

National Activities under Pan-European and Local Components CLMS

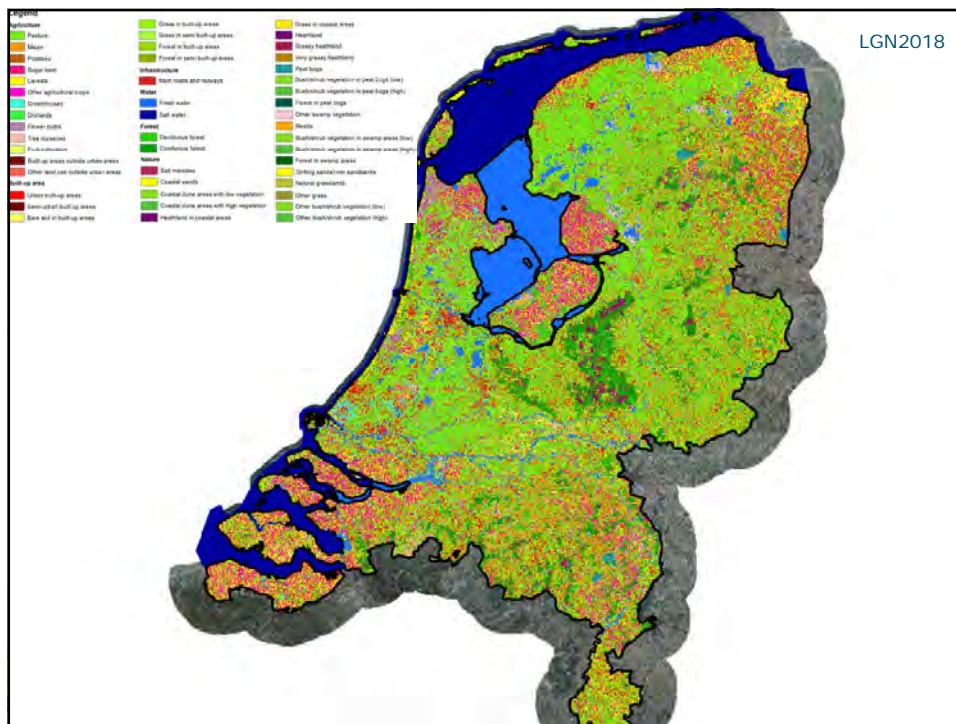
Copernicus Land, Marine & Coastal WS: where land meets water

30-3-2021, Gerard Hazeu



Introduction

- Personal Note:
 - WENR, land cover/land use, LGN, CLC
- Activities:
 - National Reference Center – Land Cover (NRC LC)
 - EIONET Action Group on Land monitoring in Europe (EAGLE)
 - European Topic Center on Urban Land Use and soil Systems (ETC-ULS – SC Copernicus)



Activities 2018-2021

- Production CLC2018
- Enrichment UA with Land use data
 - + European assessment of MS contributions

Urban Atlas Enrichment

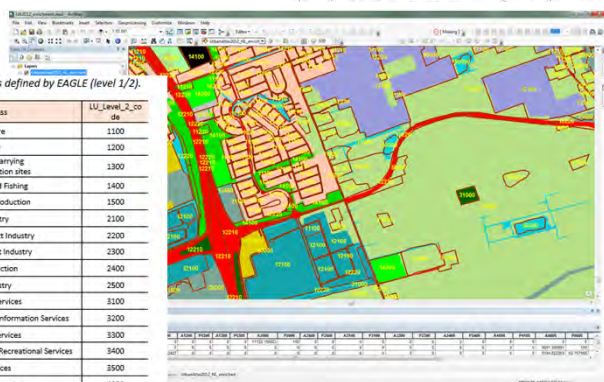
- Use national data - BBG2012- Bestand Bodem Gebruik 2012
- Reclassify to EAGLE Land use attributes
- Combine UA with BBG2012

Table 5. Conversion from BBG2012 codes to LUA level 2 codes as defined by EAGLE.

Main class	Class	Lower limit (ha)	Description	LUA level 1	LUA level 2
Transport	10	None	Railroad	4000	4100
	11	None	Motor-road	4000	4100
	12	1	Airport	4000	4100
Build-up area	20	1	Residential	5000	5100
	21	1	Retail trade, hotel and catering	5000	5100
	22	1	Public institutions	5000	5100
	23	1	Socio-cultural facility	5000	5100
	24	1	Industrial area and offices	5000	5100
Open built-up area	30	1	Dumping site	2000	2100
	31	0,1	Car track site	2000	2100
	32	0,1	Openway	3000	3100
	33	0,5	Mining area	3000	3100
	34	1	Building site	6000	6100
	35	1	Other open built-up area	6000	6500

Table 4. Explanation of the different land use attribute (LUA) classes as defined by EAGLE (level 1/2).

Level 1 class	LUA_Level_1_code	Level 2 class	LUA_Level_2_code
Primary Production	1000	Agriculture	1100
		Forestry	1200
		Mining and Quarrying	1300
		Aquaculture and Fishing	1400
		Other Primary Production	1500
Secondary Production	2000	Raw Industry	2100
		Heavy End Product Industry	2200
		Light End Product Industry	2300
		Energy production	2400
		Other Industry	2500
		Commercial Services	3100
Tertiary Production	3000	Financial, Professional and Information Services	3200
		Community Services	3300
		Cultural, Entertainment and Recreational Services	3400
		Other Services	3500
			3600



Support collection UA enriched dataset

- collect and review the data deliveries from the MS
- analyse what has been delivered
- the comparability between countries
- and to finally make a proposal for a more harmonised data collection in the future

Country code	Present (level 1)		Absent (level 1)		Classes		Number of new classes
	Present (level 2)	Absent (level 2)	Present (level 2)	Absent (level 2)	Present (level 2)	Absent (level 2)	
AT	2000, 3000, 4000, 5000	1000, 6000, 7000	2100, 3100, 3300, 3500, 5100	1100, 1200, 1300, 1400, 1500, 2200, 2300, 2400, 2500, 3200, 3400, 4200, 4300, 4500, 5300, 6100, 6200, 6300, 6400, 6500, 6600, 7100, 7200, 7300, 7400, 7500, 7600	0	-	
BE	-	-	-	-	-	-	-
BG	1000, 2000, 3000, 4000	5000, 6000, 7000	1100, 1200, 1300, 1400, 1500, 2200, 2300, 2400, 2500, 3100, 3200, 3300, 3400, 4300	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3200, 3300, 3400, 4300, 5300, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	0	-	
CH	1000, 2000, 3000, 4000	5000, 6000, 7000	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3200, 3300, 3400, 4300, 5300, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3200, 3300, 3400, 4300, 5300, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	0	-	
CZ	all	none	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	2500, 3500, 6400, 7400, 7600	2	-	
ES	1000, 2000, 3000, 4000, 5000, 6000, 7000	1000, 2000, 3000, 4000, 5000, 6000, 7000	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3200, 3300, 3400, 4300, 5300, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3200, 3300, 3400, 4300, 5300, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	2	6310, 6320	
FR	2000, 3000, 4000, 5000, 6000, 7000	1000, 6000	2300, 2400, 3100, 3200, 3300, 3400, 4100, 4300, 5200, 5300, 5400, 5500, 6100, 6200, 6300, 6400, 6500, 6600, 7200, 7300, 7400, 7500, 7600	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 6600, 7200, 7300, 7400, 7500, 7600	0	-	
GR	all	none	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	2500, 6400, 7400, 7600	1	3111	
HR	all	7000	1200, 2100, 3100, 3300, 3400, 4100, 4300, 5100, 5200, 5300, 6100	1100, 1300, 1400, 1500, 2200, 2300, 2400, 2500, 3200, 3300, 4200, 5300, 6200, 6300, 6400, 6500, 6600, 7100, 7200, 7300, 7400, 7500, 7600	0	-	
HU	-	-	-	-	-	-	-
IC	all	none	1100, 1300, 1400, 2100, 2200, 2300, 2400, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 6600, 7100	1200, 1300, 1400, 2200, 2300, 2400, 2500, 3200, 3300, 4200, 5300, 6200, 6300, 6400, 6500, 6600, 7100, 7200, 7300, 7400, 7500, 7600	0	-	
IT	all	none	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	2500, 3500, 6400, 7400, 7600	0	-	
LT	all	none	1100, 1200, 1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 4500, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 6600, 7300, 7500	1500, 7100, 7200, 7400, 7600	12	2242, 2442, 3220, 3320, 3330, 3340, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482, 3483, 3484, 3485, 3486, 3487, 3488, 3489, 3490, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499	
NL	all	none	1100, 1200, 1300, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7300	1400, 1500, 2100, 2200, 2300, 2400, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7200, 7300, 7400, 7500, 7600	2	0	
NO	all	none	1100, 1200, 2000, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	1300, 1400, 1500, 2100, 2200, 2300, 2400, 2500, 3100, 3200, 3300, 3400, 4100, 4200, 4300, 5100, 5200, 5300, 6100, 6200, 6300, 6400, 6500, 7100, 7200, 7300, 7400, 7500, 7600	0	-	



Analysis MS supply of LU data

- Review/summarise information collected by 36 MS as part of national inventory
- Review/analyse characteristics MS datasets used to deliver LUA, LCH for CLC+ instances
- Assess the impact and feasibility for the production of CLC+ LULUCF and CLC+ Legacy
 - Harmonisation/homogeneity
 - Definition classes
- Identification of gaps and potential additional data sources to derive CLC+ instances

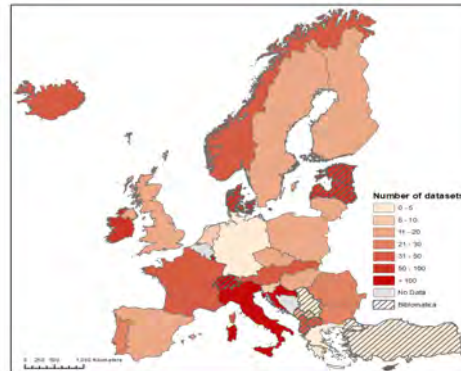


Figure 4. Number of MS covering the different LUAs needed to derive CLC+ Legacy instance. The two



Activities 2018-2021

- Production CLC2018
- Enrichment UA with Land use data
 - + European assessment of MS contributions
- National LU inventory (EAGLE LUA, LCH)
 - + European assessment of MS contributions
- Post-production verification HRLs 2015, 2018
- Verification LoCo component
 - + European assessment of MS contributions (current)



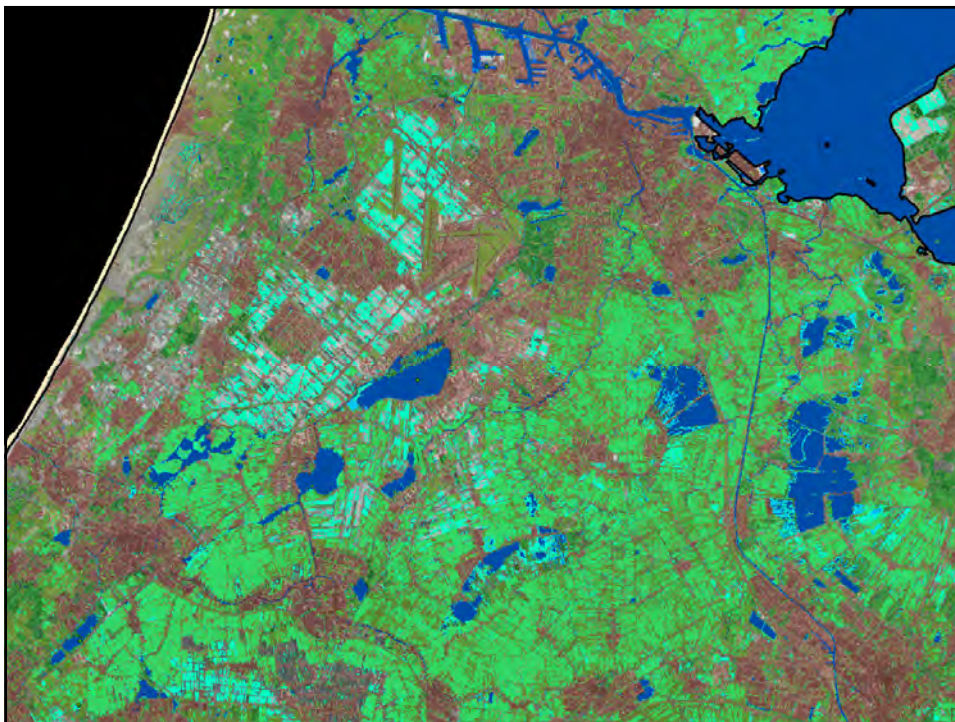
Verification High Resolution Layers HRLs 2015 & 2018

■ HRLs:

- Imperviousness (0-100%)
- Tree Cover Density (0-100%)
- Dominant Leaf Type (broadleaved, coniferous, non-tree)
- Grassland (grass, no-grass)
- Water&Wetness (permanent, temporary)
- Small Woody Features (patches, linear)

■ Verification

- General quality: statistical comparison with MS data
- Look and Feel evaluation for specific strata
- Validation
- MS reporting



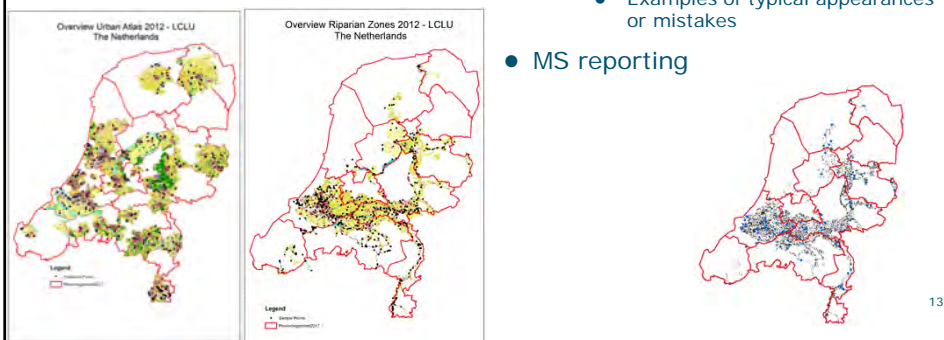
Verification Local Component

Local Component datasets:

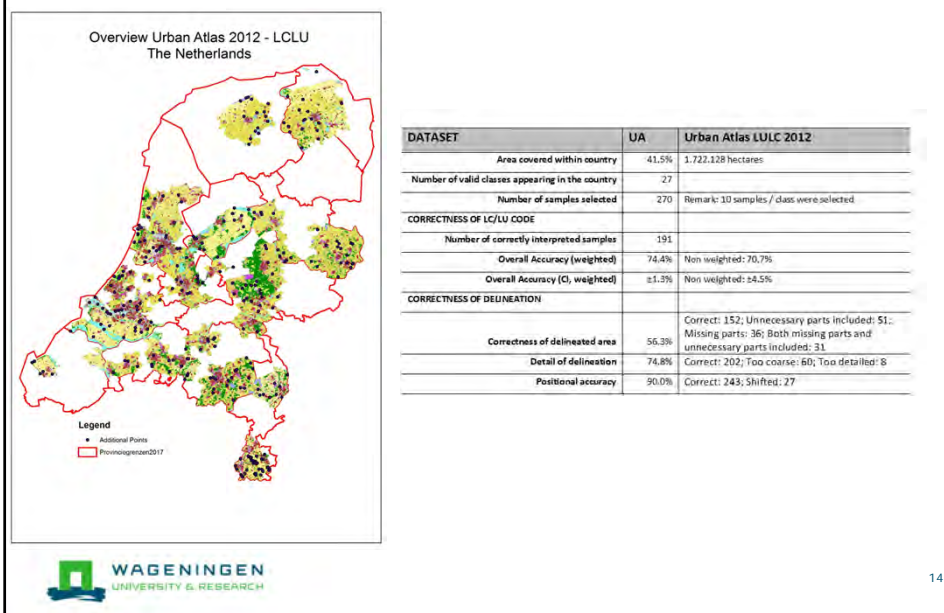
- Riparian Zones (LC + GLE)
- Urban Atlas (+STL)
- Natura2000

Verification:

- Characterization dataset
- Verification of classes with MS data (≥ 10 samples/class)
 - Correctness code, delineation and position
 - Examples of typical appearances or mistakes
- MS reporting



Verification of UA as example



European assessment of national HRL and LoCo verifications – example Urban Atlas

- Collection of national reports
- Overview of product quality, national conclusions and recommendations
- Correctness of class, delineation, position
- Analysis of MS examples: 22 countries, 27 UA classes, >=10 samples per class per country
- Recommendations

Country	N sampl.	N corr. interpr.	Correctness of delineation				Detail of delineation			Position		INTERPRET CORR	DELIN CORR	DETAIL CORR	POSACC CORR
			Correct	Unneces. parts	Missing parts	Both	Correct	Too coarse	Too detail.	Correct	Shifted				
Austria	250	225	118	67	40	25	233	2	15	234	16	90.0%	47.2%	93.2%	93.6%
Belgium	251	203	222	21	2	6	236	15	0	244	7	80.9%	88.4%	94.0%	97.2%
Bulgaria	329	279	295	20	13	1	323	6	0	322	7	84.8%	89.7%	98.2%	97.9%
Croatia	314	266	134	80	57	43	223	69	22	275	39	84.7%	42.7%	71.0%	87.6%
Czech Republic	388	323	292	37	29	30	360	28	0	382	6	83.2%	75.3%	92.8%	98.5%
Finland	250	172	70	104	24	52	212	29	9	148	102	68.8%	28.0%	84.8%	59.2%
France	387	349	303	44	27	13	371	15	1	382	5	90.2%	78.3%	95.9%	98.7%
Greece	260	204	226	15	11	8	240	19	1	256	4	78.5%	86.9%	92.3%	98.5%
Hungary	244	178	120	36	37	51	189	39	16	160	84	73.0%	49.2%	77.5%	65.6%
Iceland	324	244	232	48	34	10	270	49	5	324	0	75.3%	71.6%	83.3%	100.0%
Ireland	1,497	1,274	1,357	98	27	15	1,422	69	6	1,476	21	85.1%	90.6%	95.0%	98.6%
Italy	258	212	237	21	0	0	255	3	0	249	9	82.2%	91.9%	98.8%	96.5%
Lithuania	250	203	149	53	28	20	149	101	0	232	18	81.2%	59.6%	59.6%	92.8%
Norway	2,301	1,640	1,987	185	85	0	2,301	0	0	2,252	51	71.3%	86.4%	100.0%	97.9%
Poland	322	272	195	59	27	41	273	34	15	299	23	84.5%	60.6%	84.8%	92.9%
Portugal	260	200	203	56	1	0	223	37	0	255	5	76.9%	78.1%	85.8%	98.1%
Romania	260	246	206	50	4	0	240	20	0	258	2	94.6%	79.2%	92.3%	99.2%
Slovakia	260	176	158	32	50	20	258	1	1	258	2	67.7%	60.8%	99.2%	99.2%
Slovenia	241	197	182	30	16	13	213	17	11	231	10	81.7%	75.5%	88.4%	95.9%
Spain	4,362	3,615	2,954	932	376	100	3,429	797	136	4,051	311	82.9%	67.7%	78.6%	92.9%
The Netherlands	270	182	157	49	33	31	203	60	7	244	26	67.4%	58.1%	75.2%	90.4%
United Kingdom	249	189	183	10	53	3	249	0	0	247	2	75.9%	73.5%	100.0%	99.2%
Total:	13,527	10,849	9,980	2,047	974	482	11,872	1,410	245	12,779	750	80.2%	73.8%	87.8%	94.5%



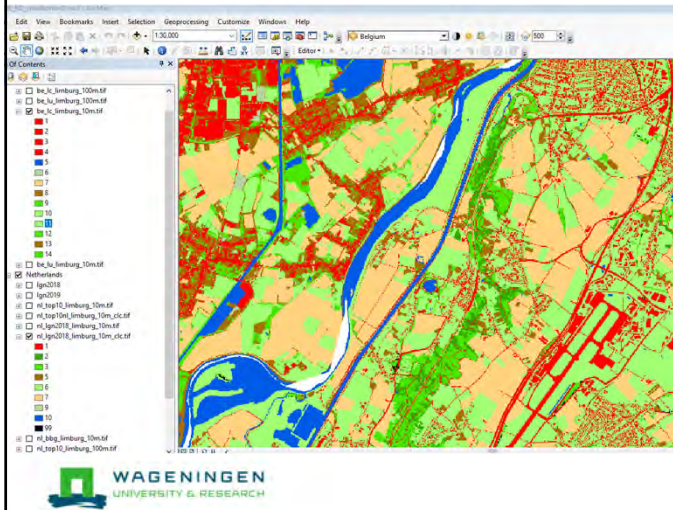
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 - + European assessment of MS contributions
- Post-production verification HRLs 2015, 2018
- Verification LoCo component
 - + European assessment of MS contributions (current)
- Support and testing of future CLC+ (future tasks)
 - Verification CLC+ BB
 - Refinement LU inventory
 - Ingestion of LU data into CLC+ Core



CLC+ case study - cross border

- Test creation of CLC+ instances



Class cod	Class name (raster)
1	Sealed
2	Woody - needle leaved trees
3	Woody - Broadleaved deciduous trees
4	Woody - Broadleaved evergreen trees
5	Low-growing woody plants (bushes, shrubs)
6	Permanent herbaceous
7	Periodically herbaceous
8	Lichens and mosses
9	Non- and sparsely-vegetated
10	Water
11	Snow and ice

Thank you

gerard.hazeu@wur.nl

