

Verification of high resolution soil sealing layer - Republic of Macedonia

- Qualitative assessment -

Prepared by:

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Introduction

This document provides the results of the qualitative assessment of soil sealing layer for the territory of the Republic of Macedonia. The assessment has been done in accordance to the EEA guidelines for the verification of the high resolution soil sealing layer:

- The original data with pixel resolution 20x20m has been aggregated to the resolution of 100x100m.
- All cells, after aggregation, has been classified as “built-up” with more than >80% sealed and as “non-built-up” with <80% sealed;

The same ancillary data used for CLC2006 has been used for the process of verification:

- Aerial photos for the whole territory of the Country
- Topographic maps, for the whole territory of the Country
- Google Earth

1. Preparatory work

The following experts have been involved in the verification task:

Expert name	Field of expertise	Institution
Vanco Gjorgjiev	GIS & Cadastre	Faculty for Geodesy
Casle Tosevski	Remote Sensing	Ministry of Environment and Physical Planning
Gorgi Gorgiev	GIS	Faculty for Geodesy

2. Reference data

The reference data used for the verification:

1. Topographic maps

☐ No ☒ Yes Year: 1980 Area: Full country

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

2. Aerial orthophotos

☐ No ☒ Yes Year: Area: Full country

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

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: Google Earth

Year: Different

Area: Full country

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

Comments concerning the reference data used (if any):

B. Geometric quality

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:

C. Thematic quality

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:

Most of the soil sealing areas in CLC “Urban fabric” are interpreted correctly, but there are some areas covered with urban structures with more than 80% coverage of the area, that are not marked as build up.



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):

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):

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):

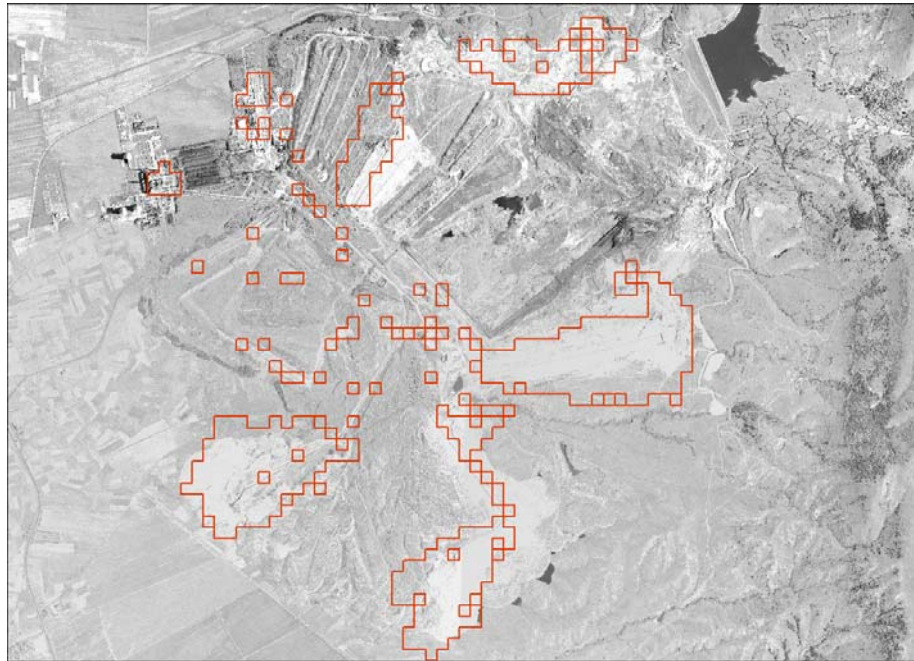
Airports:

- 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):

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):

There is some misinterpretation of regions in mine and dump sites as “build-up” areas. Image shows show the area(s) that is(are) interpreted in CLC2000 as “Mineral extraction site” (CLC 131) and “Dump site” (CLC 132), while the soil sealing layer “marked” these areas as “build-up”.



This image represents similar situation with misinterpretation of “build-up area(s) in the soil sealing layer in the region interpreted as “Dump site” (CLC 132) in CLC2000.



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):

Identification of the build-up areas in the Arable land (CLC 2.1) is good in most of the cases. However, there are some small areas that are misinterpreted. The image shows the Arable land that is interpreted as “build-up” area:



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):

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):

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):

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):

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):

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):

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):

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):

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):

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):

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

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D. Overall qualitative assessment of the dataset

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

The soil sealing data, produced by classification of the Image2006 satellite data provided good results, with accuracy more than 85%.

There are 2 general remarks regarding soil sealing layer:

- There are build-up areas, clearly visible on the ancillary data that are not interpreted as build up in the soil sealing layer. This should be subject for quantitative validation, but it should be mentioned here, too. For this case only, brief assessment has also been done to the original data (20x20m resolution and values from 0-100) and it is confirmed that interpretation is missing some clearly visible build up areas.
- The less accurate results in the soil sealing interpretation are provided for CLC areas classified as “Mine and Dump sites”. Some important areas (the biggest mine and dump sites in the Country) are interpreted as build-up, even though there are no artificial objects in that regions. The interpretation results for these areas are marked as “insufficient”.

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:

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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