Grids for pan-European land monitoring

Stephan Arnold (DESTATIS) Geir-H Strand (NFLI)

HELM

EFGS 2013, Sofia, October 2013

Content



Current Situation of Land Monitoring

Spatial Units (Polygons/Raster/Grids)

Challenges / Benefits

Excurs: EAGLE Data Model

24.10.2013



Current Situation of Land Monitoring

Spatial Units (Polygons/Raster/Grids)

Challenges / Benefits

Excurs: EAGLE Data Model

24.10.2013

Current situation Pan-European land monitoring



Lead agency: EEA Corine Land Cover (CLC) 1990 – 2000 – 2006 – 2012 MS participation Source of information: satellite image interpretation



24.10.2013

Corine Land Cover

"Traditional" digital map 44 pre-defined classes Manual image interpretation

Critique:

- * Mixing land use and land cover
- * Mixed complex classes
- * Min. size of spatial units (25 ha)
- * Statistical bias
- * Better nat. data available in MS



Corine Land Cover



New appearing approaches:

- * Several MS using bottom-up techniques,
- * GIS aggregation from national data sets,
- * Harmonization is an issue.

=> HELM (Harmonized European Land Monitoring) taking an interest in the EFGS grid concept. Applicable in Land Monitoring?





Current Situation of Land Monitoring

Spatial Units (Polygons/Raster/Grids)

Challenges / Benefits

Excurs: EAGLE Data Model

24.10.2013

Spatial units



8

The outline of a land observation (polygon), The grid as an alternative geometry to the polygon



24.10.2013

Representing land



Alt. 1: Classification and delinetation of polygons Alt. 2: Independent diagnostic criteria



24.10.2013

Raster versus Grid





24.10.2013

Spatial units

Populated grid cells with data from existing maps and registers

L			<u>, </u>							
	< < < <	>	> <i>(</i>	0	2 2 2	n N N	4			√
SSBID	Arealtype	ATO	A20	A.N	A50	AGT	A80	Total	F10	- F20
23200006635000	(0	0	2981463	0	543447	21270	3546180	0.00	0.00
23250006635000	Ĺ	0	0	430553	0	9409	0	439962	0.00	0.00
23200006640000	j 30	0	250467	12155139	0	1193510	914511	14513627	0.00	1.73
23250006640000	ē 80	0	91152	11481090	84213	943849	2780465	15380769	0.00	0.59
23300006640000		0	308828	5862929	76498	129238	1735463	8112956	0.00	3.81
23350006640000	ļ	0	396268	8841961	0	521441	1583641	11343311	0.00	3.49
23400006640000	Ļ	0	101217	6731284	0	107590	463992	7404083	0.00	1.37
23200006645000	<u>i 30</u>	0	127461	12941446	0	1072372	2040121	16181400	0.00	0.79

24.10.2013



Current Situation of Land Monitoring

Spatial Units (Polygons/Raster/Grids)

Challenges / Benefits

Excurs: EAGLE Data Model

24.10.2013

Challenges



- Difficult to track local changes
- Format (squares) unfamiliar to users
- Backward compatibility with CLC
- Thematic content overlap form several data sources
- Conglomerate of different data qualities / precisions



24.10.2013

Benefits



 + "Dual track": MS without national data can populate the grid by remote sensing data

- + "Land character description" instead of single classes
- + Improved analytical opportunities, stable spatial unit
- + Remote sensing products can be incorporated
 + INSPIRE compliant
- + Avoiding statistical bias (due to wide class definitions)
- + MS involvement in the land monitoring (bottom-up)
- + Cooperation with statistical agencies:

Integrating land monitoring data with EFGS data

24.10.2013



Current Situation of Land Monitoring

Spatial Units (Polygons/Raster/Grids)

Challenges / Benefits

Excurs: EAGLE Data Model

24.10.2013

Object orientation



A bread is a bread is a bread ...



24.10.2013

Object orientation



Characterization

- Outer Appearence
 weight
 size
 shape
- Ingredients

 salt
 wheat
 water
 yiest
- Color
 Light, dark

24.10.2013

Other Characters
 Bio-certificate
 Gen-free



Object orientation

Grassland is grassland is ...

Characterization

- Growth structure
 homogenous
 heterogenous
- Growth density
 closed
 sparse
- Moisture
 Wet soil
 Surface water
- Use
 Fodder
 Recreation
- Management Multiple mowing Single mowing
- Ecosystem type
 Inland marsh

24.10.2013



Decomposing landscapes ... HEL



24.10.2013

Content of EAGLE model

HELM

Information on landscape described with three separate main blocks...

- A.) LAND COVER Components LCC
 Abiotic (Artificial + Natural), Vegetation, Water Surfaces
 => no classes, but elements
- B.) LAND USE Attributes LUA Agriculture, Forestry, Residential, Transportation etc.

C.) CHARACTERISTICS – CH

further information on: spatial pattern, bio-physical parameters, ecosystem types, cultivation measures, land management practices etc.

24.10.2013

Draft data model structure

Decompository description of landscape with

- Land Cover Components (LCC),
- Land Use Attributes (LUA) and futher
- Characteristics (CH)



24.10.2013

Integration scheme of EAGLE concept HELM



Soon to join the grid community? http://www.fp7helm.eu/

Land monitoring

24.10.2013

Stoemast stingvegen.

HELM grid approach, EFGS 2013, Sofia, BG

Mossingan

HELM

155

Mossing østre

COB MOSSING FEED