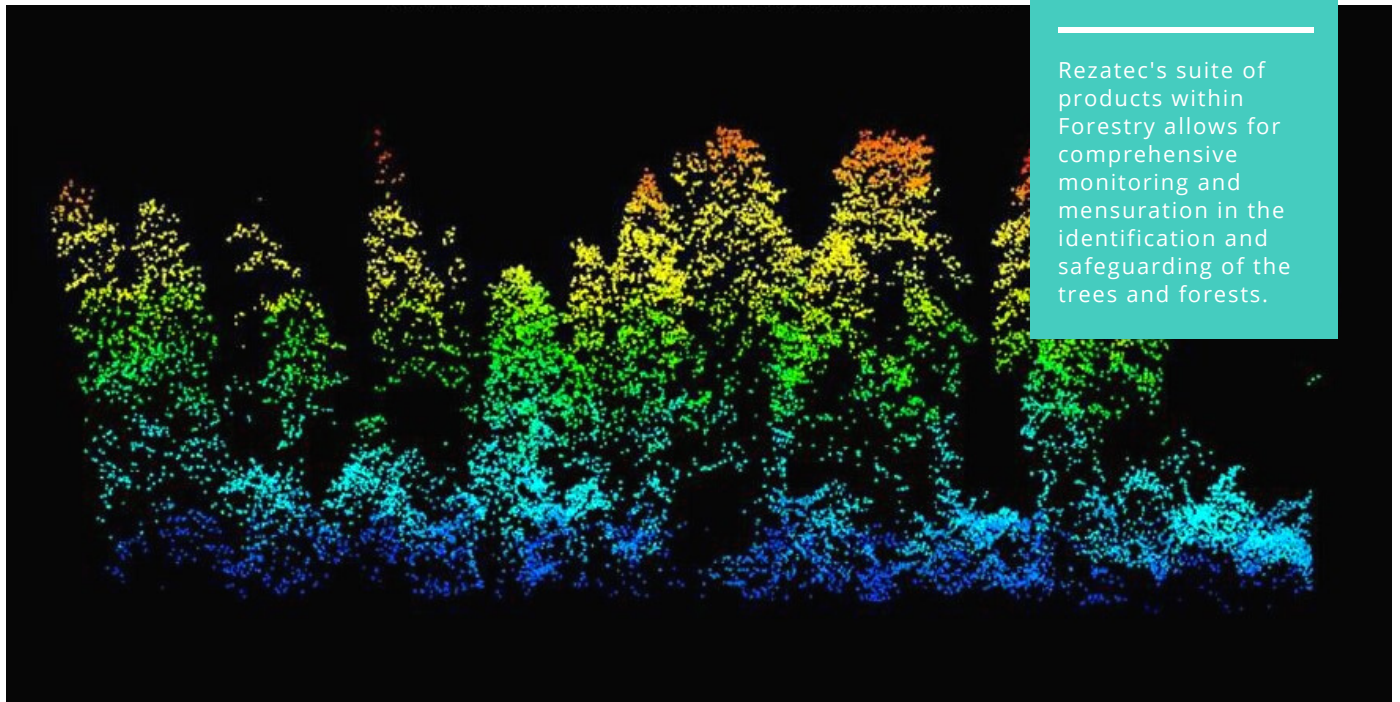


SATELLITES vs. LIDAR FOR FORESTRY MANAGEMENT?

Rezatec utilises EO optical and radar data in proprietary machine learning algorithms to output data products that are scalable and easier to update on a more frequent basis than traditional field surveys.

by Philip Briscoe



Rezatec's suite of products within Forestry allows for comprehensive monitoring and mensuration in the identification and safeguarding of the trees and forests.

Traditionally, monitoring and managing large forests has been a very costly and labour-intensive activity; involving ground teams to walk and observe a representative sample of forest.

In recent years however, two new forms of forest analysis have emerged: LiDAR and Satellites. Each offers new levels of data and insight not previously available to forest owners, but each with different characteristics.

Understanding the features of each method is crucial to identifying how and when to apply them to best effect.

In this article we look to unravel the two technologies to help foresters to gain a deeper understanding of both.

LiDAR DATA

LiDAR (light detection and ranging) is an optical remote-sensing technique that uses laser light to examine the surface of the earth. Benefits of LiDAR data include having high accuracy and good detail, however there are several drawbacks. Firstly, due to the labour-intensive process of collecting the data the costs are very high, this would typically include aircraft, employment costs and equipment.

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Then the price of obtaining the LiDAR data isn't the only thing you'll have to pay for, the data will have to be processed by a highly skilled analyst and presented in a way that's understandable showing the commercially important insights that were gathered.

Another disadvantage of LiDAR is the gap between data updates, which can often be 5 - 10 years. By the time you've got your set of data, paid for someone to analyse it and are ready to use it, it could be out of date and your forest could look completely different. There could have been an infestation of beetles, or even fire damage! Then you'll have to wait up to 10 years to go through the whole process again and recapture a new set of data. Realistically LiDAR is only used to look at a portion of the forest, rather than a tool to manage the entire forest.

Satellite Data

Satellites can provide both optical and radar data across your entire forest. The refresh rates are also much higher with satellites typically passing overhead every week (cloud cover permitting).

This frequency of monitoring allows

for a much faster response to events, as well as temporal analysis – monitoring change over time.

The combination of both optical and radar data also affords a much wider range of applications. For example, you can determine tree species, mensuration and health analysis. The continuous management of forests using such up-to-date information means there are fewer chances to miss environmental and health changes. This can play an important factor in ensuring insurance claims are valid, by detecting things like fire and storm damage much quicker.

Satellite data has other advantages over LiDAR; it is much less weather dependant as synthetic-aperture radar (a form of radar that is used to create two-dimensional images) can penetrate cloud cover, whatever the weather.

How to Use This Data?

Whichever method of gathering data you use, you'll soon realise the biggest percentage of forest management costs arise from ground truthing, to make the data you've captured useful. With satellite data the need for ground-based manual data collection can now be minimised with the use of machine learning

algorithms. This can reduce the amount of validation required and improve ground-based efficiency and targeting, so you only visit the relevant areas, hugely reducing costs.

Summary

Both LiDAR and satellite data provide useful insights and can be used to complement each other. Rezatec's GIS platform can incorporate LiDAR as well as several other data sources, but satellite data is unique in its versatility, frequency of updates and ability to monitor very large areas.

By using earth observation satellite data, you get a continuous large-scale view of your forest. You can pair this with existing LiDAR data you already have to enrich your view or use the satellite data as your stand-alone forestry management analytics.

Want to find out more? Download our guide: ['Satellite-derived forestry intelligence.'](#)

Or [request a demo.](#)

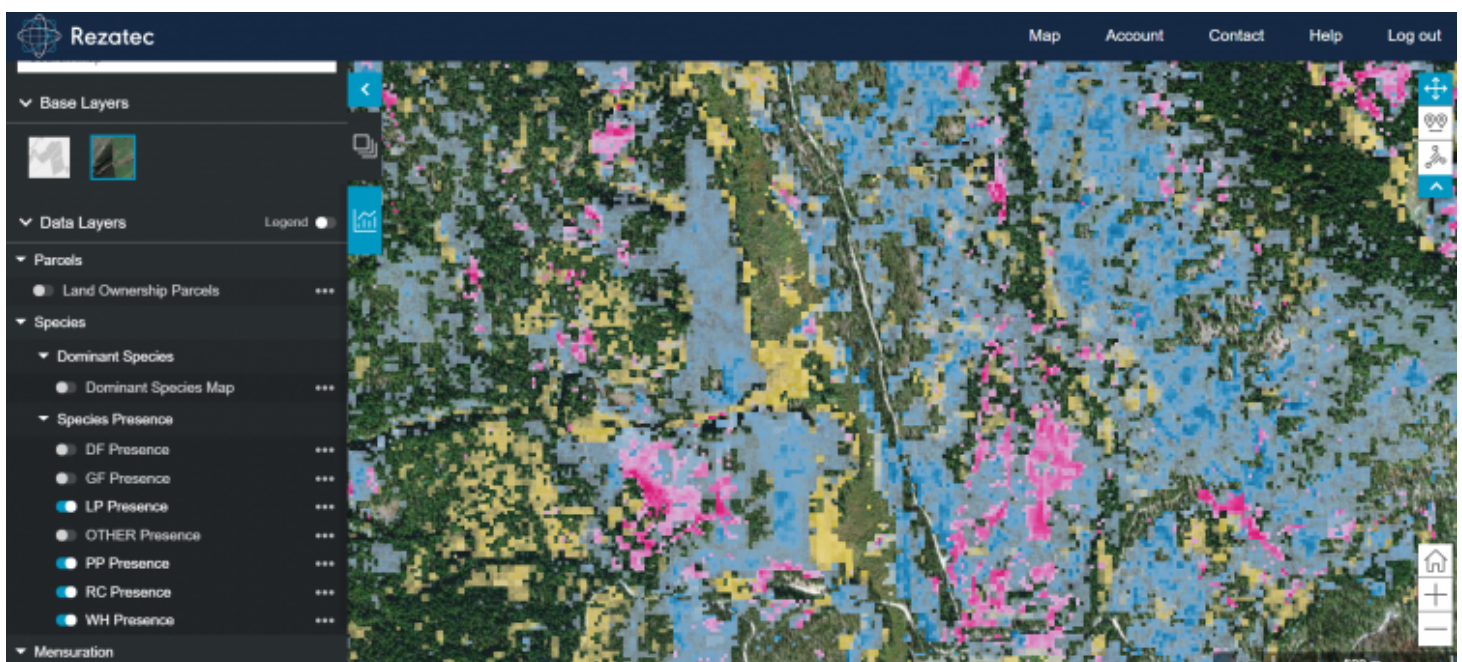


Figure 1: Rezatec Portal Showing Tree Species Distribution.