Lessons learned from use and reuse of harmonized inter-operable data sets

HLanData

HARMONIZATION OF EUROPEAN
LAND USE AND LAND COVER DATABASES
FOR THE CREATION OF VALUE ADDED SERVICES

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HLANDATA – *Creation of value-added services based on Harmonized Land Use and Land Cover Datasets (EC ICT-PSP: 2010-2012)*

- Project funded by EU Competitiveness and Innovation Framework **ICT Policy Support Program**
- Project objective – demonstrate the feasibility of European level harmonization of the Land Use and Land Cover datasets taking into account both the data categorization and the data models, for any of their possible uses and users, through the development of user oriented value-added services.
- Project web site – www.hlandata.eu
- Project consortium – 9 partners:
  - Government of Navarra (co-ordinator) (Spain);
  - TRACASA (Spain);
  - National Geographic Institute (Spain);
  - GISAT sro (Czech Republic);
  - Slovak Environment Agency (Slovakia)
  - Institute of Aerial Geodesy (Lithuania)
  - Technology Development Forum (Latvia)
  - CEIT Alanova gemeinnutzige GmbH (Austria)
  - ISOCARP Association

Pilot applications & services

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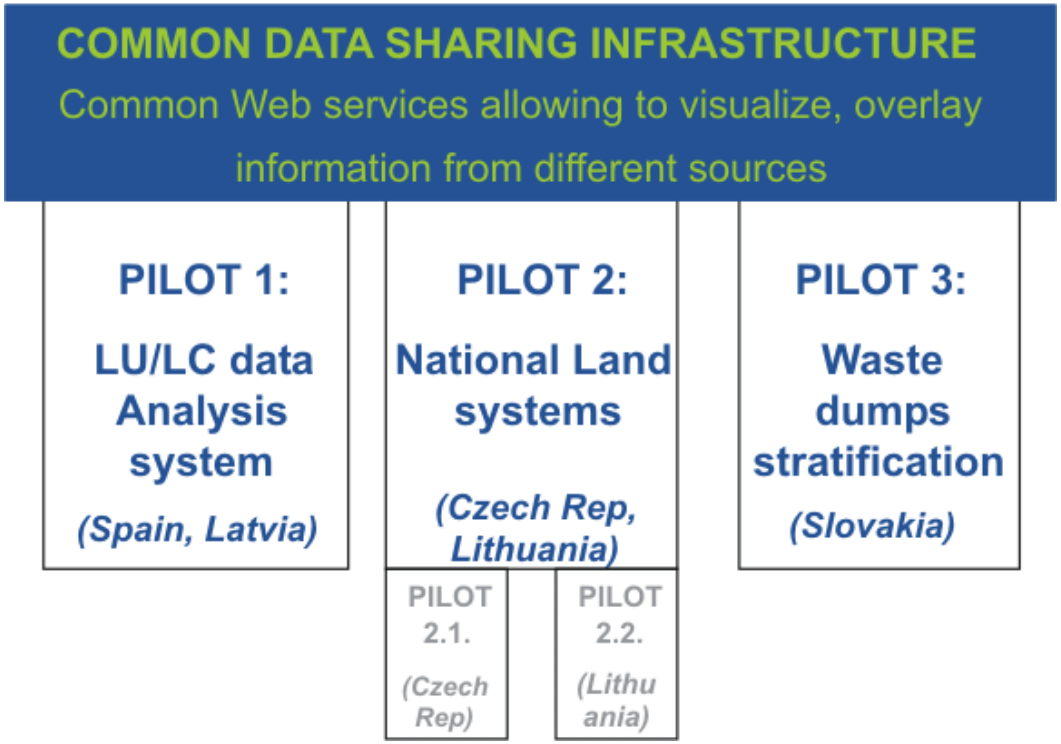
Services Starting Point



HLanData Geoportal
http://portal.hlandata.eu

Pilot 1: LU/LC Data Analysis System for intermediate-level users: https://gisportal.tracasa.es/hlandata/viewer/

Pilot 1: HLanData e-learning tool: http://hlandata.cloud-learning.net

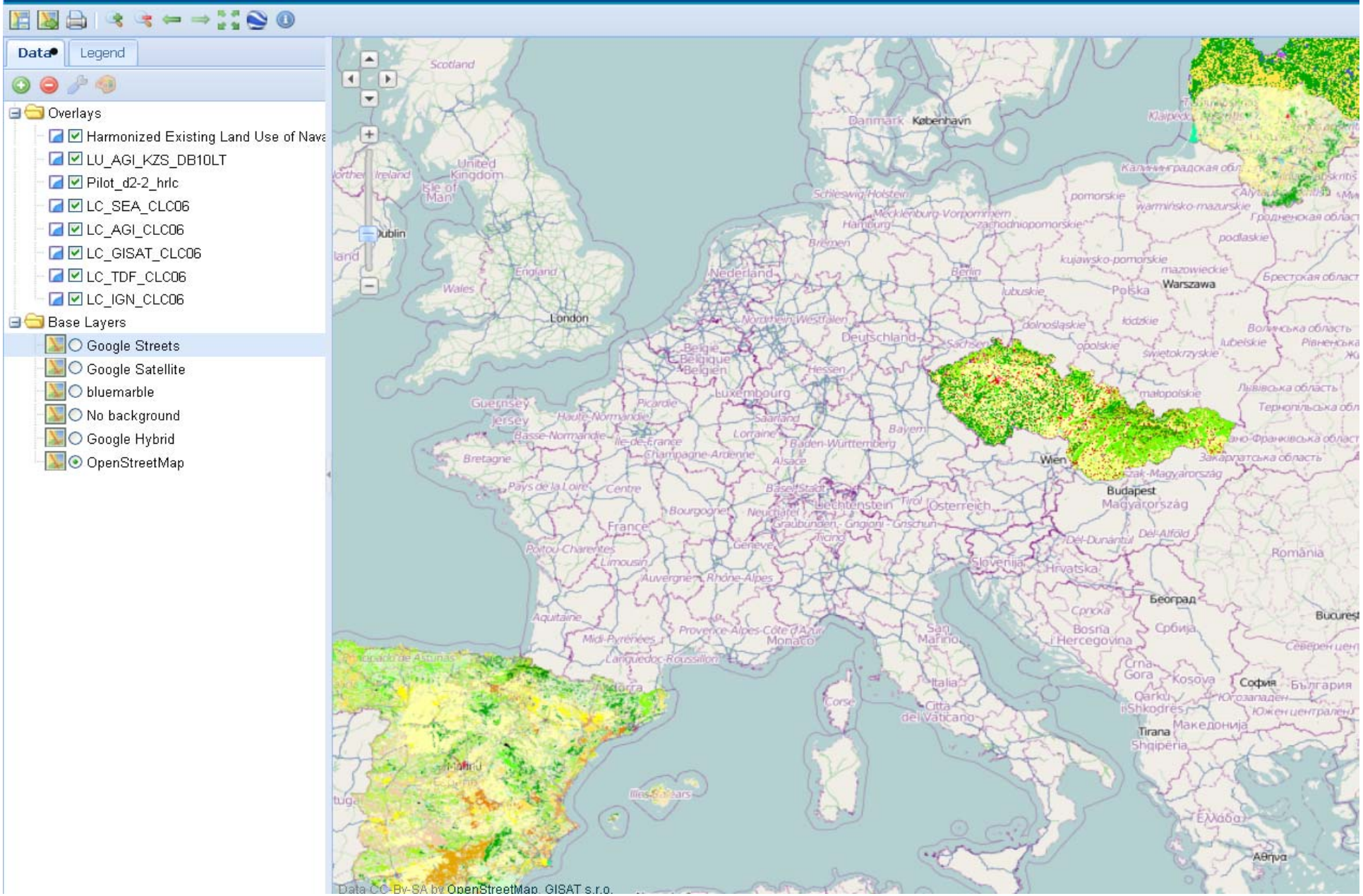
Pilot 2: Land Information Systems

Sub-pilot 2.1: Harmonized interoperable national land information system: http://hlandata.gisat.cz/appv2

Sub-pilot 2.2: Establishment of a national land statistical accounting system (SLAS) based on GMES core mapping service products: http://hlandata.agi.lt/

Pilot 3: Stratification of waste dumps: http://hlandata.sazp.sk/

Geo-portal – **discovery and portrayal services**



Geo-portal – **gateway to harmonized datasets**

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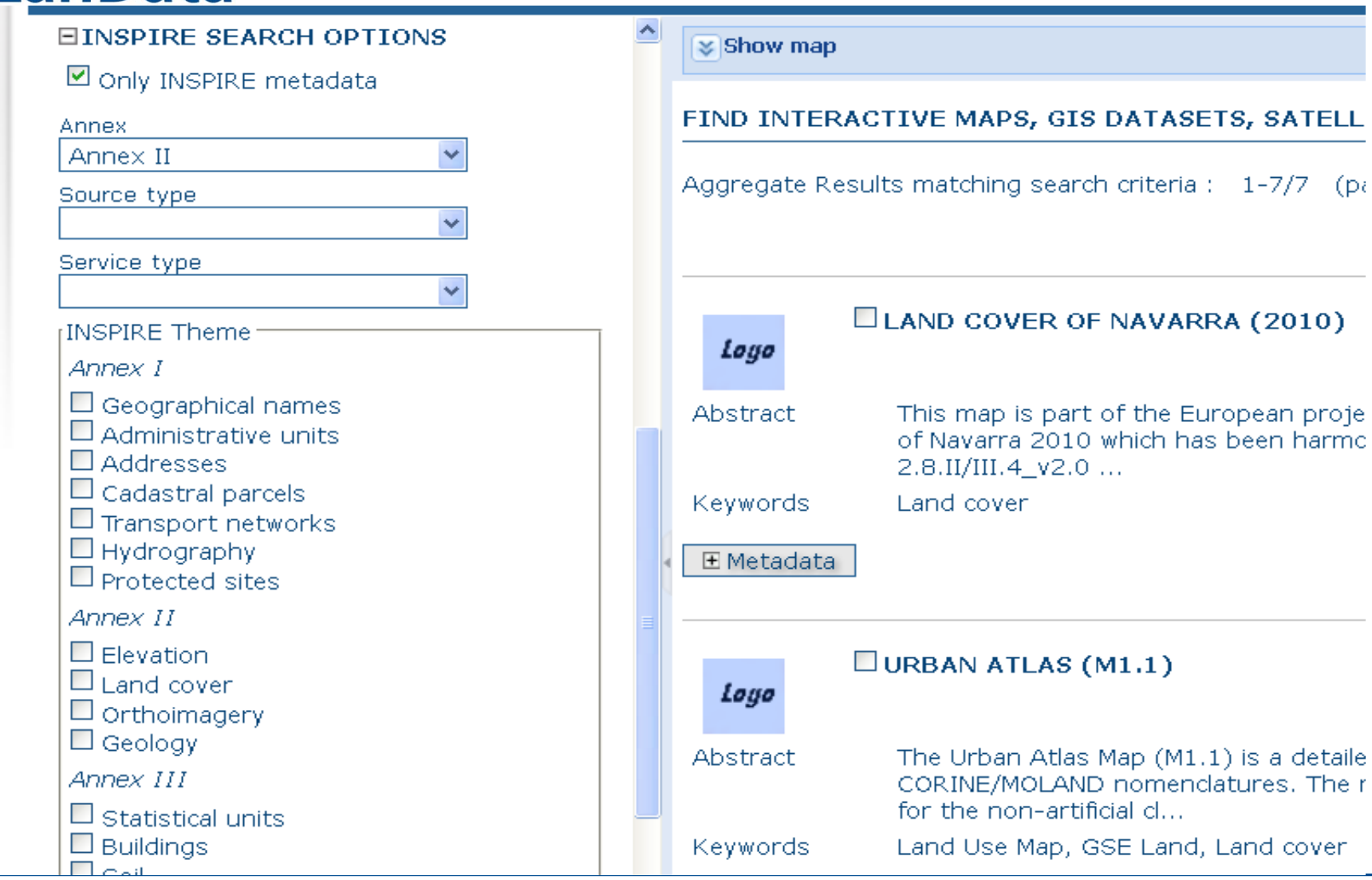
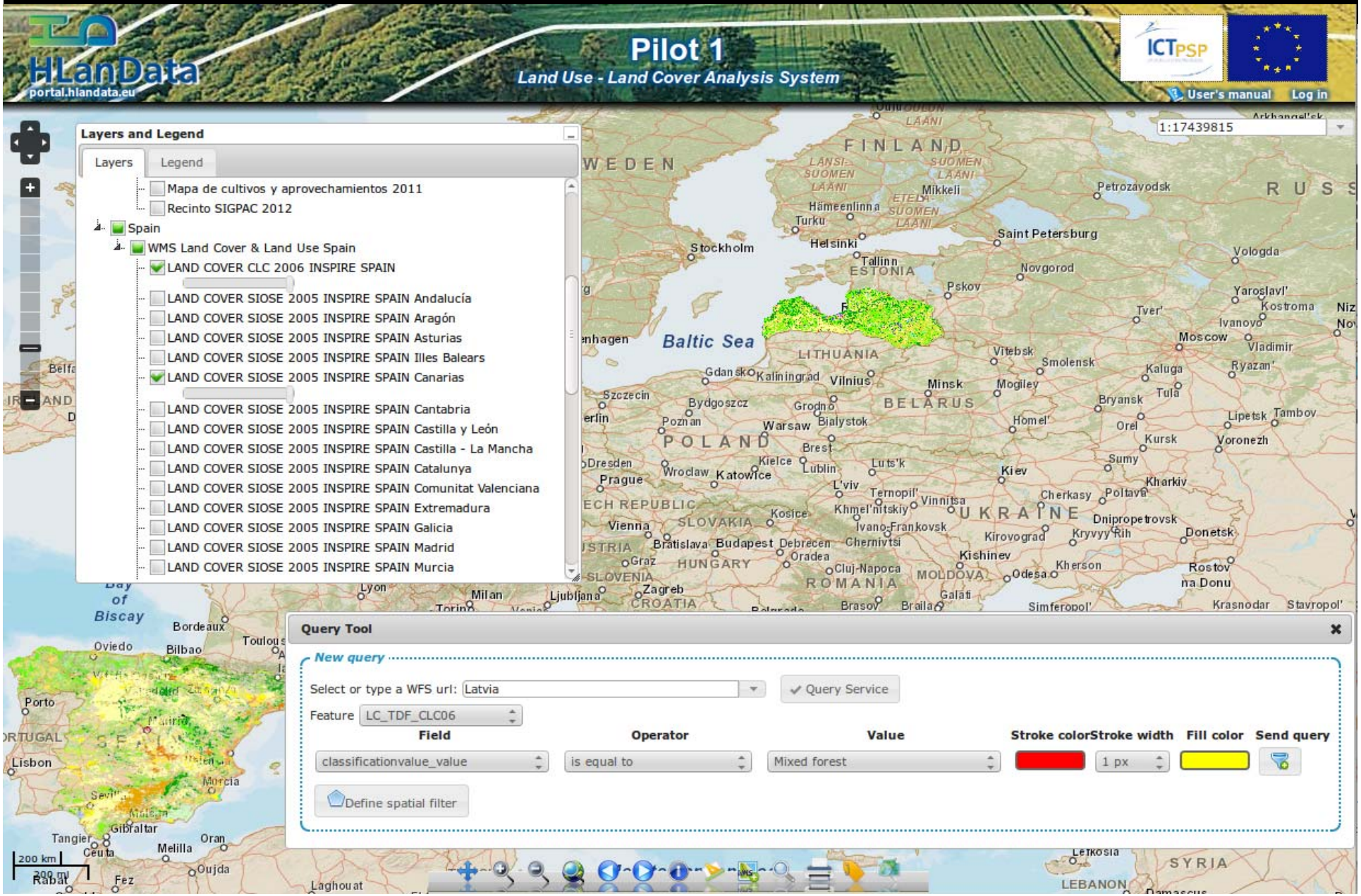
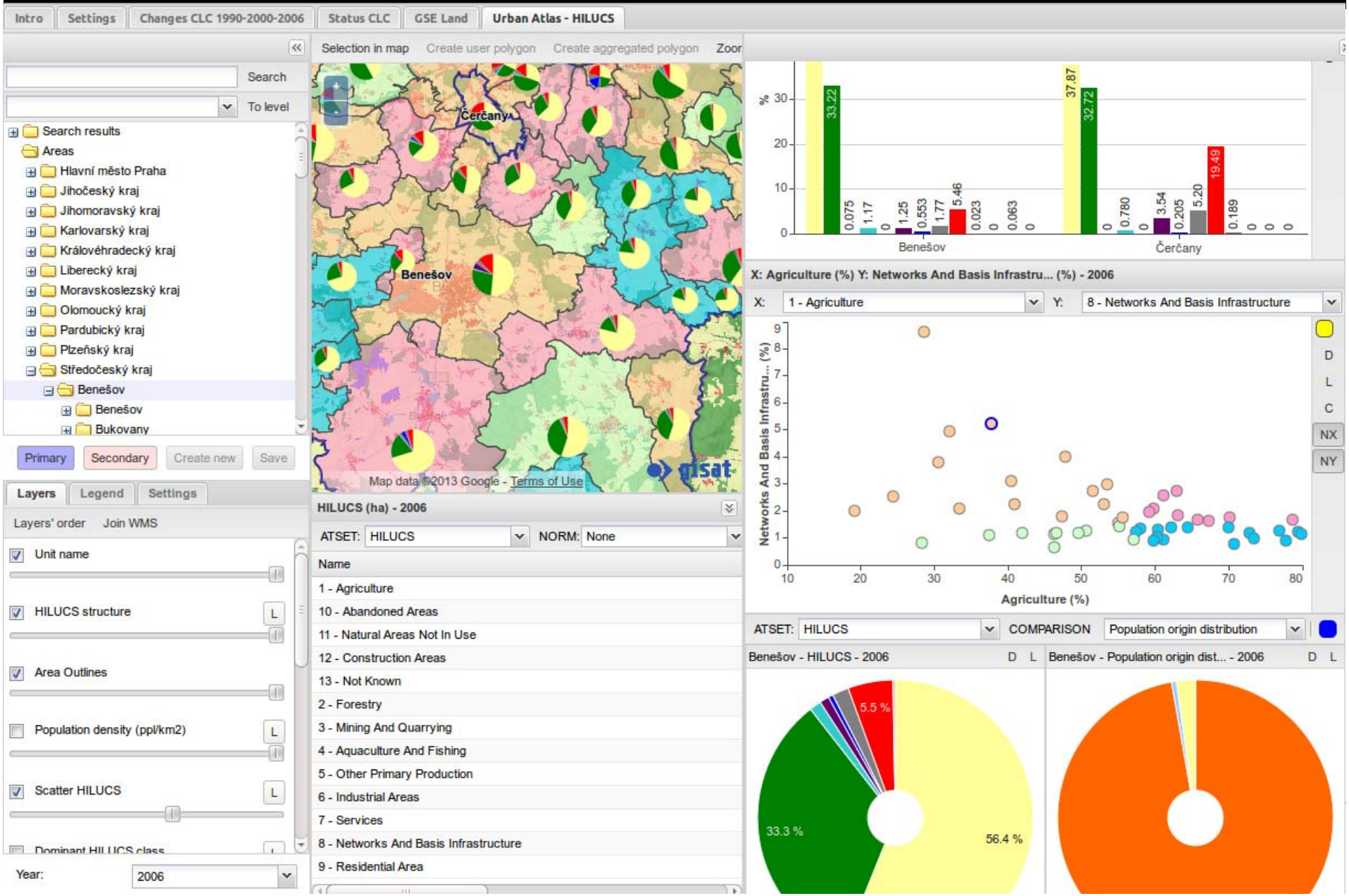


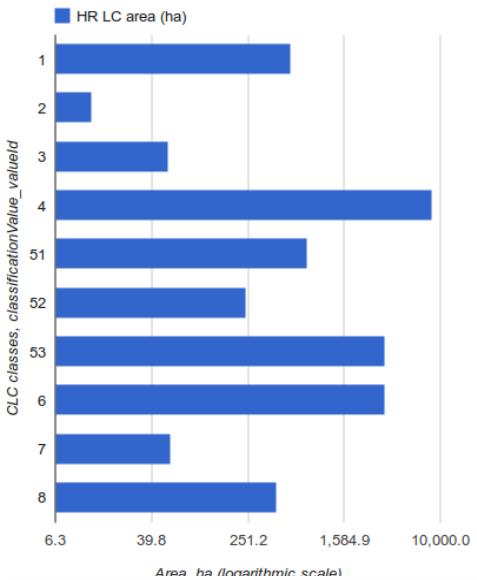
Pilot 1 – **LC/LU data harmonization**

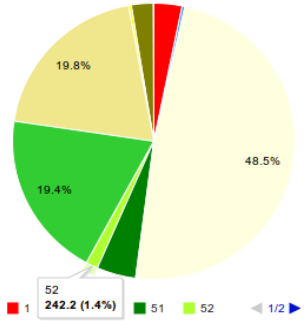


Pilot 2.1 – **interactive LC analysis**

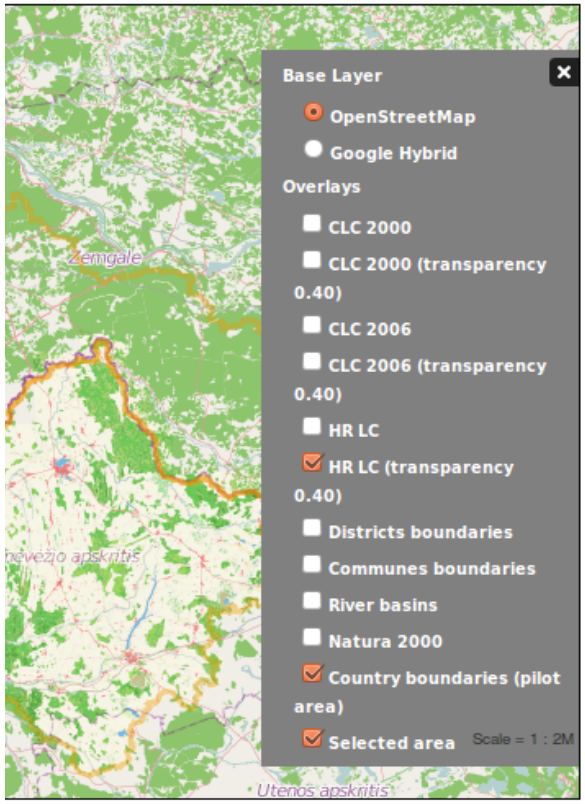


Pilot 2.2 – comparative LC statistics





HR LC class	HR LC area (ha)	%	L2 label
1	571.0	3.23	Urban areas
2	12.8	0.07	Bare ground
3	54.6	0.31	Water bodies
4	8,591.0	48.53	Arable land
51	792.6	4.48	Coniferous forest
52	242.2	1.37	Deciduous forest
53	3,439.2	19.43	Mixed forest
6	3,500.8	19.78	Transitional woodland
7	57.1	0.32	Grassland
8	441.1	2.49	Wetlands



Local level | Municipal level | Country level | WFD | Protected areas

LT Juodupės sen.

CLC2000 CLC2006 Compare CLC2000 and CLC2006 HR Landcover

Proceed

Download results as CSV

About

AGI HLanData Pilot Project D2.2 is establishment of a national land statistical accounting system based on GMES core mapping service products.

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ICTPSP

This project is partially funded under the ICT Policy Support Programme (ICT PSP) as part of the Competitivness and Innovation Framework Programme by the European Community.

Links

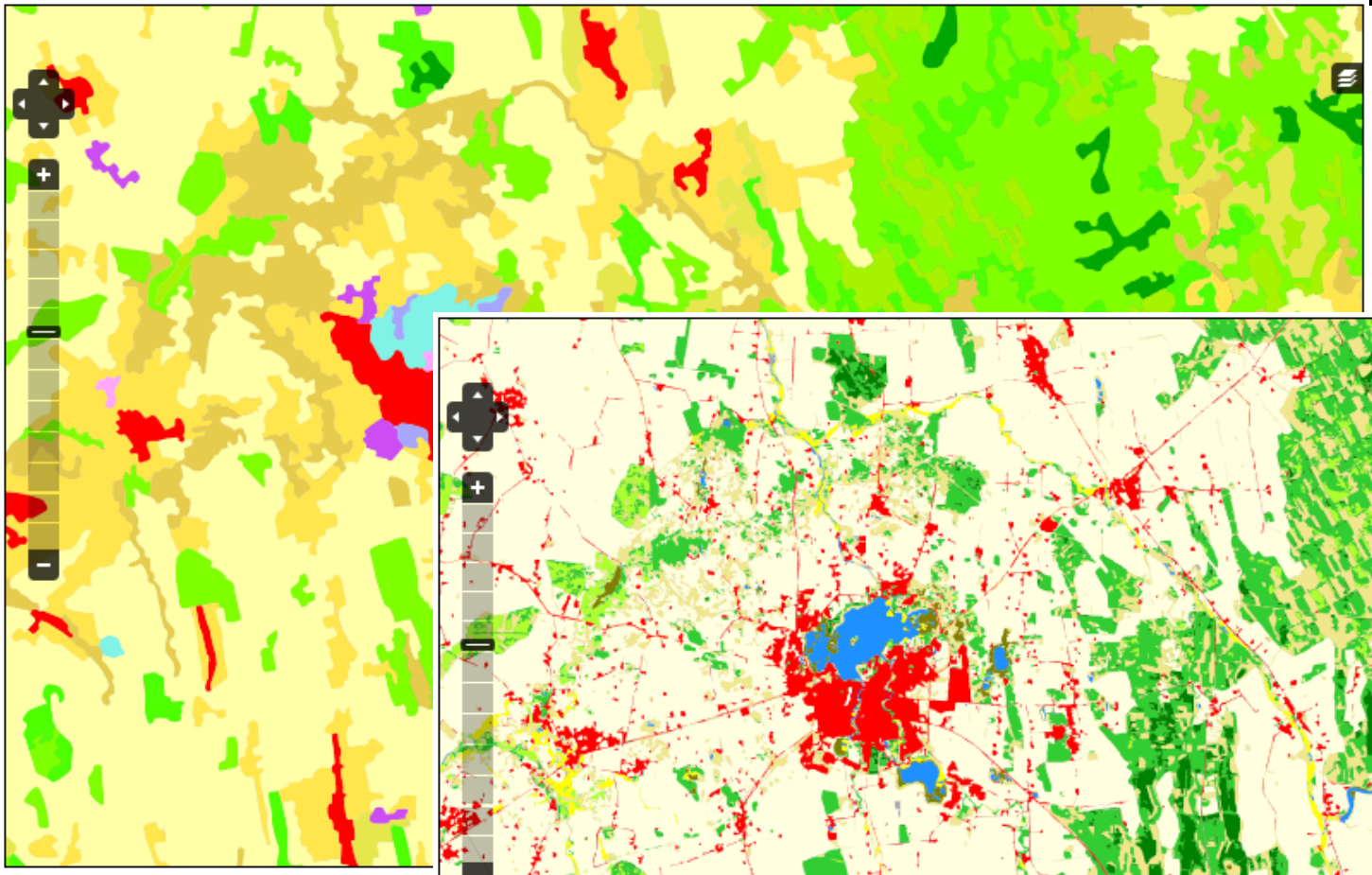
CLC Legend

HR LC Legend

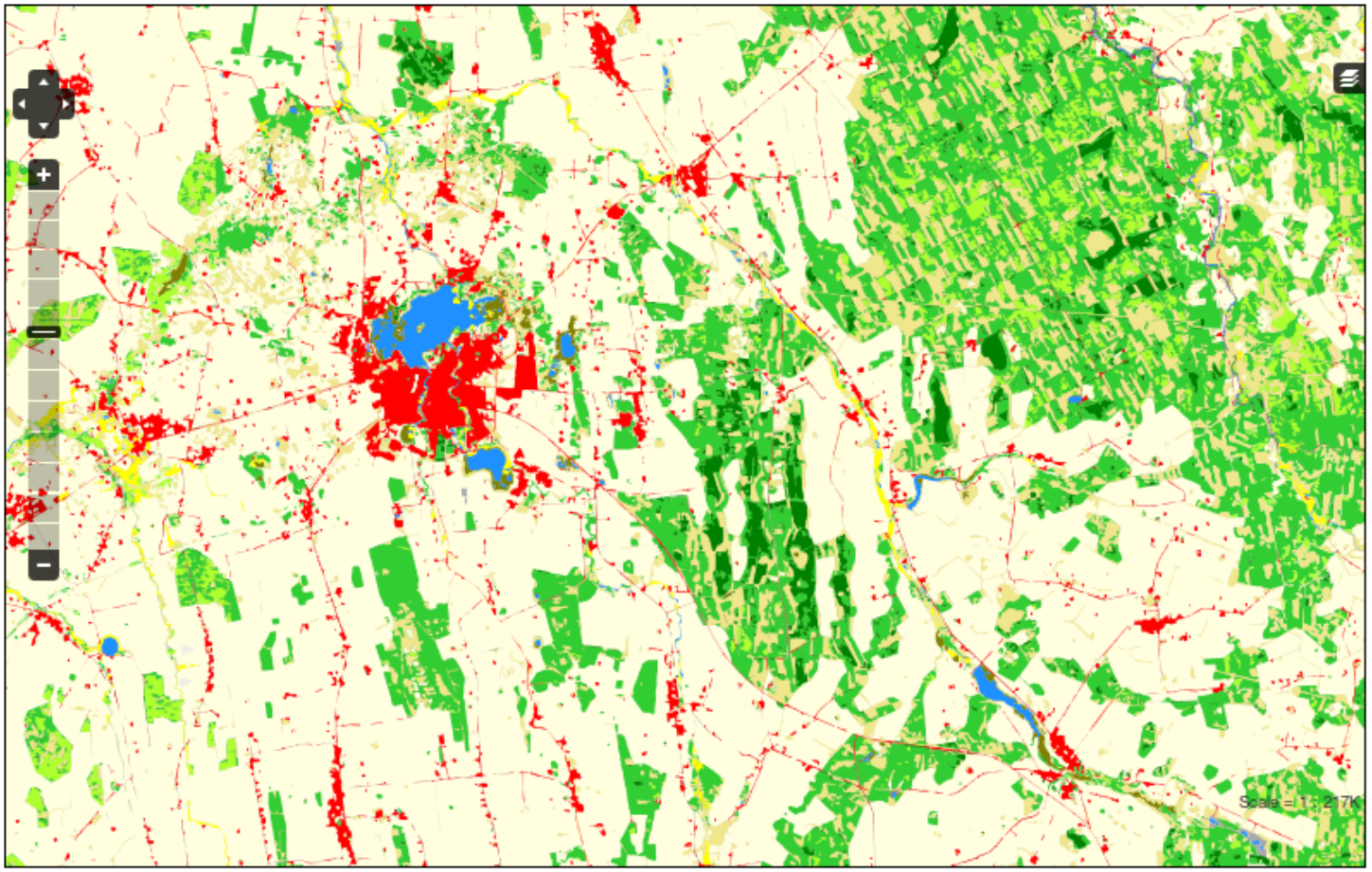
Instructions

ICTPSP

Pilot 2.2 – **HR Land Cover**

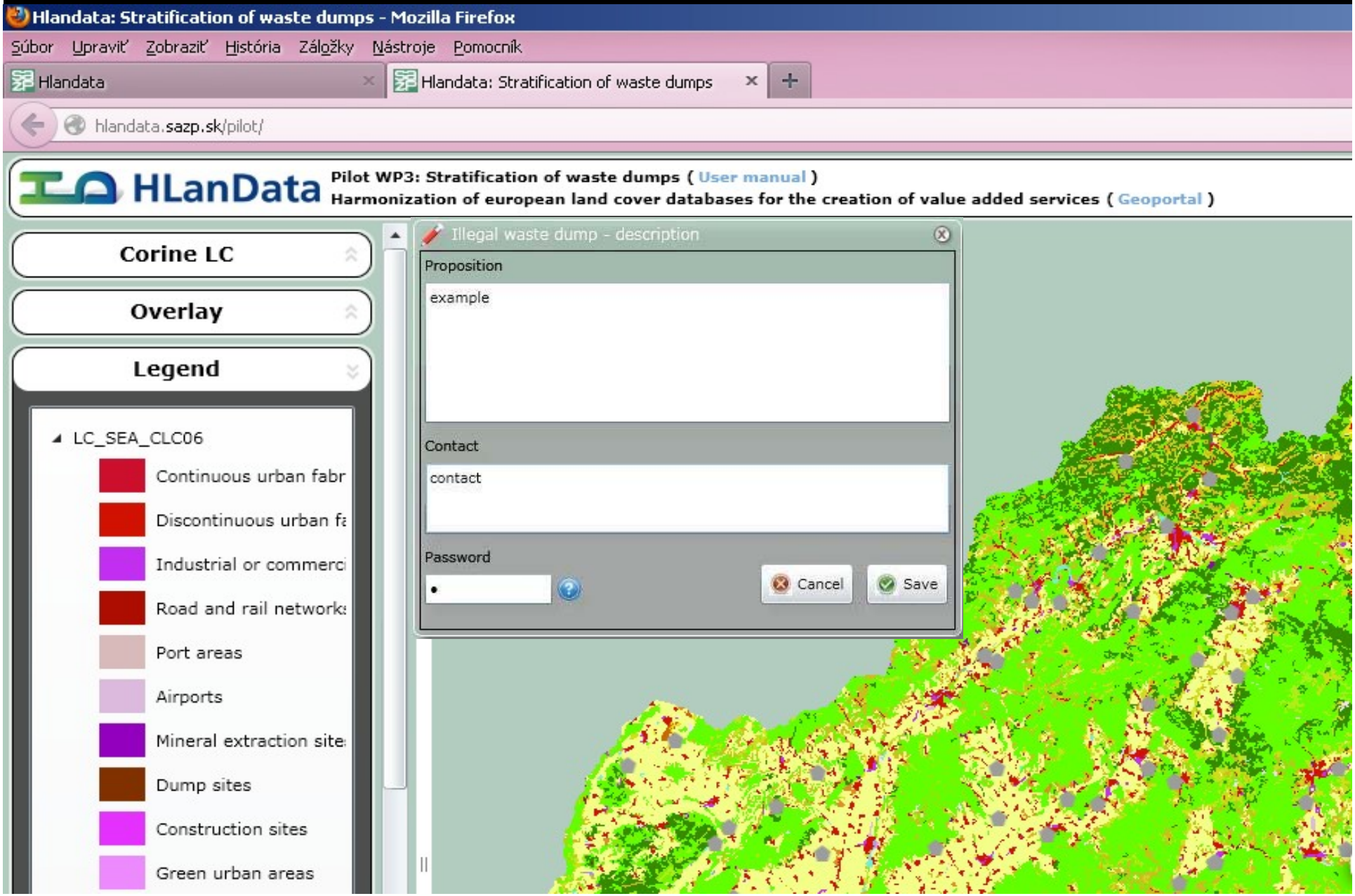


CLC 2006
MMU = 25 ha



HRLC 2012
MMU = 0,25 ha

Pilot 3 – on-line data collection tool



Data harmonization in practice

- Datasets harmonization was necessary to ensure interoperability of information and services
- Harmonization not only of database models and LU/LC datasets, but also WMS (legends even styles)
- Datasets were harmonized first to the INSPIRE DS v.2, and currently transformed to INSPIRE DV v.3
- Users can test the harmonized LU/LC datasets and services in HlanData Geo-portal and Pilot 1
- Harmonization methodology and practical guidelines are very well documented (D2.2 & D4.2)

Testing of SDI technologies

- Project Partners originally used different technologies for implementation of SDI services, so naturally the Pilots provided a good platform for operational testing
- Testing of commercial and Open Source tools:
  - Windows and Linux OS for servers
  - Oracle/ArcSDE, PosgreSQL/PostGIS
  - ArcGIS Server, UMN Map Server, GeoServer, OpenLayers, GeoExt/ExtJS, Apache, Python, etc.
  - GeoNetwork, Deegree3
  - GRASS GIS, GDAL, PyWPS
  - Google visualization API
- Web applications were originally developed by Partners or standard products modified/adapted for the Pilots
- Interoperability tested, performance issues solved
- Pilots design and testing results documented (D3.1, D3.3, D.3.4)

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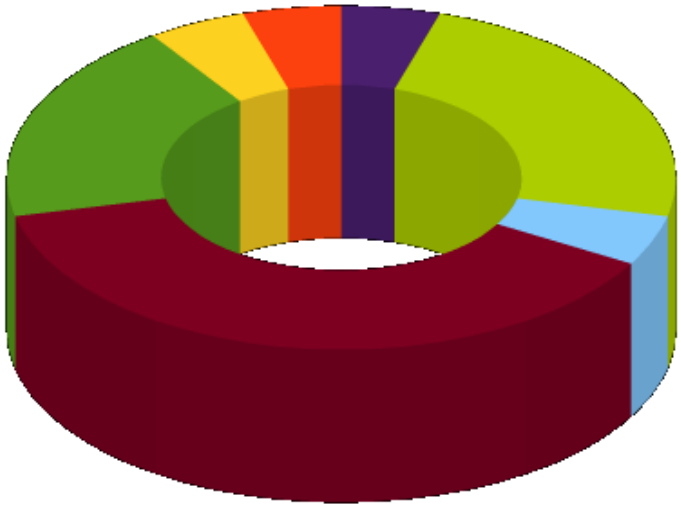
Project assessment

- Assessments of the Pilots were made separately by project partners and key users of the pilots
- Assessment of design, usability, functionality, use-cases and accessibility/support
- Numerical scores from 1 to 10 were used for the assessment along with generic categories like “excellent/good/poor” with clear specifications, later transformed into the same 1-10 scores
- Questionnaires for the users included structured lists describing their institutions, activities and the actual use-cases

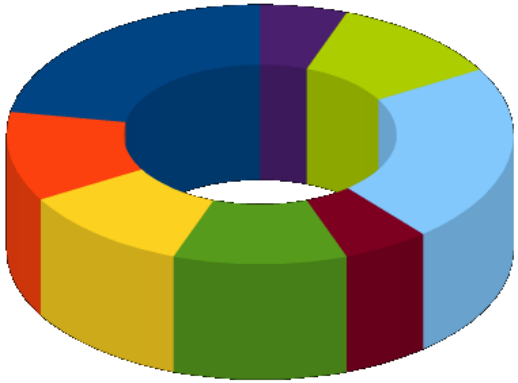
Users analysis



- Large private company
- Small/med private company
- Private person
- State/regional government
- Ministry/agency
- Municipality
- State enterprise
- Research/education
- NGO/Non-profit

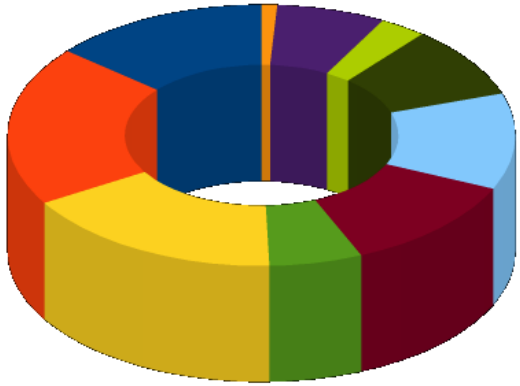
- Spatial planing
- Nature protection
- Cadastre, land surveying
- Forestry
- Agriculture
- Tourism, recreation
- Information services
- GIS/RS services
- Research, consultancy
- Public education
- Other

Use-cases analysis

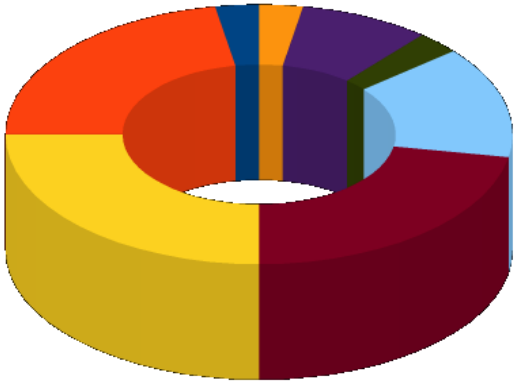


Pilot 1

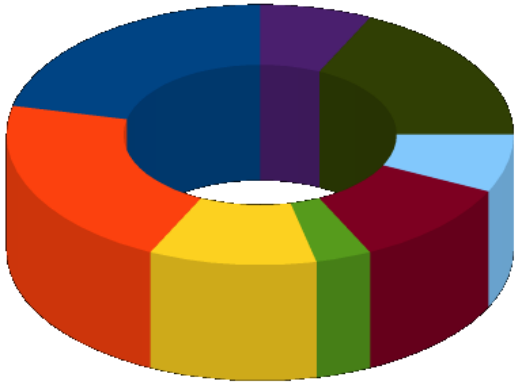
Pilot 2.1



All pilots



Pilot 3



Pilot 2.2

- Statistical analysis
- Spatial/temporal analysis
- Interactive/thematic mapping
- Preparation of reports
- Data collection
- Planning activities
- Demonstrations, presentations
- Training, education
- Research activities
- Other

Results of the assessment

Components	GEOPORTAL			PILOT 1			PILOT 2.1			PILOT 2.2			PILOT 3		
	Project	Users	Total	Project	Users	Total	Project	Users	Total	Project	Users	Total	Project	Users	Total
INTERFACE	**8.33**	**8.00**	**8.25**	**8.25**	**7.00**	**7.56**	**9.00**	**8.00**	**8.86**	**8.33**	**7.43**	**7.85**	**8.00**	**9.25**	**8.77**
Look and feel	8.89	8.33	8.75	8.33	6.67	7.41	8.89	6.67	8.57	8.33	7.62	7.95	8.67	10.00	9.49
Components	7.78	6.67	7.50	7.50	6.00	6.67	7.78	6.67	7.62	7.78	7.62	7.69	7.33	9.17	8.46
DATASETS	**7.67**	**7.50**	**7.63**	**8.75**	**7.80**	**8.22**	**8.33**	**7.00**	**8.14**	**8.33**	**7.71**	**8.00**	**8.00**	**10.00**	**9.23**
Thematic content	7.78	6.67	7.50	8.33	6.00	7.04	8.89	6.67	8.57	8.89	6.67	7.69	10.00	10.00	10.00
Resolution	8.33	10.00	8.75	8.33	7.33	7.78	8.33	10.00	8.57	8.89	7.62	8.21	8.00	8.33	8.21
Spatial coverage	8.33	6.67	7.92	10.00	7.50	8.75	9.44	10.00	9.52	8.89	7.14	7.95	10.00	10.00	10.00
Temporal coverage	6.11	5.00	5.83	9.17	6.67	7.78	7.78	6.67	7.62	7.22	7.62	7.44	5.33	6.67	6.15
Harmonisation	8.33	8.33	8.33	7.50	7.50	7.50	7.78	6.67	7.62	7.78	8.10	7.95	7.33	10.00	8.97
ANALYSES	**7.50**	**7.50**	**7.50**	**7.25**	**7.25**	**7.25**	**8.33**	**7.00**	**8.14**	**7.67**	**6.29**	**6.92**	**7.40**	**10.00**	**9.00**
Use-cases	7.78	8.33	7.92	6.67	6.67	6.67	8.89	6.67	8.57	8.33	6.19	7.18	9.33	9.17	9.23
Feedback	6.11	6.67	6.25	7.50	5.00	6.25	6.67	6.67	6.67	5.33	4.29	4.72	5.33	7.50	6.67
SUPPORT	**6.83**	**4.50**	**6.25**	**7.00**	**5.40**	**6.11**	**6.83**	**6.00**	**6.71**	**7.17**	**5.86**	**6.46**	**7.60**	**10.00**	**9.08**
Multi-lingual	5.00	3.33	4.58	5.00	4.17	4.58	4.44	3.33	4.29	3.89	3.81	3.85	6.00	6.67	6.41
Help	5.56	3.33	5.00	7.50	6.00	6.67	6.11	6.67	6.19	6.67	6.19	6.41	6.67	7.50	7.18
ASSESSMENT	**8.17**	**7.00**	**7.88**	**8.00**	**6.60**	**7.22**	**8.67**	**7.00**	**8.43**	**8.00**	**6.71**	**7.31**	**8.20**	**10.00**	**9.31**
Sample (n)	6	2	8	4	5	9	6	1	7	6	7	13	5	8	13

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Conclusions

- Project has reached it's objectives and received high assessment scores from both partners and users
- Successful harmonization of datasets and SDI services demonstrated feasibility of INSPIRE implementation
- Efficiency and interoperability of various SDI technologies proved that INSPIRE network can be built on Open Source technologies with minimal resources
- Although in some cases original intention of the pilots differs from their current use, diverse use-cases indicate that the pilots have strong user support and great development potential
- All project findings and practical experiences are very well documented, providing an excellent reference