

# **Povezovanje znanja o tleh alpskega območja za izboljšanje trajnostnega upravljanja ekosistemov (Links4Soils)**

Dr. Borut Vrščaj



# Links4Soils

## O PROJEKTU

# Ozadja

V zadnjih desetletjih le malo besede o tleh; tako globalno, v Evropi, kot v Sloveniji.

Tla dolgo ‚niso bila tema‘.

O tleh predvsem kmetijci in nekateri posamezniki ter inštitucije.

Leto 2015 prelomnica:



Food and Agriculture Organization  
of the United Nations



2015  
Mednarodno  
Leto Tal

2015 Priprava in prijava projekta

2016 Sprejet v financiranje.




# Projektne partnerji



SI	<b>Kmetijski inštitut Slovenije</b>
AT	Office of the Tyrolean Provincial Government
AT	Climate Alliance Tirol
AT	Institute of Geography, University of Innsbruck
DE	LAND-PLAN Bureau for Landscape Ecology
DE	Markt Kaufering
FR	National research institute of science and technology for environment and agriculture, Grenoble Regional Centre
IT	Autonomous Region of Aosta valley
IT	University of Torino
SI	Slovenian Forest Service

**Trajanje projekta 2016 - 2020**

# Cilji projekta

- Predvsem to, da tla postanejo tema.
- Obveščanje,  
širjenje vedenj o tleh  
in zavedanja o pomenu tal  
ter nujnosti varovanja  
in trajnostnega gospodarjenja s tlemi.
- Ne toliko v kmetijskem sektorju,  
kot pri odločevalcih v drugih sektorjih.
- Cilji  **Kmetijski inštitut Slovenije**  
Agricultural Institute of Slovenia : varovanje kmetijskih tal, zmanjšanje  
pritiska na kmetijska zemljišča, zmanjšanje pozidav, itd.

## **Rezultati projekta**

- *Dobre prakse varovanja tal*
- *Metode trajnostne rabe tal*
- *Videi*
- *Publikacije, strokovne in poljudne*
- *Delavnice za odločevalce; zakaj in kako upravljati tla*
- *Poletne šole in delo z mladimi*
- *Pridobivanje podatkov in meta-podatkov o tleh v Alpah*
- *Spletna platforme z informacijami o tleh*
- *Online svetovanje o tleh*

*Itd.*

## **IZPOSTAVLJNI REZULTATI PROJEKTA**

Globalno partnerstvo za tla (GSP) <https://www.fao.org/global-soil-partnership/en/>

Evropsko partnerstvo za tla (ESP) <https://www.fao.org/global-soil-partnership/regional-partnerships/europe/en/>

Alpsko partnerstvo za tla (AlpSP) <https://www.europeansoilpartnership.org/about-us/subregional-partnerships/alpine-soil-partnership>

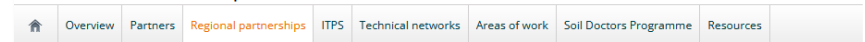
→ Alpska konvencija - **Delovna skupina varstvo tal:** <https://www.alpconv.org/sl/domaca-stran teme/varstvo-tal/>

Slovensko partnerstvo za tla (SPT)

<https://www.gov.si/zbirke/projekti-in-programi/slovensko-partnerstvo-za-tla/>



## Global Soil Partnership



**Alpine Soil Partnership**

The Alpine Soil Partnership (AlpSP) was established in 2017 during the EU Alpine Space project Links4Soils. The soil web platform serves as an information hub for users that seek information about the soils in the Alpine space. Originally developed in the Interreg Alpine Space project Links4Soils (2016-2020), the platform shares the activities of the Alpine Soil Partnership.

**Chair:** Michele Freppaz (Italy)  
**Coordination Unit:** Maria Legner (Austria)

**Objectives**

The AlpSP is a permanent transnational soil cooperation network whose objective is to pool and process in a practical manner knowledge, experience, awareness, engagement, and interest in the soils in the Alpine region. The AlpSP aims at promoting and contributing to sustainable soil management and protection in the Alpine region. Therefore, one of its supporting actions is the further implementation of the Soil Protection Protocol of the Alpine Convention. At the same time, the AlpSP activities substantially contribute to the goals of the European Soil Partnership, but are adapted to the specific Alpine situation, the needs and nature of the Alpine environment, and the Alpine soils and soil threats. Caring for Soils – Where Our Roots Grow 2 The AlpSP encourages and enhances the exchange of knowledge, know-how, data, best practices, and ideas amongst different stakeholders, including landowners, administrations, experts, decisionmakers, environmentalists, and non-government organisations. These objectives are connected to the activities of the CIPRA1 and the ESP2, a regional initiative of the GSP3 organised by the Food and Agriculture Organisation of the United Nations (FAO) in Rome. The ESP is assisted by the Joint Research Centre (JRC) of the European Commission.



REPUBLIKA SLOVENIJA  
GOV.SI

Slovensko partnerstvo za tla



**Slovensko partnerstvo za tla**



# Alpska konvencija – Delovna skupina Varstvo tal

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[Domača stran](#) > [Teme](#) > [Varstvo tal](#)

## Varstvo tal

Tla kot živa povezava med rastlinskim pokrovom in geološko podlago tvorijo kožo našega planeta. V tleh se prekrivajo trdna kamninska ovojnica, biosfera, zrak in hidrosfera. V primerjavi s človeško kožo je plast tal tanjša in izjemno ranljiva.

Tla so omejen vir in se niso zmožna obnoviti še za čas naslednjih nekaj generacij. Tla zagotavljajo številne storitve, ki so bistvene za življenja ljudi, in so osnova za izvajanje številnih dejavnosti človeka. Kljub svojemu izjemnemu pomenu za življenje rastlin, živali in ljudi so tla medij, ki mu je namenjeno veliko premalo pozornosti, kar potrjuje še vedno velika neraziskovanost življenja v tleh. Peščica vitalnih tal vsebuje več živih organizmov, kot je ljudi na Zemlji.

Ohranjanje tal je zato izjemnega pomena! To še posebej velja za gorska območja, kot je območje Alp, kjer so zaradi strmega reliefa, plitvih tal in daljšega časa nastajanja, tla veliko bolj ranljiva in ogrožena. Dodaten izziv predstavljajo podnebne spremembe, ki so v gorskih območjih veliko bolj opazne kot v drugih regijah.

Zdrava tla so ključni dejavnik blažitve podnebnih sprememb in prilagajanja nanje, ohranjanja biotske raznovrstnosti in zagotavljanja prehranske varnosti. Vsak dan predvsem zaradi človekove dejavnosti izgubimo veliko količino zdravih tal, kar je v Alpah zaradi njihove omejene razpoložljivosti še toliko bolj pomembno.

Rodovitnost tal in izogibanje njihovi degradaciji, sta osnovna predpogoja za visoko kvaliteto življenja v Alpah. Pogodbenice Alpske konvencije so se zavzele za zmanjševanje »kvantitativnega in kvalitativnega poškodovanja tal, še posebno z uporabo za tla neškodljivih kmetijskih in gozdarskih proizvodnih postopkov, varčnim ravnanjem z zemljiščem in tlemi, zaježitvijo erozije kot tudi z omejitvijo zaprtja tal« (Alpska konvencija, točka 2d 2. člena). Poleg tega je XV. Alpska konferenca pozdravila deklaracijo »trajnostna raba in zaščita tal - združimo moči za naravo, ljudi in gospodarstvo«, pripravljeno s strani Akcijske skupine 6 EUSALP, ki jo vodita Stalni sekretariat Alpske konvencije in deželni sekretariat Slovenije.

Rezultati na področju varstva tal zahtevajo vztrajnost in nenehno prizadevanje, zato so dolgoročne strategije z ustreznimi sodelujočimi partnerji nujne. Pomembni so prvi koraki, vendar so za ključne vidike varstva tal potrebni dolgoročni pristopi. Potreben je strukturiran pristop za celovito in predvsem trajnostno vključevanje varstva tal v različna tematska področja. Tako je bil oktobra 2022 na XVII. alpski konferenci sprejet »[Dolgoročni akcijski načrt za izvajanje določb in deklaracij o varstvu tal v posebnem kontekstu alpskega prostora](#)«.



# Spletni portal Alpine Soils

[Agriculture](#) [Forestry](#) [Land use planning](#) [Urban soils](#) [Sustainable Management](#) [Education & Awareness rising](#) [Tourism](#)

## The Alpine Soil Platform



[ABOUT SOILS](#) [PARTNERSHIP](#) [SOIL INFO](#) [ASK & DISCUSS](#) [SOCIETIES](#) [BEST PRACTICES](#)

## The Alpine Soil Partnership

The Multi-stakeholder ASP joins forces of experts and authorities to introduce soil protection in land management practices and promotes Alpine-wide cooperation on soil protection & soil ecosystem services management.

The Alpine Soil Partnership link experts on horizontal and vertical levels: Public authorities and soil experts (will) have the opportunity to better understand gaps & needs of soil conservation to integrate solutions and created tools in their day-to-day work as a new standard. Fragmented soil knowledge will be linked and reconciled at transnational level.

### Operationalisation of the Alpine Soil Partnership:

Adoption of memorandum on strategies for an improved implementation of the AC SCP. Improved/applied soil knowledge for better integration of ESS in management and decision-making.

Establishment of a formal long-lasting Alpine Soil Partnership will strengthen Alpine soil management/protection and the implementation of the Alpine Convention Soil Conservation Protocol. The ASP induces soil management networking and helps to overcome knowledge gaps, as it (will) link(s) cross-sectoral Alpine soil stakeholders, end-user needs and mitigates soil ESS management gaps.

[d.alpinesoils.eu](http://d.alpinesoils.eu)



SPATIAL  
PLANNING

FORESTRY

AGRICULTURE

TOURISM

NATURAL  
HAZARDS

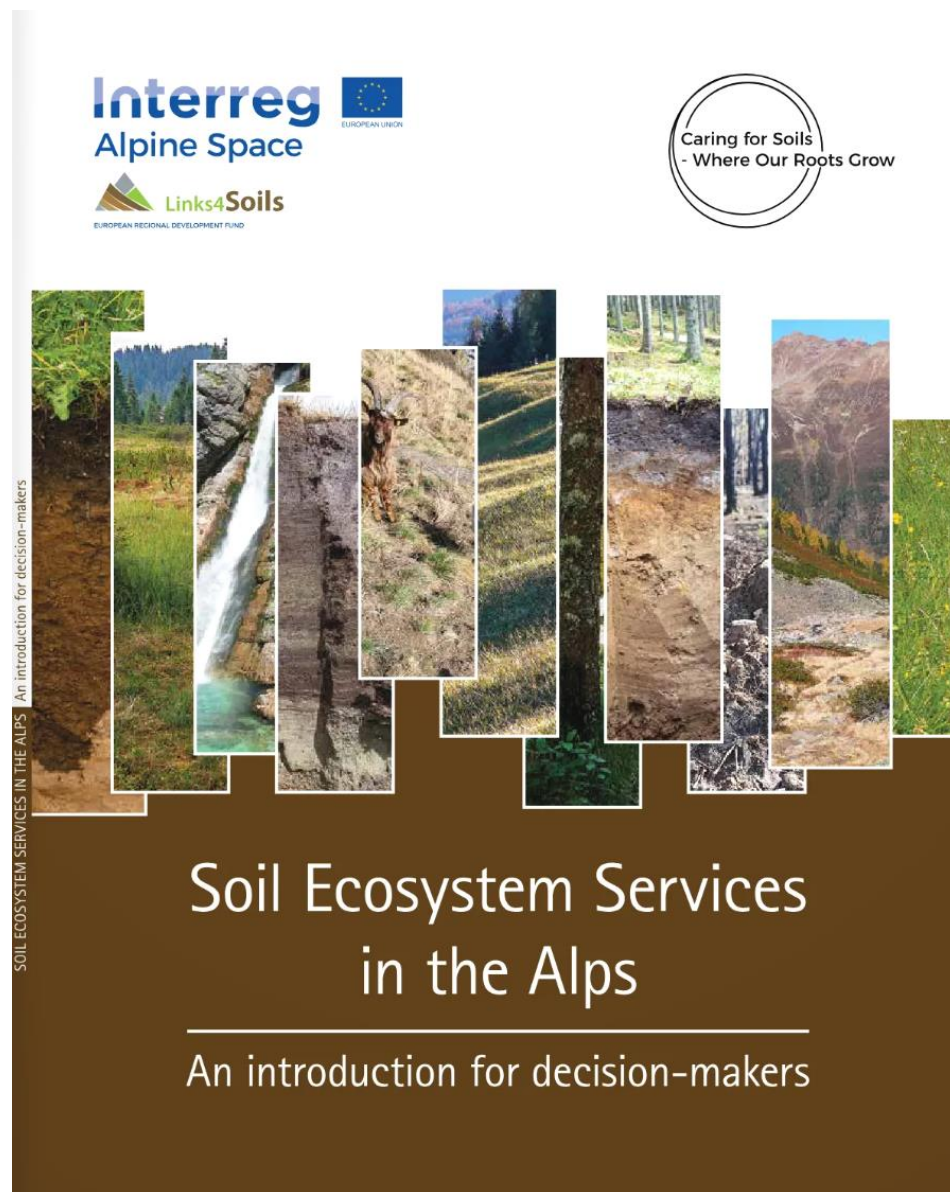
HAZARDS

# Rezultati – različne publikacije o tleh

## Trajnostna raba tal za odločevalce

Sektorji in trajnostna raba tal

<https://www.alpine-space.eu/project/links4soils/>



# Baze podatkov o tleh: primer podatkov o tleh - Italija

Result = Metadata record display

Title with description

Links to main or related source

Other information (category, keywords, language)

Contact of the resource!!!

The screenshot shows a metadata record for 'Soil map of Italy' on the Links4Soils platform. The record is displayed in a light blue box with a yellow border. The title 'Soil map of Italy' is at the top. Below it is a description: 'Available on the ESDAC website, ensuring the national soil collection and correlation data, and the evaluation for applications on a national level (parcel-specific)'. The soil classification is 'WRB' and the scale is '1:1,000,000'. The record was updated in 2012. A green 'Completed' stamp is visible in the bottom right corner of the description box. Below the description is a 'Download and links' section with a link to the PDF file: 'https://esdac.jrc.ec.europa.eu/images/Eudasm/IT/PDF/2012Carta\_Suoli\_Italia.pdf'. The 'About this resource' section includes categories (Database, Boundaries, Environment, Geoscientific information, Location), keywords (Soil, Pedology, Soil map), continents/countries (Europe, Italy), language (English), resource identifier, legal constraints (Free access), contact for the resource (Italian National Centre for Soil Mapping (CNCR, CRA-ABP, Florence)), and status (Completed). A yellow box highlights the contact information. To the right of the metadata is an 'Overview' section with a map of Italy showing soil distribution and a legend. Below the map is a 'No ratings' section and a 'Spatial extent' map showing the location of Italy in Europe.

# Podatki tal: Links4Soils Geonetwork metadata katalog

Search function for metadata

Filter

Results – metadata records

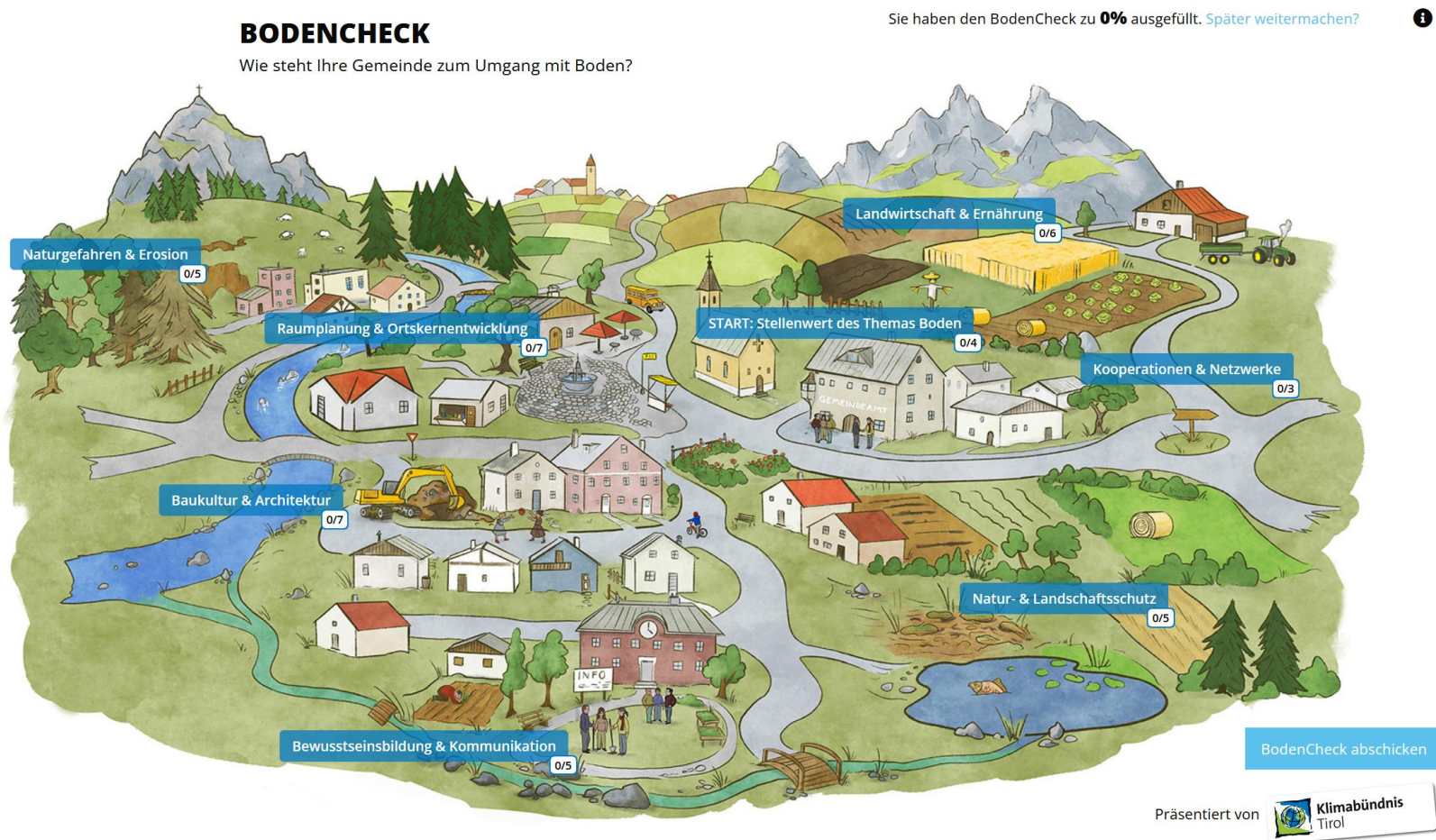
Overview map of spatial extent of resulting metadata records

The screenshot displays the Links4Soils Geonetwork metadata catalog interface. The top navigation bar includes the Links4Soils logo, a search bar, a map icon, a 'Sign in' button, and a language dropdown set to 'English'. Below the navigation bar is a search bar with the text 'Search ...' and a search icon. On the left side, there is a filter sidebar with a 'Nothing in basket' message and a 'Filter' section. The filter sidebar includes sections for 'TYPE OF RESOURCES' (Dataset: 108), 'TOPICS' (Boundaries: 105, Environment: 104, Farming: 49, Geoscientific Information: 102, Location: 103), 'KEYWORDS' (Boundaries: 105, Environment: 104, Europe: 105, Geoscientific Information: 102, Location: 103), and 'CONTACT FOR THE RESOURCE'. The main content area displays a grid of metadata records. The first record is 'Valle d'Aosta: Collection of documents (land use, maps for spatial planning,...)' with a 'Completed' status. The second record is 'Basic geological map of Slovenia' with a 'Completed' status. The third record is 'Landslide probability map' with a 'Completed' status. The fourth record is 'Forest compartments' with an 'On going' status. On the right side, there is an overview map showing the spatial extent of the resulting metadata records. The map is sorted by relevancy. A yellow box highlights the search bar, and a yellow arrow points from the text 'Overview map of spatial extent of resulting metadata records' to the map. The map shows a geographical area with a red box highlighting Slovenia.

# Rezultati – metode & orodja

## Potrebe in upravljanje s tlemi na lokalni ravni – BodenCheck (AT)

Kmetijstvo, hrana, varovanje narave, urbana tla, zaščita pred erozijo, zaščita tal, povezovanje in usklajevanje, ...



# NEKATERI ZANIMIVI REZULTATI



*Tla so za nekatere zanimiva;  
Predvsem pa je važno  
kaj tla pravzaprav ,počnejo‘?*

## *Vsebinski logotipi Ekosistemске storitve tal (EST)*



# Links4Soils logotipi ekosistemskih storitev tal

Caring for Soils – Where our Roots Grow



Soil Ecosystem Services



## Links4Soils project

### Soil Ecosystem Services in Alps

*Soil ecosystem services for practitioners*



# Izbrane/izpostavljene EST tal (oz. kaj tla dajo, kaj počnejo)

Biomasa: hrana, krma, les, medicinske in energentske rastline; itd.

Zadrževanje, filtriranje, čiščenje, bogatenje, „razstrupljanje“ meteornih in poplavnih voda; zaloge vode.

Zaloge, ciklusi elementov/hranil, lokalne in globalne temperature; ponor C, „delovanje“ okolja, → podnebne spremembe.

Biotska pestrost v:  
samih tleh! in  
nad tlemi.

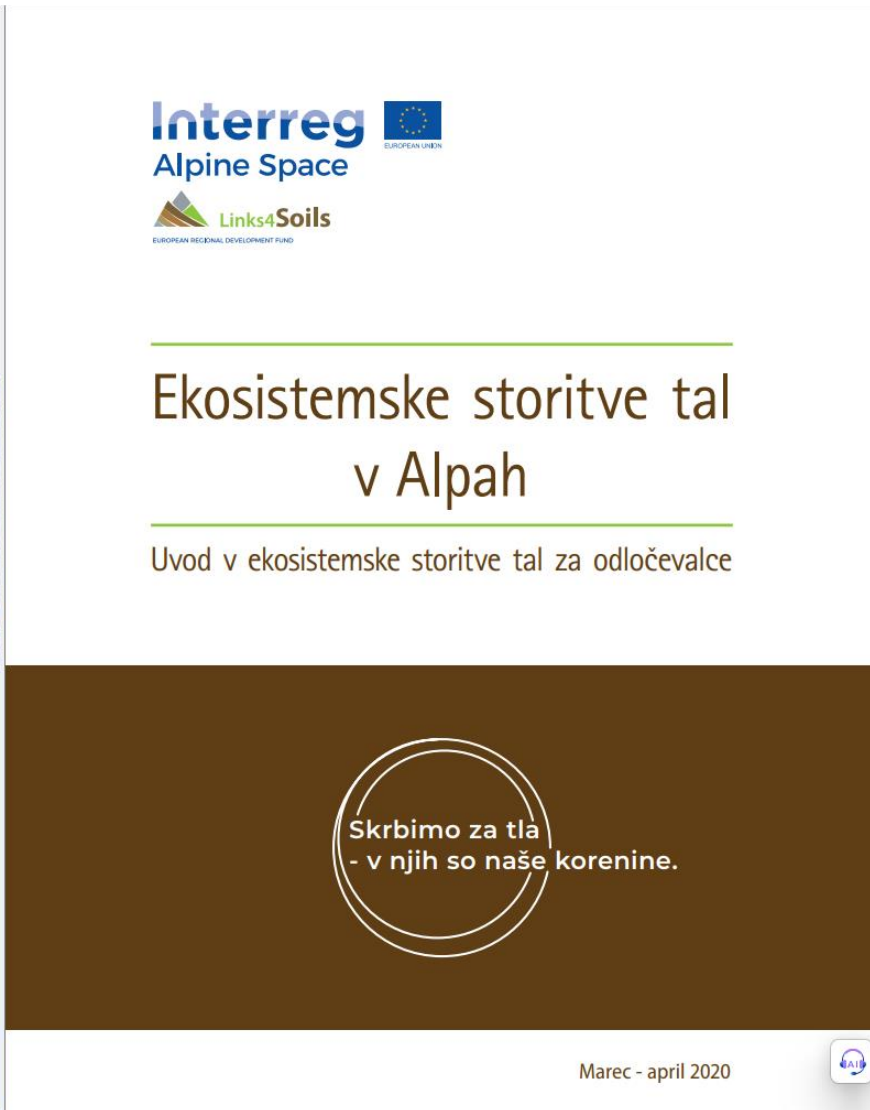
Arhiv naravne in kulturne dediščine.  
Vedenja, duhovne in rekreacijske usluge  
človeku.



*Za odločevalce in uporabnike vseh sektorjev*

## *Publikacije o ekosistemih storitvah tal*

# Knjiga o ekosistemskih storitvah tal za odločevalce (EN, SI, IT)





## Info boxe

### Did you know?

- Soil retains and cycles nutrients so that plants and living organisms can use them over and over again.
- About 33% of the world's soils are degraded due to erosion, acidification, compaction, salinization, pollution, loss of soil organic matter, and nutrients (FAO).
- About 50 to 70% of the world's original soil carbon stocks have been released into the atmosphere as CO<sub>2</sub>.
- A single handful of soil may contain billions of organisms.
- Due to the thousands and even tens of thousands of years it needs to develop, soil is considered a non-renewable natural resource.

# Žepnica; Na kratko o ekosistemskih storitvah tal (EN, SI, DE, IT, FR)



## Agricultural Biomass Production



- **Outputs:** Food, fodder, technical fibre, medicinal plants, energy biomass.



## Forest Biomass Production



- **Outputs:** Wood, timber, wood-based biofuel, forest-derived edible wood products.

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e will also grow.

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xcesses (soil organic  
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## Water Retention

- **Outputs:** Water available for plants, soil biota, and evaporation.

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Histosol – organic matter rich soil formed from peat (Photo: S. Stanchi).

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## Surface Runoff Regulation



- **Outputs:** The reduction of surface runoff and flood risk.

content, which  
es.

nd for building

on or de-struc-  
omote erosion.

tem Services in Brief

## Global Climate Regulation ("the Carbon Cycle")

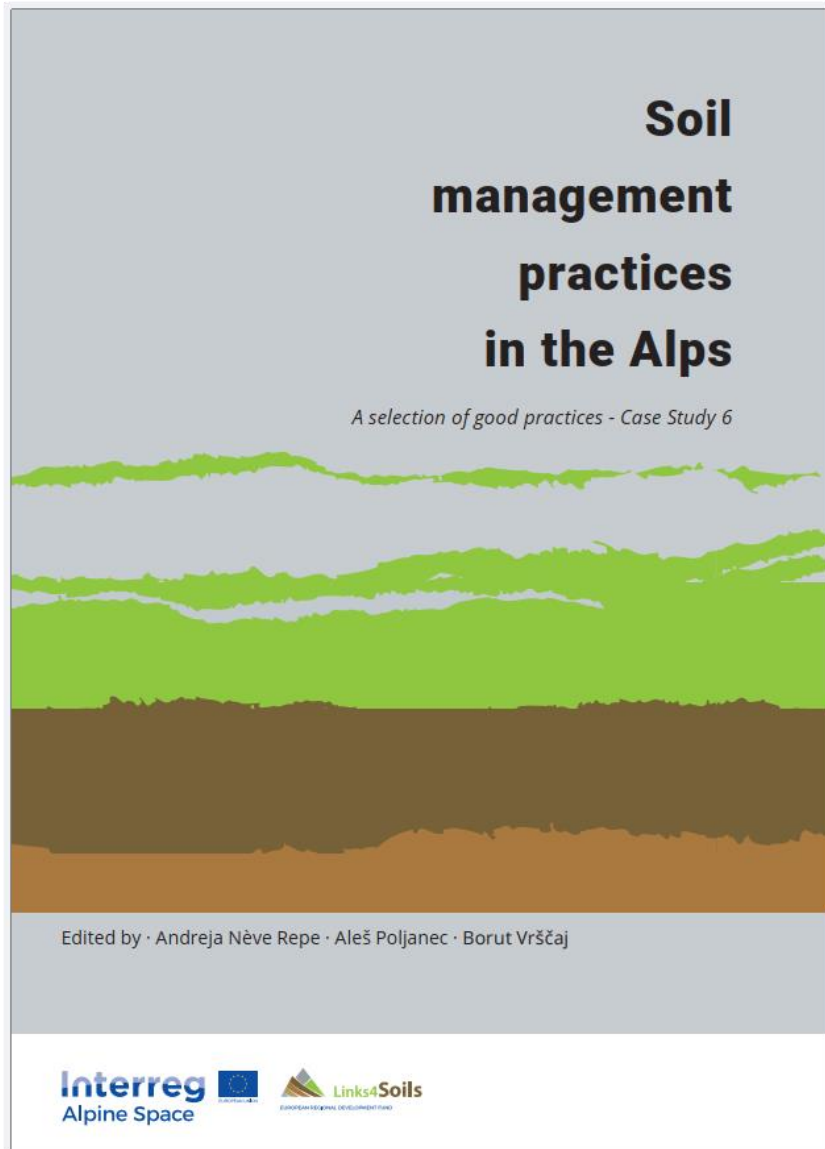


- **Outputs:** Terrestrial carbon (C) storage, climate regulation and climate change mitigation on a global scale.
- **Provision:** Through photosynthesis, carbon (C) is withdrawn from the atmosphere and, via litter and root residue, stored as organic matter in soils. The C content is controlled by the organic matter input and its decomposition within soils. Soil stores more C than the atmosphere and terrestrial vegetation combined.
- **Demands:** In order to mitigate climate change with its negative impacts (e.g. global warming), regulating the global climate should be of the highest importance.
- **Threats:** Inappropriate soil management can result in greater C emissions than sequestration, which makes the soil a C source rather than a C sink.

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Soil Ecosystem Services in Brief

# Knjiga: Dobre prakse gospodarjenja s tlemi v Alpah



**Excerpt from**  
SOIL MANAGEMENT PRACTICES IN THE ALPS  
*A selection of good practices for the sustainable soil management in the Alps*

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Links4  
Soils



ZAVOD ZA GOZDOVE SLOVENIJE  
Slovenia Forest Service

# Knjiga Dobre prakse gospodarjenja s tlemi v Alpah (17)

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*Poznamo bonton?*


*Niti ne?*

***Bonton ravnanja s tlemi***

# Rezultati – dvig zavedanj – trajnostna raba tal


## Trajnostna raba in upravljanje s tlemi v sektorjih. „Kaj se spodobi“

### SOIL ETIQUETTE



**Agriculture**

- Reduce erosion by practising contour planting and keeping soil covered.
- Practise cultivation of cover crops, conservation tillage and other techniques that increase soil organic matter, and thereby mitigate climate change.
- Practise crop rotation and intercropping, and increase crop diversity.
- Promote agro-ecological farming and rational use of organic and mineral fertilizers; maintain soil fertility and protect the soil itself as a vital habitat for soil organisms.
- Reduce the use of pesticides and avoid soil contamination.
- Limit traffic on fields to the minimum, particularly on wet and compaction-sensitive soils.



**Forestry**

- Foster continuous forest cover, also in light of climate change.
- Boost mixed forest structure and tree species composition to improve soil quality.
- Use forest structure and tree species composition adapted to the site conditions.
- Promote natural regeneration with carefully selected tree species.
- Avoid clear-cutting, especially on steep slopes.
- Encourage gap regeneration techniques.
- Leave small branch, leaf, and bark litter to ensure site productivity.
- Adapt machinery and the use thereof to minimize soil degradation.



**Natural hazard management**

- Be aware of natural hazards and the role of soils in your area.
- Carefully plan land use to decrease the risk of natural hazards.
- Maintain permanent vegetation cover from valley to peak.
- Adapt vegetation structure and species composition to natural hazard types.
- Evaluate the current and potential effectiveness of protection forests.
- Maintain and carefully manage protection forests.
- Avoid soil sealing and promote water infiltration.
- Promote integrated risk management by balancing nature-based solutions and civil engineering techniques.

**Links4Soils**


WWW.ALPINESOILS.EU  
WWW.ALPINE-SPACE.EU/PROJECTS/LINKS4SOILS  
INFO@ALPINESOILS.EU

**Interreg**  
**Alpine Space**




**Nature protection and biodiversity**

- Respect soils as an essential part of ecosystems, especially in the Alpine region.
- Identify and protect rare and special soil types as an element of the natural heritage.
- Protect carbon-rich soils, especially moors, bogs, and peatland.
- Protect and manage species-rich grasslands and forest habitats to safeguard soil and above-ground biodiversity.
- Avoid fertilization and the use of pesticides in nature-protected areas.




**Tourism**

- Limit the loss, compaction, and contamination of soils when developing tourism infrastructure.
- Plan hiking and mountain bike trails carefully and ensure adequate soil protection measures to decrease erosion.
- Restore soils in ski runs to minimize erosion and introduce local grass species to make a resistant grass cover and improve biodiversity.
- Promote soil-saving tourism infrastructure and provide public transport in order to limit soil sealing.
- Raise soil awareness among visitors and locals by increasing information on soils.



**Spatial planning and urban environment**

- Consider soil functions and soil ecosystem services in planning processes.
- Minimize soil sealing (covering soil with concrete, buildings, etc.), e.g. by soil-saving architecture and promoting permeable surfaces.
- Avoid urban sprawl, especially on highly productive and environmentally important soils.
- Reuse old buildings and foster the clean-up, decontamination, remediation, and re-utilization of industrial sites.
- Use machinery prudently during the construction of buildings and infrastructure; ensure careful topsoil removal and promote its local re-use.
- Avoid contamination and excessive use of fertilizers and pesticides in gardens, lawns, parks, and along roadsides.



# Bonton ravnanja s temi

- Tla so ‚kontinuum‘ v prostoru – od vode do vode.
- Tla prostorsko zasedajo in/ali koristijo vsi sektorji kmetijstvo, gozdarstvo, poselitev promet, industrija, ... in ‚narava‘.
- Kje, koliko in kakšna tla naj zasede nek sektor – usmerja prostorsko načrtovanje.
- Tla prilagajamo, spreminjamo in degradiramo v vseh sektorjih;
- Bonton (t.j. trajnostno upravljanje tal) je treba osvojiti v vseh sektorjih.
- O bontonu ravnanja s tlemi kmetijce pretežno učijo drugi. Upravičeno?
- Ali pa mora vsak sektor ‚pomesti‘ pred lastnim pragom?

# Bonton ravnanja s tlemi

## BONTON RAVNANJA S TLEMI

Skrbimo za tla -  
v njih so naše korenine.

### Kmetijstvo

- Zmanjšujemo erozijo z obdelavo v pasovih in primerno pokritostjo tal.
- Uvajajmo/uporabljajmo pokrovne in vmesne posevke; uvajajmo ohranitveno obdelavo tal in druge načine pridelave, ki povečujejo vsebnost talne organske snovi. S tem prispevam h kakovosti tal in blažitvi podnebnih sprememb.
- Uporabljajmo medvrstne posevke in ustrezen kolobar ter povečujemo raznolikost kmetijskih rastlin.
- Spodbujajmo racionalno uporabo organskih in mineralnih gnojil in ekološko pridelavo; ohranjajmo rodovitnost tal in varujmo sama tla kot vitalni življenjski prostor organizmov.
- Zmanjšujemo uporabo fitofarmaceutskih sredstev in preprečujemo onesnaževanje tal.
- Omejujmo vožnje po kmetijskih tleh, zlasti po mokrih ter tleh občutljivih na zbijanje.



### Gozdarstvo

- Zagotavljajmo stalno pokritost tal z gozdnim rastjem, tudi v luči blažitve podnebnih sprememb.
- Uporabljajmo primerno gozdno mehanizacijo, da bodo negativni vplivi na tla in gozdne sestoje čim manjši.
- Ustvarjajmo pestro zgradbo in drevesno sestavo gozdov, ki izboljšujejo kakovost tal.
- Izboljšujmo zgradbo gozdov in izbirajmo drevesne vrste prilagojene rastiščnim razmeram.
- Spodbujajmo naravno obnovo gozda s skrbno izbranimi drevesnimi vrstami.
- Izogibajmo se velikopovršinskim sečnjam, zlasti na strmih pobočjih.
- Uvajajmo obnovo gozdov pod zastorom odraslega drevja ali v manjših vrzelih.
- Puščajmo manjše veje, listje in lubje v gozdu, da omogočamo shranjevanje ogljika v tleh in krepimo produktivnost gozdnih tal.

### Obvladovanje naravnih nesreč

- Zavedajmo se tveganj naravnih nesreč na našem območju in vloge tal pri njihovem preprečevanju.
- Pazljivo načrtujmo rabo zemljišč, da zmanjšamo pojav naravnih nesreč, npr. usadov in plazov.
- Izogibajmo se pretirani pozidavi oz. prekrivanju tal ter omogočajmo vpijanje in odtok vode skozi tla.
- Spodbujajmo celostno obravnavanje tveganj naravnih nesreč z uravnoteženimi rešitvami uveljavljenih naravnih metod in tehnik preprečevanja naravnih nesreč.
- Ohranjajmo pokritost tal z vegetacijo od dna doline do vrha.
- Prilagodimo strukturo in sestavo vegetacije glede na tveganja naravnih nesreč.
- Ustrezno vrednotimo, vzdržujemo in skrbno upravljajmo zaščitene gozdove.

[WWW.ALPINESOILS.EU](http://WWW.ALPINESOILS.EU)

[WWW.ALPINE-SPACE.EU/PROJECTS/LINKS4SOILS](http://WWW.ALPINE-SPACE.EU/PROJECTS/LINKS4SOILS)

[INFO@ALPINESOILS.EU](mailto:INFO@ALPINESOILS.EU)

Interreg  
Alpine Space

Links4Soils  
LINKS4SOILS



ZAVOD za GOZDOVO  
SLOVENIJE

Kmetijski inštitut Slovenije  
Agricultural Institute of Slovenia

# Bonton ravnanja s tlemi



## Varstvo narave in biotske raznovrstnosti

- Spoštujemo tla kot bistveni del ekosistemov, zlasti v alpskem prostoru.
- Zavedajmo se izjemne biotske pestrosti v tleh, pomembne za delovanje celotnih kopenskih ekosistemov.
- Prepoznavajmo in zaščitimo redke in posebne vrste tal kot naravno dediščino.
- Zaščitimo tla bogata z ogljikom, zlasti barja in šotišča.
- Ohranjajmo naravna tla; izogibajmo se gnojenju in uporabi fitofarmaceutskih sredstev na naravovarstveno zaščiteneh območjih.



## Turizem



- Omejimo izgubo, zbijanje in onesnaževanje tal pri izgradnji turistične infrastrukture.
- Previdno načrtujemo pohodniške in gorske kolesarske poti ter zagotovimo ustrezne ukrepe za zaščito tal in zmanjšanje erozije.
- Obnavljajmo travnine na smučiščih in območjih zaščitene narave z lokalno in biotsko pestro sestavo avtohtonih vrst trav ter s tem preprečujemo nastanek erozijskih žarišč.
- Spodbujajmo turistično infrastrukturo, ki je racionalna s pozidavo in degradacijo tal in zato zagotovimo javni prevoz.
- Povečajmo zavedanja o pomenu tal med obiskovalci in domačini s povečanjem dostopnosti informacij o tleh.



## Prostorsko načrtovanje in urbano okolje

- Upoštevajmo funkcije tal in ekosistemske storitve tal v procesih načrtovanja in izgradnje nove infrastrukture.
- Zmanjšajmo pozidavo tal (prekritje tal z betonom, asfaltom, zgradbami itd.) in promovirajmo tlakovanje s prepustnimi materiali.
- Izogibajmo se pretirani in razpršeni poselitvi, zlasti na rodovitnih in okoljsko pomembnih tleh.
- Spodbujajmo adaptacije opušenih zgradb in pospešujemo čiščenje, dekontaminacijo, sanacijo in ponovno uporabo industrijskih in urbanih zemljišč.
- Premišljeno uporabljajmo mehanizacijo med gradnjo stavb in infrastrukture; poskrbimo za skrbno odstranjevanje in ponovno uporabo vrhnje plasti tal.
- Izogibajmo se onesnaževanju ter pretirani uporabi gnojil in fitofarmaceutskih sredstev na vrtovih, travnikih, parkih in ob cestah.

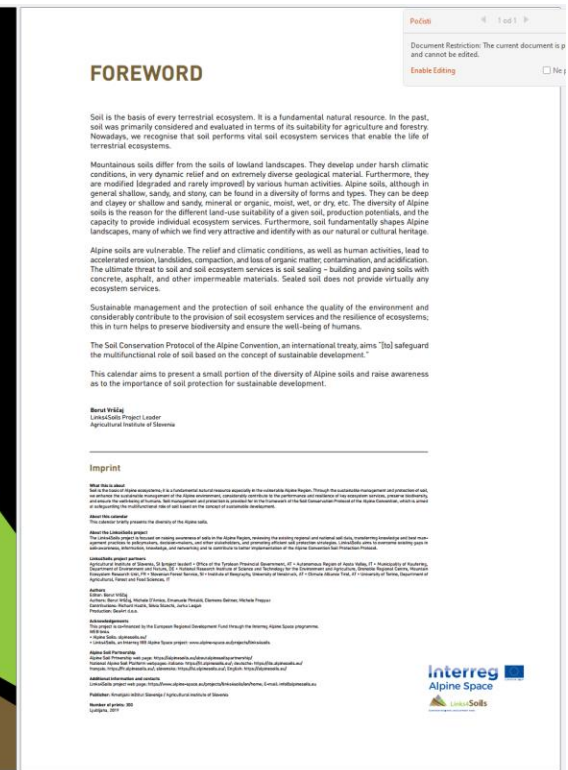
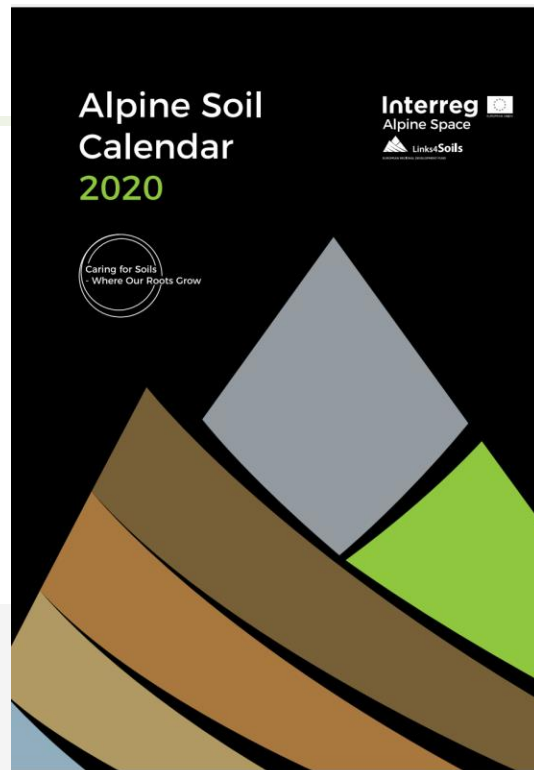


# Bonton ravnanja s tlemi



## Prostorsko načrtovanje in urbano okolje

- Upoštevajmo funkcije tal in ekosistemske storitve tal v procesih načrtovanja in izgradnje nove infrastrukture.
- Zmanjšajmo pozidavo tal (prekritje tal z betonom, asfaltom, zgradbami itd.) in promovirajmo tlakovanje s prepustnimi materiali.
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Verjetno koledar  
z daljšo dobo uporabnosti kot eno samo leto

Koledar tal

# Koledar

Koledar ima namen predstaviti pestrost tal v Alpah;  
Poimenovanje tal, lastnosti, raba, grožnje tlom in  
degradacije, primarne ekosistemske storitve.



B. Vrščaj

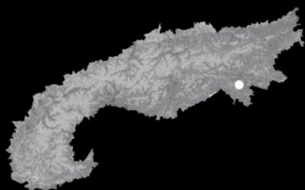


## SOIL CLASSIFICATION

Rjava rendzina na karbonatni moreni, humozna, srednje globoka (Klasifikacija tal Slovenije 2019) Luvic Phaeozem, (WRB 2014, update 2015).

## LOCATION

1300 m a.s.l., Mrzli studenec, Pokljuka, Slovenia.



## KEY SOIL PROPERTIES

Shallow silty soil. Topsoil: fine silty texture, granular structure, high organic matter, neutral to weakly acid, moderately rapid permeability; well to medium drained; low surface runoff.

## PRIMARY LAND USE

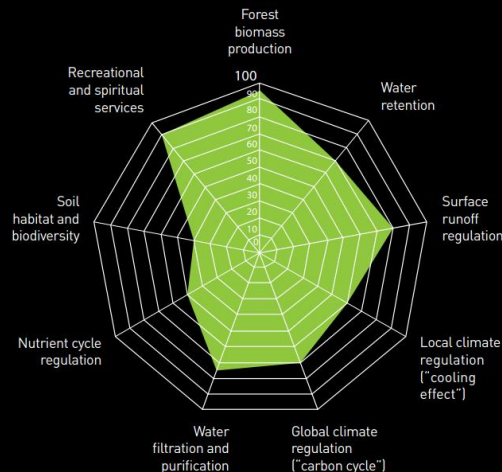
Highly productive forest, rarely mountain pastures and biodiversity-rich grasslands.

## THREATS AND DEGRADATION

Soil compaction, topsoil acidification and accelerated leaching in pure spruce stands, moderate soil erosion.

## PRIMARY SOIL ECOSYSTEM SERVICES

Forest biomass production, water retention, surface runoff regulation, local climate regulation ("the cooling effect"), global climate regulation ("the carbon cycle"), water filtration and purification, nutrient cycle regulation, soil habitat and biodiversity, recreational and spiritual services.





# Koledar (nad.)

## JANUARY



H. Chmura and E. Novak

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**SOIL CLASSIFICATION**  
Umbric Entic Podzol (WRB 2014).

**LOCATION**  
3420 m a.s.l., Rifugio Monviso, Val Vercy, Courmayeur (AOL, Italy).

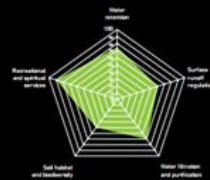


**KEY SOIL PROPERTIES**  
Medium deep, humus, sandy loamy texture, very fine granular structure, high organic matter content, very acid, well drained, slow surface runoff, weak erosion but acidification caused by low temperatures.

**PRIMARY LAND USE**  
Higher subalpine heath (*Ericaceum* spp., *Lanetorium procumbens*).

**THREATS AND DEGRADATION**  
Turf destruction and erosion in case of low-snowfall winters, enhancing cryptogamias and acidification.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Water retention, surface runoff regulation, soil habitat and biodiversity, recreational and spiritual services.



## FEBRUARY



E. Benner and R. Hahn

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**SOIL CLASSIFICATION**  
Petro-Parasitic Soil Classification of Anshu 2009/2011, Dolomitic Lithic Lepsozol (WRB 2014).

**LOCATION**  
750 m a.s.l., Pin valley near Jenbach, Tyrol, Austria.

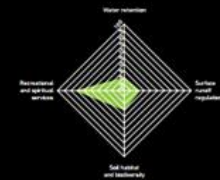


**KEY SOIL PROPERTIES**  
Very shallow soil on carbonate rock at a steep slope. Topsoil: loamy texture, granular structure, surface rich in organic matter, slightly alkaline, very low water and nutrient availability, well drained, medium surface runoff.

**PRIMARY LAND USE**  
Sparse maritime pine forest with grassy undergrowth.

**THREATS AND DEGRADATION**  
Erosion, soil organic matter decline.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Soil habitat and biodiversity, surface runoff regulation, water retention, recreational and spiritual services.



# Koledar (nad.)

## MARCH



Looking for Soil? Where Our Roots Grow.

Interreg Alpine Space

M. D'Amico, E. Petralis and M. Freppaz

**SOIL CLASSIFICATION**  
Skeletal Cambic Umbrisol (Turbic) (WRB 2014)

**LOCATION**  
3030 m a.s.l. Stolemberg Plateau, Graessental in Fiemme (AO) - Alagna Valsesia (VC) Italy



**KEY SOIL PROPERTIES**

Medium deep soil (probably paleosol), hidden below a blockfield. Thick topsoil: sandy loamy/loamy fine sand texture, subangular blocky structure, medium to high organic matter, slightly acidic, moderately rapid drainage, slow surface runoff.

**PRIMARY LAND USE**

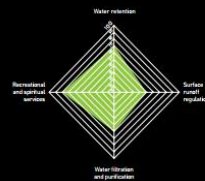
Nature protection area, sports and tourism (ski area).

**THREATS AND DEGRADATION**

Erosion, organic matter decline, removal by human activities.

**PRIMARY SOIL ECOSYSTEM SERVICES**

Water retention, surface runoff regulation, water filtration and purification, recreational and spiritual services.



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## APRIL



Looking for Soil? Where Our Roots Grow.

Interreg Alpine Space

B. Velič

**SOIL CLASSIFICATION**  
Rjava mediana na karbonatni moreni, humozna, svetlo globoka (Klasifikacija tal Slovenije 2019)  
Luvis Fluvisol, (WRB 2014, update 2015).

**LOCATION**  
1300 m a.s.l., Mrzli studenc, Poljuno, Slovenia.



**KEY SOIL PROPERTIES**

Shallow silty soil. Topsoil: fine silty texture, granular structure, high organic matter, neutral to weakly acid, moderately rapid permeability, well to medium drained; low surface runoff.

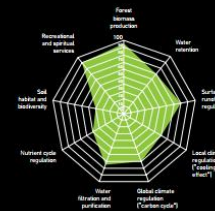
**PRIMARY LAND USE**

Highly productive forest, rarely mountain pastures and biodiversity-rich grasslands.

**THREATS AND DEGRADATION**  
Soil compaction, topsoil acidification and accelerated leaching in pure spruce stands, moderate soil erosion.

**PRIMARY SOIL ECOSYSTEM SERVICES**

Forest biomass production, water retention, surface runoff regulation, local climate regulation (the cooling effect), global climate regulation (the carbon cycle), water filtration and purification, nutrient cycle regulation, soil habitat and biodiversity, recreational and spiritual services.



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# Koledar (nad.)

## MAY



Caring for Soil Where Our Roots Grow

Interreg Alpine Space

M. Di Maria and E. Pistilli

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### SOIL CLASSIFICATION

Lepic Fluvisol (WRB 2014)

### LOCATION

2900 m a.s.l., Monti de Comus, Saint-Marcel (AO), Italy



### KEY SOIL PROPERTIES

Medium deep soil. Topsoil, sandy loamy texture, granular structure, medium to high organic matter, slightly acid; moderately rapid permeability; moderately well drained; slow surface runoff.

### PRIMARY LAND USE

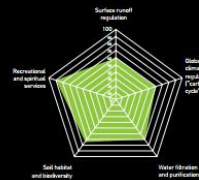
Natural grassland, sports and recreation, mountain pasture.

### THREATS AND DEGRADATION

Erosion (particularly caused by cryoturbation during low-snowfall winters), soil organic matter decline.

### PRIMARY SOIL ECOSYSTEM SERVICES

Surface runoff regulation, water filtration and purification, recreational and spiritual services, global climate regulation ("the carbon cycle"), soil habitat and biodiversity.



## JUNE



Caring for Soil Where Our Roots Grow

Interreg Alpine Space

C. Goller

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### SOIL CLASSIFICATION

Liesen-Humus-Podzol, vertisol (Soil Classification of Austria (2000/311), Gleyic Histic Podzol (WRB 2014))

### LOCATION

1870 m a.s.l., Fötsch valley near Innsbruck, Tyrol, Austria.



### KEY SOIL PROPERTIES

Deeply developed and humus rich soil on multi-layered deposits of the tree slope. Topsoil, Thick and wet organic layers, mineral components with sandy texture, single grain structure, extremely acid, low nutrient availability, slope water input; poorly drained; medium surface runoff.

### PRIMARY LAND USE

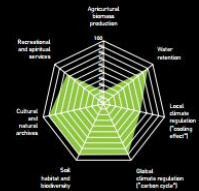
Subalpine grassland (temporarily well, extensive grazing by cows).

### THREATS AND DEGRADATION

Erosion, accumulation due to other morphodynamic processes, soil organic matter decline, loss of biodiversity.

### PRIMARY SOIL ECOSYSTEM SERVICES

Water retention, agricultural biomass production, local climate regulation ("the cooling effect"), global climate regulation ("the carbon cycle"), soil habitat and biodiversity, cultural and natural archives, recreational and spiritual services.



# Koledar (nad.)

## JULY



Caring for Soils -  
Where Our Roots Grow

Interreg  
Alpine Space  
▲ 100-CM

M. D'Amico and E. Peraldi

### SOIL CLASSIFICATION

Shelisic Umbric Leptosol (WRB 2014).

LOCATION:  
2700 m a.s.l., Lac Long,  
Valbelline (AO), Italy.



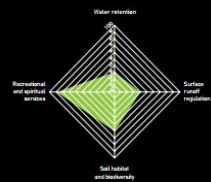
### KEY SOIL PROPERTIES

Very shallow soil. Topsoil: coarse leamy texture, granular structure, high organic matter, moderately acid, very stony, moderately slow permeability; well drained; high surface runoff; erosion.

PRIMARY LAND USE  
Alpine grassland, nature protection area, sports and tourism.

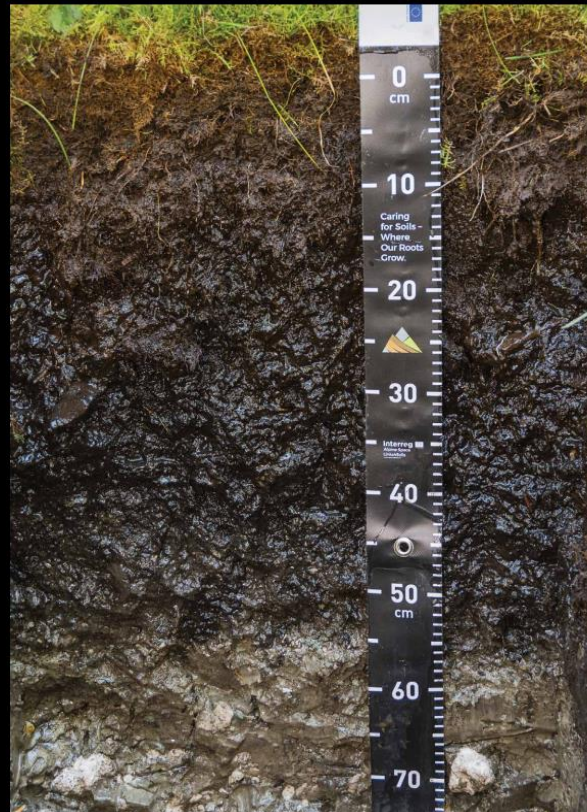
THREATS AND DEGRADATION  
Erosion, soil organic matter decline, loss of biodiversity.

PRIMARY SOIL ECOSYSTEM SERVICES  
Surface runoff regulation, water retention, soil habitat and biodiversity, recreational and spiritual services.



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## AUGUST



Caring for Soils -  
Where Our Roots Grow

Interreg  
Alpine Space  
▲ 100-CM

B. Vrščaj

### SOIL CLASSIFICATION

Ščina (la, topogama, srednje globokoka, mokra (Hidrološka) tal Slovenija 2019). Orthoentric Rhenic Histosol (WRB 2014-2015).

LOCATION:  
1200 m a.s.l. Gorjšek,  
Pokljaka, Slovenia



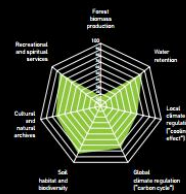
### KEY SOIL PROPERTIES

Medium deep waterlogged peat soil with mineral gleyic carbonate-rich subsoil. Topsoil: organic, leafy, fibrous structure, neutral to slightly alkaline, rapid permeability when peat is dry; very poorly drained - waterlogging; no surface runoff - water accumulation in a topographic depression.

PRIMARY LAND USE  
Nature and biodiversity protection area, low-production natural forest.

THREATS AND DEGRADATION  
Soil organic matter decline if soil is drained, loss of biodiversity.

PRIMARY SOIL ECOSYSTEM SERVICES  
Soil habitat and biodiversity, cultural and natural archives, recreational and spiritual services, water retention, global climate regulation ("the carbon cycle"), local climate regulation ("the cooling effect"), forest biomass production.



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## SEPTEMBER



Caring for Soils  
Where Our Roots Grow

Interreg  
Alpine Space

M. D'Amico and E. Perotto

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**SOIL CLASSIFICATION**  
Dystric Chernosem, Gley Cambisol  
(Turbic) (WRB 2014).

**LOCATION**  
2500 m a.s.l., Tête-Entre-Deux-Sauts,  
Val Ferret, Courmayeur (AOI, Italy).

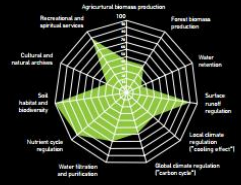


**KEY SOIL PROPERTIES**  
Humic, medium deep soil. Topsoil:  
sandy-loamy texture, fine granular structure,  
medium organic matter, very acid;  
high permeability when the subsoil is not  
frozen; weakly drained; slow surface runoff.

**PRIMARY LAND USE**  
Alpine grassland, above treeline.

**THREATS AND DEGRADATION**  
Organic matter decline, erosion, overgrazing.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Surface runoff regulation, water retention,  
soil habitat and biodiversity, recreational  
and spiritual services.



## OCTOBER



Caring for Soils  
Where Our Roots Grow

Interreg  
Alpine Space

B. Vitzig

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**SOIL CLASSIFICATION**  
Riparia, Irgano, smolje glodota  
in plina, nevostena (Klasifikacija  
tal Slovenije 2011, Lux Phaeozem,  
[WRB 2014, update 2015]).

**LOCATION**  
1220 m a.s.l., Mirni slutenec,  
Poljčana, Slovenia

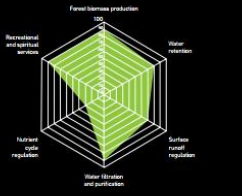


**KEY SOIL PROPERTIES**  
Medium deep and shallow soil. Topsoil: coarse loamy texture,  
granular structure, high organic matter, neutral, moderately  
rapid permeability, well to moderately well drained; low surface  
runoff.

**PRIMARY LAND USE**  
Highly productive forest, small mountain grassland areas, sports  
and recreation.

**THREATS AND DEGRADATION**  
Soil compaction, soil organic matter decline, loss of soil biodiversity.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Forest biomass production, surface runoff regulation, water filtration  
and purification, global climate regulation (the carbon  
cycle), agricultural production, soil habitat and biodiversity,  
recreational and spiritual services.



## NOVEMBER



Going for Gold  
Where Our Roots Grow

Interreg  
Alpine Space

**SOIL CLASSIFICATION**  
Opozozljena (ta, dobro uporabna, zrna gljiviška, malo skletena) (Klasifikacija tal Slovenije 2011), Folvic Entic Podzol (WRB 2014).

**LOCATION**  
1240 m a.s.l., Hrabi studenec, Poljuka Slovenia.

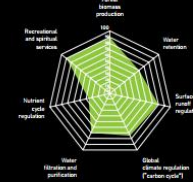


**KEY SOIL PROPERTIES**  
Deep mineral leached/podzolized soil. Topsoil: fine silty texture, granular structure, medium to high organic matter, strongly acid, rapid permeability, well drained; low surface runoff.

**PRIMARY LAND USE**  
Productive forest, sports and recreation.

**THREATS AND DEGRADATION**  
Leaching, topsoil acidification, soil compaction, soil organic matter decline, loss of biodiversity.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Forest biomass production, water retention, surface runoff regulation, water filtration and purification, global climate regulation (the carbon cycle), nutrient cycle regulation, recreational and spiritual services.



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- 14 Sat
- 15 Sun
- 16 Mon
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- 21 Sat
- 22 Sun
- 23 Mon
- 24 Tue
- 25 Wed
- 26 Thu
- 27 Fri
- 28 Sat
- 29 Sun
- 30 Mon

## DECEMBER



Going for Gold  
Where Our Roots Grow

Interreg  
Alpine Space

**SOIL CLASSIFICATION**  
Albic Ortsteinic Podzol (WRB 2014).

**LOCATION**  
2390 m a.s.l., Nomenon, Cogne (AO), Italy

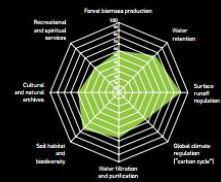


**KEY SOIL PROPERTIES**  
Deep acid soil. Topsoil: sandy loamy texture, platy structure, low organic matter in the E horizon, strongly acid, rapid permeability, moderately well drained; low surface runoff.

**PRIMARY LAND USE**  
Subalpine stone pine forest.

**THREATS AND DEGRADATION**  
Soil acidification, erosion in case of forest over-exploitation.

**PRIMARY SOIL ECOSYSTEM SERVICES**  
Forest biomass production, water retention, global climate regulation (the carbon cycle). Because of high carbon content in deep horizons, water filtration and purification, habitat provision (biodiversity), cultural and natural archives.



- 1 Thu
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- 29 Thu
- 30 Fri
- 31 Sat

*Prenos znanj na mlade*

*– dvig zavedanj o tleh pri novih generacijah*

***Mednarodna poletna šola o tleh  
Pokljuka 2019***

# Rezultati – Prenos vedenja in znanj na mlade

## Poletna šola za Youth Parliament of Alpine Convention (YPAC)

Sektorji in trajnostna raba tal

<https://www.alpine-space.eu/project/links4soils/>

Šole:

- Liechtensteinisches Gymnasium Vaduz (Liechtenstein),
- Institut Agricole Régional Aosta (Italy),
- Gimnazija Rudolfa Maistra Kamnik (Slovenia)
- Istruzione Liceale Tecnica e Professionale Verres (Italy).



# Mednarodna poletna šola o tleh za srednješolce



# Mednarodna poletna šola o tleh za srednješolce



02 field 01 industry 01 sunny/clear  
 03 orchard/vineyard 02 traffic 02 overcast  
 04 bare soil 03 bare soil 03 partly cloudy  
 05 high road 04 bare soil 04 after rainstorm  
 06 sports field 05 high road 05 after light rain  
 07 lawn playground 06 dump 06 after heavier rain  
 08 park 07 farming 07 windy  
 09 traffic area 08 military activity 08  
 10 industrial area 09 flood waters 09  
 99 other - note 10 10  
 99 other - note 99 other - note

**Soil profile**

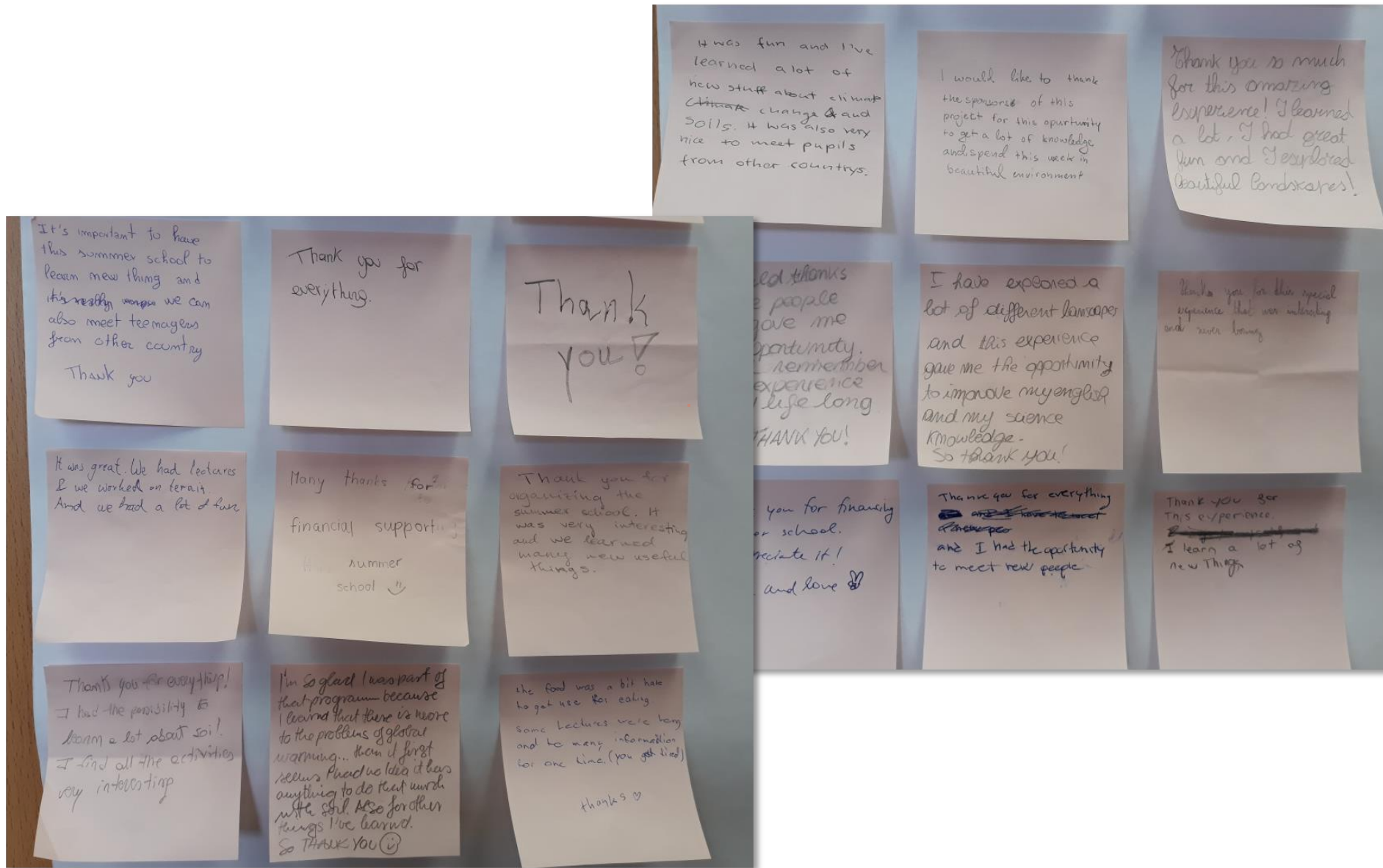
1	10	5
2	16	10
3	9a	15
4	12	20
5	15	25
6	18	30
7	21	35
8	24	40
9	27	45
10	30	50
11	33	55
12	36	60
13	39	65
14	42	70
15	45	75
16	48	80
17	51	85
18	54	90
19	57	95
20	60	100
21	63	105
22	66	110
23	69	115
24	72	120
25	75	125
26	78	130
27	81	135
28	84	140
29	87	145

Properties  
 Biodiversity  
 Soil ecosystem services  
 Soil threats  
 Soil management practices; B  
 Photos  
 number of photos, topics  
 Sampled by  
 Soil description and field sampling  
 Sampled by: <name and s  
 Organization:  
 Address:  
 Date of sampling: dd.mm.yyyy  
 Contact for further information: <name and surname>

more durable  
 BIODIVERSITY  
 SENSE OF THE TERRITORY  
 EROSION



# Mednarodna poletna šola o tleh za sredješolce



*Slika menda pove več kot 1000 besed.  
Video torej pove 1000<sup>2</sup> besed?*

*Links4Soils*

*Videi*

# Video vsebine – o pomenu tal; podatki o tleh

- Zakaj govoriti o tleh <https://www.youtube.com/watch?v=nMNwsxNdFVs&t=14s>
- #1 Kaj so to ‚živa tla‘ <https://www.youtube.com/watch?v=3-armPfxYKQ>
- #2 Raba in potenciali tal <https://www.youtube.com/watch?v=kC7U6NDyyOg>
- #3 Tla v spreminjanju podnebja <https://www.youtube.com/watch?v=5RK9CGN1k9A>
- #4 Ni tal, ni hrane, ni lesa <https://www.youtube.com/watch?v=zOETcUtTdbM>
  
- Podatki tal, GeoNetwork Web <https://www.youtube.com/watch?v=BnJFkBmpsOQ>
- Podatki tal, GeoNetwork Node <https://www.youtube.com/watch?v=UwaFuchw6YI>

## *Kmetijstvo in tla v Alpah*



Foto: Thomas Peham, AdTLR)



Foto: Thomas Peham, AdTLR)





Foto: Thomas Peham, AdTLR)



Foto: Thomas Peham, AdTLR)



Foto: Thomas Peham, AdTl(r)



Photo B. Vrščaj




Photo B. Vrščaj

*In zakaj vse te aktivnosti, rezultati,... ?*

*Rezime....*

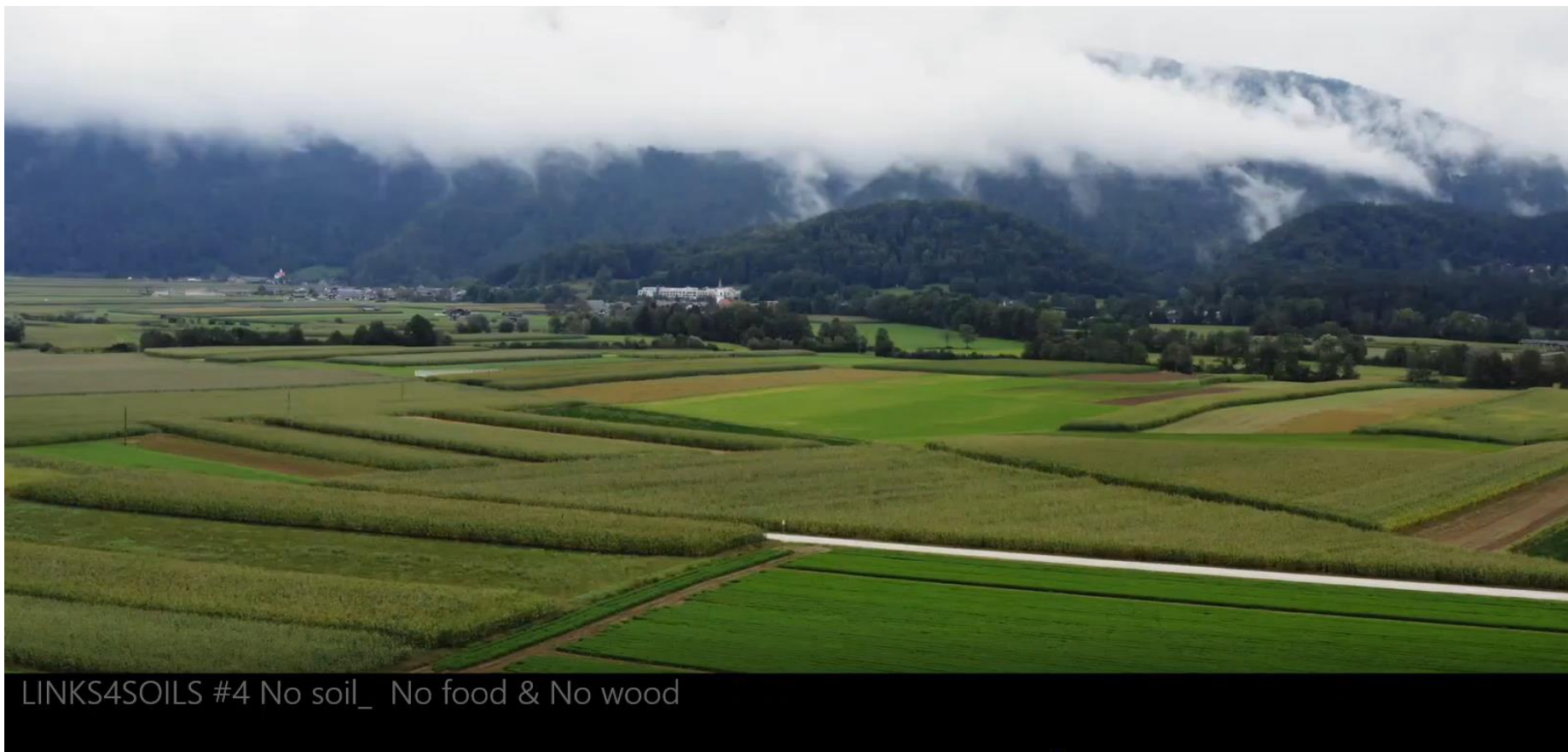
Smo izvedli ker:

- so (bila) tla pozabljena, spregledana, zanemarjena, ...;
- tla pretirano degradiramo, pozidujemo, uničujemo, ...;
- je sodobna družba pozabila, zakaj varovati tla; „kaj se spodobi in kaj se ne spodobi“;
- o tleh ne odloča kmetijski sektor; pač pa iz birojev in pisarn;
- je treba drugim povedati, da „tla štejejo“; kmetijci tega še nismo pozabili.
- ...
- **Ker z  Links4Soils aktivnostmi pomagamo varovati tla, tudi (ali predvsem?) kmetijska.**

# Mogoče najvažnejše sporočilo



v videu „No Soil – No Food, No Wood“ 2019



LINKS4SOILS #4 No soil\_ No food & No wood

*Hvala za vašo pozornost!*

[BORUT.VRSCAJ@KIS.SI](mailto:BORUT.VRSCAJ@KIS.SI)