

# Dejavniki ki vplivajo na dinamiko ogljika v šotnih tleh visokih barji v Walesu (VB).

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## Izvleček

Organska snov v tleh, predvsem v šotnih, predstavlja največji in zelo stabilen vir/zalogo kopenskega organskega ogljika na planetu. Pospešena razgradnja talne organske snovi kot posledica spremenjene rabe tal lahko močno vpliva ne le na kakovost tal, temveč zaradi usode organskega ogljika pri tem procesu tudi na nivo izpustov toplogrednega plina CO<sub>2</sub>, ki se lahko sprošča iz tal. Poleg ohranjanja rodovitnosti tal je v kontekstu okoljskih sprememb torej pomembno, da se nivo organske snovi v tleh ohranja.

V letu 2005 je bil v septembrski številki revije Nature objavljen članek, ki je na podlagi talnega monitoringa med letom 1978/80 in 2003 obravnaval dinamiko organskega ogljika v tleh Anglije in Walesa. Članek je med drugim poročal o velikih izgubah v vsebnosti organskega ogljika na nekaterih lokacijah s šotnimi tlemi, predvsem visokih barji v Walesu.

Na podlagi izsledkov je ta magistrska naloga na izbranih lokacijah ponovila vzorčenje ter v kontekstu izgub skušala natančneje opisati mehanizme te dinamike ter odnose med naravnimi in antropogenimi faktorji, ki so potencialno lahko vplivali na omenjene izgube. Pri tem je upoštevala tudi okoljske značilnosti in zgodovino posamezne lokacije ter skušala povezati vpliv različne rabe tal z dinamiko ogljika.

V okviru naloge je bil na vsaki izmed izbranih točk izkopan, opisan in fotografiran pedološki profil. Po globini profila so bile opravljene analize za določitev organskega ogljika, specifične gostote in vlage. Za analizo organskega ogljika je bil odvzet tudi povprečen vzorec površinske plasti zbran okoli profila. Rezultati so bili uporabljeni za razpravo o usodi organskega ogljika in odločilnih dejavnikov, ki vplivajo na njegovo dinamiko. Raziskava je pokazala pomen natančne navigacije ki ob veliki heterogenosti tal lahko močno vpliva na primerljivost rezultatov. Izboljšan je bil protokol izbora primernege mesta odvzema, ki se je izkazal za zelo učinkovitega. Študija je delno potrdila vpliv intenzivne paše in mehanskih, površinskih posegov na dinamiko organskega ogljika. Podana je bila hipoteza da je ogljik lahko migriral tudi v globlje plasti.

**Ključne besede:** *Tla, organska snov, naravni vir, monitoring, klimatske spremembe*

## Factors controlling Carbon loss in soils in upland Wales

### Abstract

Soil organic matter represents the largest and especially in peat soils very stable source of terrestrial organic carbon on the planet. Its enhanced degradation as a result of changed land use, can contribute significantly towards total amount of CO<sub>2</sub> emissions which are potentially discharged from soils during this process. Beside the care for soil fertility it is that for important in context of climate change to maintain soil organic matter on adequate levels.

In 2005 September issue of Nature Journal an article was published, which using soil monitoring data between 1978/80 and 2003, discusses the dynamics of soil organic carbon in England's and Wales's soils. The article reports of big losses of organic carbon on some locations, described as deep peat soils in upland Wales.

Based on results of this study, subsequent MSc thesis was designed to revisit and resample some of the sites exploring the basic mechanisms and discusses the anthropogenic and natural factors controlling carbon loss. At the same time environmental and historical data were recorded for each location and explored the influence of various land use on dynamics of soil organic carbon.

Profile was opened for each location, sampled, described and photographed. Soil organic carbon, bulk density and moisture content were measured for different soil layers/depths. Surface layer bulk sample was also collected from a grid around the profile for carbon content analysis. The resulting data was analysed to inform discussion of soil organic carbon fate and factors controlling its dynamics. The study showed the importance of good sampling methodology which could combined with heterogeneity of the soils result in significant sampling errors. Methodology was improved and proved as highly efficient. Study partly confirmed the impact of intensive grazing and surface soil disturbance on organic carbon dynamics in soils. The hypothesis was given about the organic carbon migration into deeper layers.

**Key words:** *soil, organic matter, natural resource, monitoring, climate change*