

TECH4EFFECT

Wheel ruts, DTW maps and drones: Can we reduce soil damages from harvesting?

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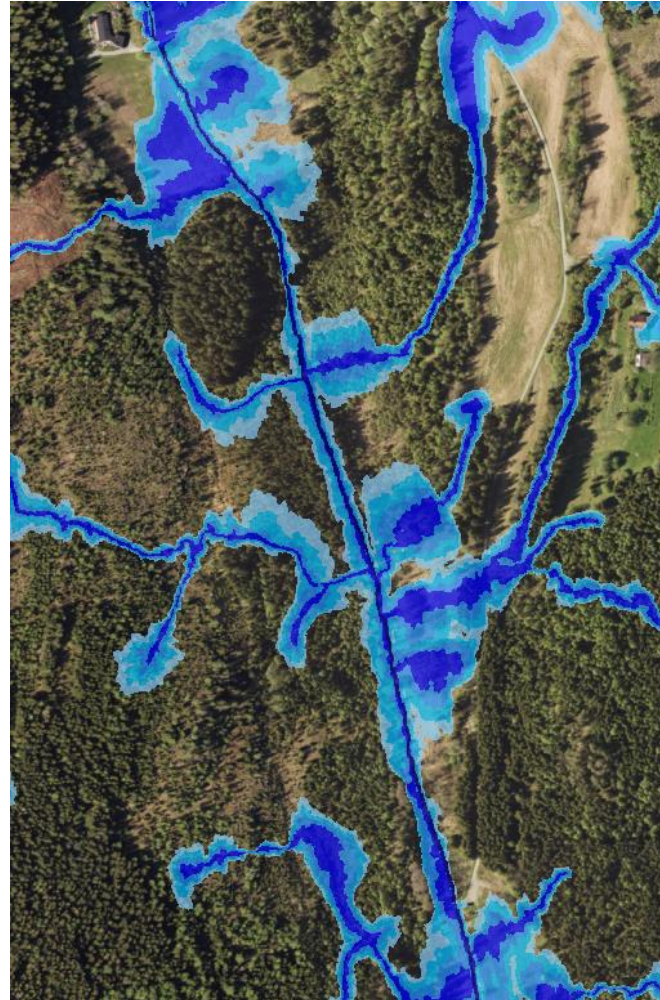


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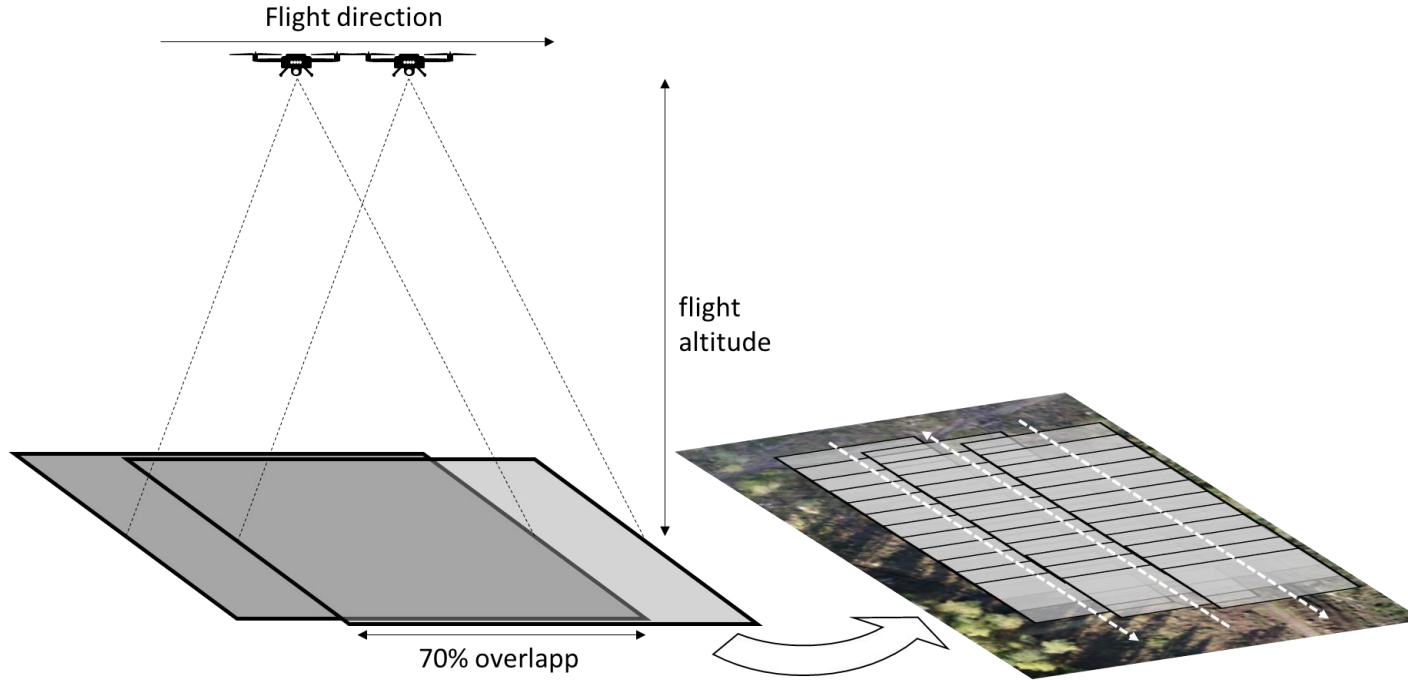
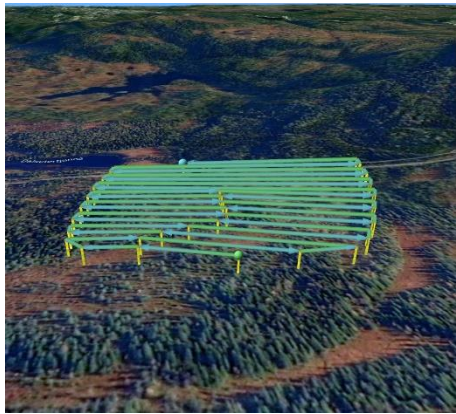


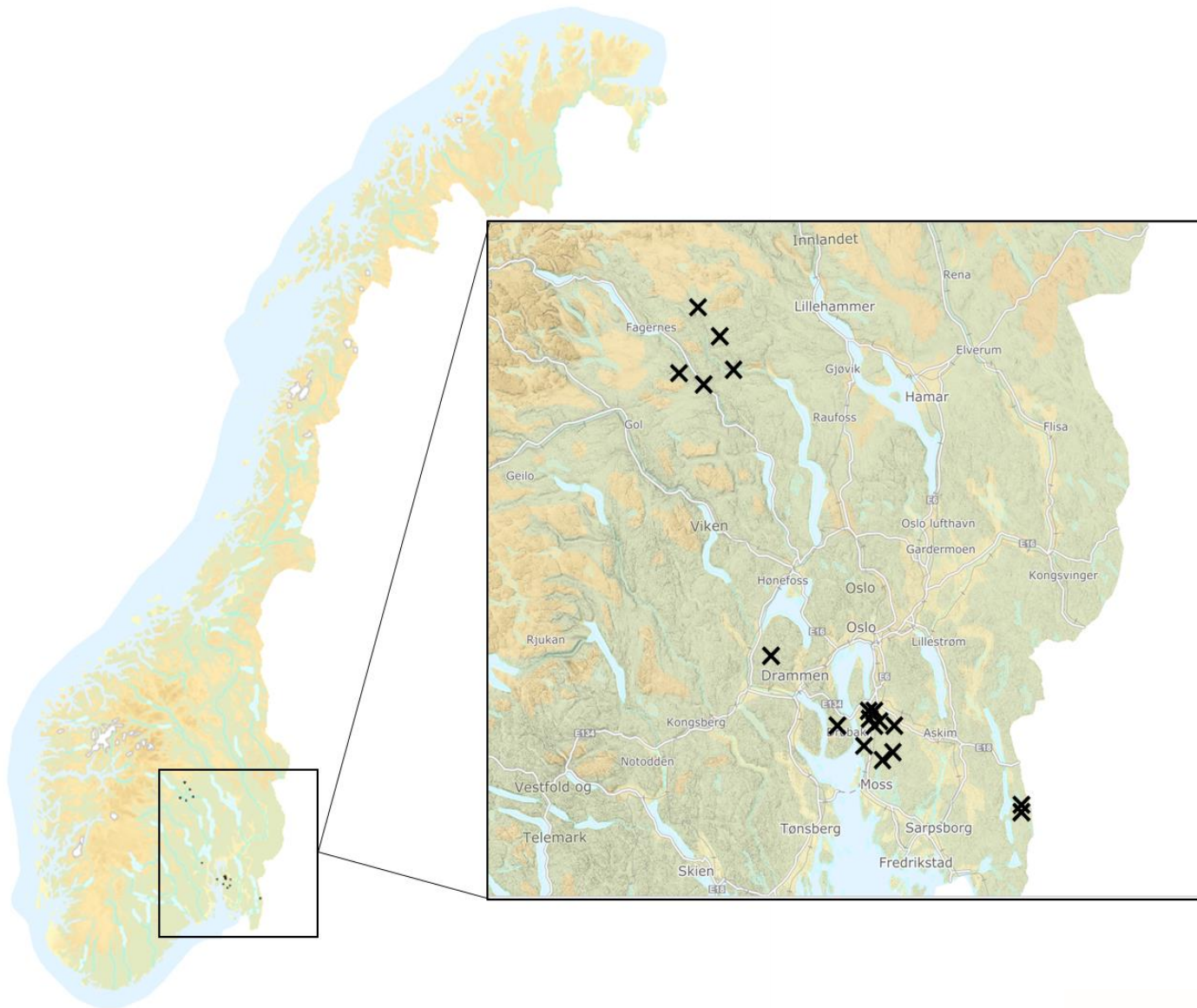
Depth-to-water (DTW) mapping

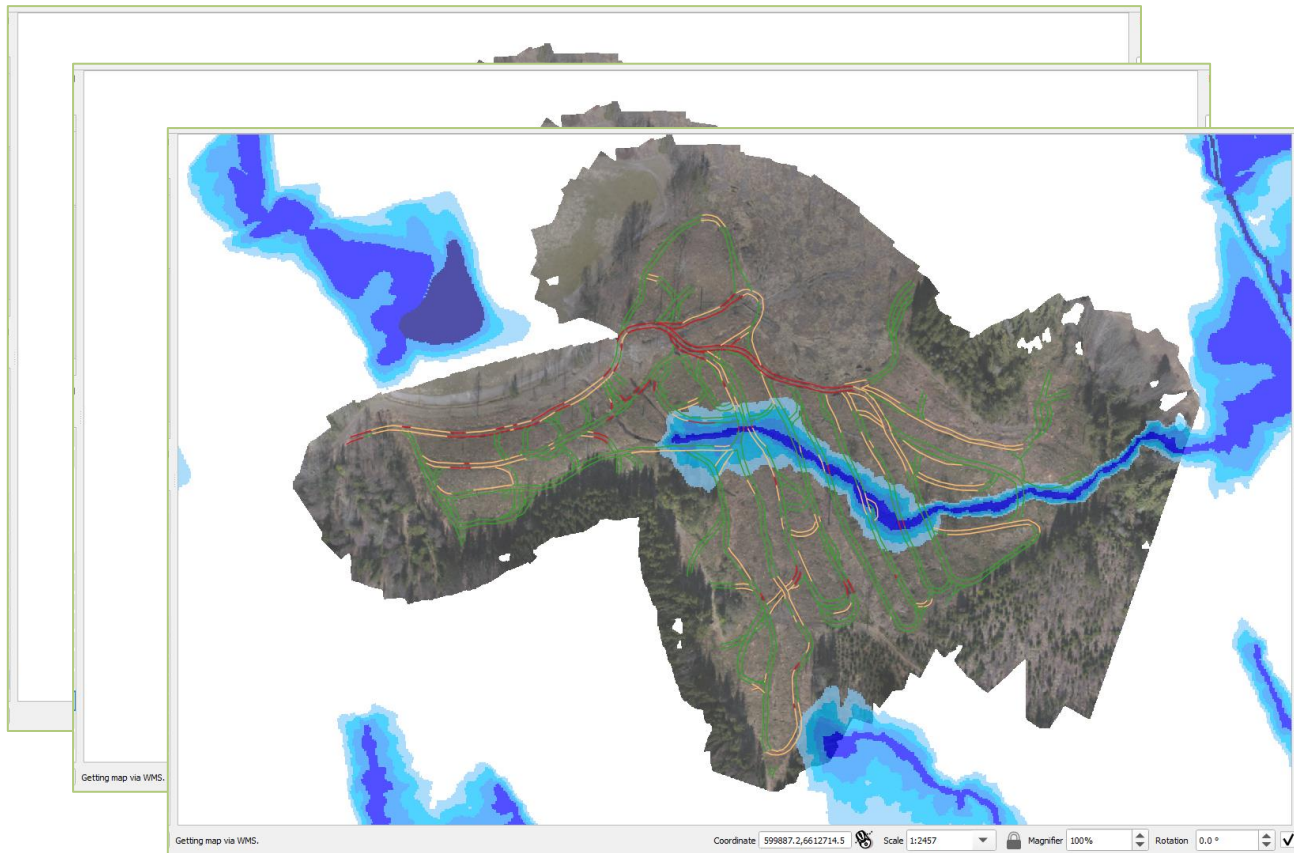
- Based on digital elevation models (DEM)
- Threshold value: Flow initiation area
- Simulation of hypothetical waterflow through the landscape
- Resulting in a tendency-map of saturated landscape points and depths
- For simplicity local factors like vegetation, rock formation, soil types etc. are neglected
- For better visualization depth to water values smaller 1m are presented as blue areas in 25cm increments



- 1) Are areas calculated as $DTW < 1m$ been genuinely avoided by operators and therefore the frequency (m/ha) of tracks decreased within these areas?
- 2) Is the severity of rut formations increasing within calculated shallow DTW areas?
- 3) Can DTW maps provide robust information for future planning processes of fully mechanized harvesting operations?







Results

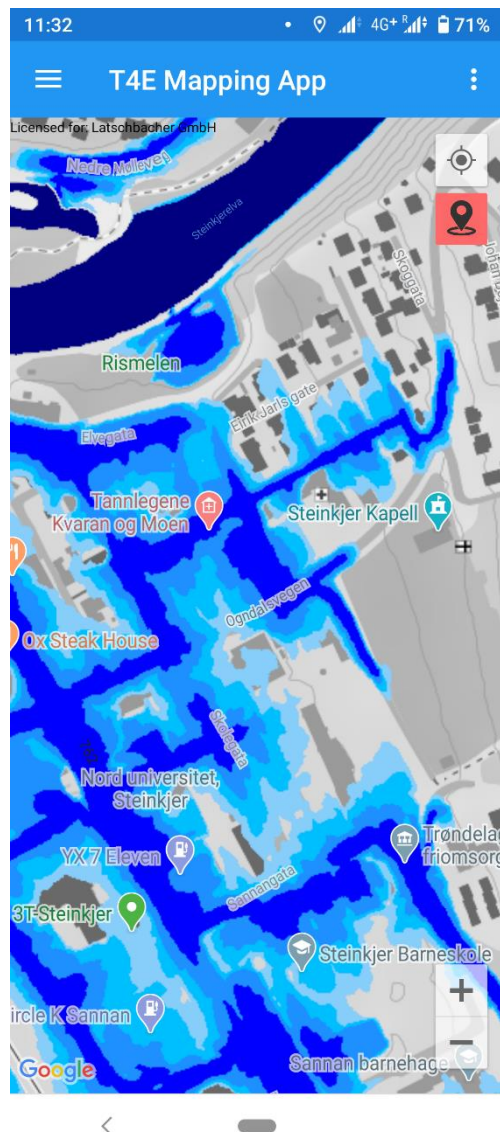
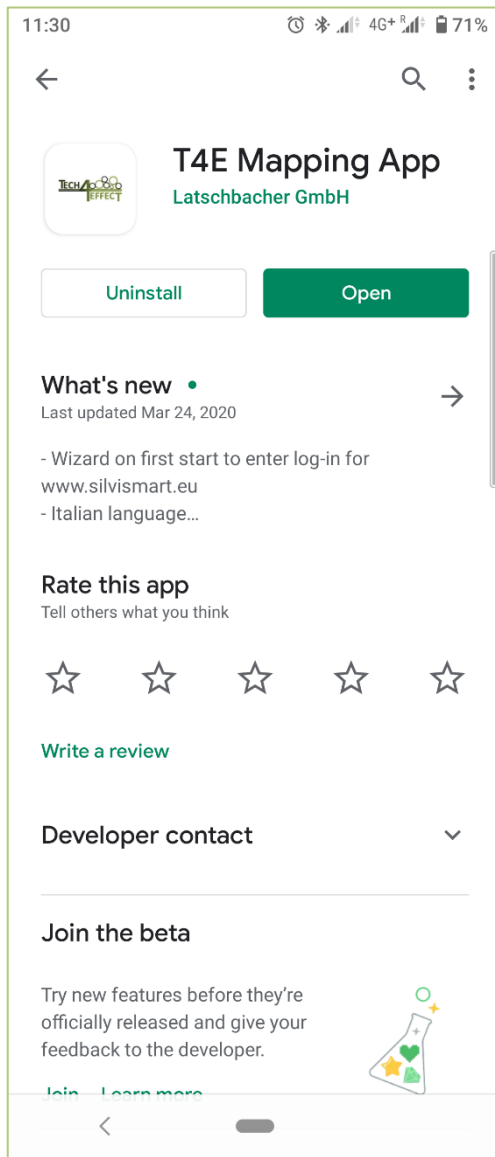
- Investigated 120 ha and ca 80km
- Equal m/ha distribution of tracks within and without the DTW area
- Positive correlation between DTW and rut severity
- 58% of moderate ruts were detected in DTW area <1m
- 71% of severe ruts were detected in DTW area <1m
- **>> Strong potential for future planning applications!**



Outlook

- Increase the database
- Diversify stand conditions
- Test different wetness scenarios and link it to weather
- Incorporate the driving pattern and number of overpasses
- Automize rut detection and categorization



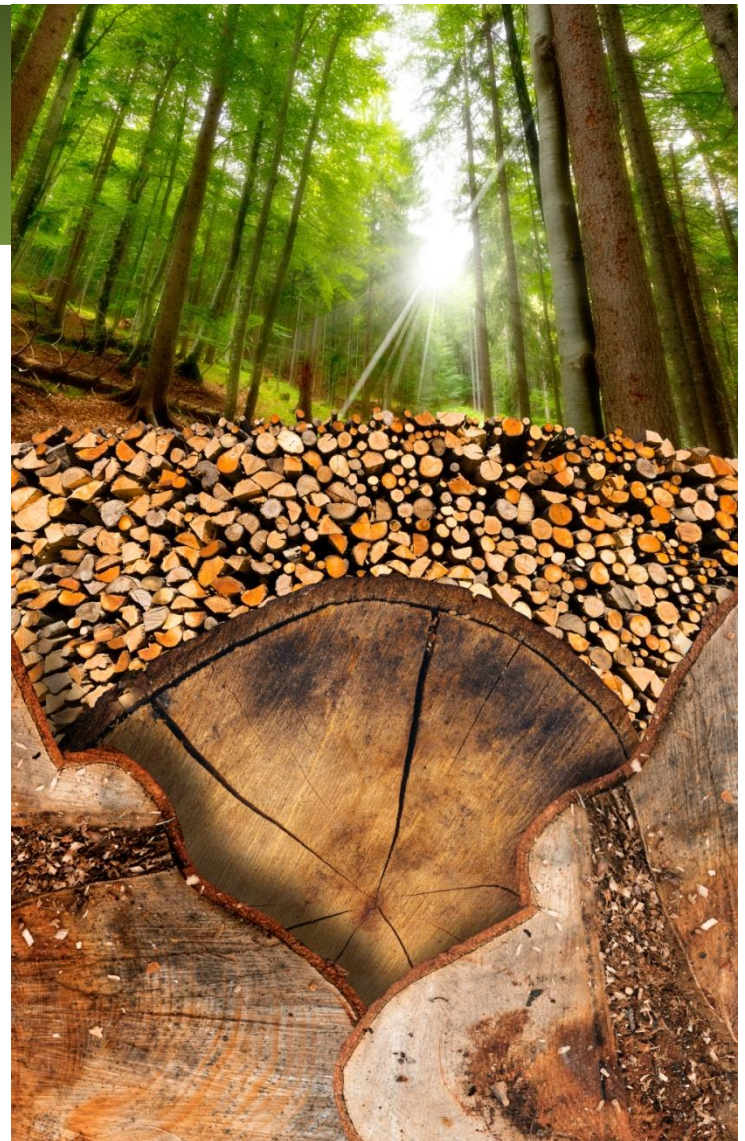


Acknowledgements

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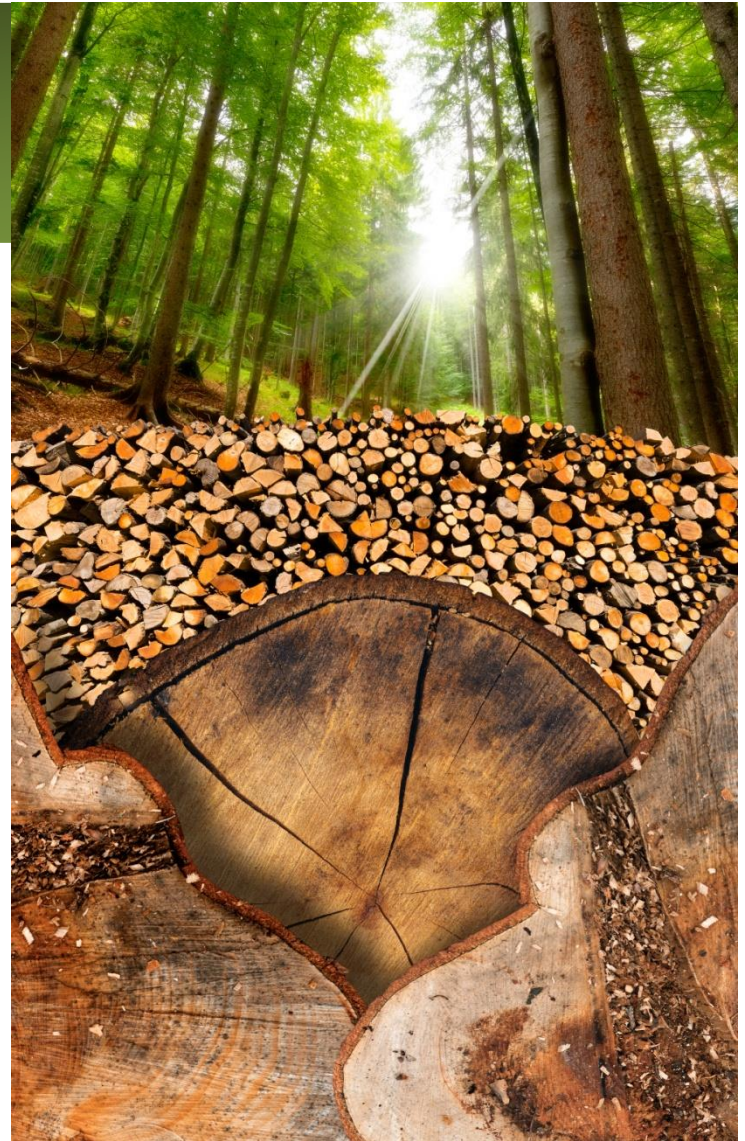


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