

Copernicus Land Monitoring Service (CLMS) products

Europe's Earth Observation programme for climate and environmental monitoring, Copernicus, provides ready-made thematic layers in the form of e.g. High-Resolution Layer (HRL) and Priority Area Monitoring products.

Examples of HRL include:

- Water and Wetness
- Grassland
- Imperviousness
- Small Woody Features

Examples of Priority Area Monitoring include:

- Riparian Zones

These datasets are freely available and comparable across Europe, but are they of high enough quality to be useful in national environmental monitoring?

What we did

In a collaborative project between Norway and Poland, we tested the accuracy and usefulness of these products for environmental monitoring, either alone or in combination with national data.

We performed spatial overlays (GIS & visual inspection) between relevant national datasets and the CLMS products to assess thematic and geometric/object accuracy.



Map of Norway showing how HRL-WAW data differed between tiles. Data users must be very careful when using "unfamiliar" datasets in analyses.

What we found

Monitor wetlands using 'Water and Wetness'?

- HRL-WAW was not sufficiently accurate or reliable to use in monitoring

Monitor vegetation along streams and waterways using 'Riparian Zones'?

- Before the Riparian Zone datasets can be used in monitoring, it is essential that they are verified as reflecting the true situation – not possible now due to lack of time stamps and the fact that the data were taken from a reference period of three or four years (and rivers may alter their course over time)

Monitor high value grassland using 'Grassland'?

- It is not realistic to identify high nature value grassland from Copernicus products
- If HRL-GRA were accurate and reliable it could show when high value grasslands have changed status
- Currently HRL-GRA is not sufficiently accurate or reliable

Monitor soil sealing using "Imperviousness"?

- IMCC 2015-2018 generally captured real cases of soil sealing correctly but both gain and loss of impervious surfaces were over-estimated (high commission error)



Photo: Wendy Fjellstad / NIBIO

Challenges

We identified several challenges, ranging from

- errors in the data
- difficulties finding information needed in the verification work (e.g. time stamp, time span)
- issues related to class definitions and thresholds (mapping rules)
- time-lag before data are available.

The work also highlighted gaps and weaknesses in the national geographic datasets.

Conclusions

There is a clear need for the CLMS products. We advise caution in using the products until they have been improved but see that they have great potential for future use in environmental monitoring.

- Verification is difficult, but necessary
- Good quality data, with timely updates, are needed
- More communication is needed between data producers and national experts to validate and adapt products and thus increase their usefulness and user uptake



Enhancing the user uptake of Land Cover / Land Use information derived from the integration of Copernicus services and national databases (InCoNaDa)



The National Centre for Research and Development

Best use of CLMS products

The main goal of the InCoNaDa project was to improve the user uptake of land cover and land use information derived from the integration of Copernicus Land Monitoring Service (CLMS) and national databases. It is important to understand the potential of the CLMS products for decision makers, reporting obligations, monitoring of natural resources and agricultural landscape, urban and spatial planning and reporting of greenhouse gas emissions and removals from LULUCF sector. More about the project on: www.inconada.eu

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