



Towards precision forestry – improved regeneration monitoring with Smart Forestry TreeMaps

AFRY Smart Forestry

MAY 2024

How to monitor the development?

SURVIVAL MAPPING

The challenge

- Successful forest regeneration requires many well-coordinated and timed actions.
- Establishment operation should be monitored but it is challenging to implement manually on very narrow time window before additional planting should be done on short rotation plantations.
- Sampling is one solution to fasten the process but only a wall-to-wall survey guarantees that internal stand variation is fully covered
- Drone surveys are an effective method to digitalise this process



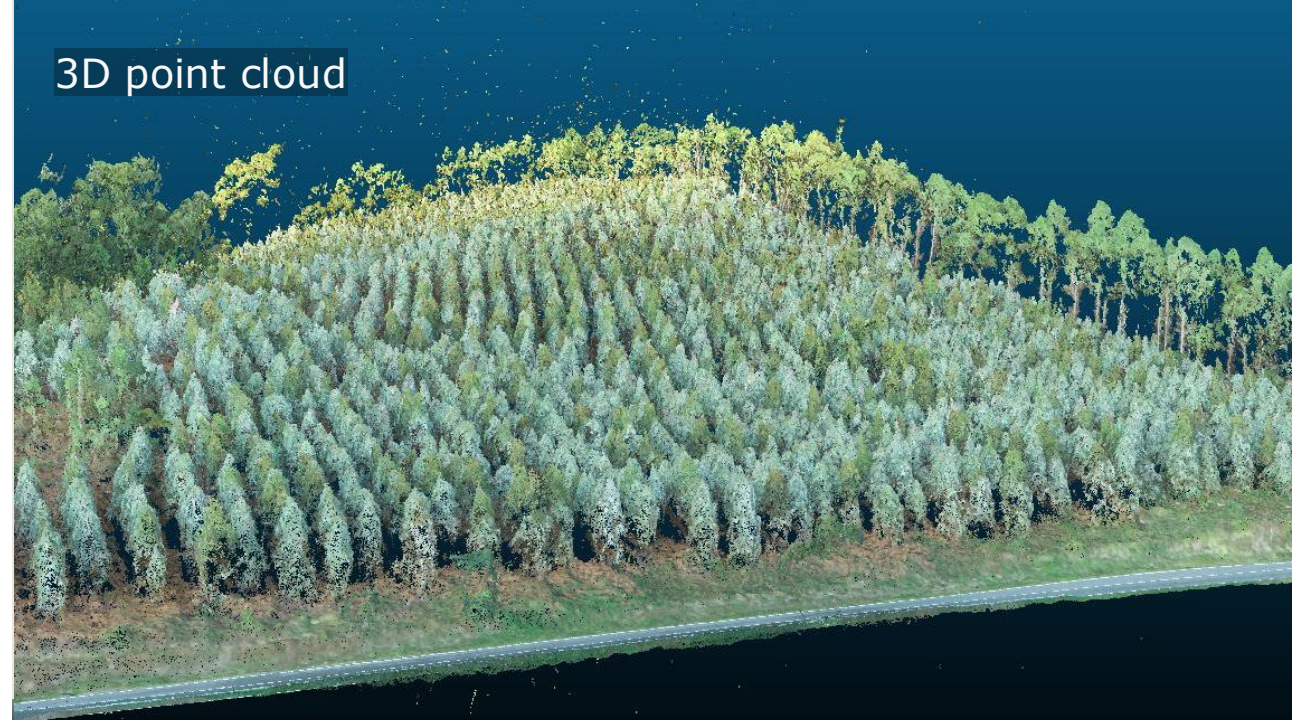
Development target after 2 years of intensive silviculture



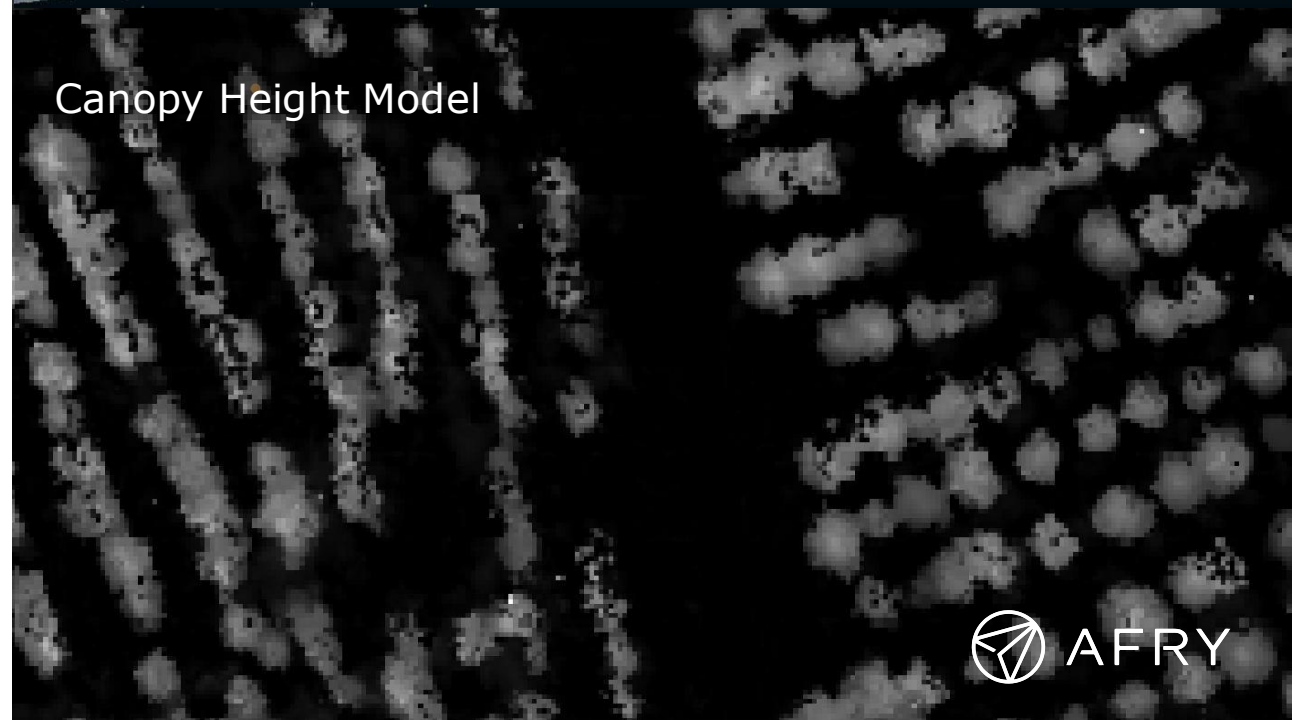
The solution

- TreeMaps SaaS solution provides fully automated drone survey management and mapping process.
- Regeneration areas are surveyed with drone at low 20 – 100 m, depending on local conditions.
- Seedlings are extracted with 3D and spectral data and height of each seedling is measured. 100 % enumeration provides full stand internal variation.
- RGB sensor is good for most work in plantations. In case seedlings are mixed with weeds or species interpretation is required, Multispectral sensor is applied.
- Efficient project management and data flow together with automatic processing provides results within a few days, this enables rapid silvicultural management decisions

3D point cloud



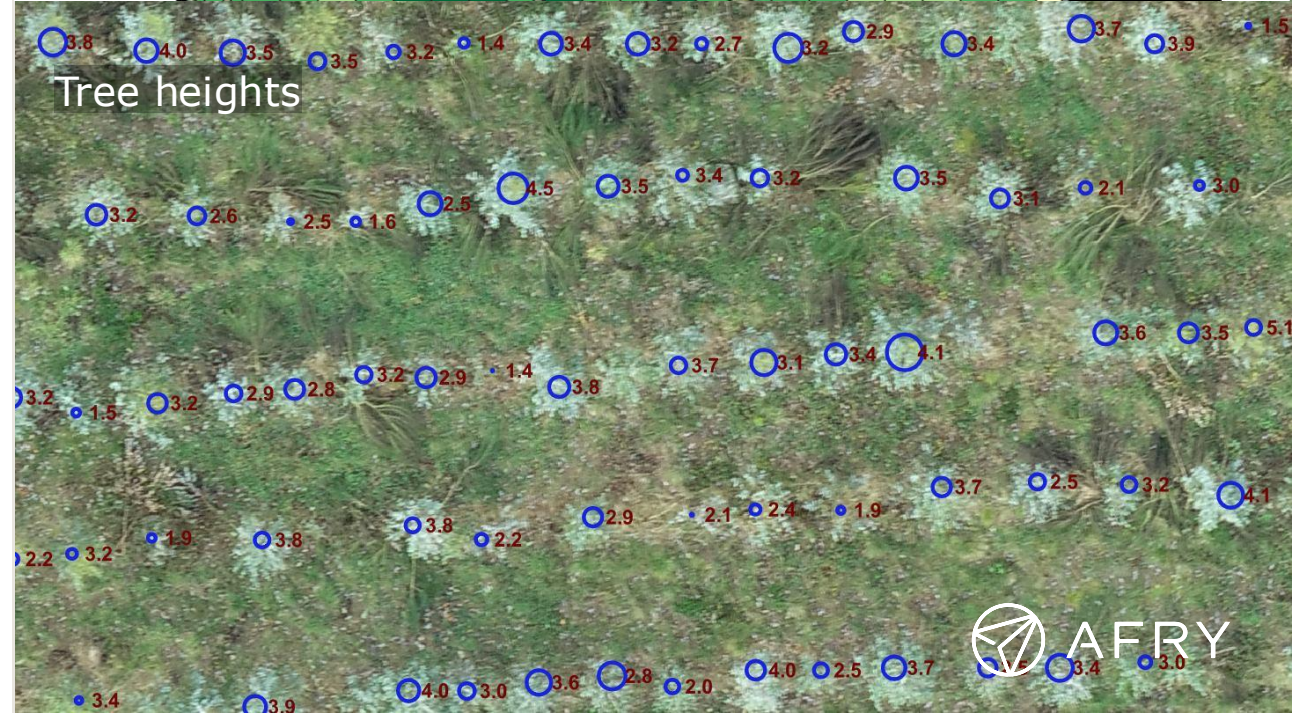
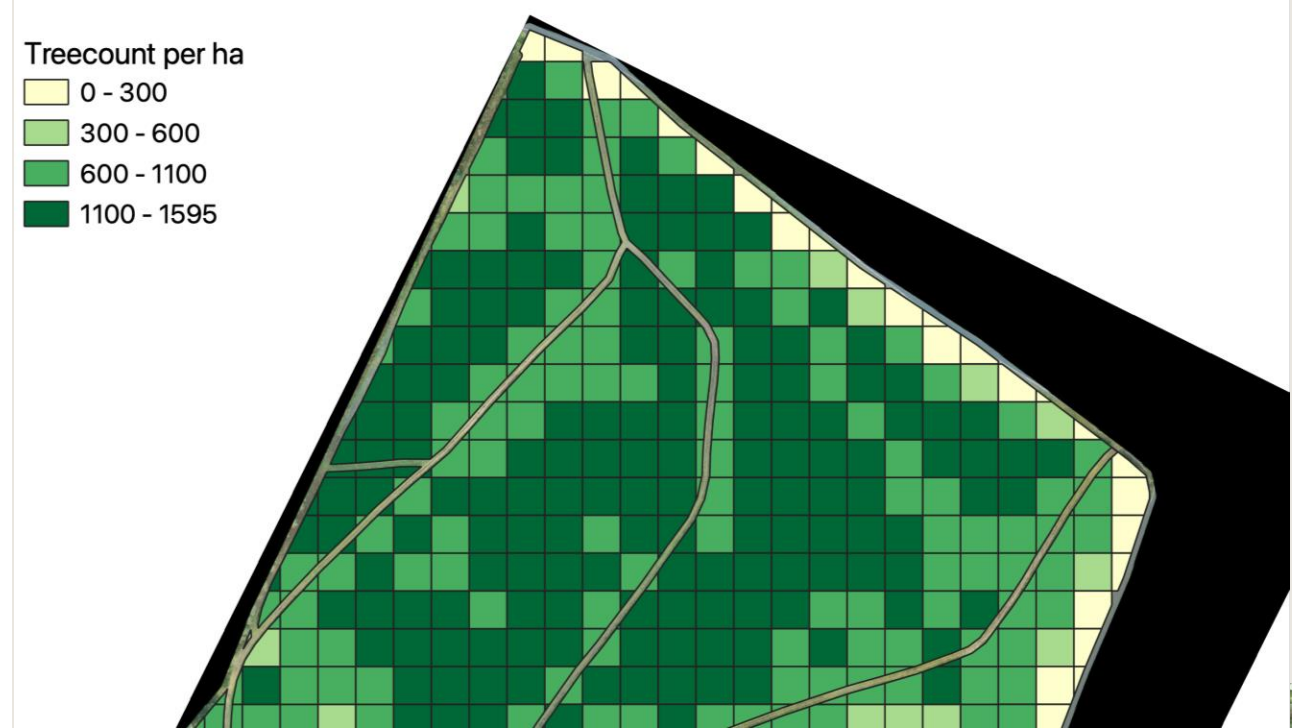
Canopy Height Model



SURVIVAL MAPPING

The result Plantations

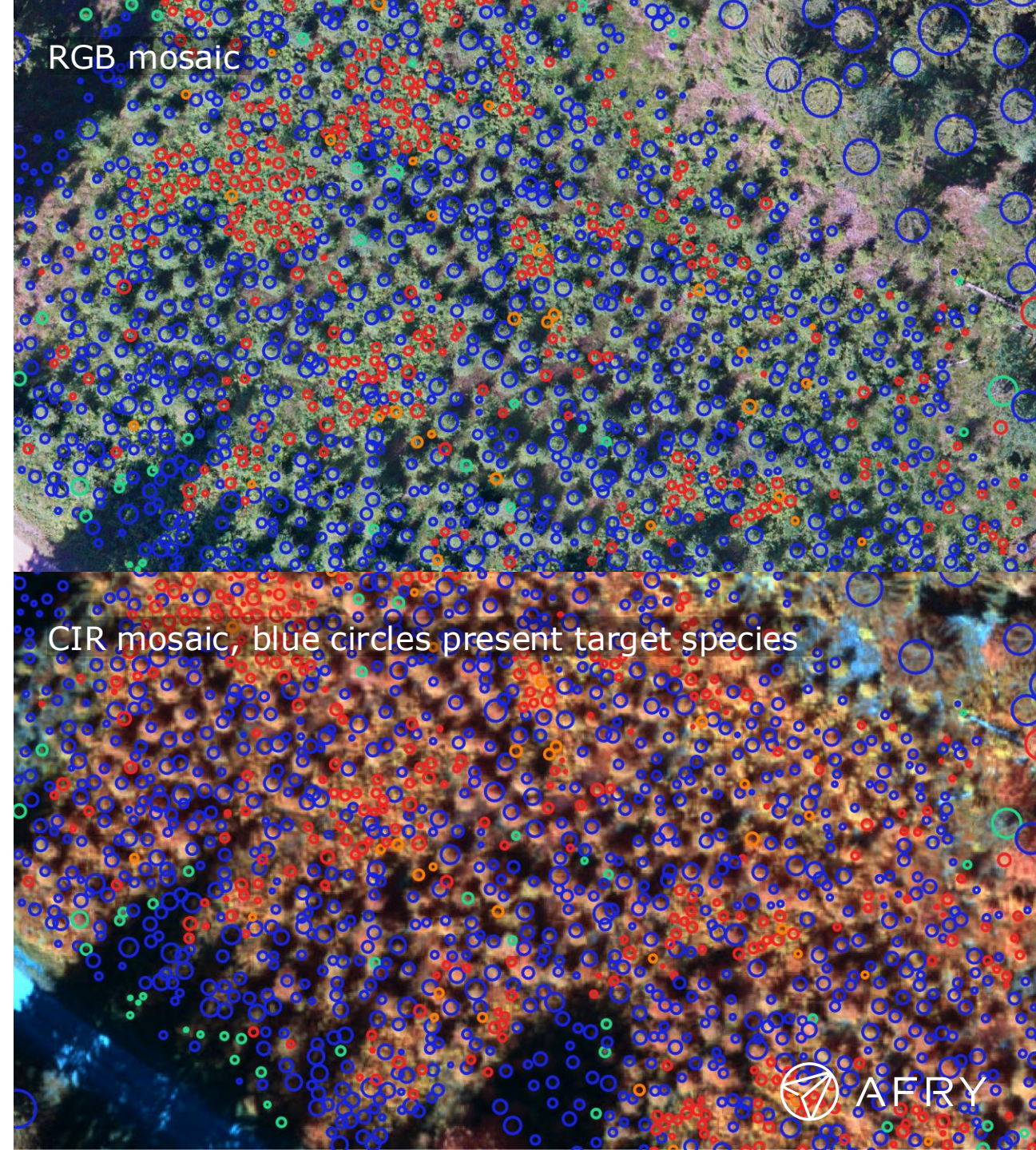
- Every seedling/tree is located
- Difference to standard 2D treecounting is that height of each seedling is measured as 3D point cloud is applied. This enables not only survival mapping but also analysis of initial growth rate and tree healthiness.
- Reports are created as tree maps compatible with any GIS and FMIS as well as in aggregated form by stands, microstands or by grid.



SURVIVAL MAPPING

The result Semi-natural forests

- In boreal and temperal areas regeneration is slower process and typically there are “unwanted” species and weeds occuring into stands.
- Target species can be interpreted by applying Multispectral cameras. Results will be reported by species.
- Need for weeding or removal of unwanted species can be analysed and reported.



CONTACT INFORMATION

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