



## **The role of litter input and bioturbation in carbon storage in reclaimed and non reclaimed post mining sites.**

Jan Frouz

Fac. Sci. Charles University in Prague, Institute for environmental studies, Praha 2, Czech Republic (frouz@natur.cuni.cz)

Repeated sampling of post mining chronosequence show high rate of soil C accumulation in initial period or reclaimed sites which decrease with site age. In sites overgrown by unassisted natural succession the rate of C storage increased with succession time peaked in sites 20-30 years old and then decreased. Most of the carbon is stored as POC.

Experiment with transplant of soil block supplied by surplus of litter in to site with abundant bioturbation show that there is differences in saturation of individual C fractions, but overall rate of C accumulation do not differ significantly between sites of different ages. Experiment show that easy accessible fractions get saturated sooner than more resistant ones. There is also indication that C saturated in one fraction may promote C storage in some other fractions. This may cause positive feedback and promote fast rate of C storage in early stages of ecosystem development.

Major differences between reclaimed and unreclaimed sites seem to be driven by dynamic of bioturbation and litter input over time. Reclaimed sites have high bioturbation from very beginning but in unreclaimed sites intensive bioturbation starts by site colonization by earthworms between 20-30 years of age. Bioturbation cause removal of litter from soil surface and incorporation of organic matter in mineral soils which promotes overall C storage in soil. Litter input gradually increased in succession sites with plot age, while in reclaimed site litter input peaked in 15-20 years old sites and then decreased. These results suggest that variation in bioturbation and litter input is a major reason for observed pattern of soil C storage.