A TALAJMONITORING RENDSZER
HUNGARIAN SOIL MONITORING SYSTEM

A Magyar Talajvédelmi Információs és Monitoring Rendszer (TIM)

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Nemzeti Élelmiszerlánc-biztonsági Hivatal

Soil Monitoring System (TIM)

- The aim of the Hungarian soil Monitoring System (TIM) is describing the soil resources (baseline condition) and keeping track of the changes in soil properties over time.

- Legislative background: Act of 2007. CXXIX on Arable Land 33 § (1)

- System design (1991): a group of soil experts from the Research Institute for Soil Science and Agricultural Chemistry, the Soil Conservation Service, Ministry for Agriculture, Ministry for Environment

Method of data collection

- Sampling: soil conservation experts of county governmental offices (Dept. of Plant Protection and Soil Conservation)
- Laboratory analyses:
    - Laboratory network of the the National Food-chain Safety Office
    - regional soil conservation laboratories
    - and soil biology laboratorys
- Coordination and data management: National Food-chain Safety Office Department of Plant Protection and Soil Conservation

Sampling

- Nested sampling design based on existing maps, data and expert knowledge
- Representative profile of smaller geographic area
- 1236 sampling sites:
  - 865 arable land
  - 183 forest
  - 188 special (degraded land, sensitive areas, contamination)
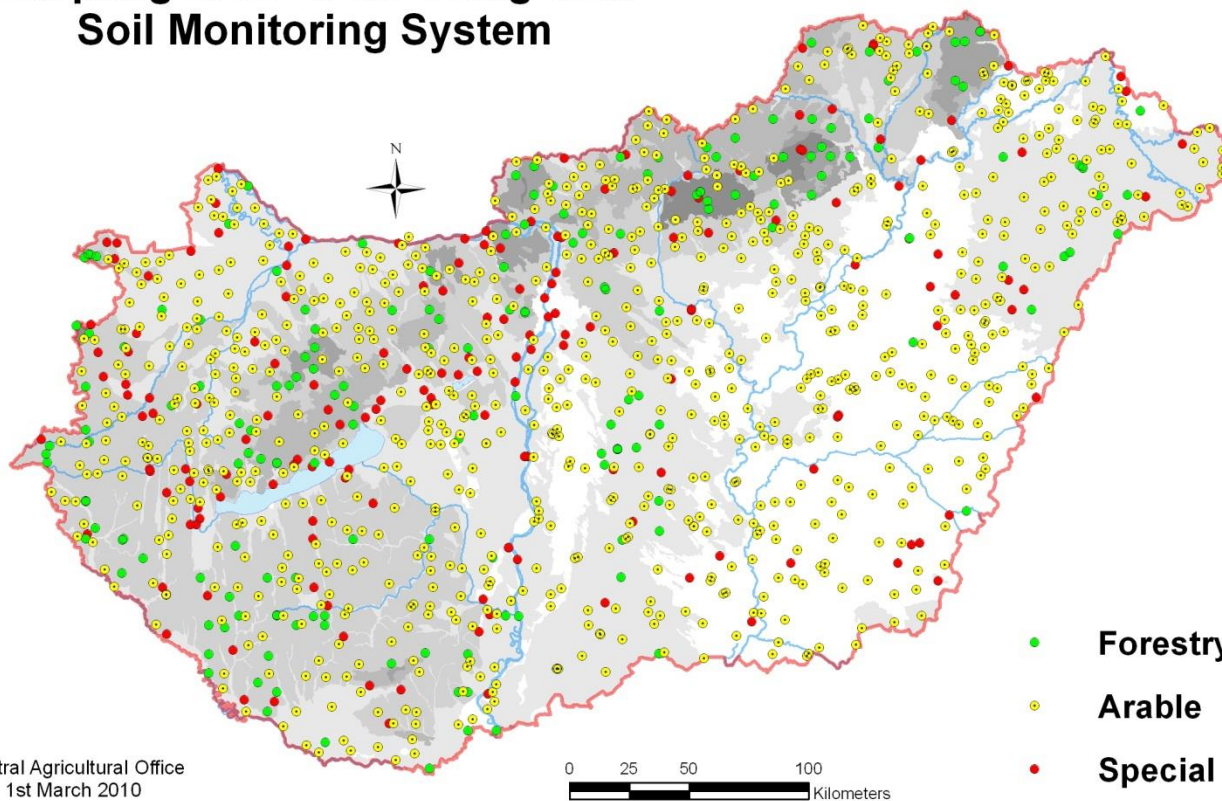
Sampling sites

Sampling sites of the Hungarian Soil Monitoring System

Legend:
- Forestry
- Arable
- Special

Central Agricultural Office
1st March 2010

0   25   50   100
Kilometers

Sampling

- Every year between 15th September and 15th October
- First sampling 1992, 150 cm deep soil profiles, detailed profile description and on site analysis for soil mapping and sampling from each genetic horizon for laboratory analysis
- Location of the site was determined by GPS 3m accuracy
- Other years: drilling samples from genetic horizons (1992-2000)
- Layers: 0-30, 30-60, 60-90 cm, from 2000
- Composite sample out of 9 point sample in 50 m diameter circle
- Sampling of forestry points remained on genetic horizons
- Sample bank: first year and every 6 years

Measured parameters

- Baseline condition: detailed analysis physical chemical and microbiological parameters
  - pH, total salt content, acidity, CEC, exchangeable cations, organic matter content, CaCO3 equivalent, total nitrogene content, plant available nutrients, toxic eements
  - Bulk density, particle size distribution, water retention curve, hygroscopy
- Every year: $CaCO_3$ content, pH (water, KCl), hydrolitic acidity, salt content), nitrate content
- Every 3rd years: phenolphtalein reaction (salic/sodic soils), organic matter content, total N content, plant available nutrients, biological parameters
- Every 6 years: toxic elements

Methods

- All national standards:

- Examples:

  – Toxic element content: „total" content concentrated nitric acid and hydrogene-peroxide digestion ICP measurement „ (MSZ-21470-50:1998)

  – Organic matter content wet combustion colorimetry

  – Plant available nutrients:

  – CaCO3 equivalent

- All the 3 laboratories use the same method and they take part in ringtests and validation programs.

TIM database

- TIM is based on an SQL database (currently, a single-user FireBird 2.0 instance)

- Data access, management and maintenance is facilitated by an application written in Delphi 7.

- It is off-line and it is not yet connected to any other databases

- Plans for redesign of the database and changing the engine to MS SQL system

Application of TIM data

- Served as a basis for determining limit values for soil (legislation 6/2009. KvVM-EüM-FVM joint Ministerial Decree on determining tresholds to protect soil and groundwater against pollution)

- Analysis of soil degradation processes (soil acidification, waste of organic material, accumulation of toxic substances in the soil), international reports on the state of Hungarian soils

- For river basin management plan of Hungarian part of the Danube River basin required by 2000/60/EK Water Framework Directive

- Determining organic carbon stock change factor for the greenhouse gas inventory for Hungary

- Report on the implementation of the Nitrates Directive
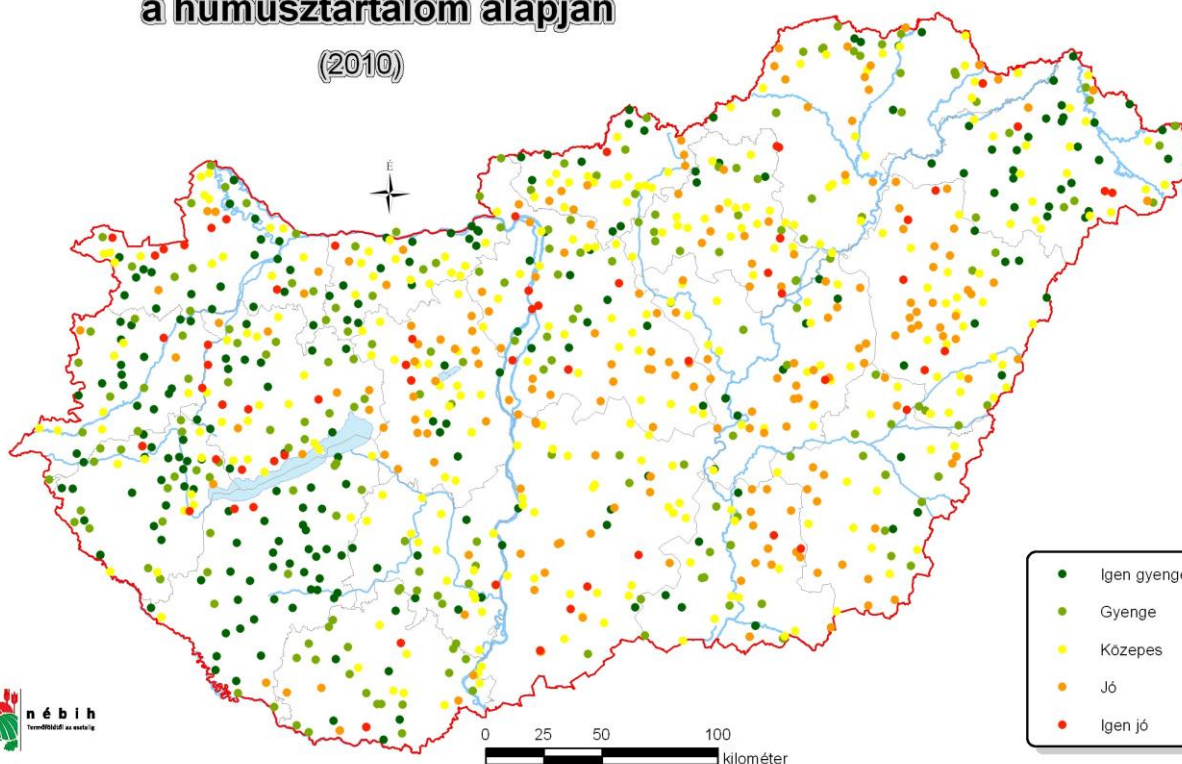
- Applied research projects

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N supply of soils based on organic matter content based on TIM data 0-30 cm layer (2010)

Talajaink nitrogén ellátottságának megítélése a humusztartalom alapján

(2010)

●	Igen gyenge
●	Gyenge
●	Közepes
●	Jó
●	Igen jó

NÉBIH NTAI
2015. január 27.

Lead content of Hungarian soils based on TIM data
0-30 cm layer (2004)
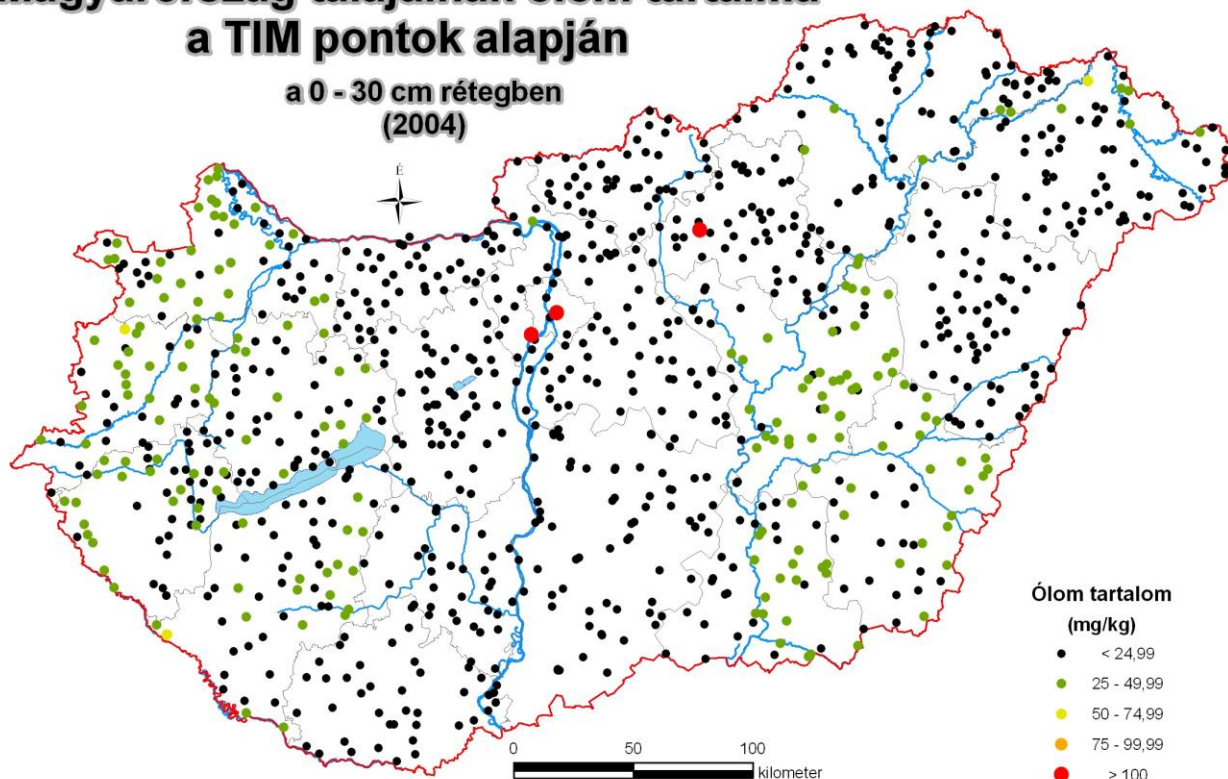
Availability of data

- TIM data is available for anybody who ask for it
  - Email to nti@nebih.gov.hu
  - Information: szentesd@nebih.gov.hu

Thank you for attention!