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Functional applications of primary soil property maps provided by DOSoReMI.hu

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Highlights

- **DOSoReMI.hu (Digital Optimized Soil Related Maps and Information) is the initiative for the renewal of national spatial soil data infrastructure (SSDI) in Hungary.**
- **Significant number of Global Soil Map conform countrywide DSM products were elaborated. Still missing and upcoming GSM products.**
- **Introduction of generalized pedotransfer functions for the mapping of soil hydraulic properties.**
- **Functional application of primary soil property maps. Spatial assessment of certain provisioning and regulating soil functions and services.**
- **Modifications of GSM conform products according to user demands.**

Renewed SSDI

The map products are published on the www.dosoremi.hu website, (at the moment only in Hungarian) in two different ways.

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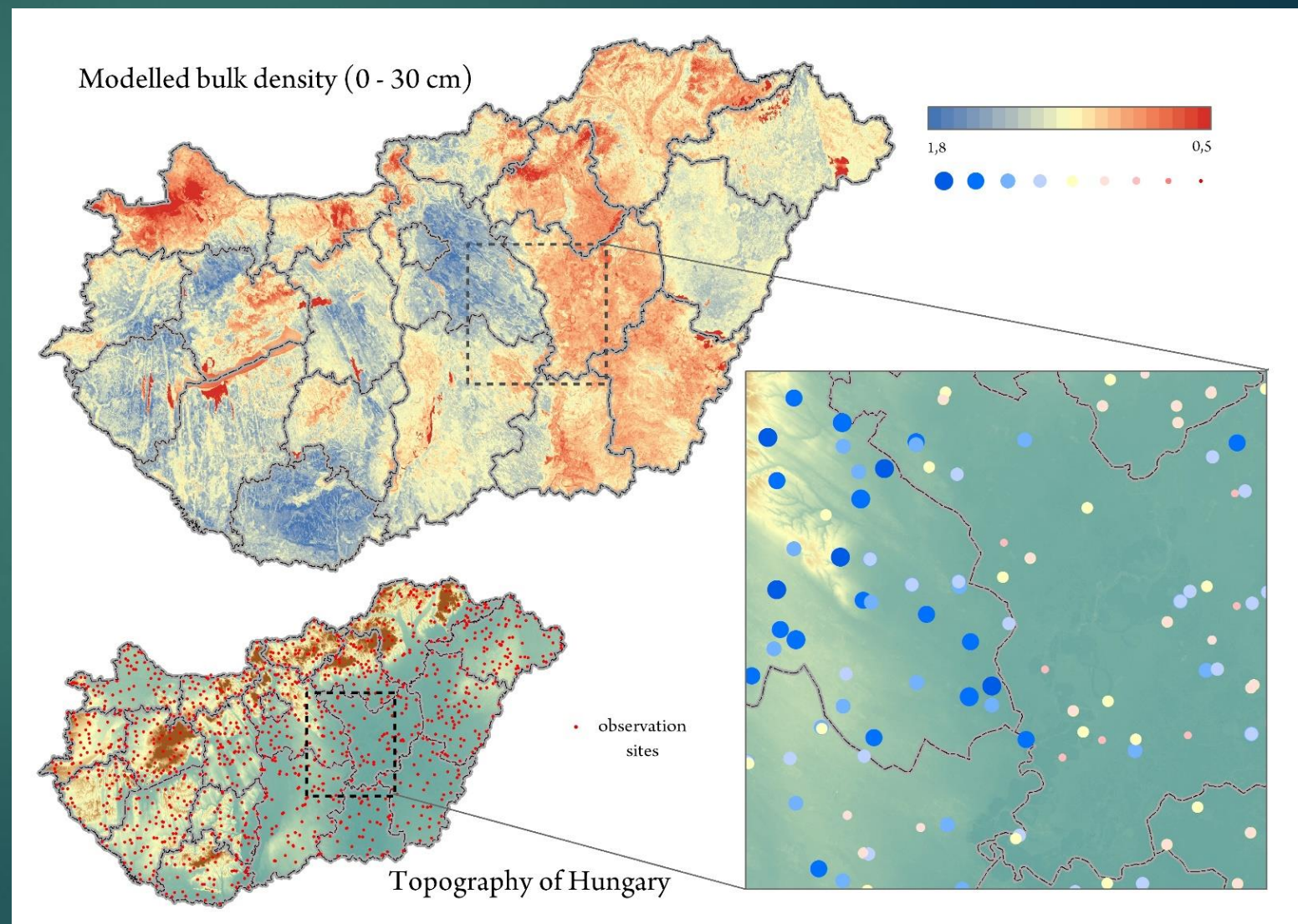
- How to proceed?
- How the elaborated products are utilized?

Missing GSM products

Striking resemblance in the pattern of the modelled bulk density map and county borders. In spite of laying in physiographically continuous region, there is a sharp change in the observation data on the two sides of the country border



problem with reference data, which might have been caused by biased measurement or sample collection

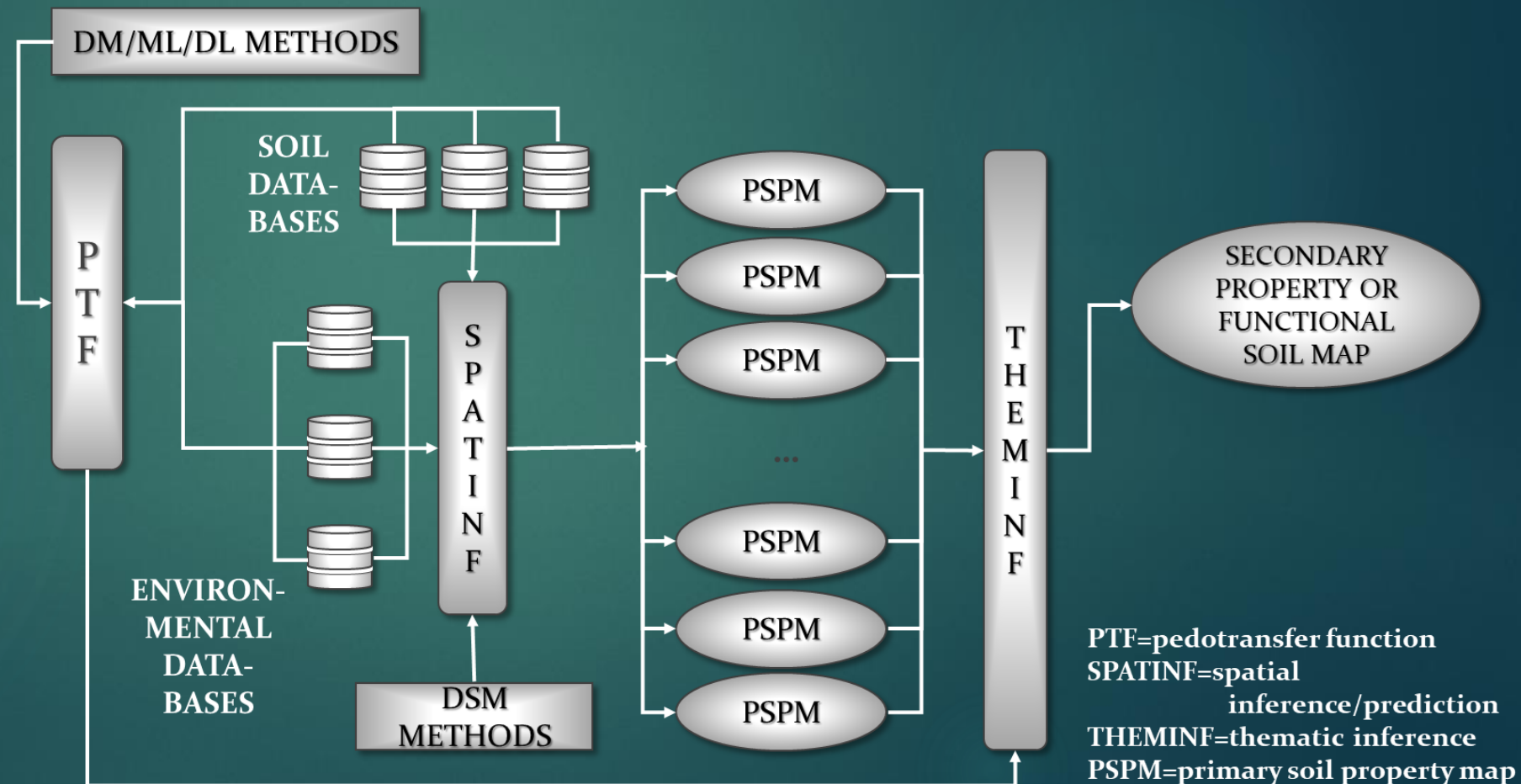


Missing → upcoming GSM products

Soil hydraulic properties is planned to be modelled applying generalized pedotransfer functions on available, primary soil property maps supplemented with further environmental co-variables, which were also used in the elaboration of the specific PTF.

Secondary soil property maps

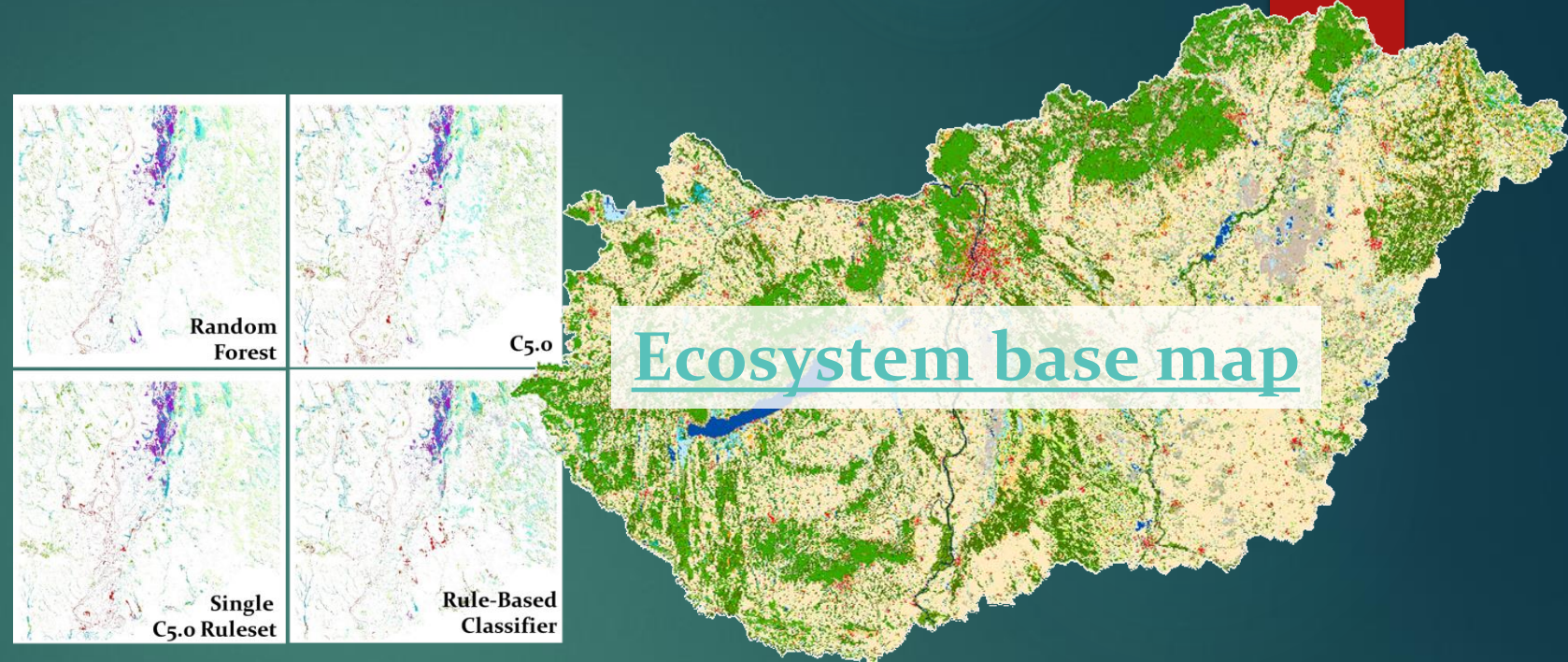
Available water capacity, saturated hydraulic conductivity, wilting point, field capacity, saturated water content, ...



Actual and potential vegetation mapping

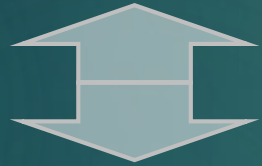
- Abiotic characteristics of natural and semi-natural habitats for their spatial delineation
- Mutual inspiration and interactions
- DSM-type modelling
- Soil properties as covariates

Implementation and application of multiple potential natural vegetation models for the territory of Hungary



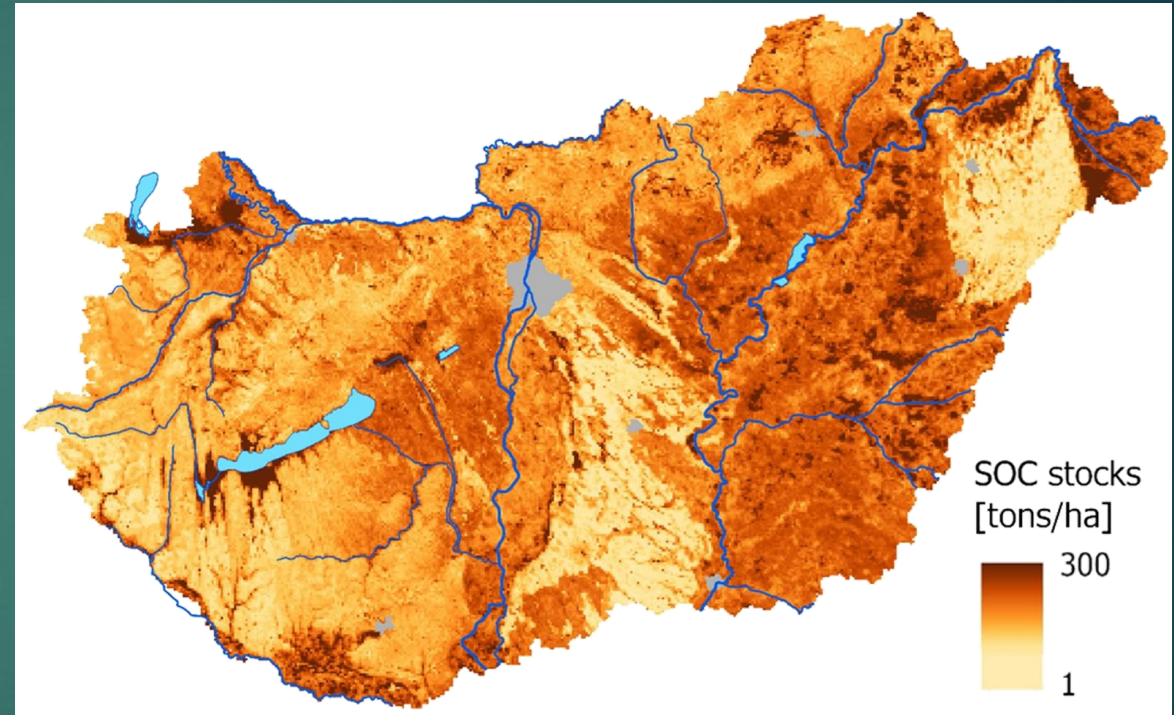
Primary property as indicator vs. functional product

[Fifth MAES report \(2018\)](#) lists exclusively SOC as structural soil indicator, which is relevant in 6 of 7 considered ecosystems.



The organic matter/carbon in soils is indeed related and determines numerous processes and functions of soil, but cannot be considered as an omnipotent feature (“one feature does not fit all”).

National ecosystem service assessment and mapping



Climate
regulation



Food
production



Water
regulation

Primary property as indicator vs. functional product

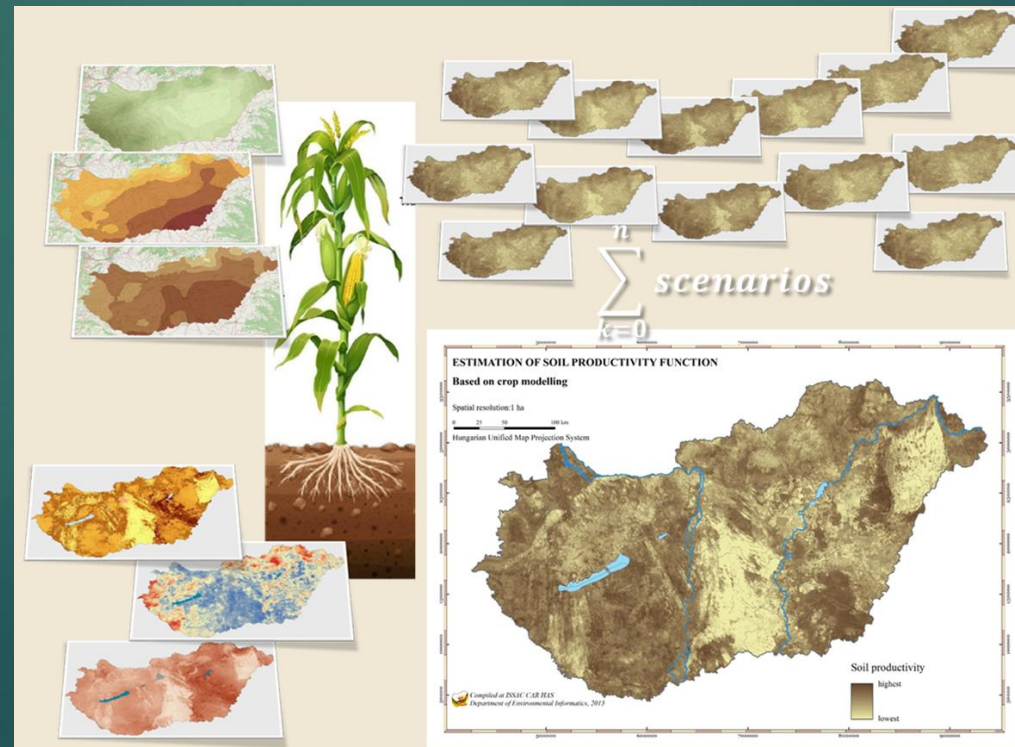
Soil property maps provide quantified spatial information, which can be properly utilized in the spatial inference of soil functions and services. The most promising approach is their involvement in digital process or crop models.

4M -> Biome - BGCMuSo
agrometeorological/biogeochemical model

Spatialization of
model results

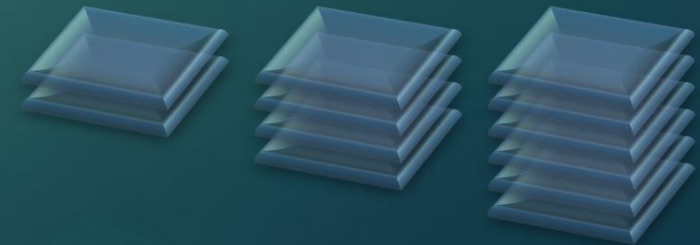


Soil function maps
(provisioning,
regulating)



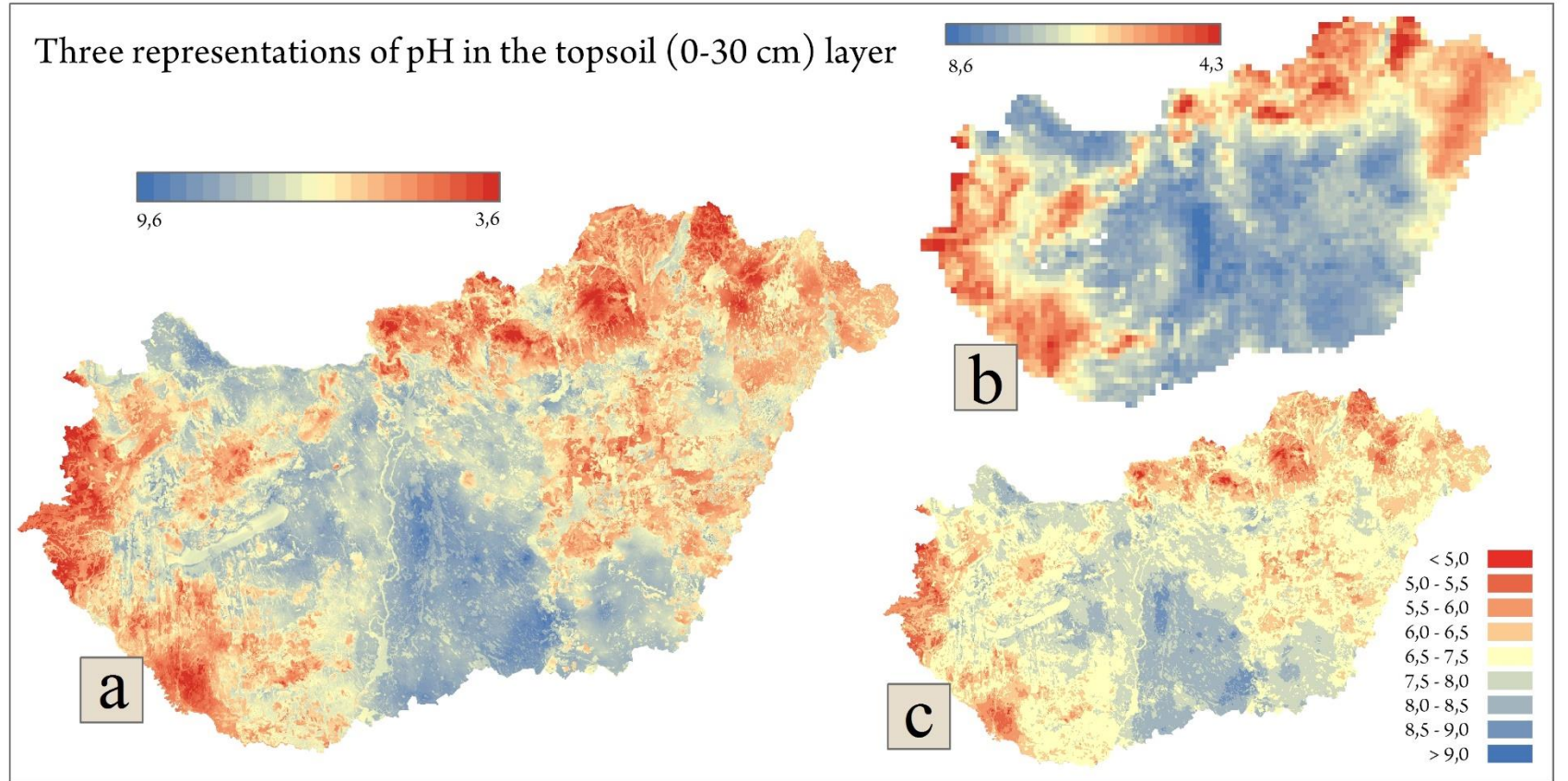
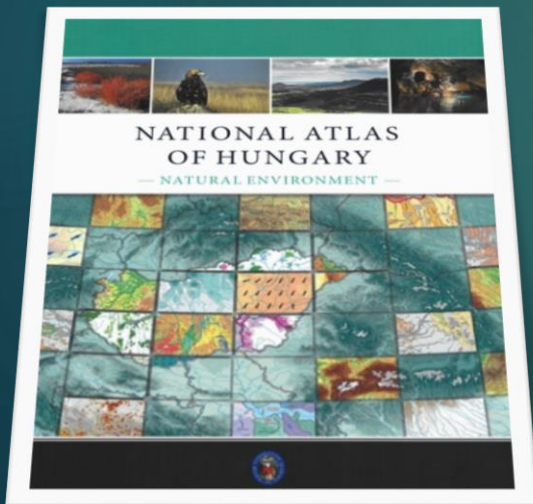
Improving model design:

- Representation of soils by diversified and quantified parameters;
- multiplied layers.



Simplified DSM products

Upscaled derivative (e.g.: ragweed forecast) or generalized, vectorized map output ([National Atlas of Hungary](#)).



Source: Pásztor et al., 2020 *Geoderma Regional* 21;
<https://doi.org/10.1016/j.geodrs.2020.e00269>

TAKE HOME MESSAGE

- Instead of omnipotent soil maps standardized and/or specific products;
- Sometimes even too wide range of products for the user;
- Goal-oriented maps for numerous user groups;
- Fine-tuning, conversion or even the simplification of the formerly elaborated products;
- Optimum can be reached in the case of mutual inspiration and collaboration.



To
read
more



THANK YOU FOR YOUR ATTENTION