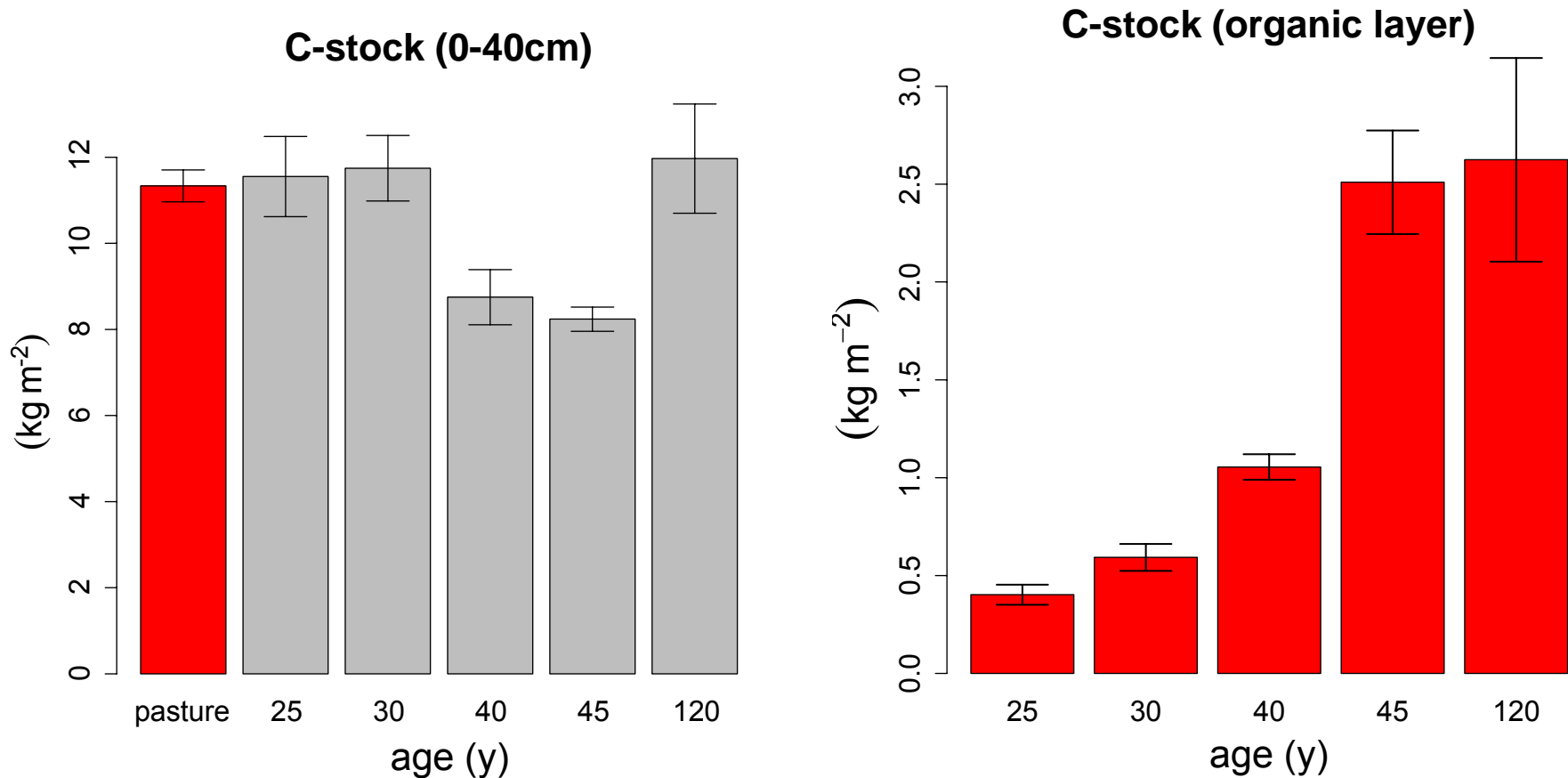
$$\Delta SOC = (75-62)/20 = 0.65 \text{ t C ha}^{-1} \text{ y}^{-1}$$

Dynamics Soil-C after Afforestation





Dynamics Soil-C after Afforestation

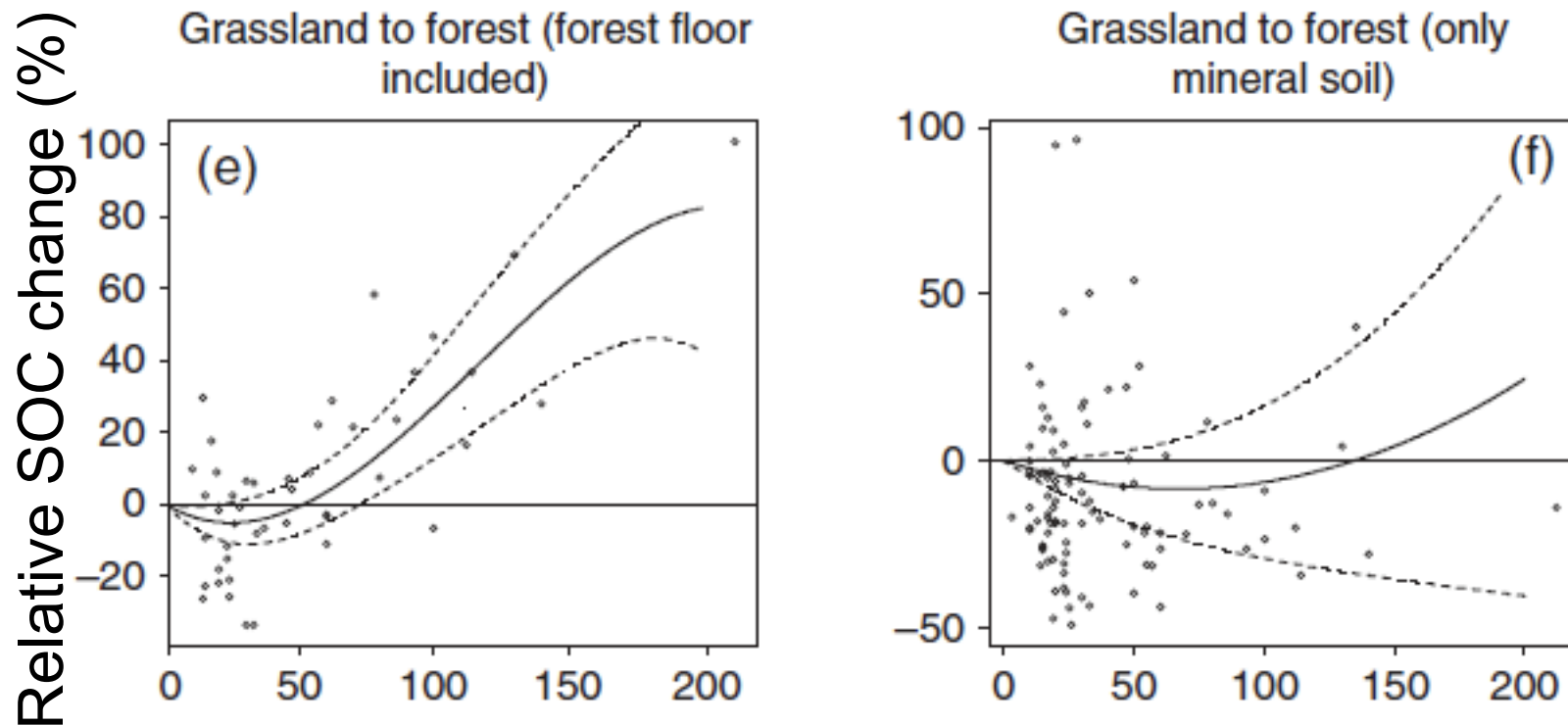


Case study alpine site Jaun
– decrease SOC after 40 years
– increase C in organic layers



Dynamics Soil-C after Afforestation

Meta-analysis: LUC temperate zone
-> initial decrease in SOC



Poeplau, C., Don, A., Vesterdal, L., Leifeld, J., Van Wesemael, B., Schumacher, J., Gensior, A., 2011. **Temporal dynamics of soil organic carbon after land-use change in the temperate zone - carbon response functions as a model approach.** Global Change Biology 17(7), 2415-2427.



Discussion Items



Changes in SOC, litter and dead wood with



Have other parties experience with
splitting modelling results?
esp. Yasso07 or soil-C-modelling

Dynamics Soil-C after afforestation



How do other parties report SOC after
afforestations?



KP Art. 3.3 - Afforestations

