

HOW COULD COPERNICUS DATA SUPPORT GRASSLAND CONSERVATION?

Grassland is not just a feed base for livestock but also serves as a habitat for plants and animals. Proper management of these semi-natural habitats is critical to maintain their biological value.

The challenge

The lack of appropriate management risks the long-term preservation of grasslands. As grasslands are semi-natural habitats they are exposed to a variety of risks, such as land use change, conversion to arable lands, invasive species, overgrazing or overgrowing (caused by depopulation and abandonment). The deterioration of grassland quality reduces the quality of ecosystem services and functions provided, leads to a loss of biodiversity, opens up the possibility of EU sanctions and decreases the quality of rural life. The existing monitoring practice of physical visits to grasslands is time- and labour-intensive, therefore cost-effective solutions are necessary that provide information on a large spatial scale.

The space based solution

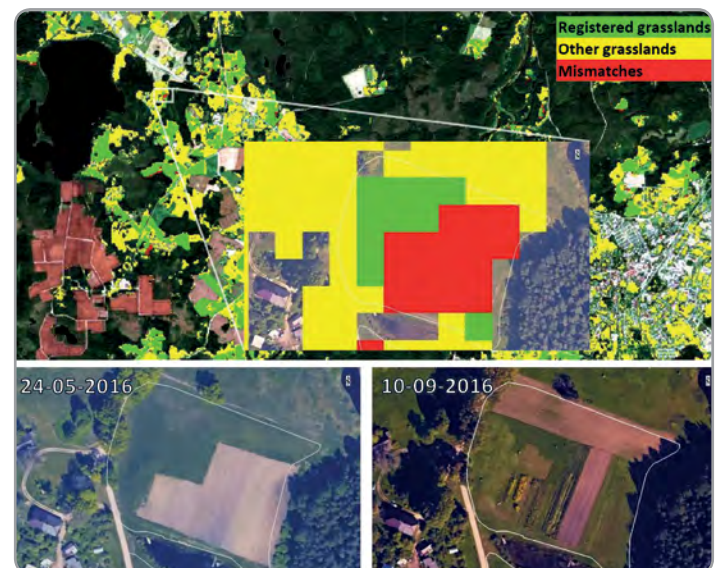
The joint use of Copernicus Sentinel-1 optical and Sentinel-2 radar satellite data provides such benefits as the ability to discriminate spectral optical data, operation of radar data in all weathers as well as repeated image acquisition every 5 - 6 days. Therefore, testing of Copernicus Sentinel data capabilities for mapping of grasslands and monitoring of their management activities in Vidzeme region, in Latvia was performed within the SentiGrass project.

Mapping of grasslands was performed using all available Sentinel-2 optical data scenes and automatically analysed spectral signature of each image pixel to determine whether grassland was present or not. The obtained accuracy was above 90%. Whilst investigating the misclassifications, it was found that the ploughed grasslands are not classified as grasslands, thus showing potential for detecting disturbances in grassland cover.

Sentinel-2 optical data has also shown potential in the assessment of grass biomass and spread detection of invasive species (e.g. Giant Hogweed), whilst Sentinel-1 radar data is able to fill observation gaps (due to cloudy sky) and has shown potential for tracking grassland management events (e.g. ploughing and mowing).

Benefits to Citizens

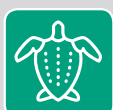
Nature is not only an environmental resource, but also a cultural value. Current generations should preserve and improve their natural "inheritances" from their ancestors for the benefit of their descendants. Thus, appropriate management approaches are crucial. Field visits to sites are necessary but they are resource (time, labour, etc.) intensive. The free of charge data provided for the whole world by Copernicus enables methods that improve resource management to be developed whilst also increasing cost-effectiveness.



Mapping of grasslands near Cesis in Vidzeme region. Example of the mismatch where ploughed grassland is identified.

Credit: Contain modified Copernicus Sentinel data [2016]

Thematic Area



BIODIVERSITY AND ENVIRONMENTAL PROTECTION

Region of Application



LATVIA VIDZEME REGION

Sentinel mission used



S1
S2

Copernicus Service used



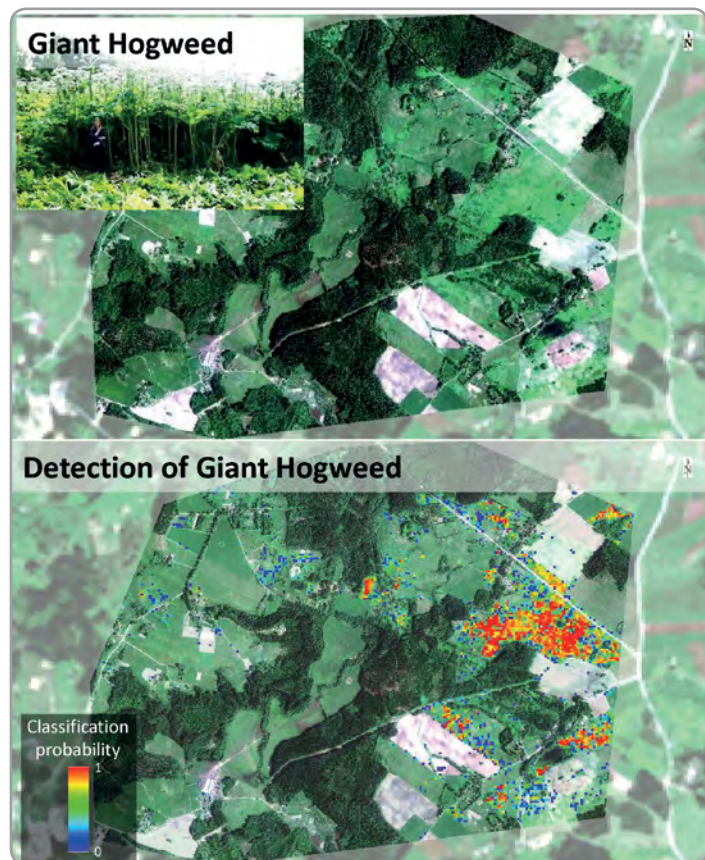
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Usage Maturity Level



2/3

Mapping of grasslands and tracking management practices using Copernicus data allows monitoring of these habitats at a scale that would be practically impossible to do with traditional methods. Satellite data cannot fully replace habitat experts but can serve as a valuable complementary tool for remote evaluation of grassland status and targeted planning of field visits.



Detection of Giant Hogweed in grasslands near Cesis in Vidzeme region.
Credit: Contain modified Copernicus Sentinel data [2016]

“Copernicus data could be considered as a complementary approach to standard ones in the assessment of grasslands due to the possibility of frequent observation of large areas.”

*Inga Racinska,
the Latvian Fund of Nature*

EU Member States have to report on the status of the natural habitats of EU importance every six years. Copernicus provides regular data that not only enables regulatory commitments to be fulfilled, but also enables real-time activities to be supported, for example, monitoring of biologically valuable grasslands that should be mowed or grazed but cannot be ploughed in order to maintain biodiversity.

Outlook to the future

It is planned to apply the developed approach to a larger scale and map grasslands over the whole Latvian territory for further development of the grassland connectivity model within the GrassLIFE.

Acknowledgements

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ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication “**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**”, 2018, Edited by NEREUS, the European Space Agency and the European Commission.

The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains. The views expressed in the Copernicus User Stories are those of the Authors and can in no way be taken to reflect the official opinion of the European Space Agency or of the European Commission.

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