

TRACKING OUR FORESTS FROM SPACE: HOW GEOSPATIAL TECHNOLOGIES ARE HELPING US TO DEMONSTRATE THE BENEFITS OF FSC CERTIFICATION

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Spatial technologies are a key pillar of the digital transformation of FSC toward a data-driven organization. Spatial data obtained from remote sensing and geospatial technologies unleash the full potential of conducting more advanced analysis and help us understand the what, where, and when of the forest value and benefits associated with forest stewardship. As part of Monitoring & Evaluation activities, FSC International is now using these technologies to monitor FSC-certified forests. Based on available spatial boundaries we started our analysis in forests located in Canada, New-Zealand and Portugal on two aspects:

Evolution of forest cover over time

The graphs below show the evolution (aggregated and country-specific) of percentage of forest cover in 57 FSC-certified forests (47 million ha) between 2015 and 2021. The color palette helps identifying locations with red tones indicating high density of FSC forests, and the green line representing the trend.



Evolution of forest vegetation health

The graphs below show the evolution of vegetation health (as a measure of NDVI, or photosynthetic activity) between 1990 and 2022, where each line represents a sampling point. The higher the value, the higher the photosynthetic activity. Drops in value indicate local disturbance caused by forestry activity or natural hazard, while increasing values can be interpreted as regrowth.



Satellite imagery tells us that forest cover in the FSC-certified forests experienced a net **increase** between 2015 and 2022 in the three countries. Specifically, Canada shows a steep growing trend, New Zealand a stable one, and Portugal a slightly decreasing one.

- More than 90% of the analyzed forests have at least 75% of forest cover.
- The two FSC-certified forests in New Zealand show a vegetation loss pattern (harvesting, natural causes, land cover transition) shown by a clear drop in vegetation health.

- In New Zealand, local disturbances to forest vegetation seem to be compensated by regrowth over time, here, the forest cover takes between 5-10 years to fully recover its original status.
- In Canada and Portugal, the forests do not follow the same patterns and seem to be preserved as natural forests.

To conclude, modern remote-sensing and geographical analysis technologies have great potential for FSC to obtain robust evidence of the effects of FSC certification of forest management. After the implementation of Motion 61 (mandatory submission of spatial boundaries), we will be able to expand the analyses to the whole set of FSC-certified forests and include more metrics. This will help us to better understand the spatio-temporal dynamics in FSC-certified forest ecosystem and support the evaluation of impacts and benefits associated with forest stewardship.

Methodological details: Forest Cover: inputs: Google's & WRI's Dynamic World (near real-time 10m resolution global land use land cover). Process: extraction of all the land classified as forests for 57 FSC-certified forests each year. Forest Health: inputs: Sentinel-2 (10m resolution) satellite imagery. Process: calculation of the Normalized Difference Vegetation (NDVI), an indicator that helps differentiate vegetation, and its condition, from other types of land cover.

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