Landuse Dataset Derivation from the Fundamental Base of Geographic Data feasibility study

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• Why are we even trying to derive LU from geographical data?
• What is the required result?
• From what data we want to derive the dataset?
• How did we approach the problem? How the possible result may look
• How bad idea it is?
INSPIRE Implementation in CR

- Implementation is a responsibility of Ministry of the environment
- Act No 123/1998 Coll. of the right to environmental information
- Coordination committee on INSPIRE (KOVIN) is an advisory body for minister of environment
- Revision of implementation status in 2016
- LU theme is assigned to Ministry for regional development, (no competition for „future landuse“ scheme)
LU regulation in Czech republic

- Water Act No.254/2001 Coll.
- Act No. 334/1992 Coll., on protection of agricultural land,
- 183/2006 Coll., on town and country planning and building code (Building Act)
- ...
- Hunting Act No. 449/2001

⇒ legal procedures, where state is usually represented by municipalities of lowest order (6258) or at best municipalities of 3rd order – with extended competencies, (205)

Some decisions are registered in Cadastre IF the parcel owner forwards the decision to cadastre
LU vs. LC data specification approach

- **LU**: To accommodate the wide variety of spatial information that is already available on Land Use, the application schemas described in chapter 5 are as open ended as possible. And supports two different systems of classification. First of all there is the Hierarchical INSPIRE Land Use Classification System (HILUCS). This is a new, multi-level, classification system. It will be general enough for the member states to map their specific classification system to the appropriate level of HILUCS.

- **LC**: The approach taken by this data specification is instead to allow many different land cover nomenclatures to coexist in the context of INSPIRE. The owners of the various code lists are, however, encouraged to document their code lists by using ISO 19144-2 Standard.

- Land Cover and Land Use are, however, related and often combined in practical applications. Data sets combining Land Use and Land Cover often emphasize land use aspects in intensively used areas and land cover aspects in extensively used areas.
# HILUCS

3 levels; 98 codevalues overall, split by levels (6,27,65)

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Production</td>
<td>Agriculture</td>
<td>????</td>
</tr>
<tr>
<td>Forestry</td>
<td>????</td>
<td>????</td>
</tr>
<tr>
<td>Mining And Quarrying</td>
<td>Aquaculture And Fishing</td>
<td>n.d.</td>
</tr>
<tr>
<td>Other Primary Production</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
<tr>
<td>Secondary Production</td>
<td>Raw Industry</td>
<td>n.d.</td>
</tr>
<tr>
<td>Heavy End Product Industry</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
<tr>
<td>Other Industry</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
<tr>
<td>Tertiary Production</td>
<td>Transport Networks Logistics And Utilities</td>
<td>n.d.</td>
</tr>
<tr>
<td>Residential Use</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
<tr>
<td>Other Uses</td>
<td>n.d.</td>
<td>n.d.</td>
</tr>
</tbody>
</table>
ZABAGED®

• Fundamental base of geographic data of CR
• Origin in 1995, vectorized base maps 1:10 000
• Inherited classification
• Finished 4th updating cycle
• Improved accuracy, enhanced attribution

117 published feature types
16 mil. individual object representations
~111 mil. vertexes
<table>
<thead>
<tr>
<th>75</th>
<th>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</th>
<th>Plocha</th>
<th>211 výstaviště</th>
<th>ANO</th>
<th>3</th>
<th>4</th>
<th>Terciární produkce</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>301 sportovní areál 302 plavecký areál 303 stadión 304 dostihový areál, parkur 305 auto-moto-cyklo areál 306 golfový areál 307 střelnice 308 plochy pro SLZ 309 koupaliště 311 hřiště 314 kynologické cvičiště</td>
<td>ANO</td>
<td>3</td>
<td>4</td>
<td>3 Terciární produkce</td>
</tr>
<tr>
<td>77</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>310 camping 313 rekreační zástavba</td>
<td>ANO</td>
<td>3</td>
<td>1</td>
<td>3 Terciární produkce</td>
</tr>
<tr>
<td>78</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>312 chatová kolonie</td>
<td>ANO</td>
<td>3</td>
<td>4</td>
<td>4 Terciární produkce</td>
</tr>
<tr>
<td>79</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>401 - sklad, hangár</td>
<td>VĚTŠINOU</td>
<td>4</td>
<td>2</td>
<td>Dopravní sítě, logistika a inženýrské sítě Nelze zcela zaručit že samostatně klasifikovaný skladový areál není spojen s výrobním odvětvím, ZABAGED toto hledisko nerozlišuje.</td>
</tr>
<tr>
<td>80</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>402 přístav</td>
<td>ANO</td>
<td>4</td>
<td>1</td>
<td>5 Dopravní sítě, logistika a inženýrské sítě Analýzou by pravděpodobně bylo možno depa následně rozlišit mezi kolejovou a silniční dopravu</td>
</tr>
<tr>
<td>81</td>
<td>1.27 AREÁL ÚČELOVÉ ZÁSTAVBY</td>
<td>Plocha</td>
<td>403 depo</td>
<td>ANO</td>
<td>4</td>
<td>1</td>
<td>Dopravní sítě, logistika a inženýrské sítě</td>
</tr>
</tbody>
</table>

www.cuzk.cz
• 80 lines (feature – attribute value combinations) with area representation were considered
• First run: 64 feature-attribute combinations could be assigned to HILUC values (covering just 4% of the area)

BE MORE BRAVE !!!
• Second try: Forests, Permanent grass, „Arable and other“, and „Orchards and gardens“ although ambiguous, were included, improving the coverage to 97% of the state area
• Remaining unclassified: waters, „other industry“
LU WMS service

http://geoportal.cuzk.cz/WMS_INSPIRE_LU/service.svc/get?
Difficult classes: Forests

Forestry act knows three forest types:

- A) productive forests

- B) „protective“ forests: forests in exposed places (ridges, difficult conditions) – often „pinus mungo“

- C) „special purpose“ forests – I.zones of national parks, recreation forests, water source protection zones etc.

„forest purpose“ land parcels may have no trees
„Agriculture and other“ ft. vs. transport areas

Only linear representation of communications

In Agriculture and „other“ areas „other“ includes area of roads and railroads
Railroads possible solution

Required minimal distance between tracks and standoff distance of other infrastructure from tracks is defined by construction standards.

The area of railroad body could be reasonably reconstructed using buffer zones of 4m diameter around individual tracks, while dissolving overlapping buffers of multi track railway into single area.
Railway area
• Buffering doesn’t really work well, roads are too variable (width is not always known)
Solution for roads – assisted vectorization
Challenges: Residential areas
Challenges: Residential areas: inner city
Waters vs. aquaculture vs. commercial fishing

- Aquaculture:
  - Fish ponds
Conclusions

• LU with coverage close to 100% area could be produced from geographic data
• Such dataset would not be, could not be and must not be confused with authoritative data
• Useful for regional LoD overview of land use
• Fails in detail, particularly in confrontation with urban spatial planing
Current land use vs. Planned land use
Conclusions

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• Such dataset would not be, could not be and **must not** be confused with authoritative data
• Useful for regional LoD overview of land use
• Fails in detail, particularly in confrontation with urban spatial planing
• Resulting dataset may be useful for „cross checking“ or reality checking of authoritative data

Disclaimer: It’s very likely the idea will not be realized as presented
Thank you for your attention!

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