Ground Truthing Forest Change Detection Algorithms in Working Forests of the US Northeast

FEMC 2022
Forest Disturbance Detection Algorithms

From Kennedy, R. E., & Braaten, J. (n.d.). LT-GEE Guide. eMapR.
Why remote monitoring? Why now?

• Net Zero Carbon Legislation
• Forest Carbon Markets
• Sustainable Forestry Certifications (FSC, SFI)
• Increased Invasive Insect Presence
• Extreme Weather
• Climate Stress
Forest Disturbance Detection Algorithms
Ground Truthing Assessment

• Continuous Change Detection and Classification (CCDC)
• LandTrendr (LT-GEE)
• Landscape Change Monitoring System (LCMS)

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Reference Data
Higher level of disturbance detection, higher level of accuracy
Algorithms less likely to detect partial harvests
Landtrendr magnitudes were the best predictor of pulpwood removals

LT-GEE
- \( n = 148 \)
- \( r^2 = 0.67 \)
- RMSE = 0.56
- \( p < 0.0001 \)

CCDC
- \( n = 85 \)
- \( r^2 = 0.09 \)
- RMSE = 0.80
- \( p = 0.005 \)
Summary

• Need for a regional monitoring tool
• Landtrendr preformed the best at detecting partial harvest and estimating magnitudes
• Remote monitoring will play an important role in the future of forest management
Acknowledgments

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