FOREST HEALTH MONITORING: AN APPLICATION IN PORTUGAL

Silvisense is a state-of-the-art service offering timely detection of disturbance outbreaks within forest resources.

The challenge

Today the forestry sector is struggling to capture the disturbance outbreaks in a timely manner to limit the corresponding damage to their forest. Substantial values are lost if the disease spread is not contained in due time. In Europe, as of 2005, forest disturbance affected over 6.4% of the total forested area, with a production turnover estimated (in 2011) of 485 billion euro. Thus, forest disturbances cost Europe 31 billion euro annually. The disturbances are reducing the volume of healthy and viable forest for wood products, timber industries hence threatening the global bioeconomy.

The space based solution

Manual identification of disturbance outbreaks in a tree is not only time consuming but also does not give accurate results. Providing a fast, automated and accurate solution using image processing techniques offers significant added value. Some of the benefits of remotely sensed, multispectral imaging are that this technology gives consistent results, is simple to use, allows for rapid assessments, is non-destructive, highly accurate, and has a broad range of applications.

The Silvisense service uses the latest technology innovations to offer a cost- efficient monitoring service for a wide range of customers. We combine Sentinel-2 imagery with state-of-the-art algorithms to perform scalable and fully automated data analyses. The customers can choose from a range of products available for subscription through the Silvisense API:

- Pine disturbance maps
- Clear-cut validation maps
- Land classification maps
- Updated, tailored satellite imagery over select regions
- Forest fire mapping
- Drought mapping

A Silvisense user will have the capacity to detect disturbance outbreak and clear-cut the declining trees at an earlier stage, resulting in a 60% reduction in corresponding disease outbreak during the following season. Thus, increasing 4% of the total forest value.

Benefits for citizens

We offer annual monitoring for forest ownership associations to provide input on volume estimates of forest area per forest stand. By incorporating the Silvisense service into their production chain, our customers are able to improve the planning, containment and removal of disturbances at a lower cost, and With improved forest management, society gains an increased capacity for capturing

The red polygons show automated change detections in region of Sertã, Portugal (large: forest fire, small: disease outbreaks).
Credit: Contains modified Copernicus Sentinel data [2017]

Thematic Area: AGRICULTURE, FOOD, FORESTRY AND FISHERIES

Region of Application: CONTINENTE, NORTE, CENTRO, ALENTEJO SOR-OSTLANDET, NORD-NORGE

Sentinel mission used: S2

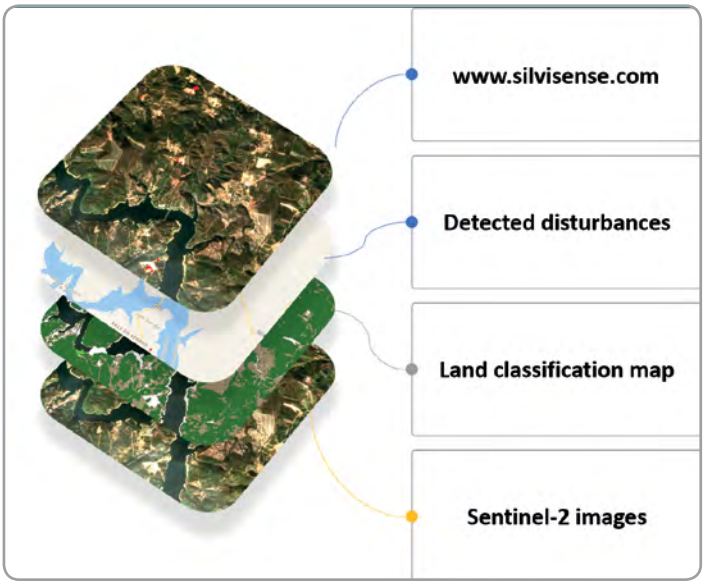
Copernicus Service used: –

Usage Maturity Level: 4

global carbon emissions through the securing of a larger volume of standing viable forest. Ecological damage is reduced with access to more timely disturbance detections, and this results in improved water and air quality, wildlife habitats and genetic diversity.

Our industrial partners occupied with timber and wood production are happy to have available tools for mitigating the effects of forest disturbances and thereby keeping an improved overall forest resource quality, leading to higher priced values for re-sales and further production.

The Silvisense service is already rolled out in two different European countries, with differently sized pilot customers operating and providing feedback. Amongst them there are representatives of the national associations of forest owners such as AproFlora and Unimadeiras of Portugal and Allskog and Viken Skog of Norway.



Silvisense is a service that provides automated forest monitoring using Copernicus satellite data.
Credit: Contains modified Copernicus Sentinel data [2017]

> "This is the perfect tool to get an affordable overview of our properties, providing important information. It makes our lives easier and allows us to focus on other topics."
>
> ***Jorge Freire, AproFlora, a national association of forest owners of Portugal***

Outlook to the future

We are currently busy setting up an infrastructure as a part of the operationalisation. Moreover, together with our Partners we are focused on demonstrating a new set of products through the EU FOCUS project. This will be achieved by extracting biophysical parameters from Sentinel-2 data and hyperspectral data acquired with airborne systems.

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ABOUT COPERNICUS4REGIONS

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The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains.
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