



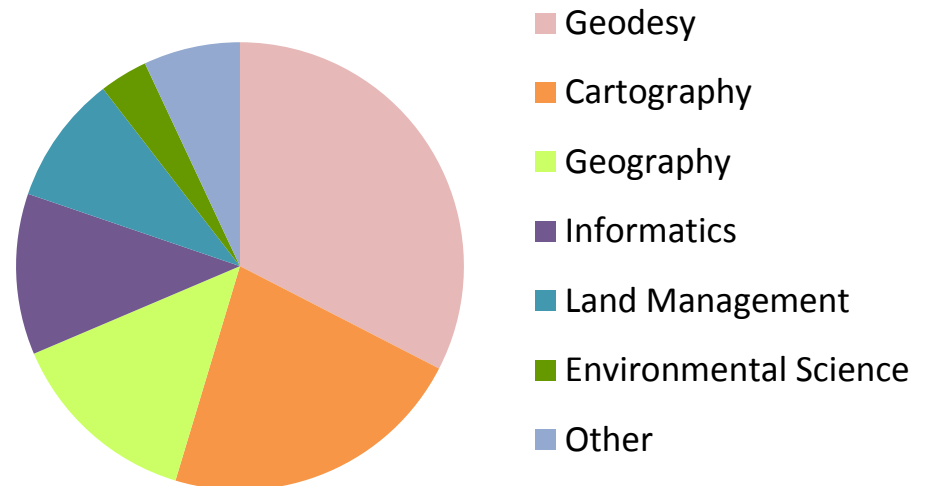
ERM & EBM VISUALIZATION

LITHUANIAN EXPERIENCE

GIS-Centras – activities & staff

State information systems
GIS applications and services
Cartography
Communication of spatial
information

Staff background



Our information systems

- Portal of the National Spatial Data Infrastructure
www.geoportal.lt

Technological implementation of the ES INSPIRE directive (2007/2/EC)

- Reference base cadastre: framework data and multiscale maps
- Topographic information system for engineering infrastructure (large scale) information exchange
- National Global Positioning System station network



Management of urban data

Large volumes of data on topography and engineering infrastructure

Automated object recognition. Self-learning algorithm

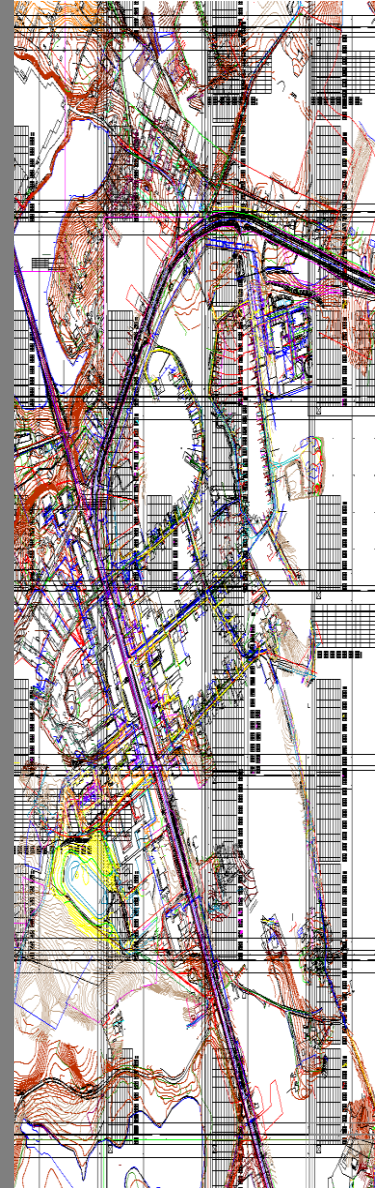
Example: small town data

Input:

- 5 000 dwg files
- 4 300 000 lines (3000 unique types)
- 2 600 000 points (1000 unique types)
- 1 000 000 text objects

Output:

- single database
- 200 000 lines (100 code values)
- 300 000 points (100 code values)



Topography and cartography of relief

Various scales

National reference base map 1:10000

- Multiscale 1:1000–1:5000000
- Automated generalisation 1:10000 – 1:50000

Relief isolines

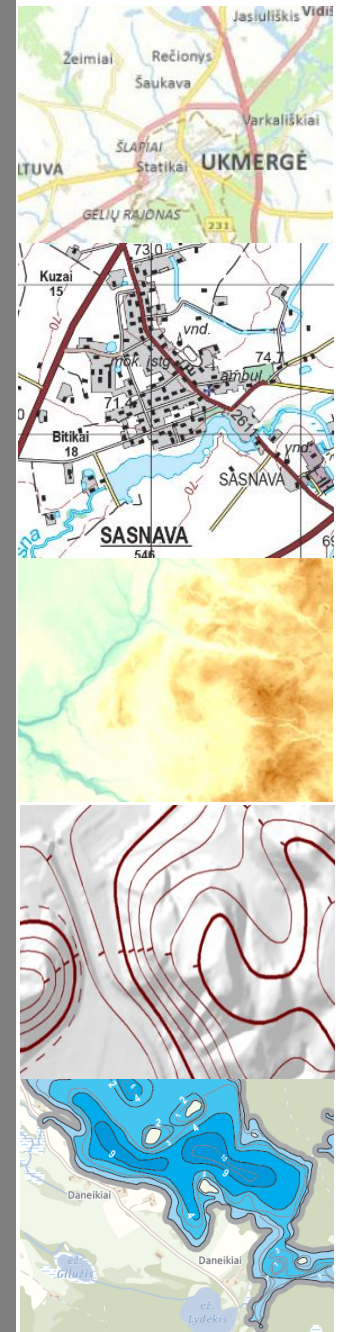
- Completely automated drawing of isolines
- Adjustable to different needs
- Selection of generalisation level
- Alignment with other objects in the territory

Elevation strokes

- Automated placement
- Unique algorithms
- Applicable for different scales

Bathymetric maps.

Exhaustive placename database



Various thematic maps

Tourist maps

Maps of transport networks

Managed areas (population census units, postal zones, police zones ...)

Statistical maps

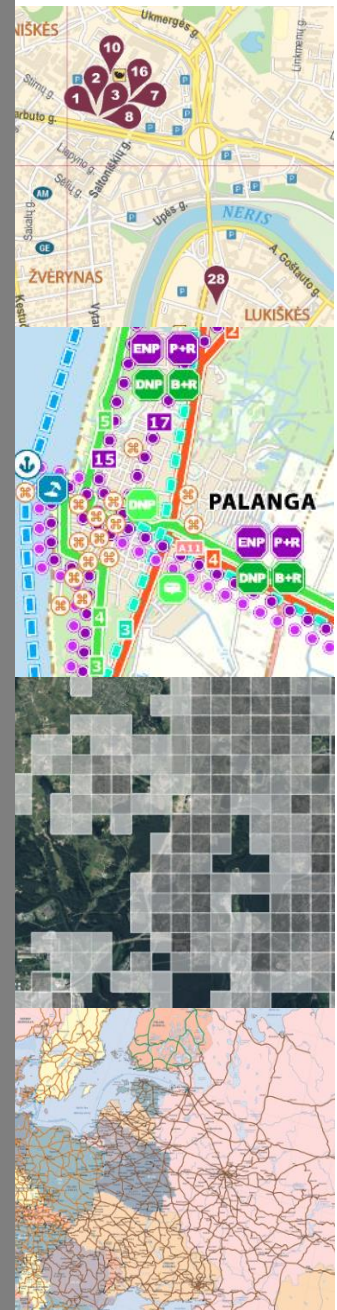
Analytical maps

Interactive map services

Data visualization services

Data selection, processing , analysis and generalization

Various scale and format, quality design



Fun maps

Advertisement maps

Event maps: printed and interactive

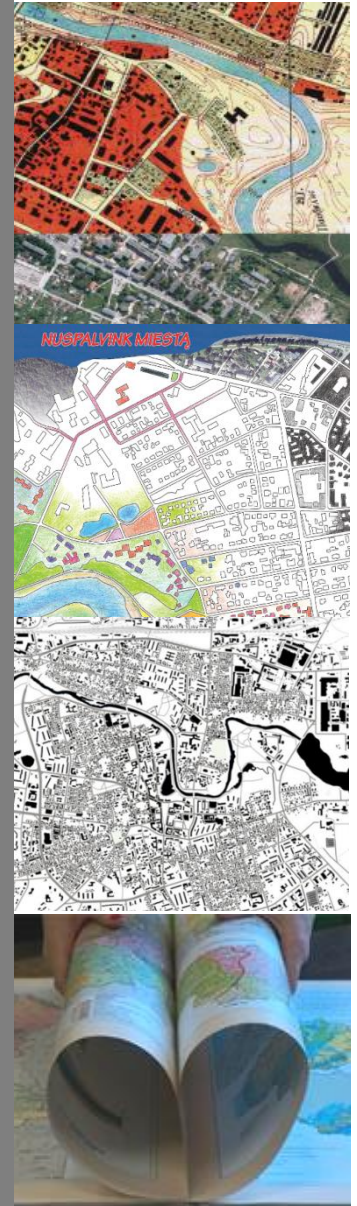
Maps for booklets, posters and books

Education maps and games

Old maps, map mosaics

Map series

Tailored to most demanding user needs



Geoportal.It



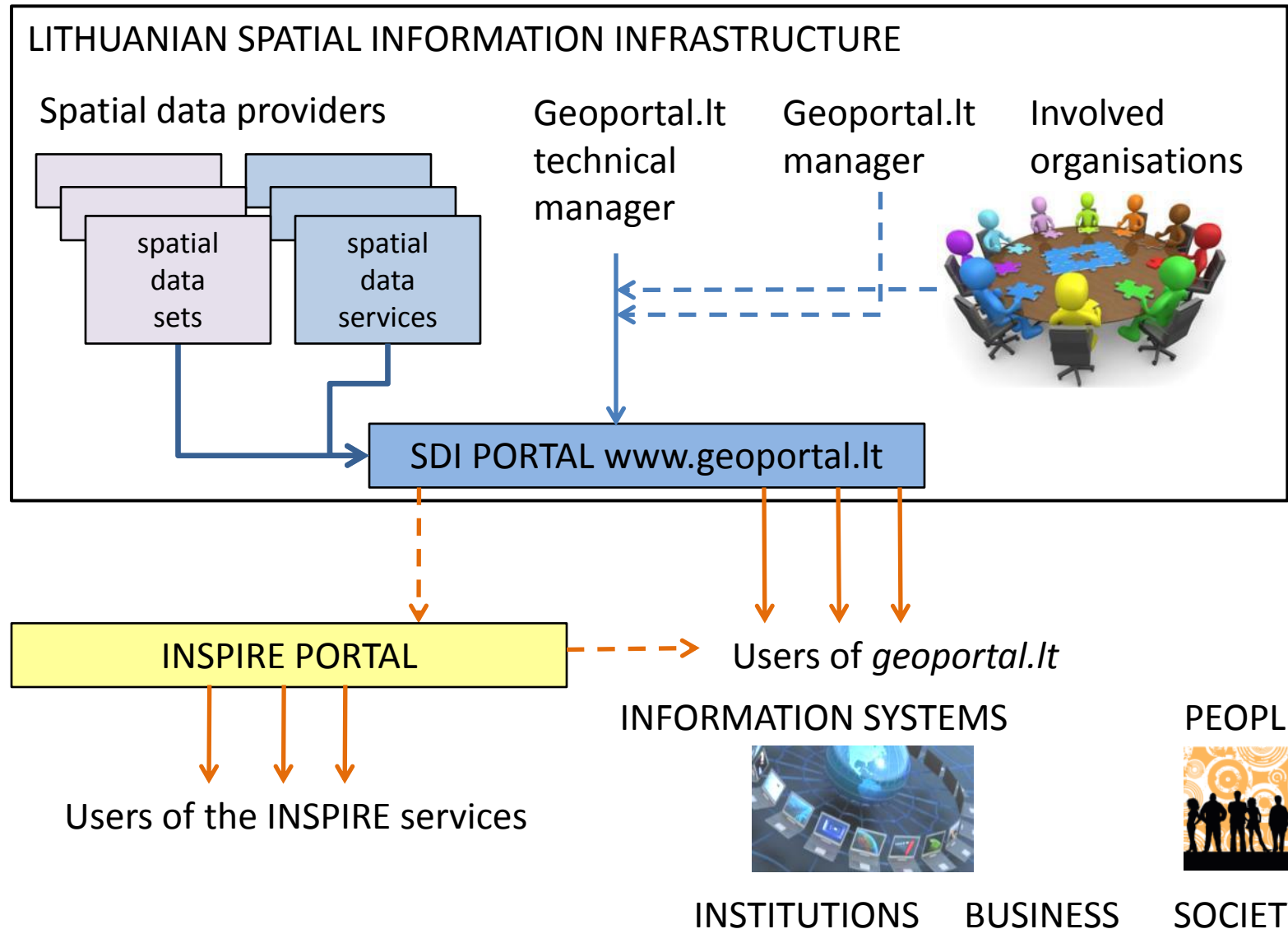
National spatial data sharing platform and Web GIS for everyone
Public, free of charge

- ERM_250LT
- EBM_100LT

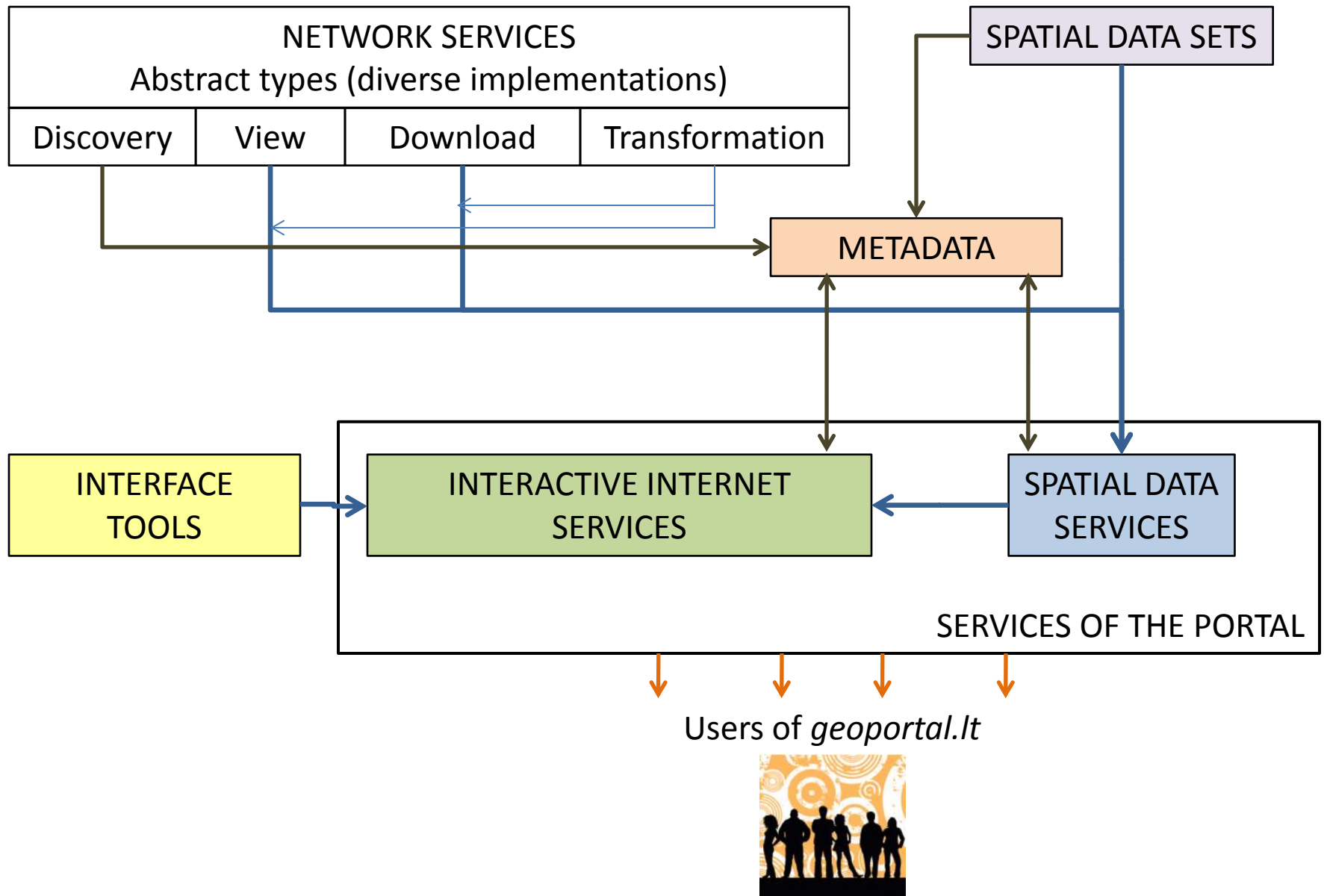


Discovery
View
Transformation
Download

Lithuanian Spatial Information Infrastructure



Services at geoportal.it



Task of a cartographer

Signification

Present what is needed
Represent using
Symbols



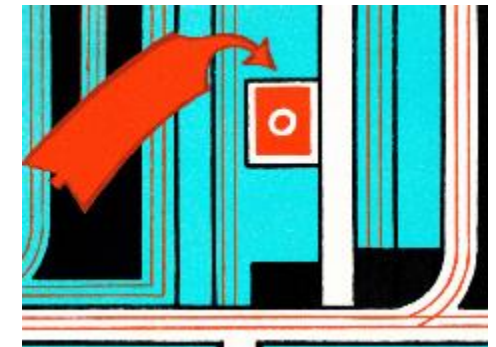
Clarification

Remove the excessive
Generalise
Clean up



Emphasis

Direct
Suggest
Attract



ERM & EBM Visualization decisions

ArcGIS platform

No information beyond the state boundary

Multiscale maps

Traditional symbols

Overview scales

1:3 000 000, 1: 2 000 000

Cartographic generalization for scales:

1:1 000 000

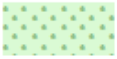
1: 500 000

1: 250 000

1: 100 000

1: 50 000 (EBM only)

Tradition: ERM

	ERM	LT TOP50LKS	LT TOP50WGS Military, MGCP specification
Peat mines			
Wind turbines			
Helipads; heliports			
Plantations; orchards			

Visualization principles

Semiological principles

Associative symbols

Appropriate visual variables for quantitative and qualitative values

Structural approach: internal hierarchies and groups

Clarity vs complexity: Optimized graphic load

Emphasis (several visual variables for the same attribute value)

Qualitative data: EBM NUTS 3

	LT011 Vilniaus aps.
	LT021 Alytaus aps.
	LT022 Kauno aps.
	LT023 Klaipėdos aps.
	LT024 Marijampolės aps.
	LT025 Panevėžio aps.
	LT026 Šiaulių aps.
	LT027 Tauragės aps.
	LT028 Telšių aps.
	LT029 Utenos aps.

Emphasis: ERM

	International boundary
	First-order administrative boundary
	Second-order administrative boundary
	Third-order administrative boundary

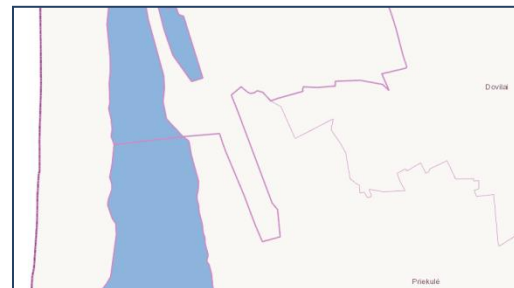
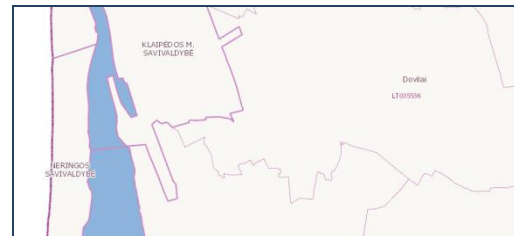
	automagistralės
	pirmaeiliai keliai
	antraeiliai keliai
	kiti keliai

Associative Symbols: ERM

	Airports
	Railway stations
	Hydro-electric power plants
	Observatories
	Museums

EBM

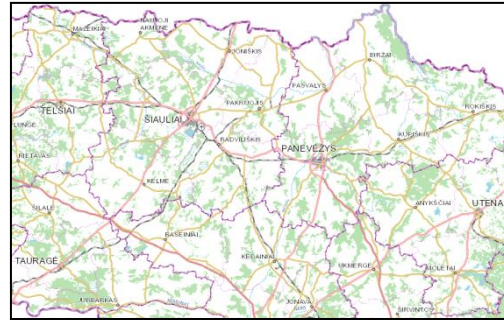
1:3 000 000
1:2 000 000



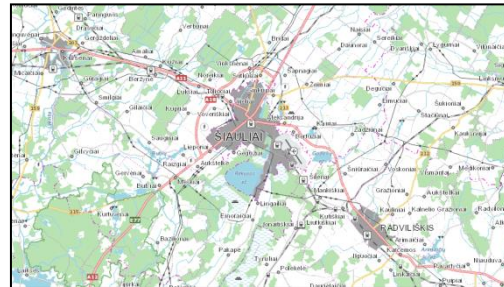
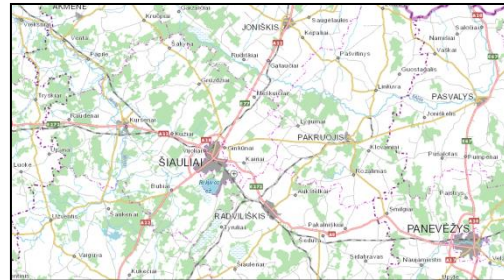
1:1 000 000
1:500 000
1:250 000
1:100 000
1:50 000

ERM

1:3 000 000
1:2 000 000



1: 1 000 000
1: 500 000
1: 250 000
1: 100 000



Generalization: comparison

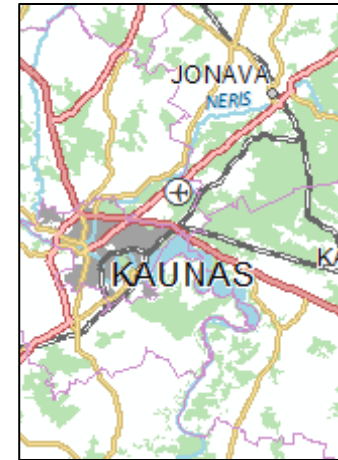
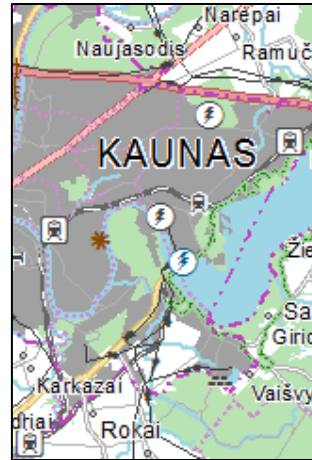
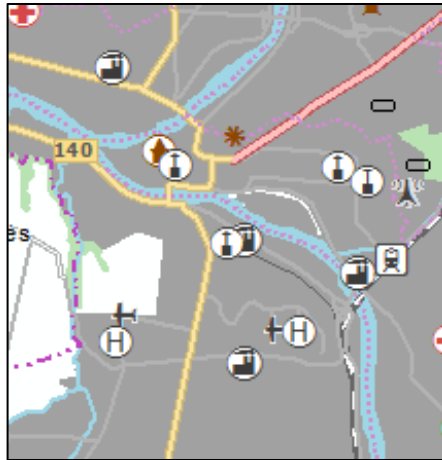
1:100 000

1:250 000

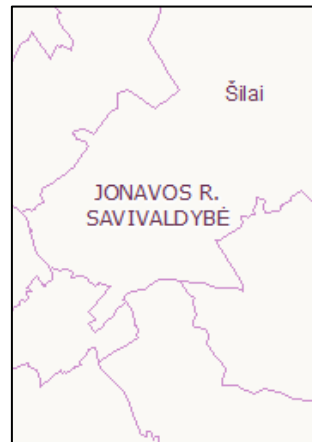
1:500 000

1:1 000 000

ERM



EBM



Technological solutions

Original data is unchanged

Rule-based (cartographic) design for different scales

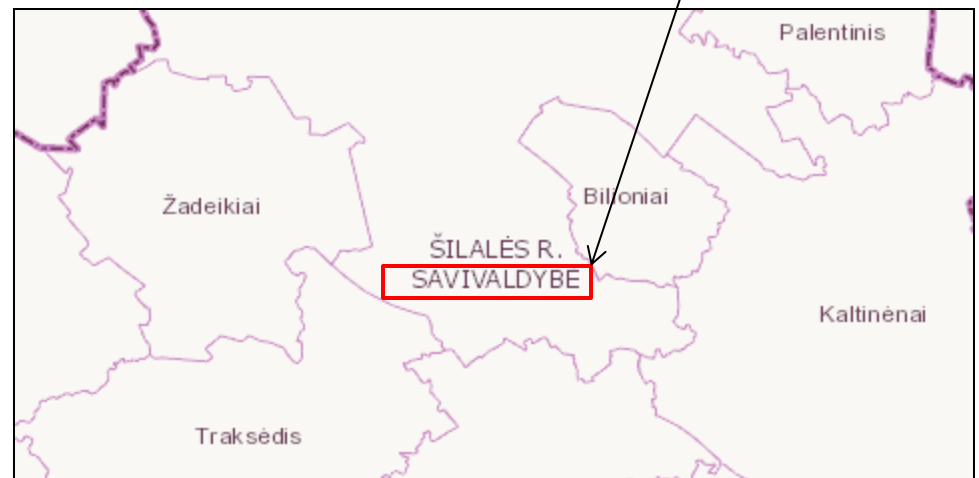
- data filters

- setting appropriate label sizes

- enrichment of labels (adding Lithuanian parts to the labels)

ArcGIS based

Not a part of the data



Presentation

ERM

Cached. User cannot manipulate layers

Annotations

White halo

Lines 0,2 mm or thicker

EBM

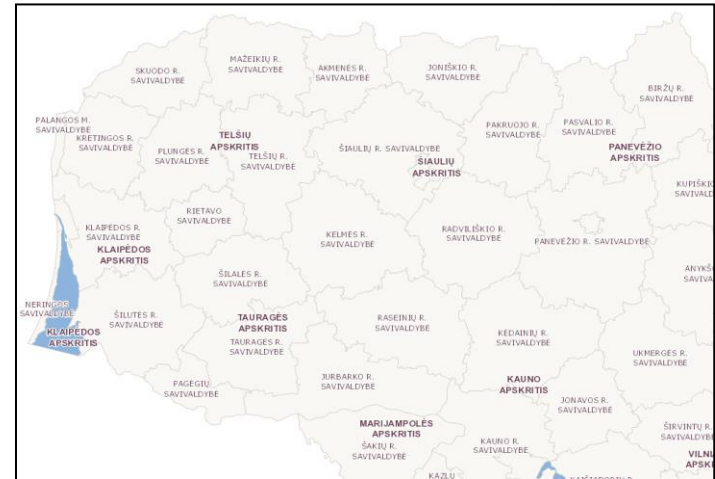
Not cached

Capability to turn layers on/off

No annotations

Separate layers for lines and polygons that overlap

EBM: administrative units

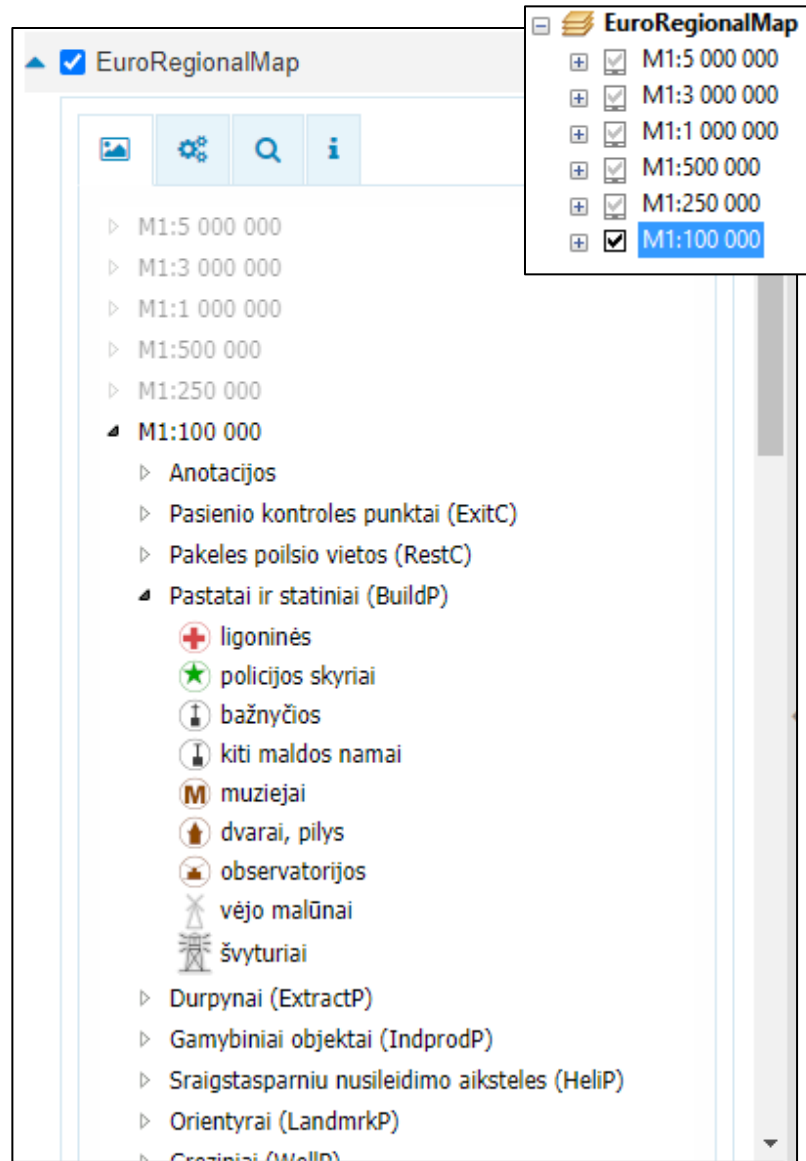


EBM: boundaries over NUTS

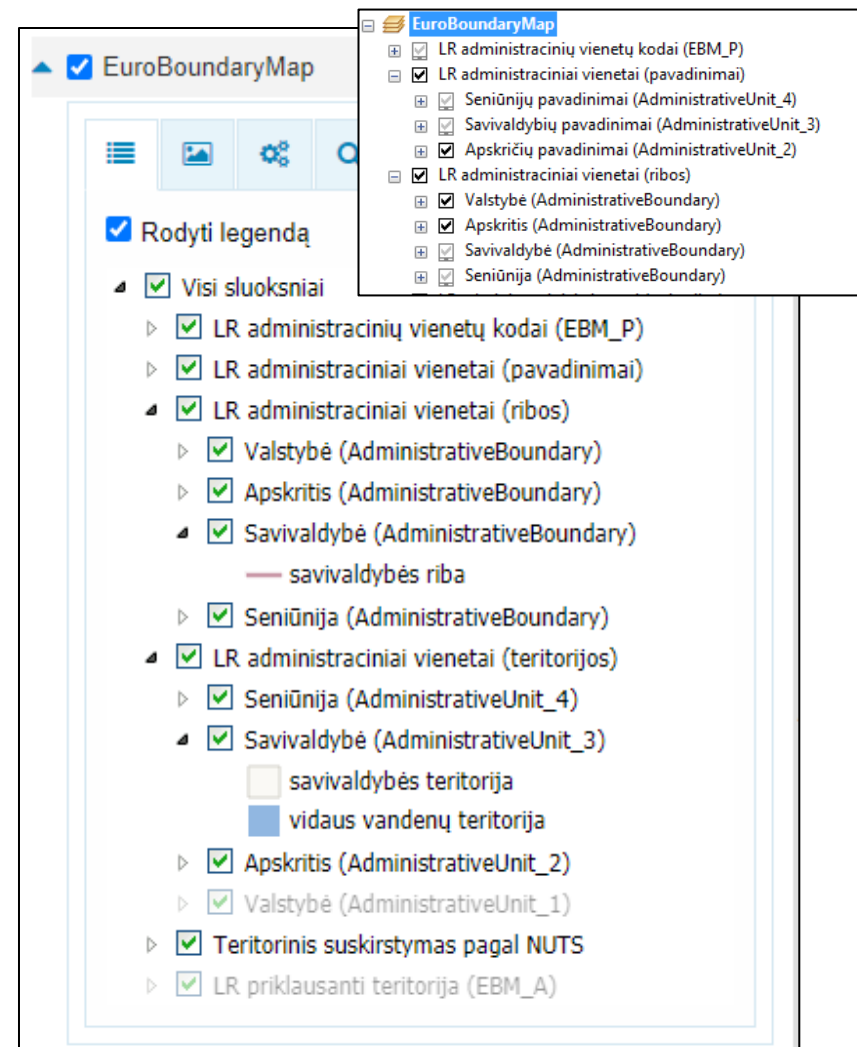


Legends

ERM: by scales



EBM: by geometry types



Contents

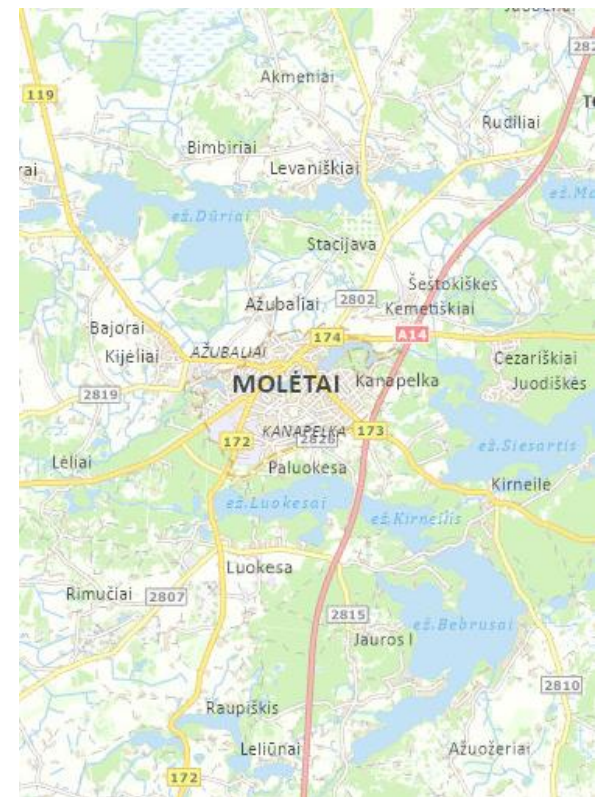
- Not all the objects of the ERM specification are present in the Lithuanian extent of the dataset

ERM data generalization level is convenient for national thematic mapping

ERM



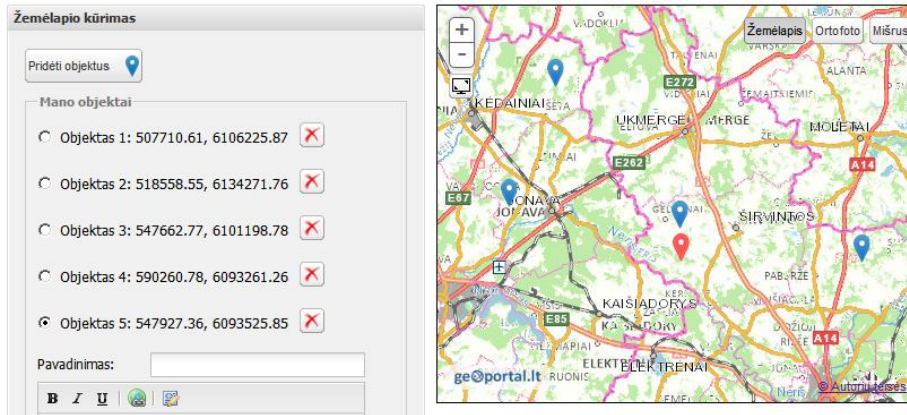
National reference base map



1: 100 000

Geoportal.lt for added value

Map mashups, map linking and embedding



Data transformations

- Co-ordinate systems: LKS-94, WGS 84, ETRS89
- Formats: ESRI, CAD, raster formats

ERM_250LT – Lietuvos Respublikos EuroRegionalMap reikalavimų

Pažymėkite pageidaujamą geoproducto duomenų formatą.

Formatai

- ☐ Autodesk AutoCAD DWG (R2000) | *.dwg
- ☐ Autodesk AutoCAD DWG (R2010) | *.dwg
- ☐ ESRI File Geodatabase (*.gdb)
- ☐ ESRI Shape (*.shp)

[Informacija apie duomenų formatus](#)

Koordinatų sistema

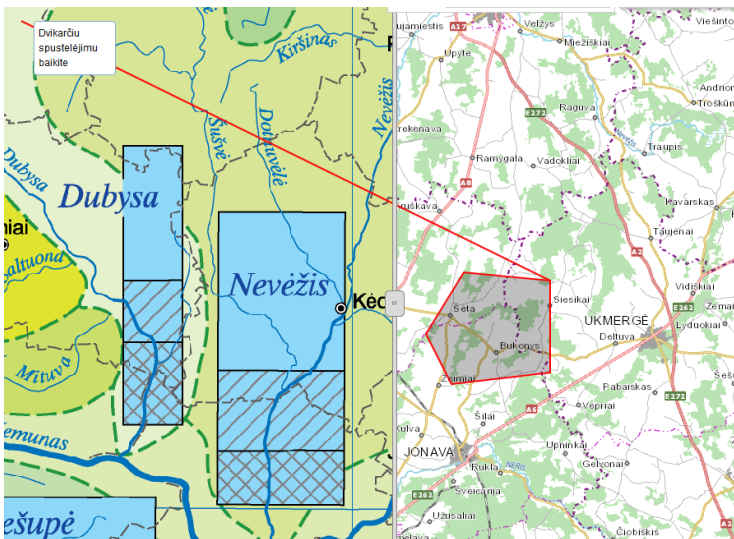
- ☐ LKS-94 / Lithuania TM
- ☐ WGS 84
- ☐ ETRS89 / TM Baltic93

[Atšaukti](#) [Atgal](#) [Toliau](#)

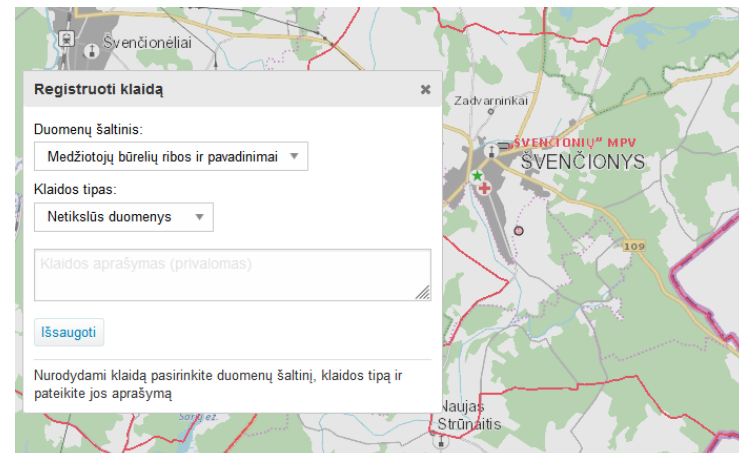
Paspauskite figūrą pridėti, arba paspauskite pradekite ir pabaikite atleidę



Comparison and measurement tools



Tools for reporting errors



The background features a large blue gear on the left and a grey gear on the right. Inside the blue gear is a map of Radviliškis, showing roads, green spaces, and labels for Kauliniai, Radviliškis, and Ilguočiai. Inside the grey gear is a map of Kauno apskritis, showing rivers and lakes, with labels for Užusalis, Kaunas, and other regions.

Thank you!

Giedrė Beconytė.
SE „GIS-Centras“. www.gis-centras.lt
Contractor of National Land Service for ERM and EBM. www.nzt.lt