Recenzije knjig / Book review

Tla Slovenije s pedološko karto v merilu 1:250 000

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Konec preteklega leta, ki je minilo v znamenju svetovnega leta tal, je s sodelovanjem Centra za pedologijo in varstva okolja na Biotehniški fakulteti Univerze v Ljubljani in Evropske komisije, Raziskovalnega centra (JRC Ispra, Italy), izšla knjiga Tla Slovenije s pedološko karto v merilu 1:250 000. Knjiga podaja pregled tlotvornih dejavnikov, s poudarkom na matični podlagi, ter lastnosti in prostorsko zastopanost tal v Sloveniji. Pedološka karta je izrisana na 13 transparentnih listih, ki prekrivajo topografsko karto, kar omogoča dobro prostorsko orientacijo pri branju karte. Seznam pedokartografskih enot karte merila 1:250 000 je opremljen z razponom vrednosti pomembnejših talnih lastnosti, kot so tekstura, kislost tal in talno število ter s seznamom pedokartografskih enot izvorne pedološke karte merila 1:25 000. Knjiga podaja tudi kratko zgodovino pedološkega kartiranja v Sloveniji, opis klasifikacijskega sistema za tla, nastanek in zgradbo talnega informacijskega sistema ter podaja primere, kako lahko podatke pedološke karte koristno uporabimo; npr. pri prostorskem načrtovanju, ocenjevanju kmetijskih zemljišč z vidika ranljivosti za sušo ali spiranja nitratov v podtalnico idr.

Pedološke raziskave in pedološko kartiranje tal se je v Sloveniji začelo v šestdesetih letih prejšnjega stoletja, pod mentorstvom pokojnih profesorjev, začetnikov pedologije v Sloveniji, prof. dr. Bogdana Vovka, prof. dr. Albina Stritarja, prof. dr. Jožeta Sušina, prof. dr. Dušana Stepančiča in prof. dr. Marijana Ažnika, ki so vpeljali metode opisa in klasifikacije tal ter analitske postopke za ugotavljanje morfoloških, fizikalnih in kemijskih lastnosti tal. Poglobljen študij in v tujini pridobljene izkušnje so bile potrebne, da so znanje uspešno prenesli v slovenski prostor. Vendar je majhna skupina raziskovalcev uspela dokončati le posamezne tiskane liste pedološke karte do leta 1986. Posebno mesto v tem procesu pripada zaslužnemu profesorju dr. Francu Lobniku, ki je imel vizijo in pogum za dokončanje začetega dela in izdelavo digitalne pedološke karte, ki bi nudila informacijo o lastnostih tal za celotno ozemlje Slovenije. Zbral je ekipo pedologov in geologov, s katero se je lotil obsežnega dela ob finančni podpori Ministrstva za kmetijstvo gozdarstvo in prehrano Republike Slovenije. Da imamo sedaj na voljo informacijo o talnih lastnostih in prostorsko zastopanost tal za celotno Slovenijo, je bilo potrebno opraviti res obsežno delo: izvrtanih je bilo več 10 000 sond, izkopanih preko 2 000 profilov, opisanih 7 000 talnih horizontov in pridobljenih 70 000 analitskih podatkov, za kar so zaslužni terenski pedologi, predvsem specialist Jani Rupreht, Marjan Šporar, mag. Tomaž Prus, mag. Marko Zupan in sodelavci v pedološkem laboratoriju, Andreja Hodnik in drugi. Omeniti je potrebno še doc. dr. Natašo J. Vidic, ki je pomembno prispevala k razumevanju razvoja tal na različnih geoloških podlagah in doc. dr. Boruta Vrščaja, ki je imel ključno vlogo pri zasnovi in postavitvi talnega informacijskega sistema. Talni informacijski sistem, ki ga vzdržuje in posodablja Center za pedologijo in varstvo okolja na Biotehniški fakulteti, sedaj hrani vse pridobljene podatke, ki so na voljo za številne okoljske in kmetijske študije.

Prostorska heterogenost tal v Sloveniji je izjemno velika, kar je posledica razgibanega reliefa in prostorske variabilnosti geoloških podlag. Izvorna pedološka karta merila 1:25 000 je zajemala kar 1046 pedokartografskih enot, od katerih jih je bila večina sestavljenih iz več pedosistematskih enot. Da bi izbistrili pogled na slovenska tla in znanje približali širši javnosti, smo leta 2005 pedološko karto generalizirali za merilo 1:250 000; več kot 1800 pedokartografskih enot iz detajlne karte 1:25 000 smo združili v 63 kartografskih enot generalizirane karte, ki jo je izdelala prof. dr. Anka Lisec iz Fakultete za gradbeništvo in geodezijo.

Prostorska analiza je pokazala, da v Sloveniji prevladujejo kambična tla, ki prekrivajo 50 % ozemlja; distričnih rjavih tal je 20,7 %, evtričnih rjavih tal 17,4 % in rjavih pokarbonatnih tal 11,9 %. Druga najbolj razširjena skupina tal so humusno akumulativna tla, ki pokrivajo 31 % ozemlja; največ je rendzin, ki pokrivajo skoraj 29 % ozemlja in so najbolj razširjen talni tip v Sloveniji. Najdemo jih tako na apnencih in dolomitih, ki sta najbolj razširjeni kamnini v Sloveniji, kakor tudi na drugih karbonatnih sedimentnih kamninah; predvsem prodih in peskih ter fliših. Obrečnih tal je 5 %, oglejenih tal 4,4 %, psevdoglejev 3,7 % in izpranih tal 2,4 %. Mestoma se pojavljajo terra rosse (0,2 %), in šotna tla (0,2 %). Zabeležena so tudi majhna najdišča podzola (0,01 %). Zaradi plitvosti in skeletnosti tal ter drugih omejitvenih lastnostih, ki se pojavljajo na posameznih območjih (kislost, zastajanje vode), je povprečna boniteta tal v Sloveniji samo 41,5, v lestvici vrednotenja od 0 do 100. Samo 6 % tal ima boniteto večjo od 60. Slednje nam nalaga veliko skrb pri prostorskem načrtovanju, ki mora temeljiti na podatkih o lastnostih tal in stremeti k čim manjši izgubi rodovitnih tal.

Knjiga Tla Slovenije s pedološko karto 1:250 000 pomeni velik doprinos k širjenju znanja o tleh v Sloveniji in je zahvala vsem sodelavcem Centra za pedologijo in varstvo okolja Biotehniške fakultete, ki so svoje življenje posvetili raziskovanju tal in prenašanju znanja na nove generacije študentov, izmed katerih smo izšli sedanji profesorji, asistenti in raziskovalci.

Izzid v mednarodnem letu tal in dvojezična izdaja daje knjigi tudi mednarodni pomen. Leto 2015 je bilo na pobudo FAO proglašeno za mednarodno leto tal, ki postajajo eden od najbolj ogroženih naravnih virov. Ogrožajo jih številni degradacijski procesi; erozija in plazovi, zaslanjevanje, zbijanje, zmanjševanje organske snovi in biodiverzitete, onesnaževanje in pozidava. Slednja je tako v Sloveniji kot drugje v razvitem svetu izjemno pereč problem. V Sloveniji izgubimo dnevno 5 ha kmetijskih zemljišč, v Evropi 275 ha dnevno. Avtorji in uredniki iskreno upamo, da bo knjiga prispevala k zaščiti tal, ki podpirajo številne človekove aktivnosti in so temeljni vir za obstoj človeštva.

Izr. prof. dr. Helena Grčman

Predstojnica Centra za pedologijo in varstvo okolja

Soils of Slovenia with soil map 1:250 000

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At the end of the year 2015 new book Soils of Slovenia with 1:250 000 scale soil map was published in collaboration of Centre for soil and Environmental Science at Biotechnical faculty, University of Ljubljana and European Commission, Joint Research Centre (Ispra, Italy).

The book features an overview of soil forming factors, soil properties and spatial distribution of soil types in Slovenia with special focus on parent material which is, beside topography, the most important soil forming factor in Slovenia. The soil map is printed on 13 transparent sheets which cover topographic maps so as to facilitate the reader's orientation. The list of pedocartographic units with ranges of important soil properties, such as soil texture, pH and production potential of the soil expressed as soil value are given. For each pedocartographic unit of new map the list of pedocartographic units of original soil map in scale 1:25 000 is given as well. The history of soil mapping in Slovenia, soil classification system and soil information system is described. Some examples, on how to use soil information data for spatial planning, evaluation of agricultural land, prediction of vulnerability to drought or leaching of nitrates into aquifers, are presented.

Soil research and mapping started in the early sixties with our first pedologists prof. dr. Bogdan Vovk, prof. dr. Albin Stritar, prof. dr. Jože Sušin, prof. dr. Dušan Stepančič and prof. dr. Marijan Ažnik. They introduced methods for soil description and classification along with procedures for morphological, physical and chemical analysis of soil. Being a small team, they only managed to print few sheets by 1986. In this context a special position belongs to professor emeritus, dr. Franc Lobnik due to his vision and courage to develop a comprehensive project – Soil mapping in the scale of 1: 25 000. It started in 1992 under financial support of Slovenian Ministry for agriculture, forestry and food production. He assembled a team of agronomists and geologists skilled in soil science and after ten years of intensive field and laboratory work, they gathered the information on soil properties covering the entire territory of Slovenia. Many thousands of soil probes, more than 2 000 soil profiles, 7 000 soil horizons and 70 000 soil analyses were processed. Specialists Jani Rupreht, Marjan Šporar, mag. Tomaž Prus, mag. Marko Zupan, Andreja Hodnik and many other experts and technicians from Soil laboratory deserve special mention. The knowledge of geologist doc. dr. Nataša J. Vidic was crucial for understanding soil development on different parent material. Parallel to field work, soil information system was also established by doc. dr. Borut Vrščaj. Soil information system is maintained and updated by the Centre for Soil and Environmental Science at the Biotechnical Faculty. Data are available for a number of environmental and agricultural studies.

As a consequence of diverse topography and parent material, the spatial heterogeneity of Slovenian soils is extremely high. The original Soil map in the scale of 1:25 000 includes more than 1800 pedocartographic units and most of them consist of two or three pedosystematic units. For a better overview of Slovenian soils, we decided to generalise the map to the scale 1:250 000. Pedocartographic units of the detailed soil map were grouped to 63 pedocartographic units of the generalised map. The generalisation was done in the year 2005 by prof. dr. Anka Lisec.

Spatial analyses revealed that cambic soils are predominant in Slovenia and cover 50 % of territory. There are 20.7 % of Dystric Cambisols, 17.4 % of Eutric Cambisols and 11.9 % of Chromic Cambisols. The second most frequent soil group is the group of humus accumulative soils (Leptosols) which covers 31 % of territory, the most common are Eutric Leptosols (i.e. Rendzinas), which cover almost 29 % of territory and represent the predominant soil systematic unit in Slovenia.

Rendzinas are found on limestone and dolomite, which are the most common rocks in Slovenia, and on other calcareous sediment rocks such as gravel, sandstone or flysch. Fluvisols cover 5 % of territory, Gleysols 4.4 %, Stagnosols 3.7 % and Luvisols 2.4 %. Rarely Rhodic Cambisols, known as "Terra rossa", (0.2 %) and Histosols (0.2 %) could be found. At some locations also Podzol (0.01 %) is found.

Shallow soils, with high spatial variability in depth; high surface stoniness and rockiness, low pH or hydromorphic properties are causes for low land rating in Slovenia. On the scale from 0 to 100, only 6 % of agricultural land has land rating greater than 60, average land rating is 41. Therefore, special attention on soils by spatial planning should be paid to minimize loss of good agricultural soil. Spatial planning should be based on data of soil properties.

We believe that generalized information about Slovenian soils is very important and will help Slovenians and other nations to understand heterogeneity of Slovenian soils and raise the awareness of how important and unique natural resource soils are. It is also an opportunity of thanks to all researchers from the Centre for Soil and Environmental Sciences, who have dedicated their lives to exploring the soil and transferring knowledge to new generations of students from whom emerged the current professors, assistants and researchers.

The book is of international importance; it is written in Slovenian and English language and was published during the International year of Soils. Year 2015 was dedicated to the soils on the initiative of Food and Agricultural organisation since soils are one of the most threatened natural resource. Degradation processes are soil erosion, landslides, organic matter and biodiversity decline, salinization, contamination, compaction and sealing. Soil sealing is the most pressing for fertile soils in Slovenia and other developed countries. Five hectares and 275 ha of agricultural land per day are sealed in Slovenia and Europe respectively. Authors and editors hope that the book Soils of Slovenia with soil map 1:250 000 will contribute to the protection of soils, which supported many human activities and are a fundamental resource for human survival.

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