

COPERNICUS SUPPORTS FOREST MONITORING FOR SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

EUGENIUS is the SME network for the provision of Copernicus-based services for end users in various European regions.

The challenge

The management and exploitation of Pyrenean forests are real challenges for local public authorities to ensure the sustainability and the economic development of their territory. Most of the Pyrenean forests belong to small private owners making it difficult to monitor and manage forests at a regional level. This natural resource is thus difficult to assess and mobilise, preventing the development of industrial and economical activities.

Earth observation applications referenced as Eugenius services aim to provide accurate indicators on more than 300,000 ha of forest to update environmental and economic indicators used by the Region. Tree species identification, logging detection and parcel accessibility assessment are key indicators used to estimate the economic value of forest areas. These indicators are used by public authorities to define land planning policy, to promote sustainable forest exploitation activities and to attract new financial authorities.

The space based solution

Eugenius Earth Observation products developed for forest monitoring make massive use of Copernicus Sentinel data and products.

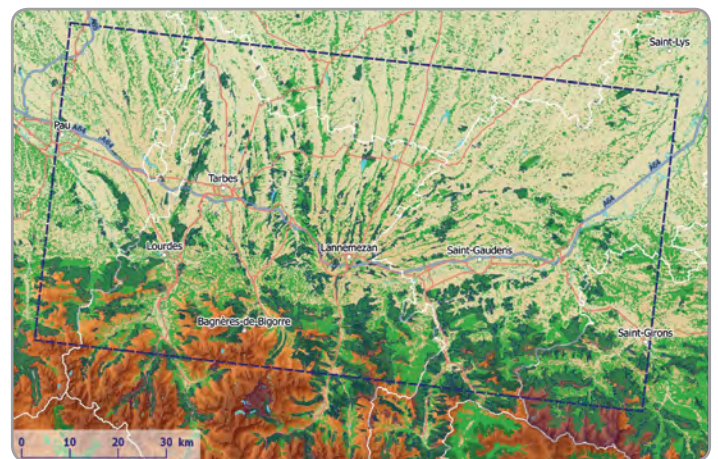
Tree species identification is based on the use of a Sentinel-2 image time series composed of ten dates. Biophysical parameters are extracted from these multispectral images to describe forest canopy; the evolution of these indicators makes the differentiation of tree species possible giving precise information at specific phenological stages. Forest areas are located using the Copernicus High Resolution Layer Forest Type. For logging identification, change detection algorithms are used to compare Sentinel-2 images acquired in 2015 and 2017.

Benefits to Citizens

Because most private Pyrenean forest parcels are underexploited, forests are getting older with low profitability and a low rate of resource renewal. Having a better knowledge of the forest at a regional scale is mandatory to define a coherent planning policy to favour a sustainable forest exploitation and to attract industrials and economic activities (ex.: creation of forest roads, territorial projects development or forestry sector support).

Eugenius forestry products are mainly delivered to local public authorities to be used for better management of their territory. Thematic indicators are extracted from these products to describe, compare and monitor heterogeneous situations (different tree species, various soil and climatic conditions and various forestry practices).

Amongst these indicators, we can mention the "Forest Value Indicator" which groups information such as the parcel accessibility and the tree species to estimate the economic value of the parcel. Logging detection products provide land managers with indicators such as the "Annual Exploited Forest Area".



Area of interest (8 250 km²) for the Forestry Earth Observation Application delivered to local public authorities and located in the south-west of Occitanie region (France).

Credit: Contains modified Copernicus Sentinel data [2017]

Thematic Area



AGRICULTURE,
FOOD, FORESTRY
AND FISHERIES

Region of Application



OCCITANIA

Sentinel mission used



S2

Copernicus Service used



-

Usage Maturity Level

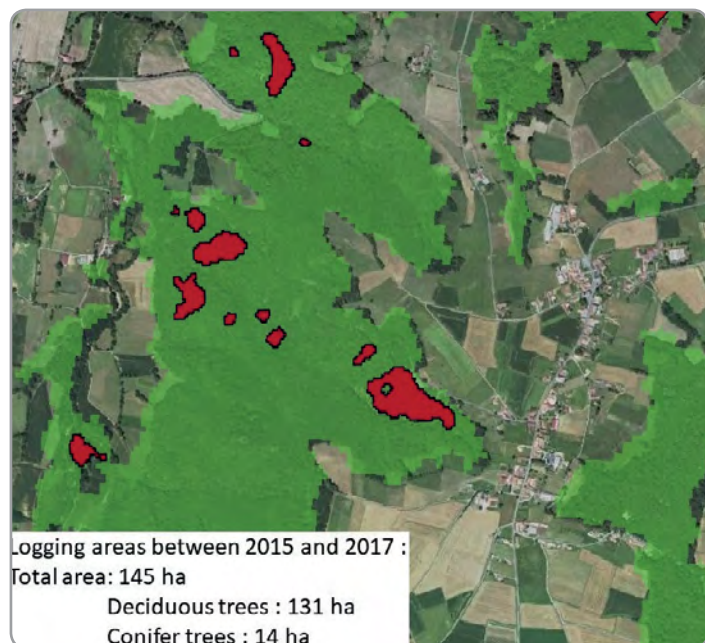


3

These indicators are used by public authorities to define regional strategies in terms of environmental policy, territorial planning and economic development. For example, the benefit of creating new forest tracks to access isolated parcels can be evaluated from these products.

Outlook to the future

Forest monitoring services developed as part of the Eugenius project make sense for public local authorities if they are integrated into a single “thematic service package” with interoperable and complementary products. Additional products will be included into this package using other Copernicus data and products such as Sentinel-1 images and their complementarity with optical sensors.



Logging areas detected with Sentinel-2 images in a forest region of the Pyrenees.

Credit: Copernicus Service information 2017

“Earth Observation services provide accurate indicators to monitor Pyrenean forests and to promote economic activity development in the territory.”

*J.M Noisette, Project Manager,
Regional Direction for Agriculture and Forestry of Occitanie*

Thanks to the Eugenius network, the complementary skills of 3 European companies (Terranis, Spacebel, Sertit) can be gathered for proposing the best use of Copernicus images by several regional authorities in Europe.

Acknowledgements

This project has received funding from the EU H2020 research and innovation programme under grant agreement No 730150 EUGENIUS H2020-E0-2016.

Guillaume Rieu¹, Nadine Tholey² and Sadri Haouet³

1. Terranis, France

2. ICube-Sertit, France

3. Spacebel, Belgium

Email: guillaume.rieu@terranis.fr

nadine.tholey@icube.unistra.fr

sadri.haouet@spacebel.be

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.

Funded by the European Union, in collaboration with NEREUS. Paging, printing and distribution funded by the European Space Agency. IPR Provisions apply. Copernicus4Regions material may be used exclusively for non commercial purposes and provided that suitable acknowledgment is given.