Verification of
high resolution soil sealing
layer

LITHUANIA

- Qualitative assessment -

Vilnius, 2008

1. Preparatory work

1. Upload the data that will be made available by EEA via ftp server or sent by mail. Please inform EEA on reception of the data;
2. Check for available reference data that will be used during the verification;
3. List the experts/expertise that are involved in the verification task:

Expert name	Field of expertise	Institution
Daiva Vaitkuvienė	RS data interpretation	Institute of Ecology of VU
Mindaugas Dagys	RS data interpretation	Institute of Ecology of VU

The average time needed for this verification is estimated at one person/day per10.000 km^2. Please note that this time can vary depending on the experience of the interpreter, the availability of the reference data and the complexity of the landscape. The table below gives an indicative estimate for the EEA member countries.

Country	Area (km^2)	Person days	Country	Area (km^2)	Person days
Austria + Liechtenstein	83.855	9	Lithuania	65.200	7
Belgium	30.520	3	Luxembourg	2.586	<1
Bulgaria	110.994	11	Malta	316	<1
Cyprus	9.251	1	Netherlands	41.526	4
Czech Republic	78.864	8	Norway	323.878	33
Denmark	43.075	4	Poland	312.683	31
Estonia	45.200	5	Portugal	88.935	9
Finland	338.145	34	Romania	237.500	24
France	543.965	55	Slovakia	20.251	5
Germany	357.028	36	Slovenia	49.035	2
Greece	131.957	13	Spain	504.782	51
Hungary	93.030	9	Sweden	449.964	39
Iceland	102.820	10	Switzerland	41.293	4
Ireland	70.282	7	Turkey	789.452	79
Italy	301.245	30	United Kingdom	244.082	25
Latvia	63.700	6			

2. Reference data

Please list the reference data that is used for this verification:

1. Topographic maps

    ☒ No   ☐ Yes   Year: Area: Please, select:

    If only a subset, then please specify the area(s):

2. Aerial orthophotos

    ☐ No   ☒ Yes   Year: 2005   Area: Subset

    If only a subset, then please specify the area(s):

        Various areas, covering ca. 60% of the country's area

3. Very High Resolution satellite data

    ☒ No   ☐ Yes   Year: Area: Please, select:

    If only a subset, then please specify the area(s):

4. CLC2000

    ☐ No   ☒ Yes

5. Other

    Name: GDBLT50   Year: 1996   Area: Full country

    If only a subset, then please specify the area(s):

    Name: CLC2006   Year: 2006   Area: Full country

    If only a subset, then please specify the area(s):

Name: IMAGE2006   Year: 2006   Area: Full country

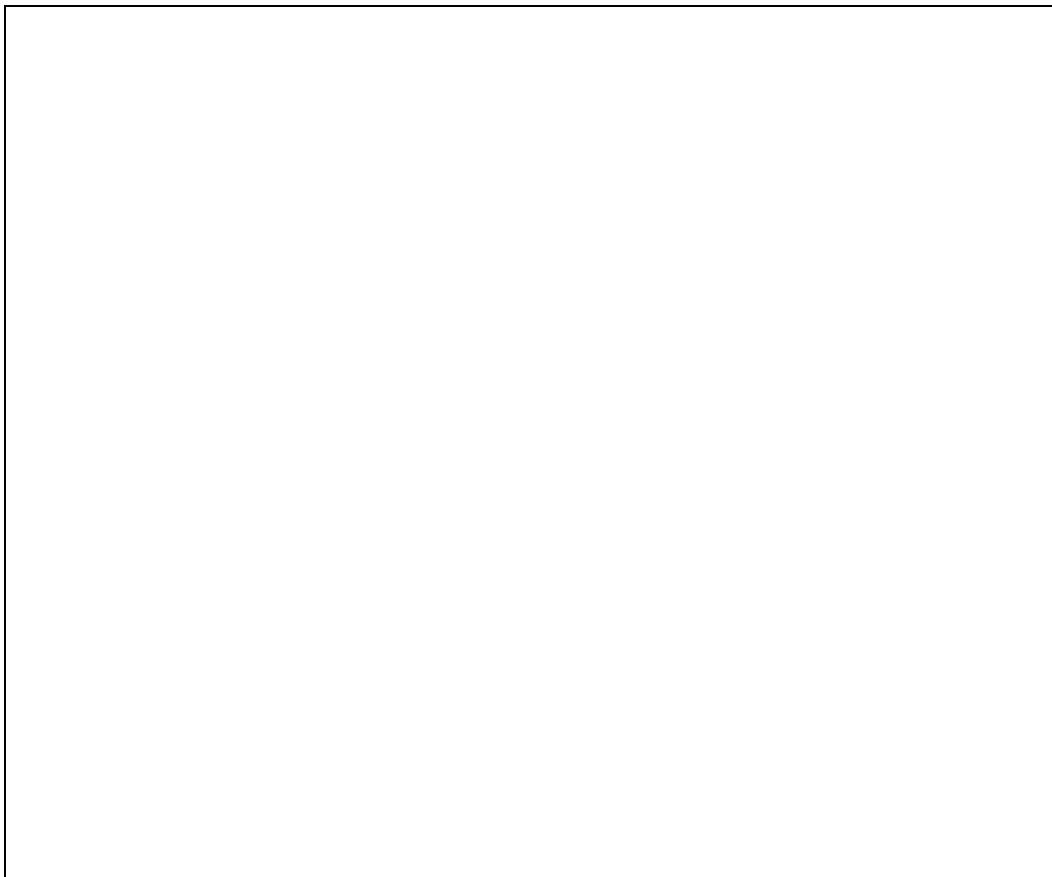If only a subset, then please specify the area(s):

Name: Year: Area: Please, select:

If only a subset, then please specify the area(s):

Comments concerning the reference data used (if any):

B. Geometric quality

Please provide your qualitative assessment of the geometric quality of the data. The objective of this task is to perform a visual analysis of the soil sealing dataset concerning its co-registration when put in overlay with other reference datasets.

1. Check geometric accuracy:

Is there a visible shift? ☐ Yes ☒ No

If yes:

    a. Is there a systematic shift? ☐ Yes ☐ No

    b. Is there a local shift? ☐ Yes ☐ No

       Where?

Please indicate the region, place name, coordinates or other description of location:

2. Is the used projection correct? ☒ Yes ☐ No

3. Comments concerning geometric issues (if any), or in case the geometric quality could not be checked, please provide a short explanation:

Geometric quality is good. Slight shift was observed in some areas, but it was not systematic and usually did not exceed 1 pixel (i.e. 20 m).

C. Thematic quality

Please provide your qualitative assessment of the thematic quality of the data. The objective of this task is to perform a visual comparison between available reference data and the soil sealing dataset. You are requested to verify for a number of land cover classes (similar to the CLC classes at levels 2 or 3) to check if any errors in the data can be identified. Please note that many land cover classes can include sealed surfaces, especially for features <25 ha.

For this part of the verification, it is recommended to use a binary mask (built-up/non-built-up area) that can be used in overlay with the reference data:

1. Apply a lookup table to map all pixels > 80% degree of soil sealing as built-up area;

2. Perform the checks on pixels > 80% degree of soil sealing by screening for each of the land cover classes if built-up or non built-up areas are correctly mapped. Feel free to add screenshots with examples to illustrate the quality judgement.

For your qualitative assessment, following examples of check boxes can be ticked:

☐ "excellent"   meaning that you expect that the accuracy of the built-up data is reaching almost 100%; no errors could be found in the areas that were verified.

☐ "good"   meaning that you are confident that the classification results are at least 85 % correct; only sporadic errors were encountered in the areas that were verified.

☐ "acceptable"   meaning that you estimate that in most of the verified areas the classification results will probably reach an accuracy of 85 %; some minor errors could be detected in the areas that were verified.

☐ "insufficient"   meaning that you do not expect that the classification results will reach the minimum of 85 % accuracy; you encountered several errors in different regions.

☐ "very poor"   meaning that you are confident that the classification results are bad with regard to presence of built-up area; most of the areas verified are wrongly mapped.

Urban fabric:

a. Did you check if built-up/non built-up areas are correctly mapped within urban fabric (e.g. houses, buildings, streets, etc.)?

    ☒ Yes   ☐ No   ☐ Not possible

b. How would you assess the quality of the mapped built-up area within the urban fabric?

    ☐ very poor ☐ insufficient ☒ acceptable ☐ good ☐ excellent

a. Short description of errors found (if any): Thematic accuracy is generally acceptable. Commission errors are not too common; however, omission errors are rather frequent, particularly in less densely built up areas (small settlements) – a lot of apparently sufficiently large sealed areas are not recognised as such.

Industrial or commercial units:

a. Did you check if built-up/non built-up areas are correctly mapped within industrial or commercial units (e.g. parking lots, buildings, etc.)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☒ good ☐ excellent

b. Short description of errors found (if any): Thematic accuracy is generally good. Only some omission errors, where large industrial buildings are not marked as built-up areas. In some cases open soil/gravel is classified as built-up area.

Road and rail networks and associated land:

a. Did you check if built-up/non built-up areas within road and rail networks and associated land are correctly mapped (e.g. railway stations, highways >20 m width, etc.)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

c. Short description of errors found (if any): Thematic accuracy generally excellent. Only occasional errors, e.g. large complex of metal garages not recognised as built-up areas in one case (near Klaipėda).

Port areas:

a. Did you check if built-up/non built-up areas in port areas are correctly mapped (e.g. installations, dykes, etc)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

d. Short description of errors found (if any):

Airports:

c. Did you check if built-up/non built-up areas in airports are correctly mapped (e.g. runways, buildings, etc)?

☒ Yes ☐ No ☐ Not possible

d. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

e. Short description of errors found (if any): In one case a small, but sufficiently wide paved runway was not identified.

Mine, dump and construction sites:

a. Did you check if built-up/non built-up areas in mine, dump and construction sites are correctly mapped (e.g. buildings, infrastructure, etc)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☒ insufficient ☐ acceptable ☐ good ☐ excellent

f. Short description of errors found (if any): Some major inconsistencies were revealed in this land cover class. In case of mine sites (131), exposed gravel areas are most often classified as built-up/sealed areas. Dump sites (132) are also often classified as built-up/sealed areas. Construction areas (133) were not verified, since these sites are very dynamic and the VHR layer was at least one year out of date from the HR layer.

Arable land:

a. Did you check if built-up/non built-up areas in arable land are correctly mapped (e.g. bare soil, large farm houses, roads>20m width, etc)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☒ good ☐ excellent

g. Short description of errors found (if any): In general arable land is well identified as non-built-up. In some cases open soil appears to be identified as sealed. Buildings in arable land area are mostly too small to be identified as built-up areas. Major roads crossing arable land are generally identified quite well.

Heterogeneous agricultural areas:

a. Did you check if built-up/non built-up areas in heterogeneous agricultural areas are correctly mapped (e.g. buildings, roads >20m, etc)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☒ good ☐ excellent

h. Short description of errors found (if any): In general heterogenous agricultural areas are well identified as non-built-up. In some cases open soil appears to be identified as sealed. Solitary buildings/farms in these areas are mostly too small to be identified as built-up areas. Major roads are generally identified quite well. Classification in 243 areas is usually better than in 242, particularly in the proximity of large urban areas, affected by the urban sprawl. Verification of mapping in collective gardens (special case of 242 class) is rather difficult, since percentage of sealing within these areas varies a lot, which makes it difficult to assess the mapping qualitatively. It would be advisable to perform quantitative assessment in such areas.

Forest:

a. Did you check built-up/non built-up areas in forests are correctly mapped (e.g. clear-cuts, roads, etc.)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

i. Short description of errors found (if any): Almost no errors were encountered in forest areas.

Scrub and/or herbaceous vegetation associations:

a. Did you check if built-up/non built-up areas in scrub and/or herbaceous vegetation areas are correctly mapped (e.g. dry vegetation, rock outcrop, etc.)?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

j. Short description of errors found (if any): This class in Lithuania is comprised mostly of clear-cuts, which are very well identified as non-built-up areas.

Beaches, dunes and sands:

a. Did you check if built-up/non built-up areas in beaches, dunes and sand areas are correctly mapped?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

k. Short description of errors found (if any):

Bare rocks:

a. Did you check if built-up/non built-up areas in bare rock areas are correctly mapped?

☐ Yes ☐ No ☒ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☐ excellent

l. Short description of errors found (if any): No such areas in Lithuania

Sparsely vegetated areas:

a. Did you check if built-up/non built-up areas in sparsely vegetated areas are correctly mapped?

☒ Yes ☐ No ☐ Not possible

c. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

m. Short description of errors found (if any): Generally excellent identification, with the exception of some sandy tracks in military training areas that are misinterpreted as sealed areas.

Glaciers and perpetual snow:

a. Did you check if built-up/non built-up areas in glaciers and perpetual snow areas are correctly mapped?

☐ Yes ☐ No ☒ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☐ excellent

n. Short description of errors found (if any): No such areas in Lithuania

Inland wetlands:

a. Did you check if built-up/non built-up areas in inland wetlands are correctly mapped ?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

o. Short description of errors found (if any): Almost no errors were encountered

Salines:

c. Did you check if built-up/non built-up areas in salines are correctly mapped?

☐ Yes ☐ No ☒ Not possible

d. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☐ excellent

p. Short description of errors found (if any): No such areas in Lithuania

Intertidal flats:

a. Did you check if built-up/non built-up areas in intertidal flats are correctly mapped?

☐ Yes ☐ No ☒ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☐ excellent

q. Short description of errors found (if any): No such areas in Lithuania

Coastal lagoons:

a. Did you check if built-up/non built-up areas in coastal lagoons are correctly mapped?

☒ Yes ☐ No ☐ Not possible

b. How would you assess the quality?

☐ very poor ☐ insufficient ☐ acceptable ☐ good ☒ excellent

r. Short description of errors found (if any):

3. Comments concerning thematic content check (if any). Please indicate which part of the data was verified (full coverage or partial coverage, etc.):

Full national coverage was checked.

D. Overall qualitative assessment of the dataset

The overall qualitative assessment is meant to support EEA in our contractual procedures with the service provider regarding the acceptance of the dataset. While the previous thematic quality assessment was looking at class by class, this section should provide your assessment of the quality for the whole territory.

How would you assess the overall quality of the mapped built-up/non built-up areas for the dataset provided?

☐ very poor ☐ insufficient ☐ acceptable ☒ good ☐ excellent

Please provide your final comments and additional remarks concerning overall qualitative assessment (e.g. difference in quality between regions e.g. mountains, agglomerations, coastal zones, etc), if any:

Overall, the quality of the mapped built-up/non built-up areas is good. Very few errors were encountered in natural areas (forests, clear-cuts, wetlands) and in agricultural land. Densely built-up areas were also identified quite well – major cities, industrial areas, road networks, port, airport. More errors or uncertainties were encountered in less densely built-up areas – smaller towns and settlements, collective garden communities. Mapping accuracy in such areas should be checked quantitatively, by assessing the real soil sealing extent. No regional differences in mapping quality were observed during the verification.

E. Quantitative validation

Are you planning to carry out a statistical validation (quantitative assessment) of the national dataset?

☒ Yes   ☐ No

If yes, it would be helpful to provide us information about the timing, methodological approach or any other additional information which might be available:

We are planning to carry out quantitative assessment of the national dataset until the end of June 2008. We intend to follow the recommendations for "Quantitative assessment of high-resolution soil sealing layer" (Maucha & Büttner, 2007).

Are you willing to contribute to the final validation of the European dataset (actions scheduled from the second half of 2008 onwards)?

☒ Yes   ☐ No

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Thank you!