The role of forest (no)management in soil and water recovery

Forest disturbance

Plešné lake, Bohemian Forest National park
• Forest disturbance by bark beetle (*Ips typhographus*)
SO$_2$, NH$_3$, NO$_x$ emissions (Czech Republic)

Decline by:
- SO$_2$ – 90%
- NH$_3$ – 50%
- NO$_x$ – 60%

(Kopáček et al. 2012. Atmospheric Environment 50)
Schematic View of the MAGIC Model

Atmospheric Deposition

Exchangeable Cations and Sulfate In Soil

Net Uptake

CO₂

Chemical Weathering

RCOOH

Stream or Lake
No disturbance (MAGIC Model)

Forest Disturbance (MAGIC model)

Measured annual data
Conclusions

• Natural forest disturbance (no intervention, no logging or biomass removal) – endmember of „management“

• Biomass decomposition increased significantly soil pools of Ca, Mg and K in soils within 10 years

• Result: significantly enhanced recovery from acidification

Forest management is very important for soil and water status and recovery