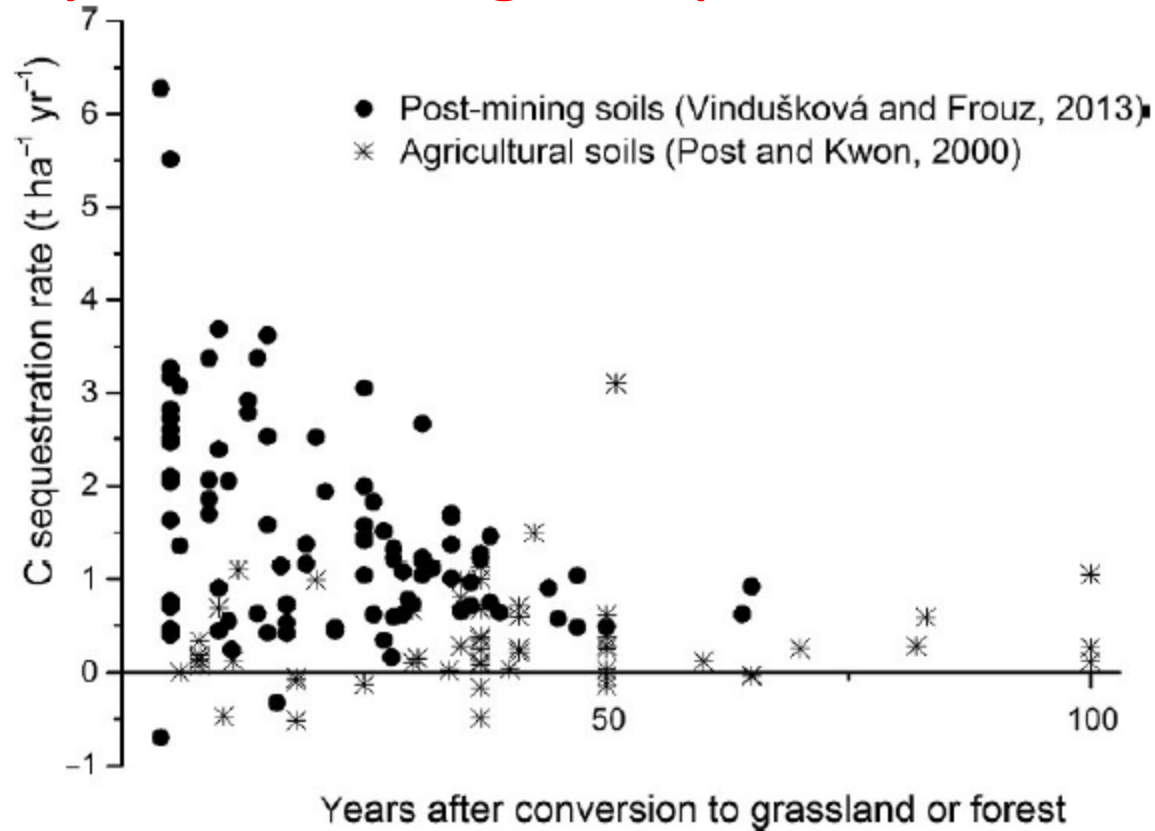


# Do heavily degraded soil really sequester carbon faster? Can that be change for soil restoration?

Jan Frouz *Charles University Prague, Biology Centre AS CR České Budejovice  
Czech Republic*

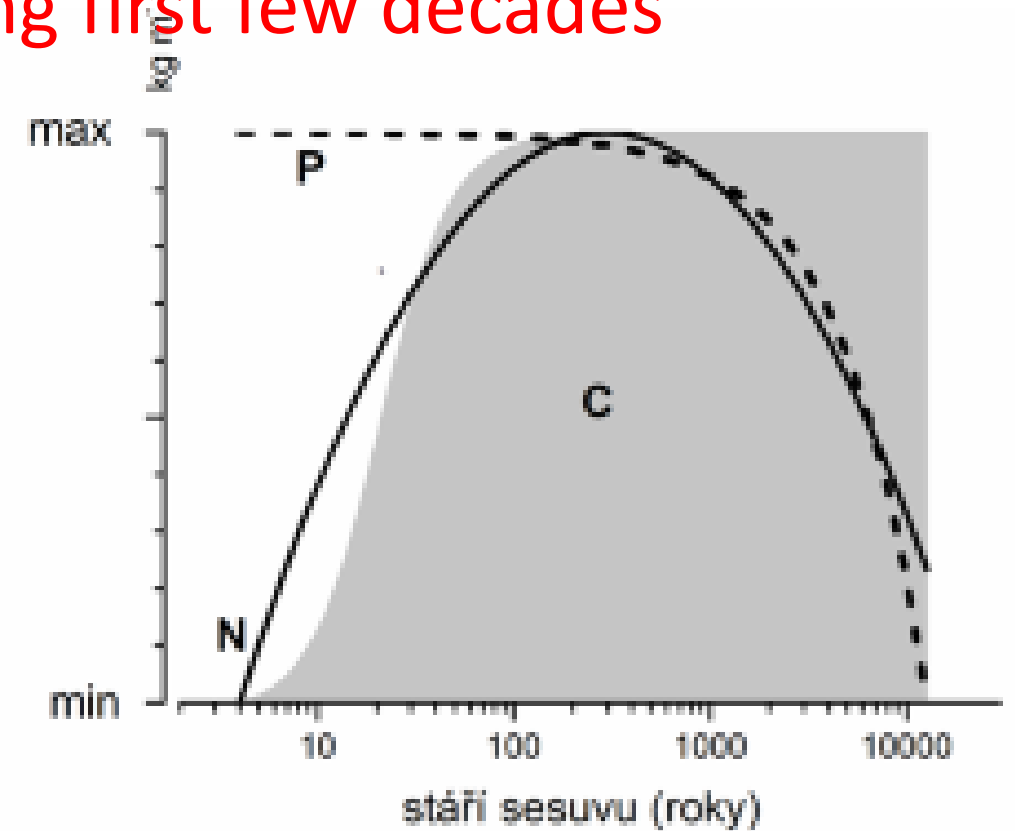


# Heavy degraded sites , where disturbance expose deeper subsurface layers show high sequestration rate during first few decades



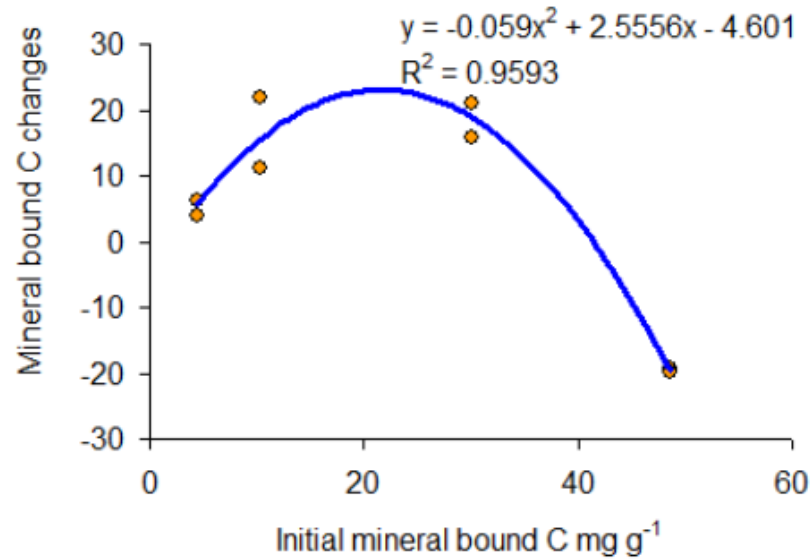
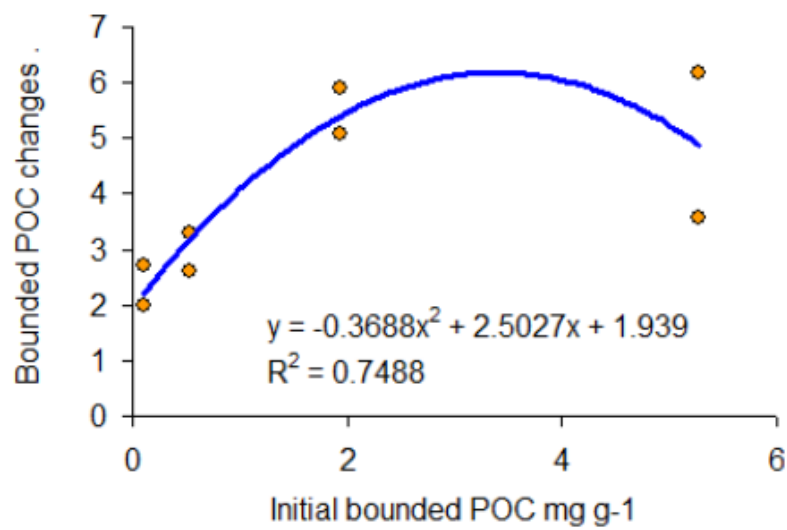
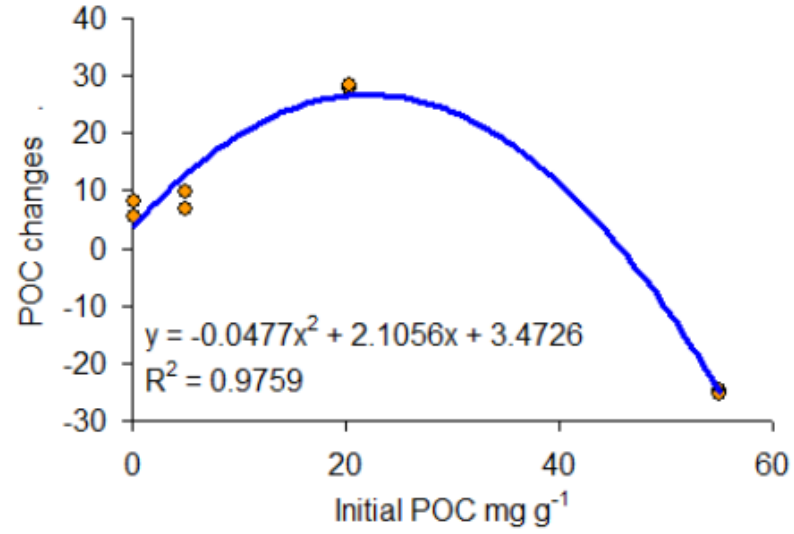
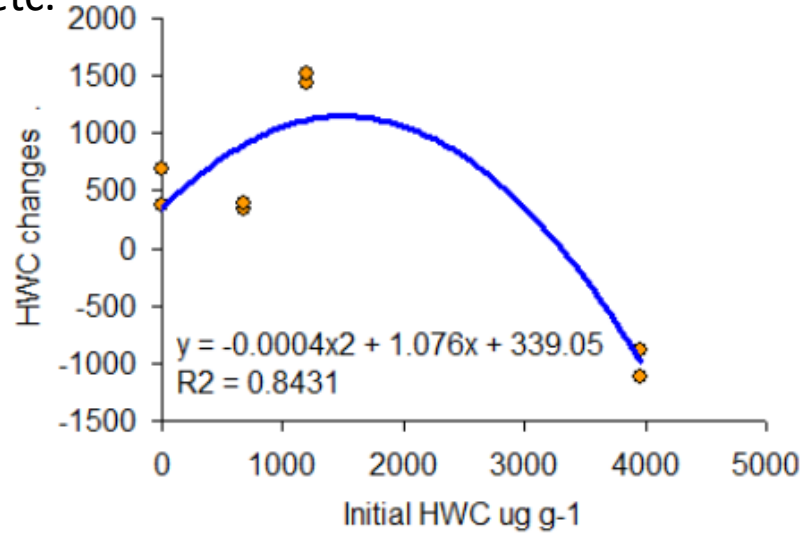
Carbon sequestration in post mining sites and in reforested agricultural land.

Sequestration rate is order of magnitude higher in forest mining sites that in agriculture land and slowly decrease. Fifty year old post mining sites are comparable to agricultural land.

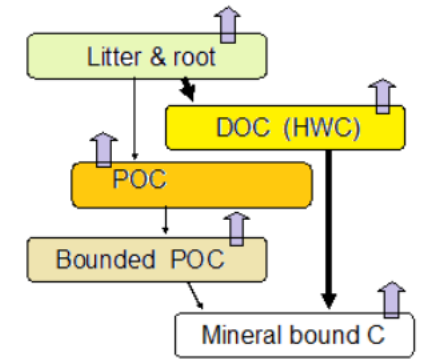


Carbon sequestration in landslides along 13ka long chronosequence base on Vindušková et al., 2019. One can see high C sequestration rate young sites which reach values common in surrounding sites in first 50 years afer landslide, then sequestration rate diecrease.

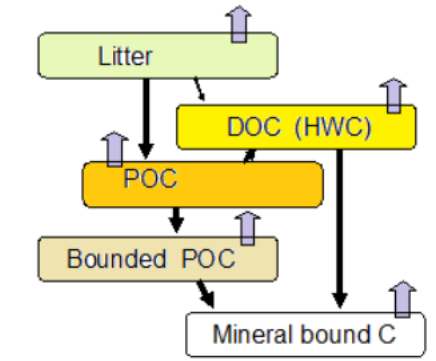
Most likely, this is caused by fact that soil are far from saturation and set of positive feedback loops which cause that increase in one SOM pool may increase rate of saturation in other pools. More DOM promote aggregation this promote storage of POC in aggregates etc.



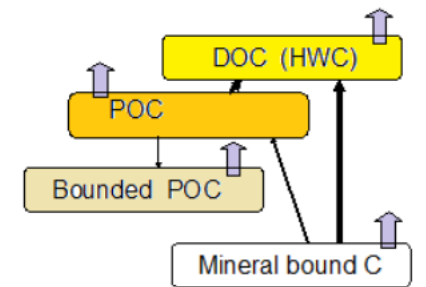
### Root exudates & Litter leaching



### Litter with bioturbation

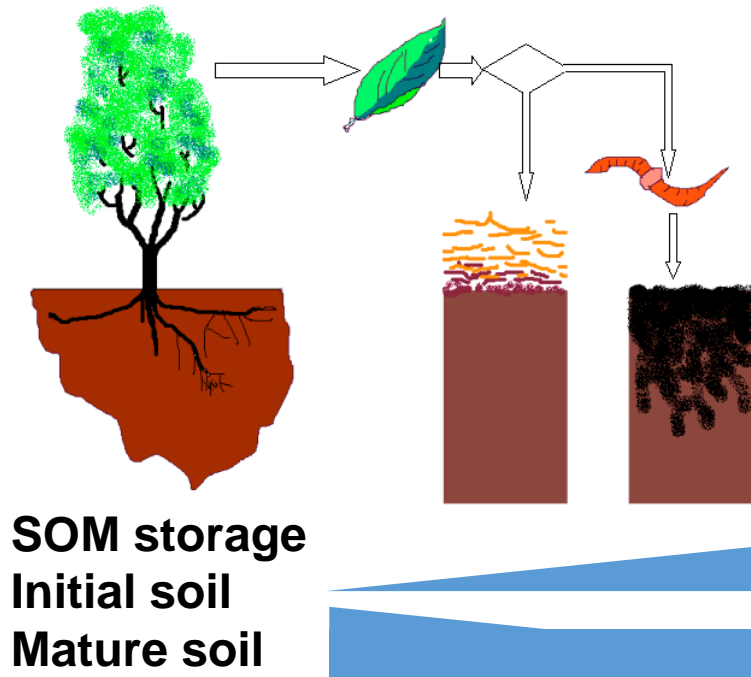
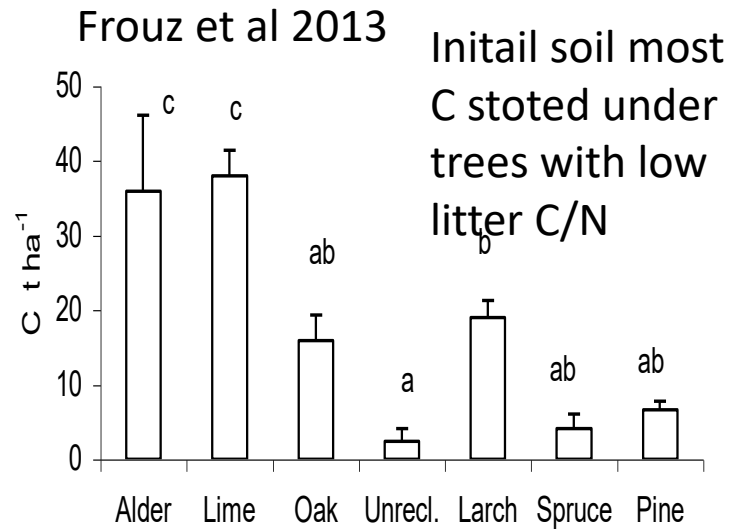


### Fossil C

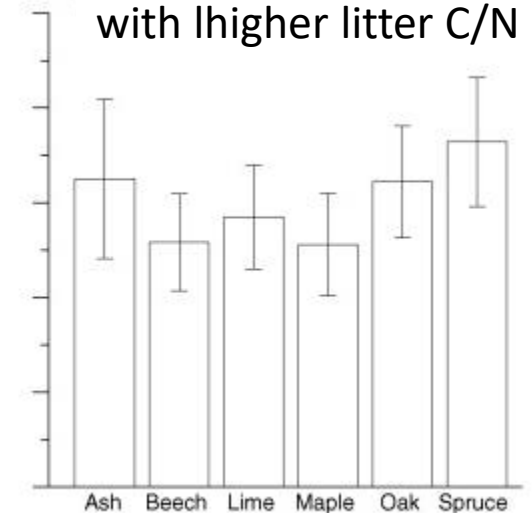


There are also some indication that major mechanisms how the SOM its stored in soil vary along soil development gradient.

Vestredal et al. 2008



Mature soil most C stoted under trees with lhigher litter C/N



In Initial soils there may be high rate of SOM sequestration achieved under fast growing plants producing easily available litter, in this stage incorporation POC in mineral matrix, storing microbial neuromas and activity of earthworms play crucial role in SOM sequestration. While in latter stages of soil development, when soil is already close to saturation slow growing plants, producing slow decomposing litter result in higher carbon sequestration, ir seems to be that shift of microbial necromass to fungal rather than bacterial necromass, and difference in litter and microbial necromass decomposability may play important role in this stage. Implication of these finding for ecosystem restoration is discussed.





**Thank you for your attention**