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Population, extension and some functional applications of DOSoReMI.hu, the renewed Hungarian Soil Spatial Data Infrastructure

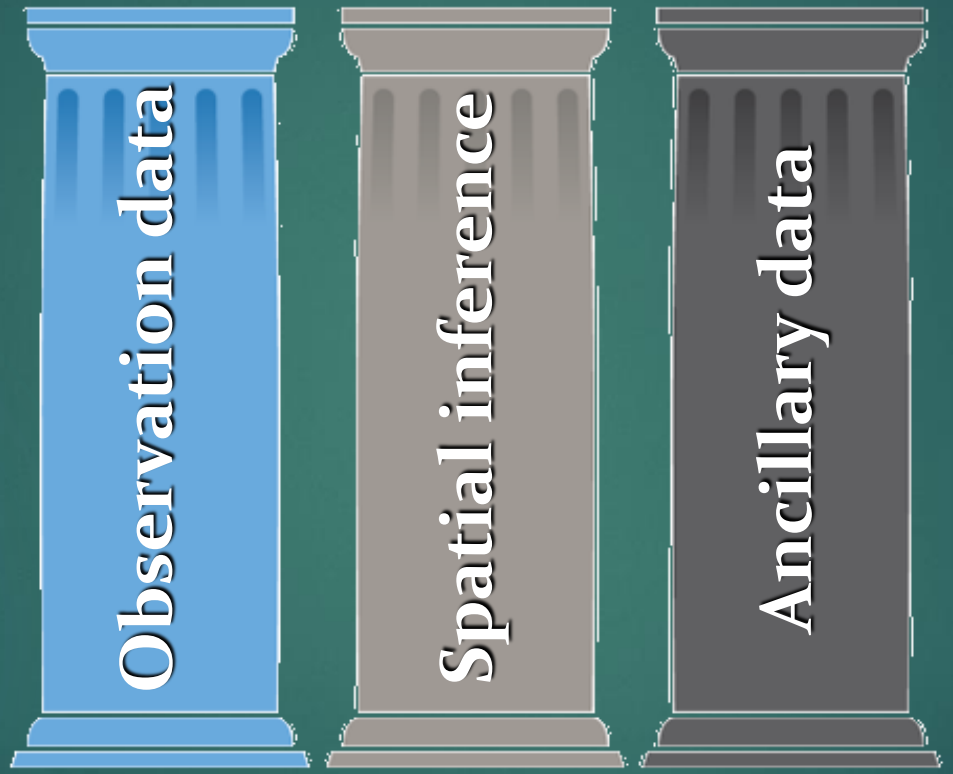
Institute for Soil Sciences, Centre for Agricultural Research
Department of Soil Mapping and Environmental Informatics

Highlights

- **Pillars of DOSoReMI.hu**
- **Changes in the applied observation/reference data**
- **Developments in the used ancillary data**
- **New products**
- **Some national functional applications**
- **Renewed publication environment (soil portal)**

Pillars of DOSoReMI.hu

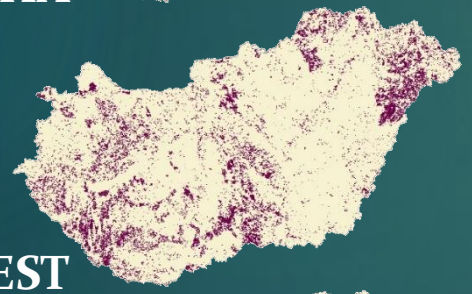
Digital soil map



CART, RK,
RF, RFK, QRF,
DL, GB, GLM,
BBN, ANN
...

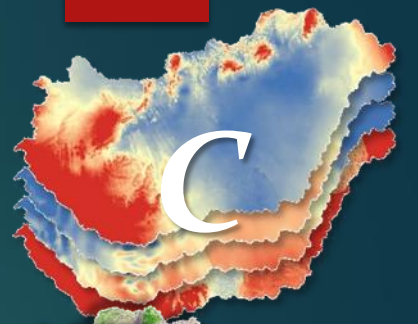

SIMS


MARTHA


FOREST


DKSIS


S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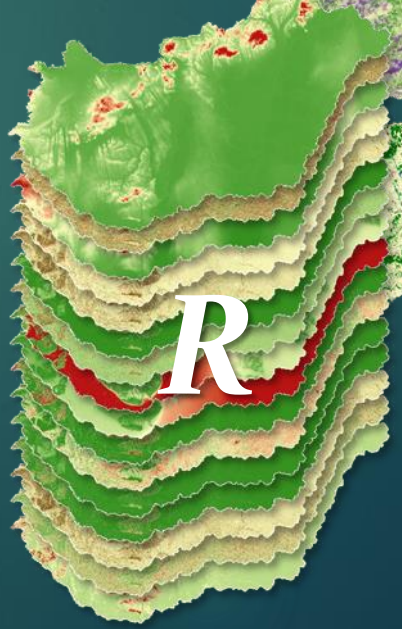
O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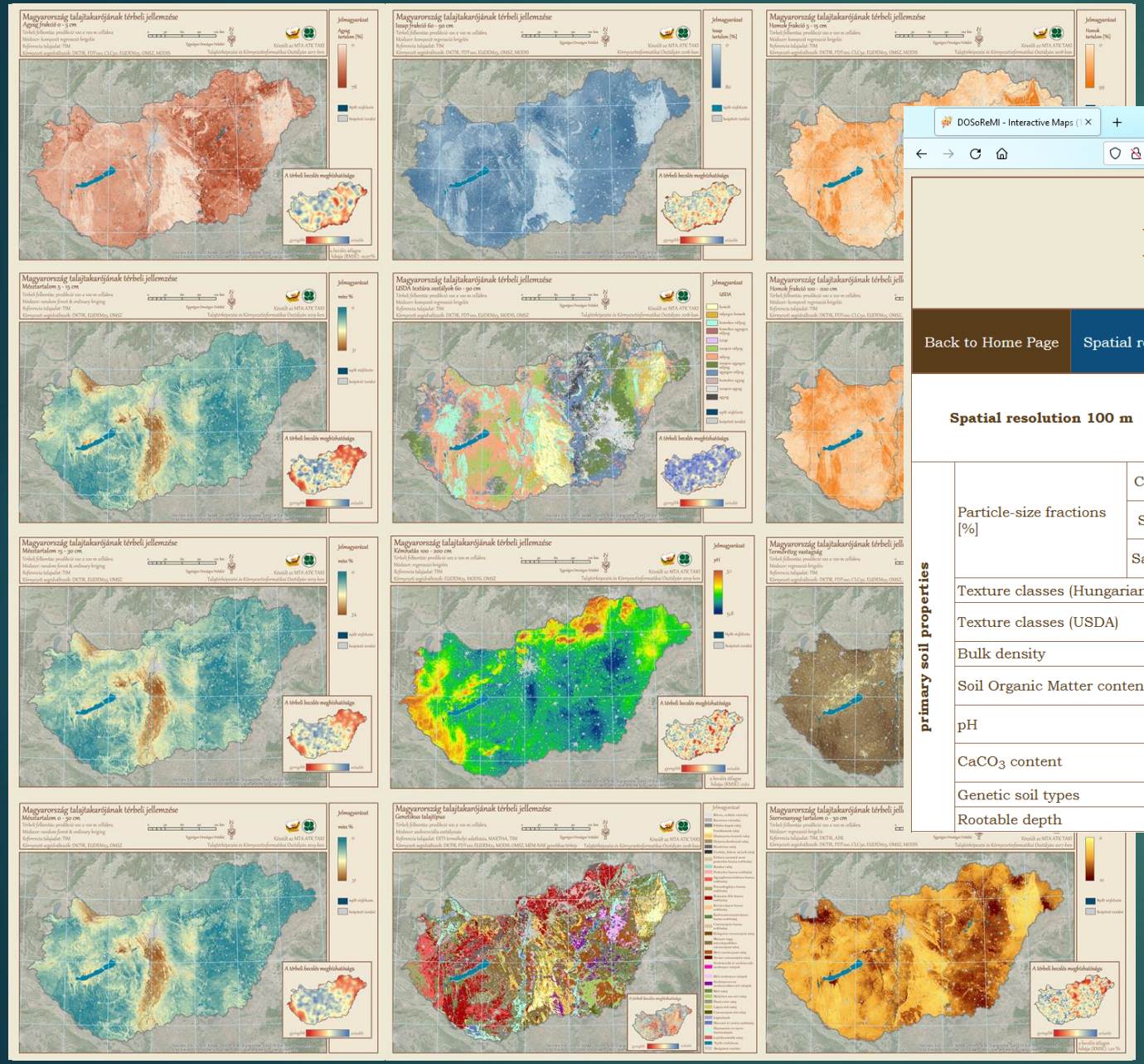

DOSoReMI - Interactive Maps

dosoremi.hu/table_en.html

DOSoReMI Digital Soil Information

Back to Home Page | Spatial resolution: 100 m

Spatial resolution 100 m			Soil Profile	Topsoil - Subsoil		Equal depth intervals			Special depths			GSM.net standard layers					
				Topsoil	Subsoil	0-30 cm	30-60 cm	60-90 cm	0-20 cm	20-50 cm	50-100 cm	0 - 5 cm	5-15 cm	15-30 cm	30-60 cm	60-100 cm	100-200 cm
primary soil properties	Particle-size fractions [%]	Clay				■	■	■				■	■	■	■	■	■
		Silt				■	■	■				■	■	■	■	■	■
		Sand				■	■	■				■	■	■	■	■	■
	Texture classes (Hungarian)																
	Texture classes (USDA)					■	■	■				■	■	■	■	■	■
	Bulk density																
	Soil Organic Matter content					■											
	pH					■						■	■	■	■	■	■
	$CaCO_3$ content					■						■	■	■	■	■	■
	Genetic soil types																
	Rootable depth																

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Changes in the applied observation/reference data

SIMS

Operational difficulties

MARTHA

Legacy data

FOREST

Only forests

DKSIS

Legacy data

Problems:

Expectations on DSM products:

- Freshness
- Renewability
- Thematic expansion

Potential solutions:

- Revival, actual operation and potential expansion of the Hungarian Soil Information and Monitoring System (SIMS)
- SOIL Web
- LUCAS expansion

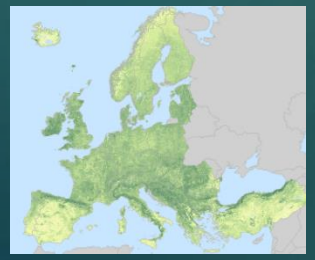
Developments in the used ancillary data

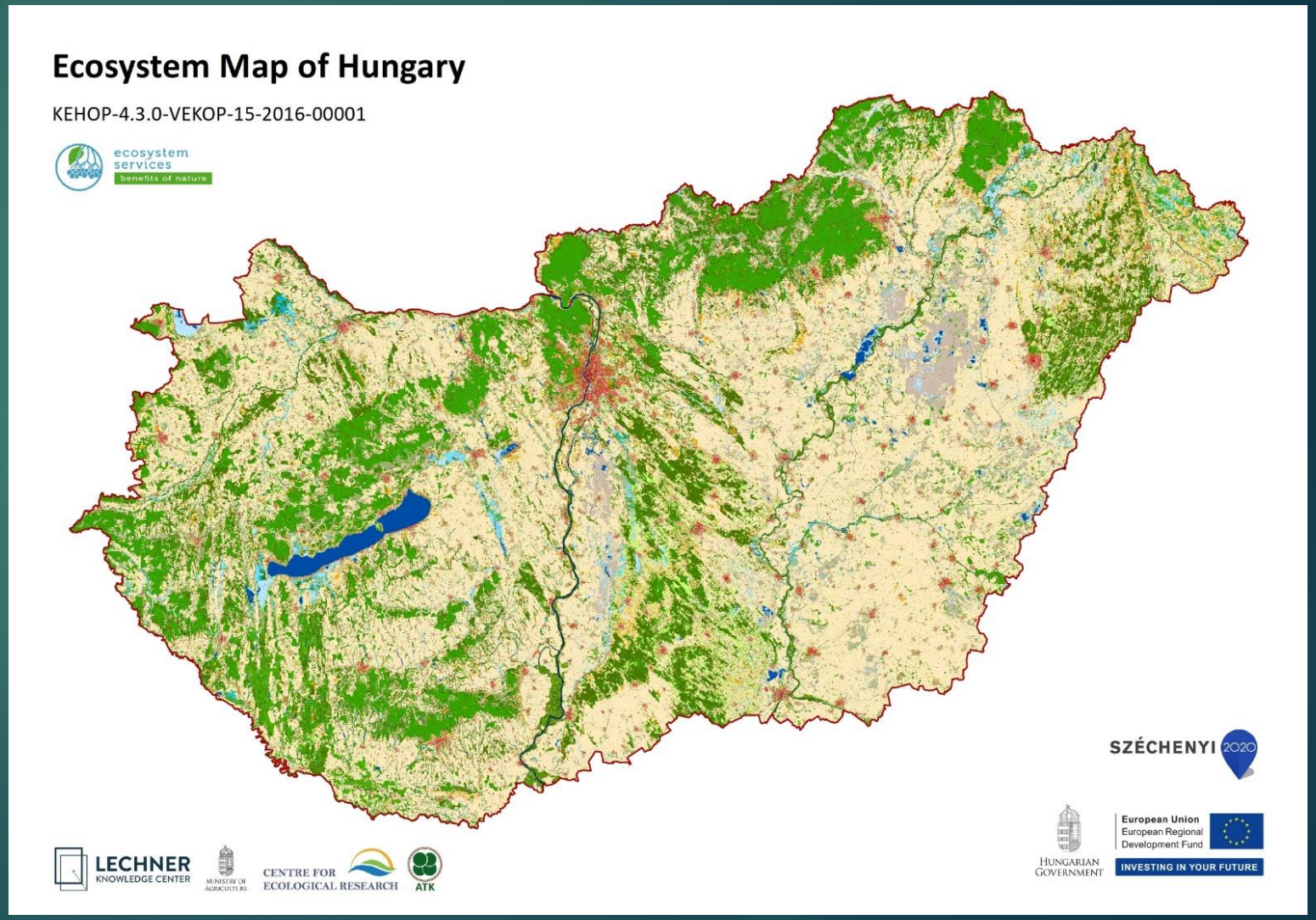
Earth Observation Information System
Portal for Sentinel products (Hungary)

Sentinel-2 mosaic for Hungary
NDVI, NDWI, BSI, NDMI, GLAI

Bare Soil Composite:
- Sentinel-2
- relevant pixels according to NDVI & NBR
- median value of pixels for a time period

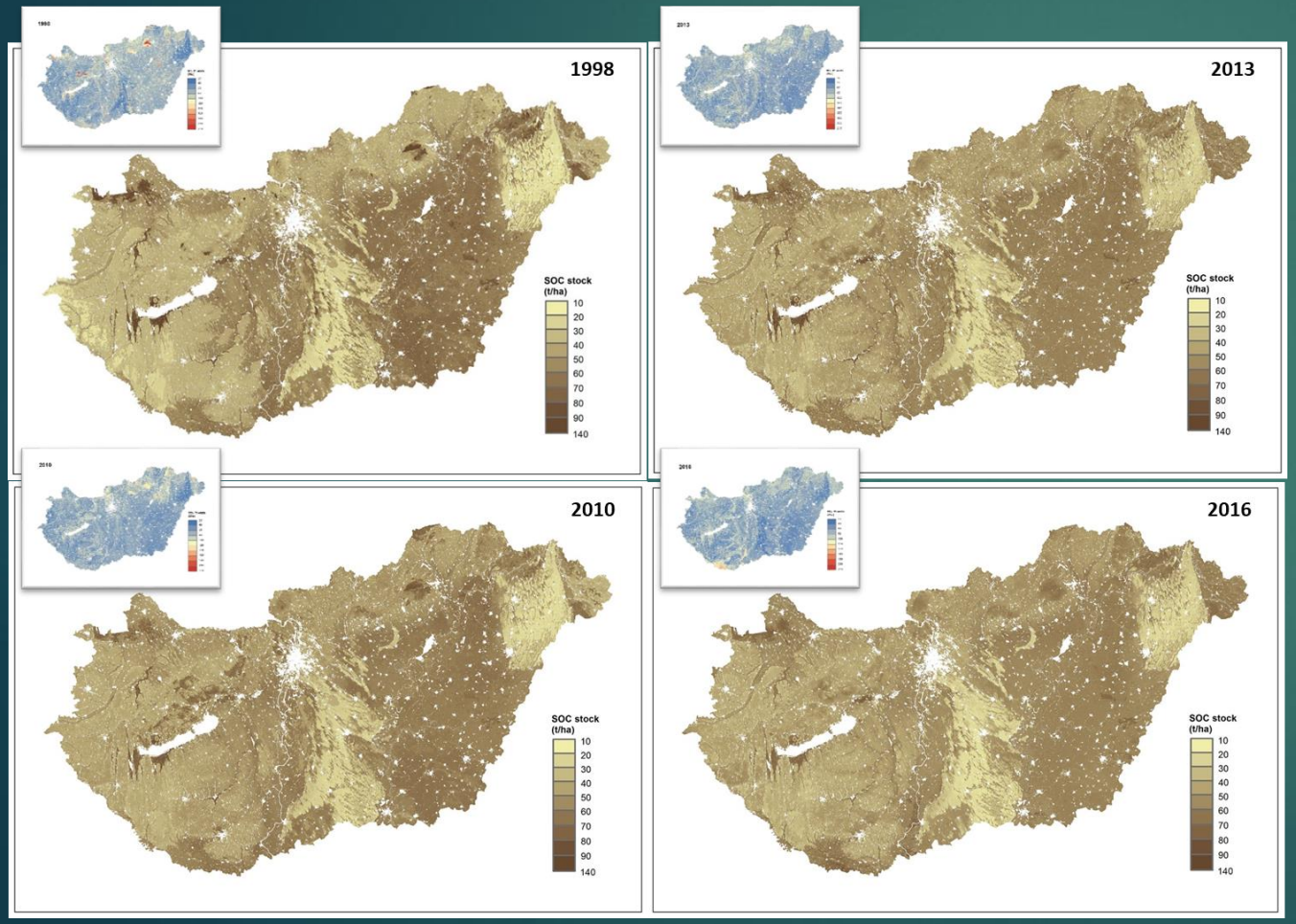
Pan European High Resolution Vegetation Phenology and Productivity



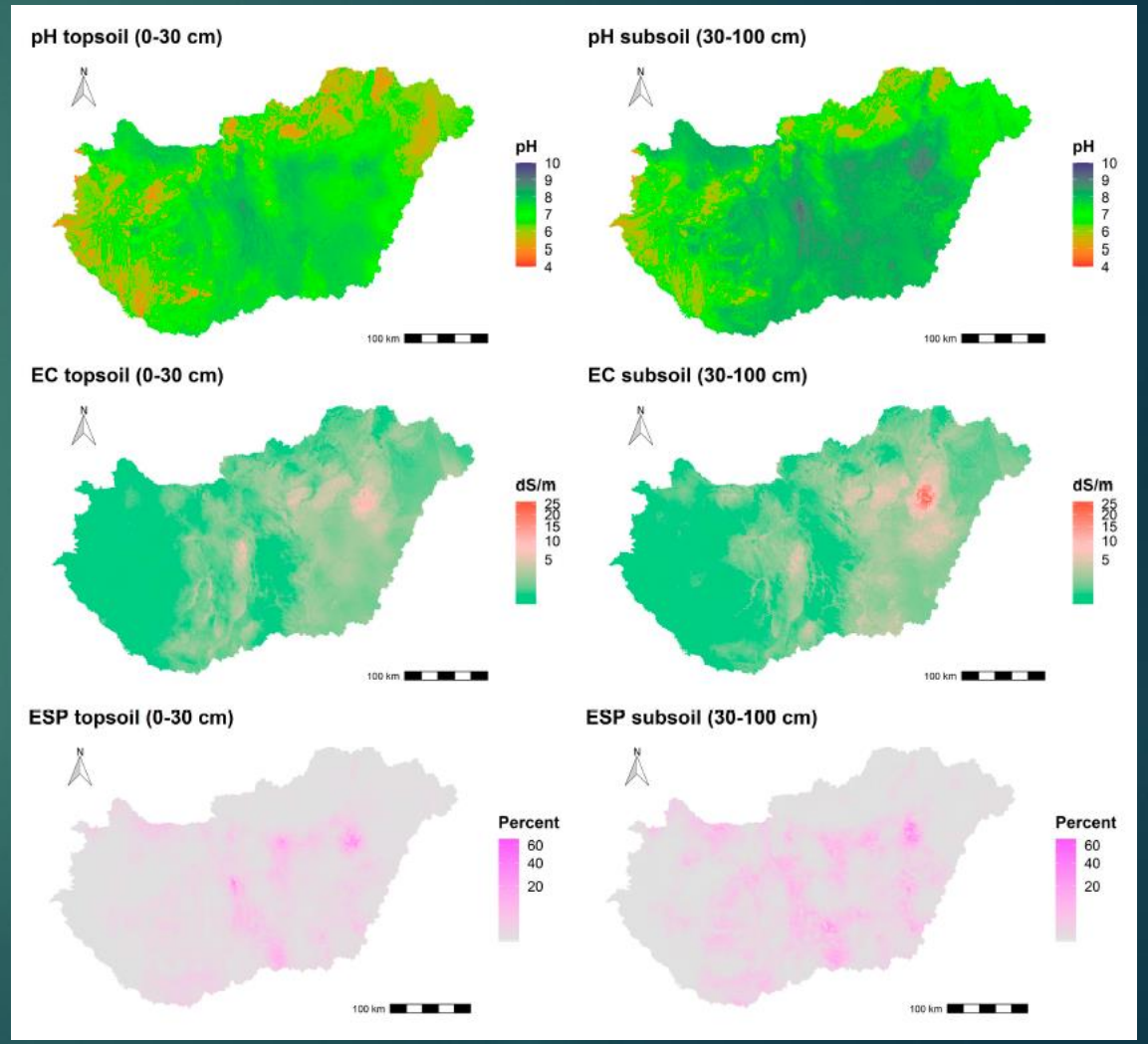


New products

SOC stock prediction time series supplied with width of the 90% prediction intervals for different years

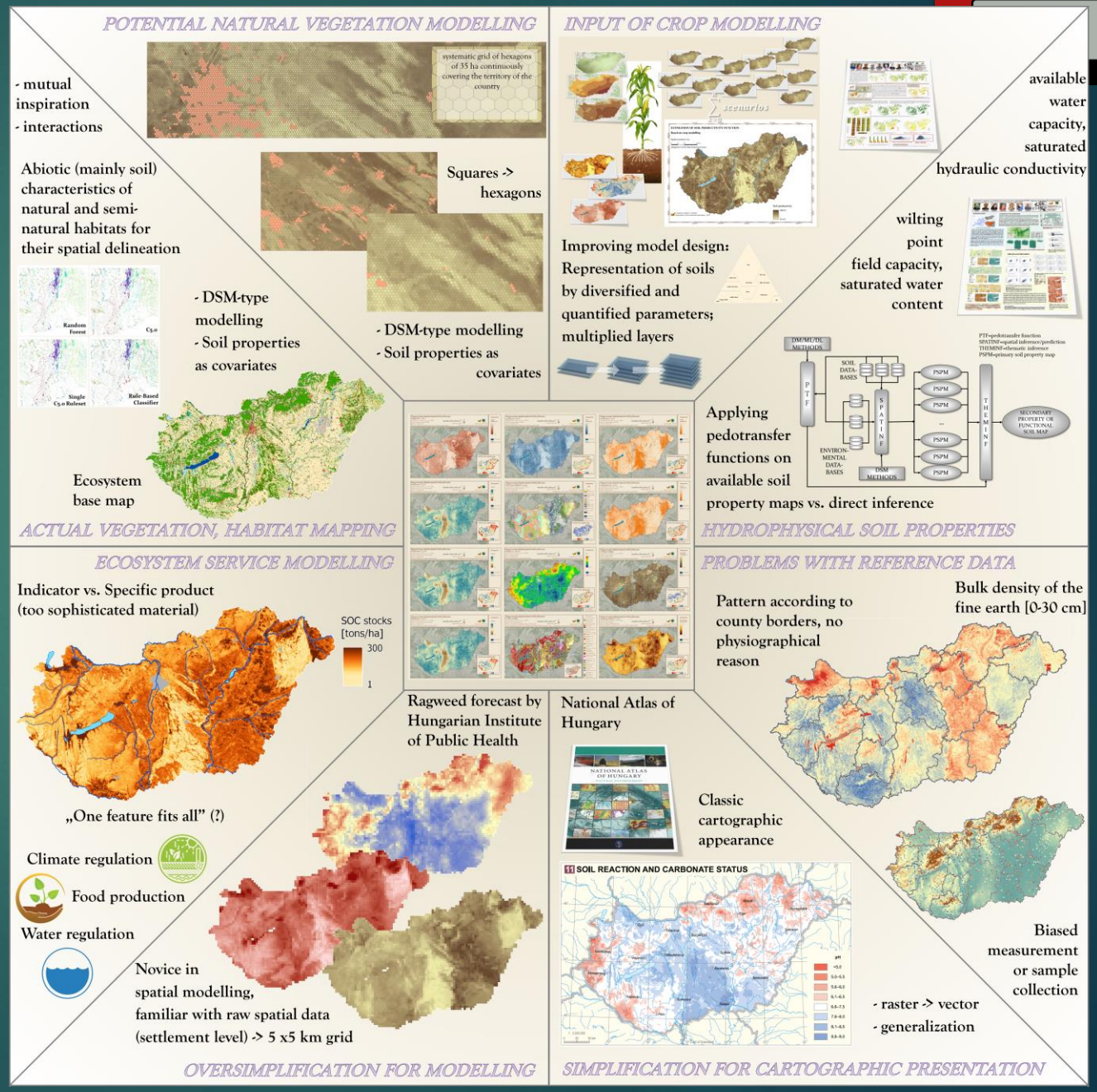


Indicators for Global Map of Salt-Affected Soils (GSSmap)

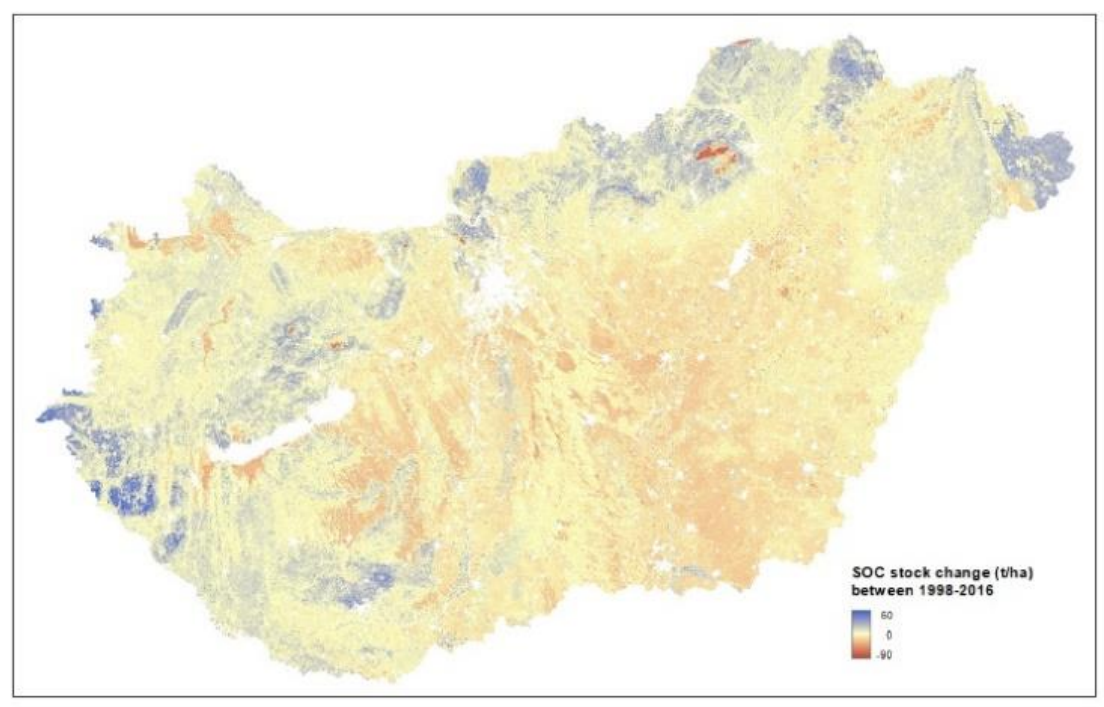


Some national functional applications

- Land Degradation Neutrality
- Sustainable Development Goals
- Ecosystem Services Assessment



Some national functional applications



United Nations Convention to Combat Desertification

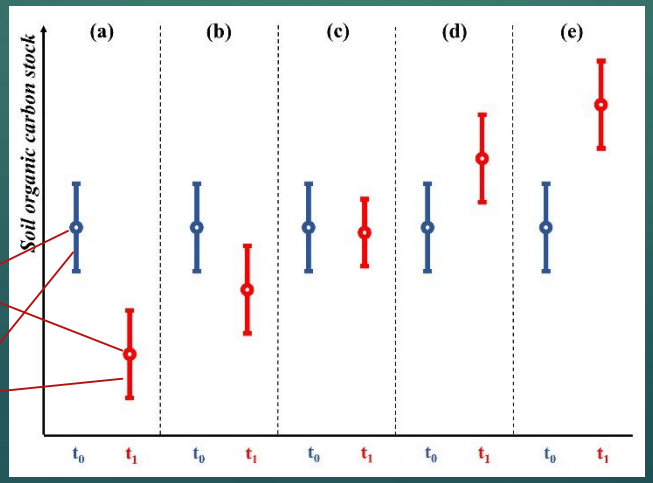
SUSTAINABLE DEVELOPMENT GOALS

Strategic Objective 1 (SO1: Proportion of land that is degraded over total land area)

- Improve conditions of affected ecosystems,
- Combat desertification/land degradation,
- Promote sustainable land management,
- Contribute to land degradation neutrality.

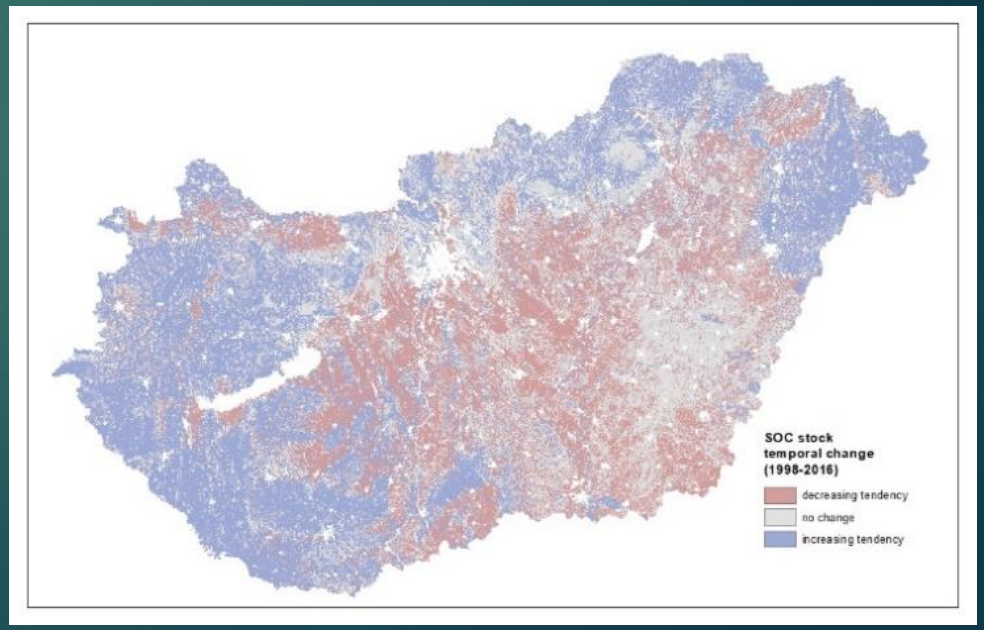
SO1-3: Trends in carbon stocks above and below ground

Scheme for assessing SOC stock temporal change based on the 90% prediction intervals
(a) decreasing, (b) decreasing tendency, (c) no change, (d) increasing tendency, (e) increasing

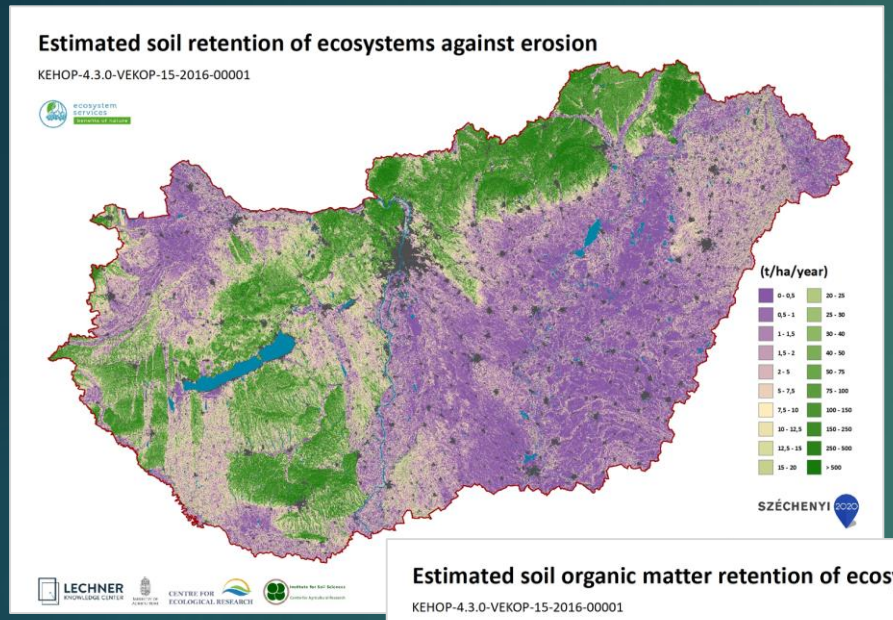


spatial prediction for years 1998 (t_0) and 2016 (t_1)

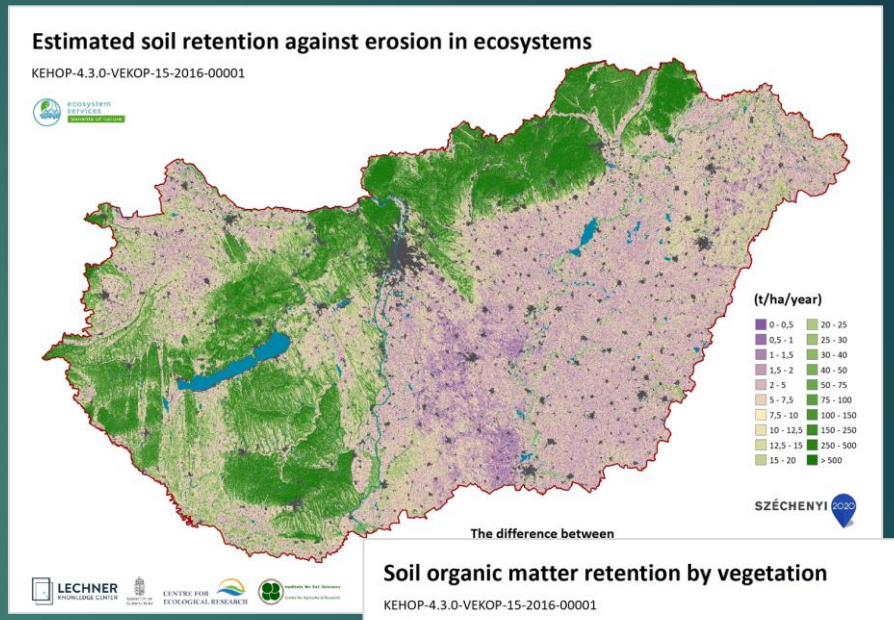
corresponding 90% PI for years 1998 (t_0) and 2016 (t_1)



Some national functional applications



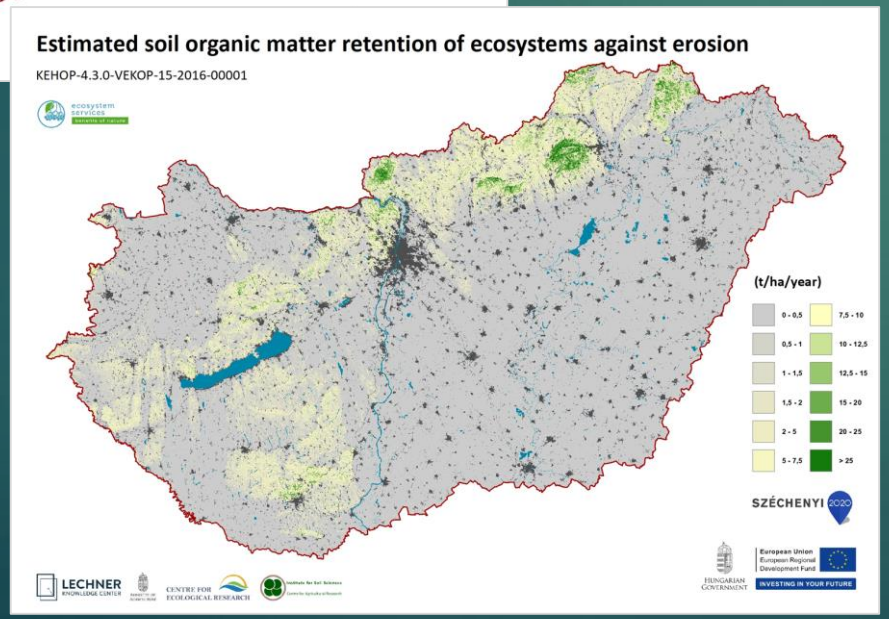
Ecosystem Services Assessment



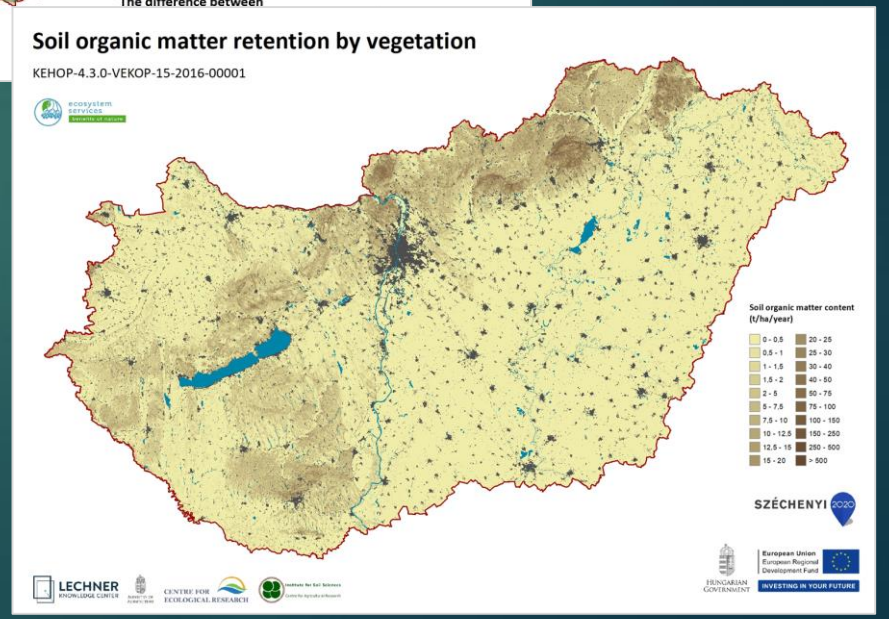
Universal Soil Loss Equation (USLE) model

$A = R * K * LS * C * P$

Optimal land cover scenario



Actual land cover scenario



Renewed publication environment (soil portal)

	THEMES		Soil Profile	Equal depth intervals (cm) 0-30	30-60	60-90	GSM.net standard layers (cm) 0-5	5-15	15-30	30-60	60-100	100-20
Primary soil properties	Particle-size fractions [%]	- clay										
		- silt										
		- sand										
	Texture classes (USDA)											
	Bulk density											
	Soil Organic Matter content											
	pH											
	Particle-size fractions [%] Clay											
	Genetic soil types											
	Rootable depth											
Secondary soil properties	Soil Organic Carbon stock 1992											
	Soil Organic Carbon stock 2010											
	Saturated water content											
	Water content at field capacity											
	Water content at wilting point											
	Soil water management categories											

Legend: Available; Not relevant; Under processi

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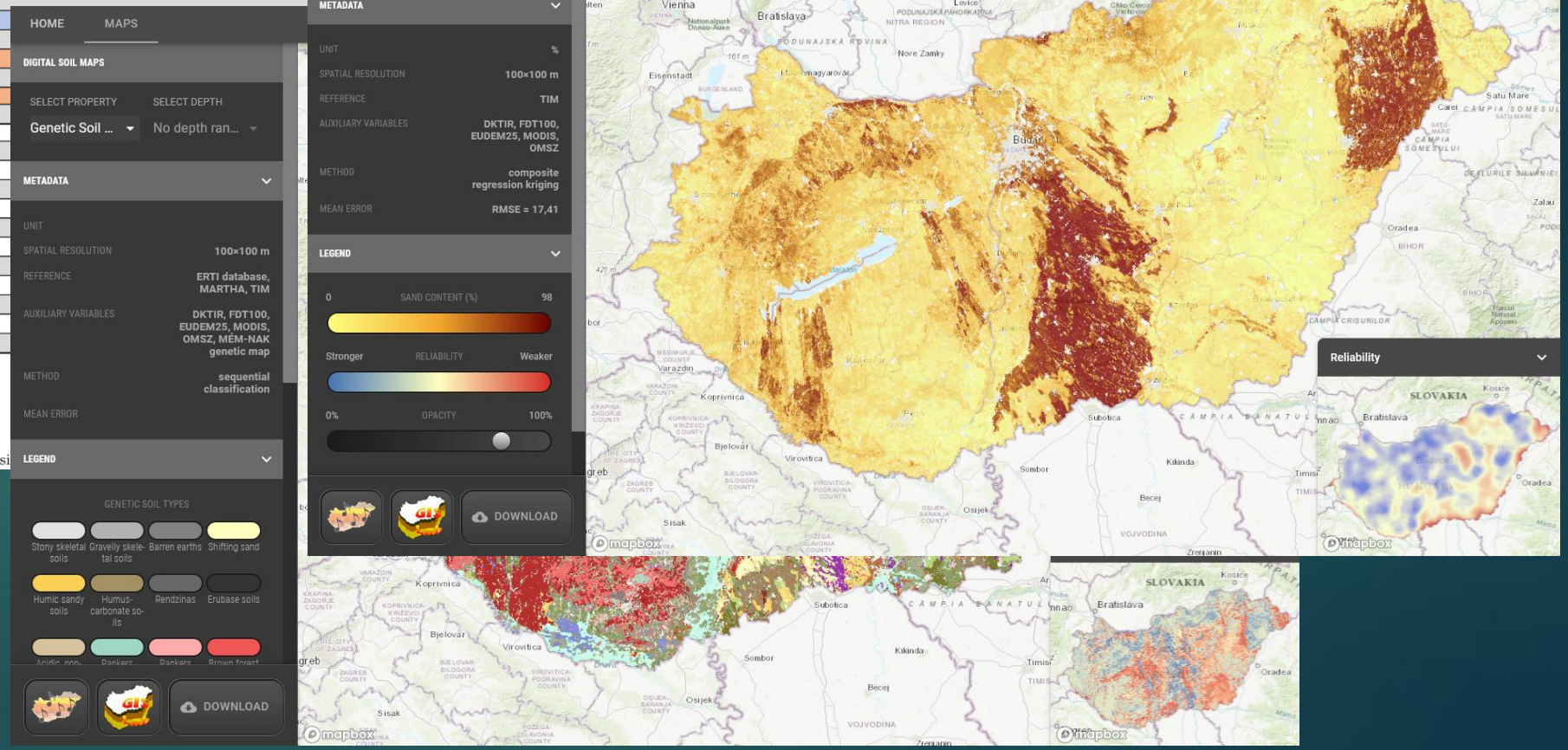

Take home messages

- **DSM knowledge and environment can be considered well established in Hungary**
- **Development could and should be mainly expected from the availability of proper observation data**
- **Further fine tuning could be expected from the increasing pool of Earth Observation based auxiliary data**
- **Further functional applications depends on user demands, which can be inspired by quality DSM products**

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THANK YOU FOR YOUR KIND ATTENTION

International Decade of Soils 2015-2024