PRO AGRO LECTORIUM

International Union of Soil Sciences

Possible Policies and Actions to Protect the Soil Cultural and Natural Heritage

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President - International Union of Soil Sciences

The IUSS

- The International Union of Soil Sciences (IUSS) is the global union of soil scientists.
- The objectives of the IUSS are to promote all branches of soil science, and to support all soil scientists across the world in the pursuit of their activities.
- The IUSS aims to promote the recognition of soil as a vital resource, in need of sustainable management and conservation.
- The IUSS is a free and autonomous organization, financed primarily by member contributions, providing a reputation for soil scientists and a collaborative space.
- The IUSS is based on two pillars:
  - it is a union of national societies or academies (the Full members)
  - it is an organization of soil scientists (individual members).

The IUSS Full an Individual Members

- The Full members of the IUSS are 79 National Soil Science Societies or Academia.
- The estimated Individual members (through the National Soil Science Societies) is about 50,000
- The IUSS holds relationships with 8 regional societies:
  - African Soil Science Society (ASSS)
  - East and Southeast Asia Federation of Soil Science Societies (ESAFS)
  - European Confederation of Soil Science Societies (ECSSS)
  - Federation of Eurasian Soil Science Societies (FESSS)
  - Latin American Soil Science Society (SLCS)
  - Soil Science Society of East Africa (SSSEA)
  - Pacific Regional Society of Soil Science (PRSSS)
  - Central Asian Soil Science Society (CASSS)

The IUSS Structure

- Governance: the Council, the Executive and President's Committees, the Secretariat, responsible for management.
- Science: 4 Divisions, 21 Commissions, 17 WGs, and the Forum

Division 1 – Soils in Space and Time

C1.1 Soil morphology and micromorphology
C1.2 Soil geography
C1.3 Soil genesis
C1.4 Soil classification
C1.5 Pedometrics
C1.6 Paleopedology

Division 2 – Soil Properties and Processes

C2.1 Soil physics
C2.2 Soil chemistry
C2.3 Soil biology
C2.4 Soil mineralogy
C2.5 Soil chemical, physical and biological interfacial reactions

The IUSS Structure

Division 3 – Soil Use and Management

C3.1 Soil evaluation and land use planning
C3.2 Soil and water conservation
C3.3 Soil fertility and plant nutrition
C3.4 Soil engineering and technology
C3.5 Soil degradation control, remediation, and reclamation
C3.6 Salt-affected soils

Division 4 – The Role of Soils in Sustaining Society and the Environment

C4.1 Soil and the environment
C4.2 Soil, food security, and human health
C4.3 Soil and land use change
C4.4 Soil education and public awareness
C4.5 History, philosophy, and sociology of soil science

The IUSS WGs

Division 1

1. Cryosols
2. Digital Soil Mapping
3. Digital Soil Morphometrics
4. Global Soil Map
5. Proximal Soil Sensing
6. Soil Information Standards
7. Soil Monitoring
8. Universal Soil Classification
9. World Reference Base

Division 2

1. Hydropedology
2. International Soil Modeling Consortium

Division 3

1. Acid Sulphate Soils
2. Forest Soils
3. Paddy Soils
4. Soils of Urban, Industrial, Traffic, Mining and Military Areas (SUITMA)

Division 4

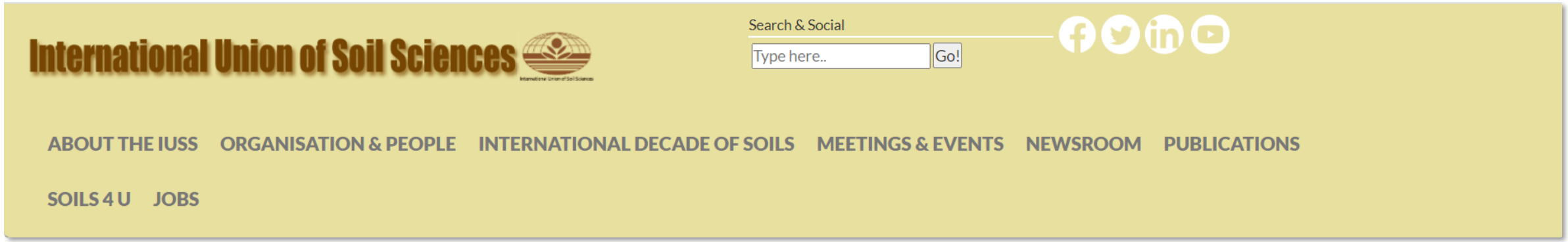
1. Cultural Patterns of Soil Understanding
2. Young and Early Career Scientists

The IUSS main outputs

- WCSS every 4 years + 1 inter-congress + special congress: Centennial
- Every year:
  - 40-80 main scientific events organized by Divisions, Commissions and WGs
  - Over 2000 events organized for the World Soil Day on the 5th of December every year, in collaboration with the FAO
  - 2 Bulletin and 12 Alert
  - 1-2 Books, also open source
- Awards and prizes:
  - the Dokuchaev and Von Liebig Award, for basic and applied researches
  - the Jeju Award for young and mid-career soil scientist
  - the IUSS Distinguished Service Medal, for outstanding world soil leaders who have translated soil science into action;
- Honorary members
- Promotion of individual member by other scientific organization, such as the ISC
- IUSS Stimulus Fund and projects

The IUSS Website and Social Media

https://www.iuss.org/



- Facebook www.facebook.com
- LinkedIn www.linkedin.com
- Youtube www.youtube.com
- Twitter www.twitter.com

International Decade of Soils
2015 - 2024

The IUSS 2021-2030 Strategic Plan

Our strategic goals

- Improvement of soil consciousness.
- Increasing participation of the IUSS members.
- Raising stakeholder engagement and strengthened linkages with international scientific organizations.
- Fostering scientific publications with higher impact.
- Boosting communication of scientific results, promoting public understanding, recognition, esteem, and engagement in soil science.
- Enhancing education, awareness and outreach at all levels.
- Supporting awards, prizes, and medals.
- Improved allocation and evaluation of economic resources.
- Adoption of an equality and equity policy and their internal practice.

100 years of SOIL SCIENCE
past achievements and future challenges

International Union of Soil Science

SISS · SOCIETÀ ITALIANA DELLA SCIENZA DEL SUOLO

Centennial of the IUSS

Florence - Italy
May 19 - 21, 2024

www.centennialiuss2024.org

General themes

Soil health in achieving the Sustainable Development Goals
Soil governance
Soil in the circular economy
Soil sciences impact on basic knowledge
Soil in the digital era
Soil and the human society
Equity, diversity and inclusivity in soil sciences

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UPCOMING EVENTS

Inter-Congress 2024

We are going to host the Inter-Congress in October 2024 in Nanjing, China.

MORE INFORMATION

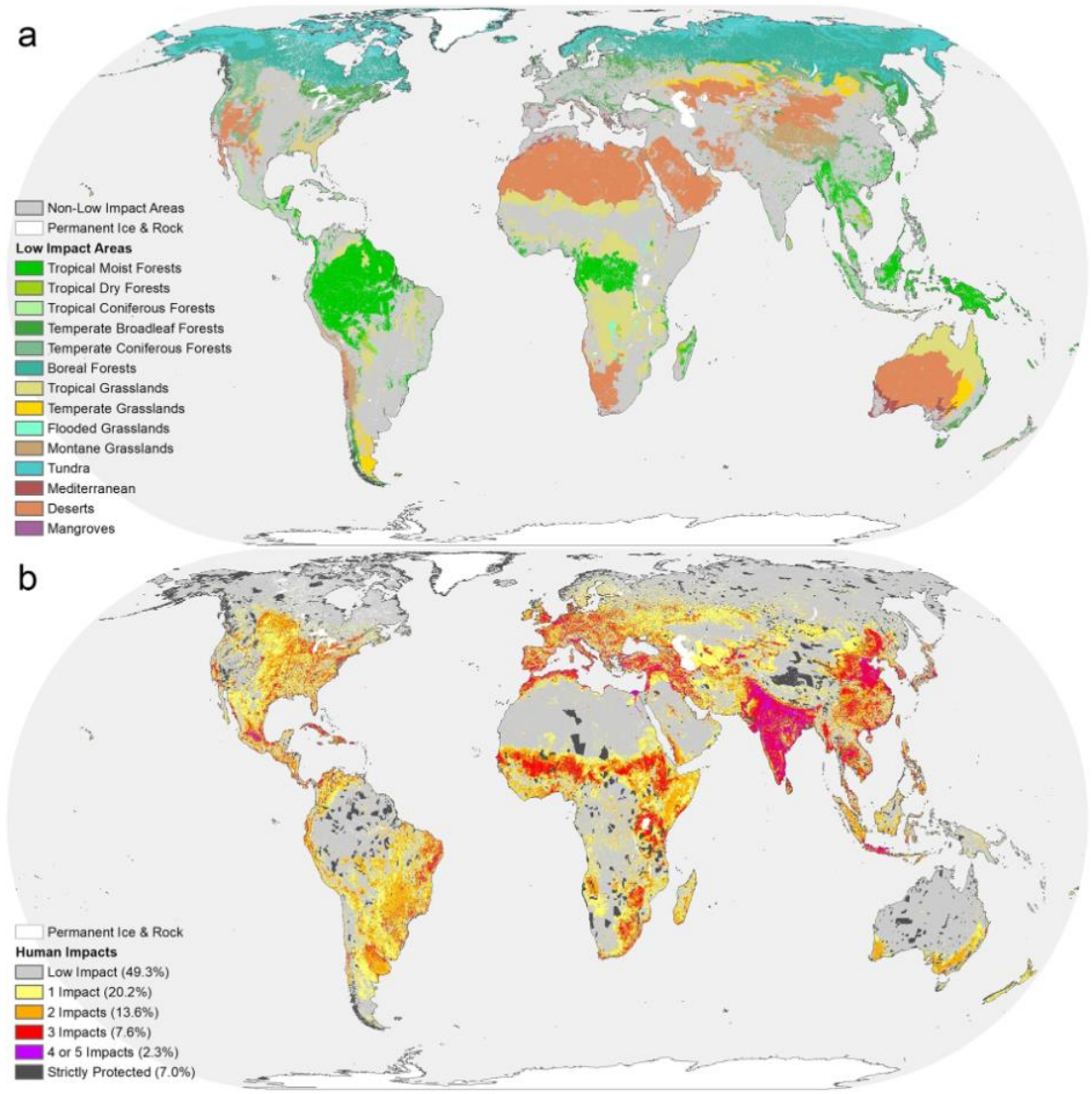
http://en.csss.org.cn/home

Strategic goal n°1: Improvement of soil awareness

Rights of man, animals, trees, nature…..

……are there soil rights?

From: Global areas of low human impact ('Low Impact Areas') and fragmentation of the natural world



(**a**) Global map of Low Impact Areas (color-coded by biome) and the surrounding human-dominated matrix in gray. (**b**) Global map of the intensity of human impacts. The majority of impacted cells have more than one impact.

Low impact areas of the World are shrinking

Many natural soils are threatened with extinction!

Jacobson et al, 2019. Scientific Reports (Sci Rep) ISSN 2045-2322 (online)

Strategic goal n°1: Improvement of soil awareness

Focus on the ability to sustain life

Soil health: the continued ability of soils to perform ecological functions for all forms of life

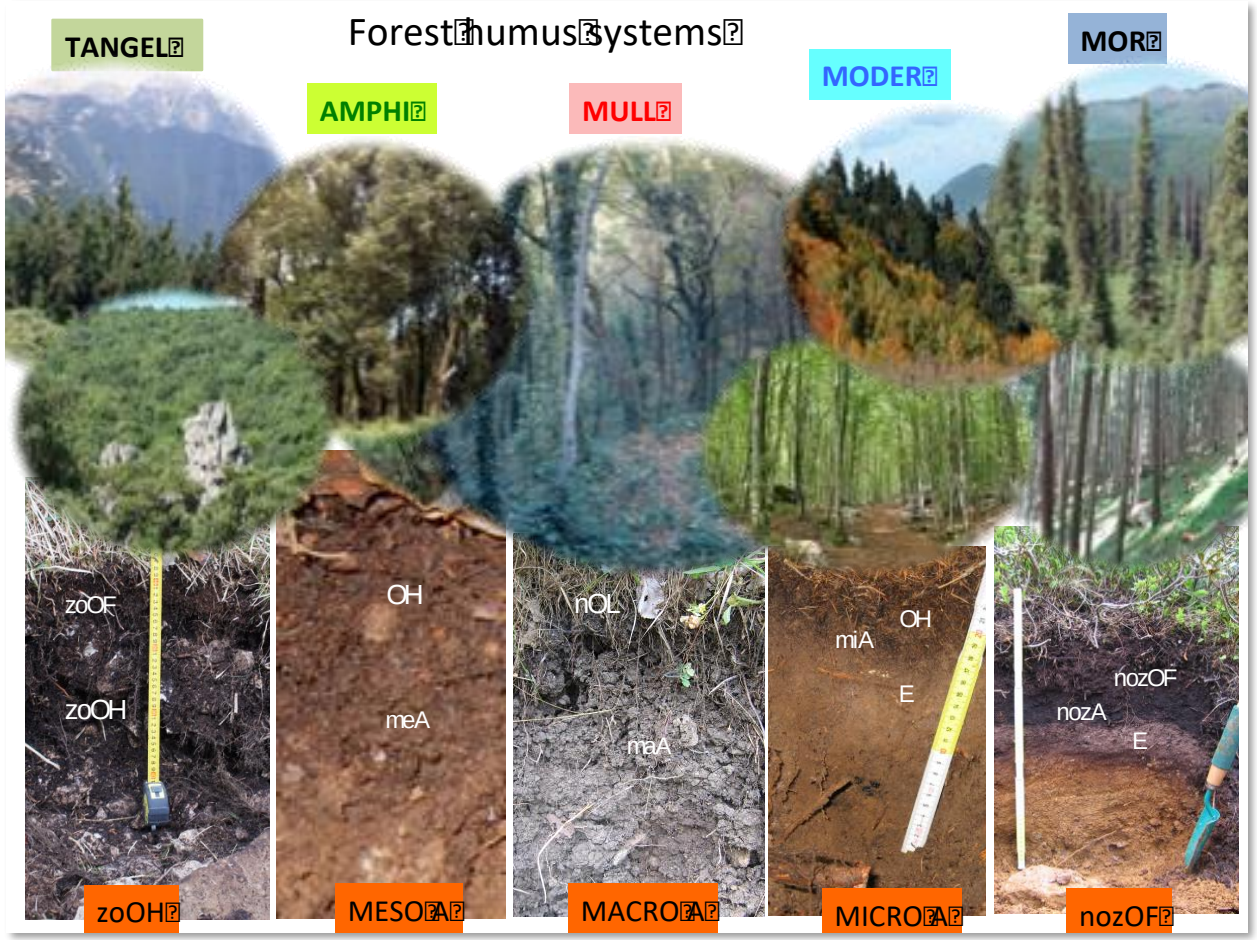
EU Soil Mission, 2020

Focus on human needs

1) provide food and biomass;
2) absorb, store and filter water and transform nutrients and substances, thus protecting groundwater bodies;
3) provide the basis for life and biodiversity, including habitats, species and genes;
4) act as a carbon sink;
5) provide cultural services for humans and a physical platform and their activities;
6) act as a source of raw materials;
7) constitute an archive of the geological, geomorphological and archaeological heritage.

EU Soil Strategy, 2021

Should we consider and respect the soil not only for its services, but in itself, as one of the manifestations of nature?

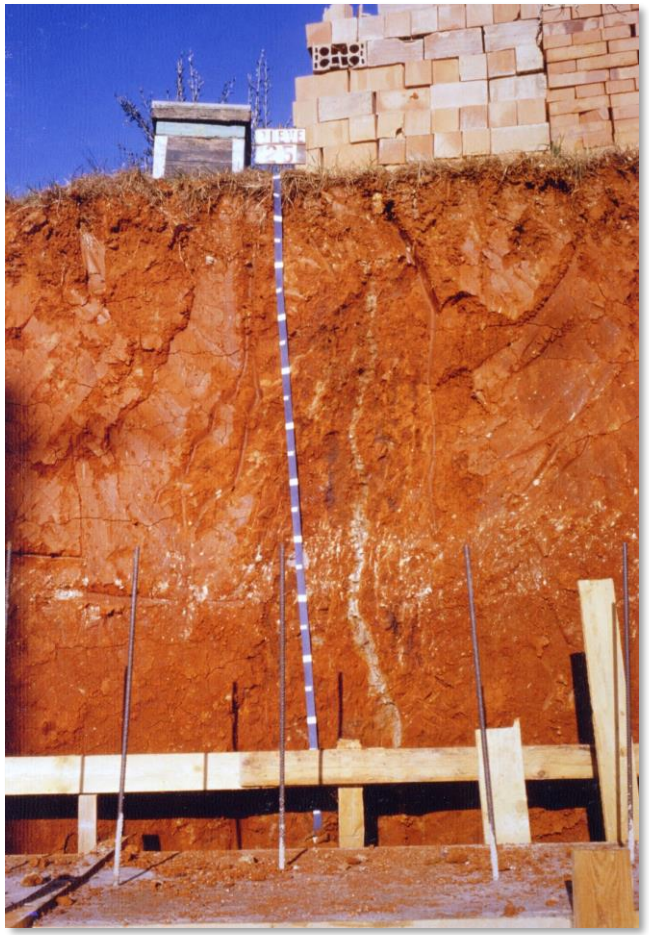


The soil as a natural body, capable of self-organization,
result of forming processes deriving from external and internal factors

Zanella A. et al., 2018

Should we protect soils with limited ecological services?

Or soils that can no longer stand current forms of life?



Should we protect soils that provide non-material values?

The 8 Criteria for highlighting the cultural and natural value of a pedosite (soil profile or pedolandscape)

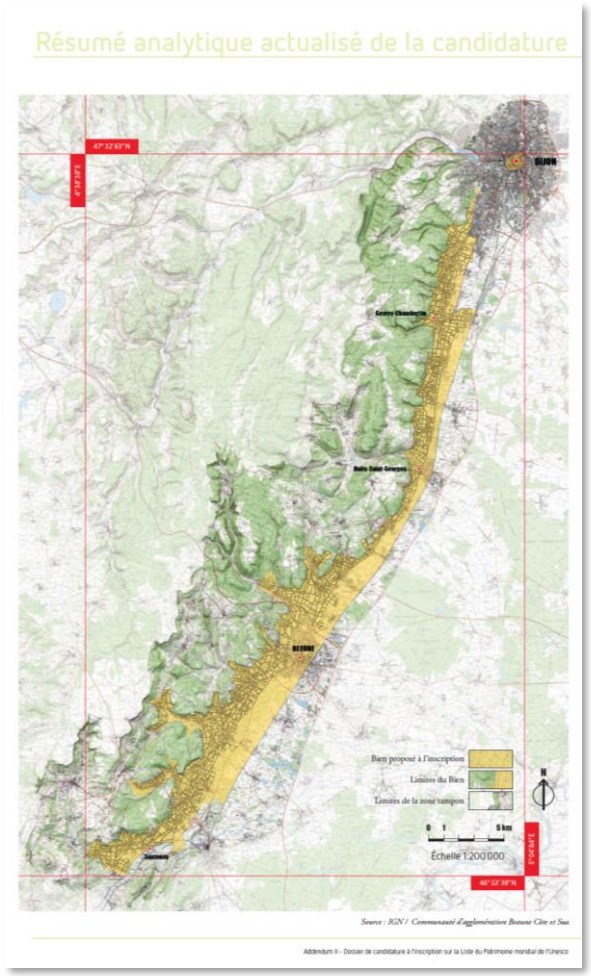
- scientific evidence of past environments, as provided by paleosols;
- didactic interest, namely, soil classification, representing the main taxonomic units, the benchmarks of the main regional types, soils that exemplify rare natural or anthropogenic processes, pedological evolution models, including toposequences or ‘‘catenas’’;
- archive of geological, geomorphological, paleontological, and archaeological heritage;
- ecological value of soils in a delicate environmental balance, such as soils that contribute to the outliving of fragile ecosystems, relic situations, wildlife refuges, and biotopes;
- historical and cultural interest, such as that of soils characterising a well-defined agricultural landscape, like soils of human terraced landscapes;
- social and economic, for instance, when it is possible to attribute to a specific soil the production of excellence and peculiar food, such as the wine produced in an outstanding ‘‘terroir’’;
- recreational, scenic and aesthetic values, including soils that contribute to the amenity of the landscape with their colours;
- inspirational, religious, identity, ethnical and ethical relevance.

(Costantini, 2022)

Policies for the conservation of the cultural and natural heritage of soil

- Global policies
  - World Heritage List, Biosphere Reserves, Geoparks of UNESCO
  - Sustainable Development Goals
  - FAO Sustainable Soil Management
- European Soil Strategy
  - Research and innovation programs of Horizon Europe
  - Soil health and food mission
  - Soil literacy
- European Conventions
  - European landscape
  - Conservation of European Wildlife and Natural Habitats
  - Natura 2000
- National policies
  - Cultural landscapes
  - Archaeological sites
  - Rural landscapes

World Heritage Sites of UNESCO, The terroirs of Burgundy



World Heritage Sites of UNESCO, tentative list

Typical Chernozems of the Balti Steppe in the Republic of Moldova

Biosphere Reserves (UNESCO)

- The World Network of Biosphere Reserves covers all major representative natural and semi-natural ecosystems
- It spans over a surface of more than 7,442,000 km² in 134 countries. It's almost the size of Australia.
- They are under the sovereign jurisdiction of the states where they are located

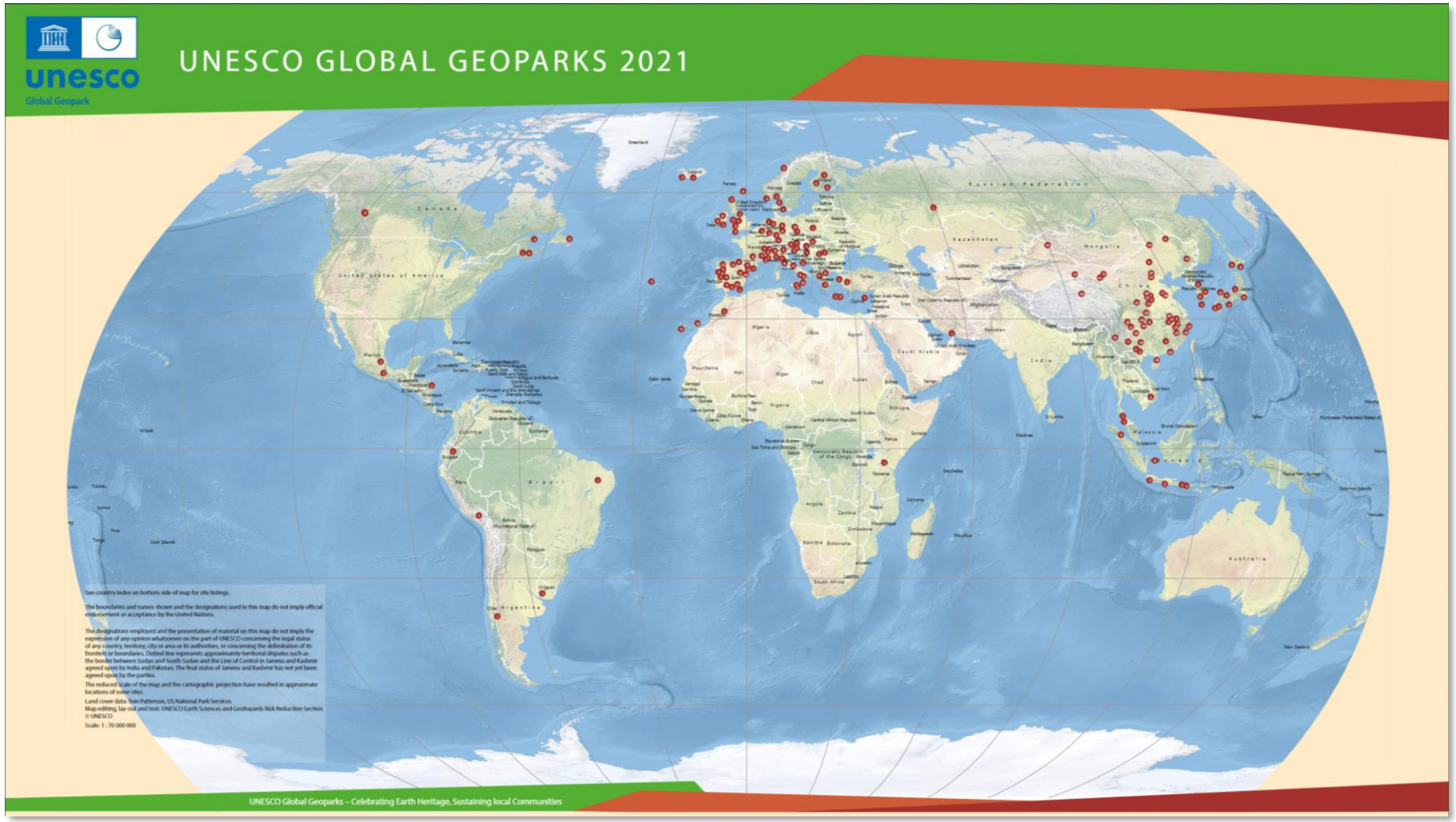
Learning places for sustainable development

Ecosystem-specific networks

- Ecosystem and theme-specific networks provide valuable insights into sustainable development models and climate change mitigation and adaptation possibilities. They include networks and research, capacity building and educational collaborations on:
- Drylands
- Mangroves
- Marine, Coastal and Island Areas
- Mountains
- Savannahs
- Tropical Forest
- Wetlands

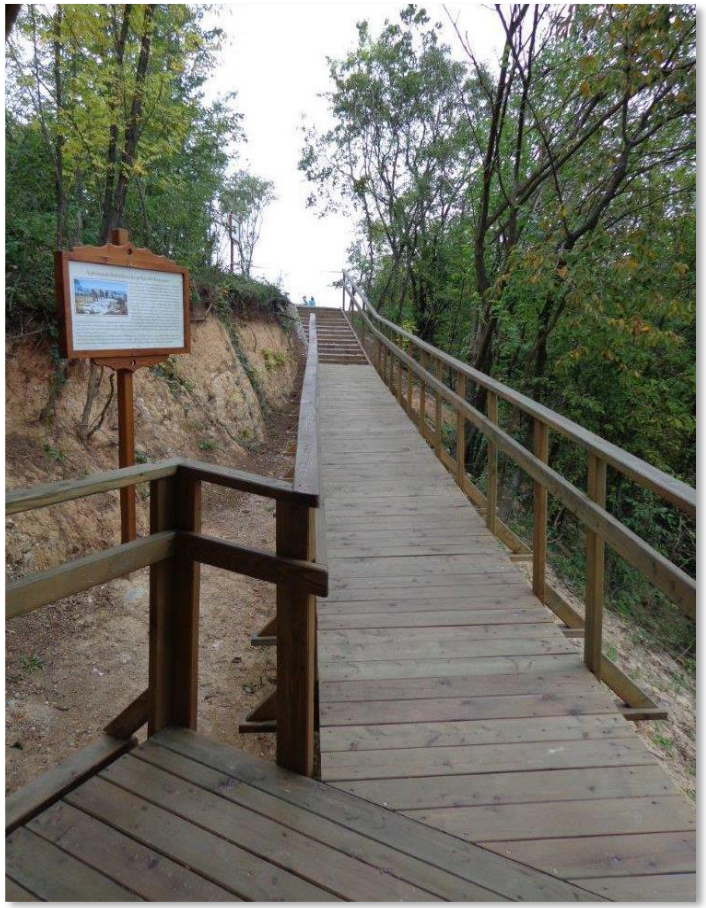
Designation and Review Process (unesco.org)

International Geoscience and Geoparks Programme (UNESCO) 195 geoparks in 48 countries



Sites and landscapes of international geological significance, managed for protection, education and sustainable development

Key point: visibility



Submit a UNESCO Global Geopark proposal | UNESCO

European policies: the objectives of the European Soil Mission

- Reducing soil degradation linked to desertification
- Conserving and increasing soil organic carbon stocks
- No net soil sealing and increased urban land reuse
- Reduce soil pollution and improve restoration
- Prevent erosion
- Improving soil structure
- Reducing the EU's global soil footprint
- **Increasing soil literacy in society in all Member States**: Have the basic tools needed to think about soils, soil processes and soil relevance in broader terms than merely utilitarian.

Conclusions

- There are no specific actions for the protection of cultural and natural values of soil at European and international level
- The importance of soil characteristics is reported in several cases present in the inventories of natural and cultural heritage
- Making explicit the cultural and natural value of a soil improves soil awareness, soil literacy, and gives greater interest and motivation to the protection of the landscape
- We must try to include soil cultural and natural values in policies already set up for the protection of the natural and rural landscape at **global**, **European** and national level.

Contents lists available at ScienceDirect

Geoderma Regional

journal homepage: www.elsevier.com/locate/geodrs

Possible policies and actions to protect the soil cultural and natural heritage of Europe

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ABSTRACT

Soils are healthy when they can continuously provide several ecosystem services. Among them, there are cultural services for humans and the archive of geological, geomorphological, and archaeological heritage. Yet strategies and policies aimed at preserving and enhancing the cultural and natural heritage of the soil are partial and rare. This paper provides a state of the art and sets a framework to give inspirational ideas for designing policies and actions to promote soil cultural and natural heritage protection, with particular reference to Europe.

PRO AGRO
LECTORIUM

Thank you!