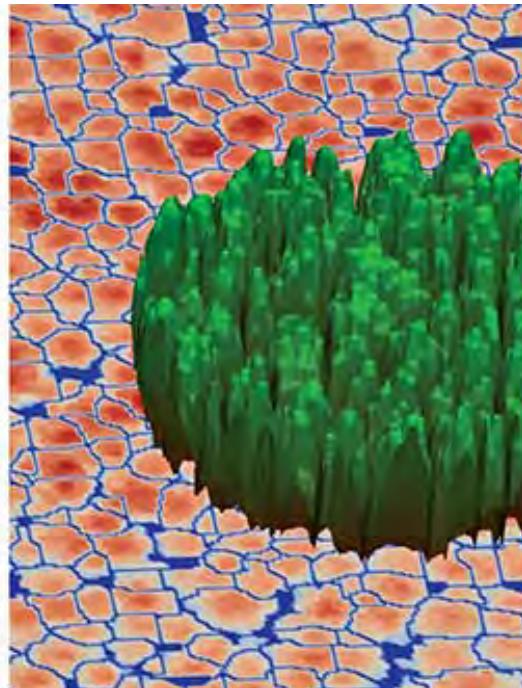


The three M's of erosion and debris flows - mapping, measuring and mitigating

Authors:

Stefanie Lumritz, Duncan Harrison, Tim Payn, Chris Phillips, Les Basher, Marie Heaphy



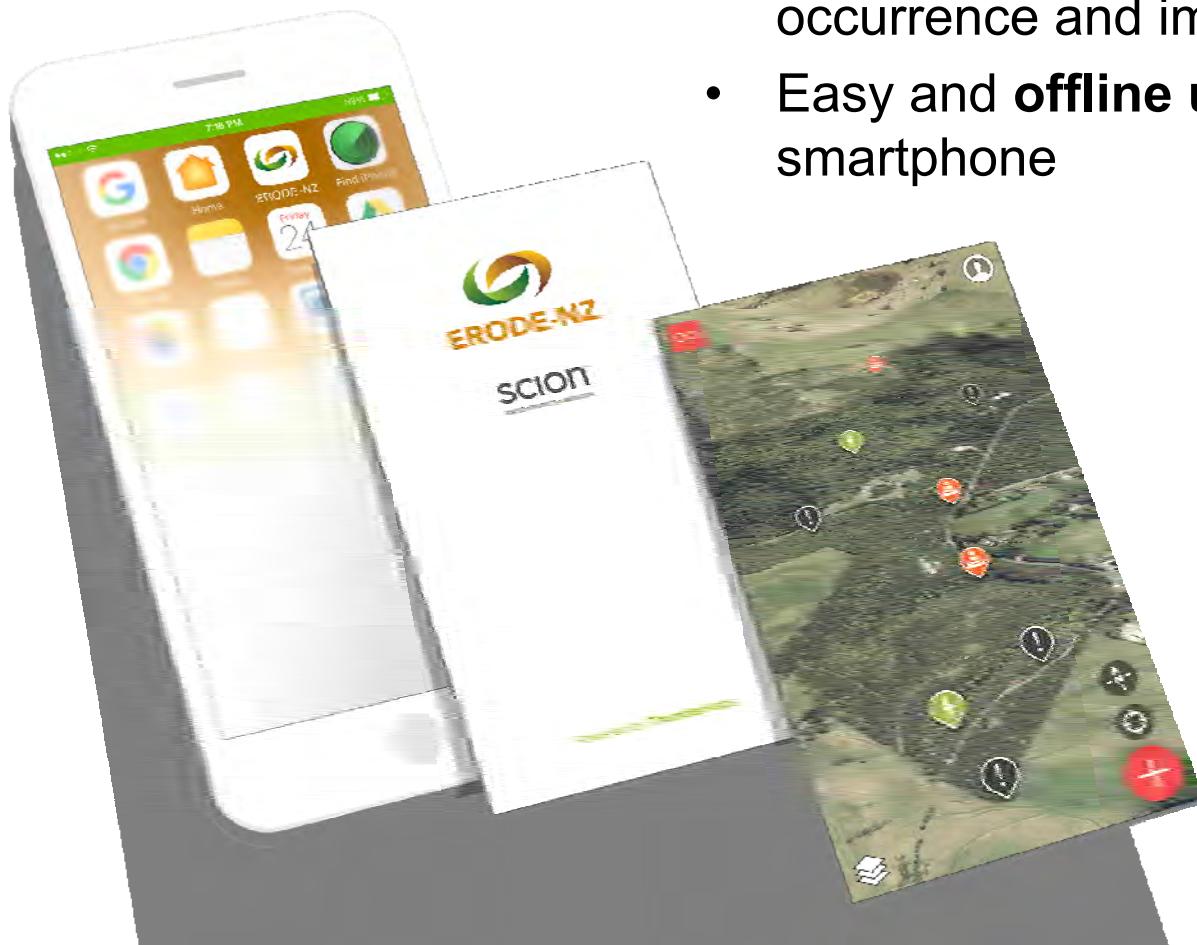
Future challenges

1. Understanding the **scale and impact**
2. Knowledge and **tools to intensively monitor** if environmental compliance is achieved under new policy regime
3. Precise information to **rebut challenges** on steep land environmental management practices



1. Mapping erosion and debris flows – ErodeNZ

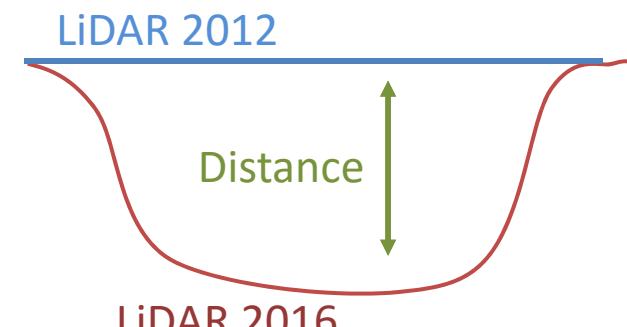
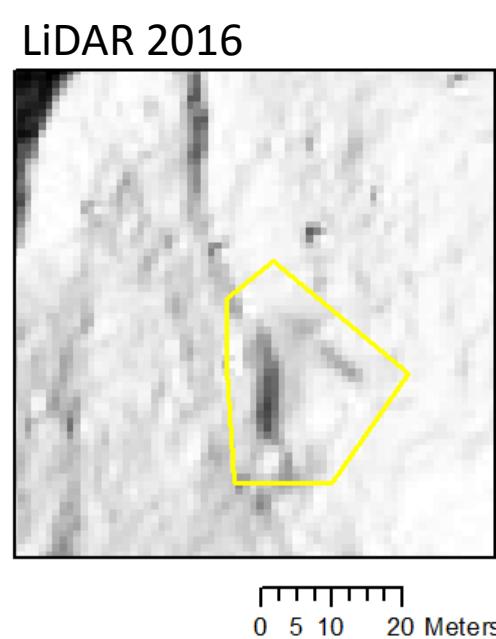
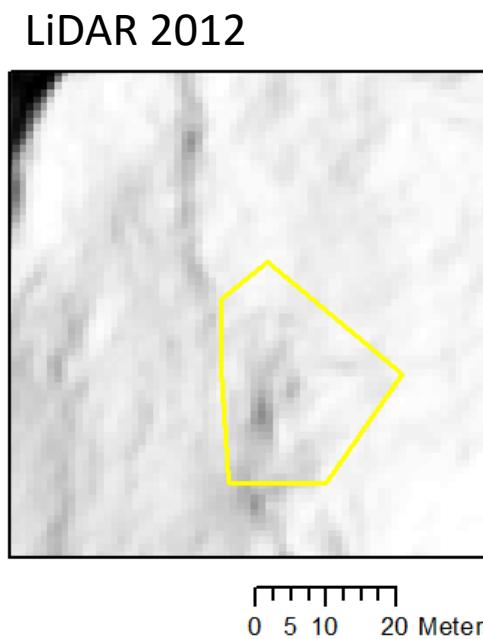
- A **mobile application** to collect erosion and debris flow data
- Provides **actual evidence** of the occurrence and impacts of erosion
- Easy and **offline use** via Android or Apple smartphone



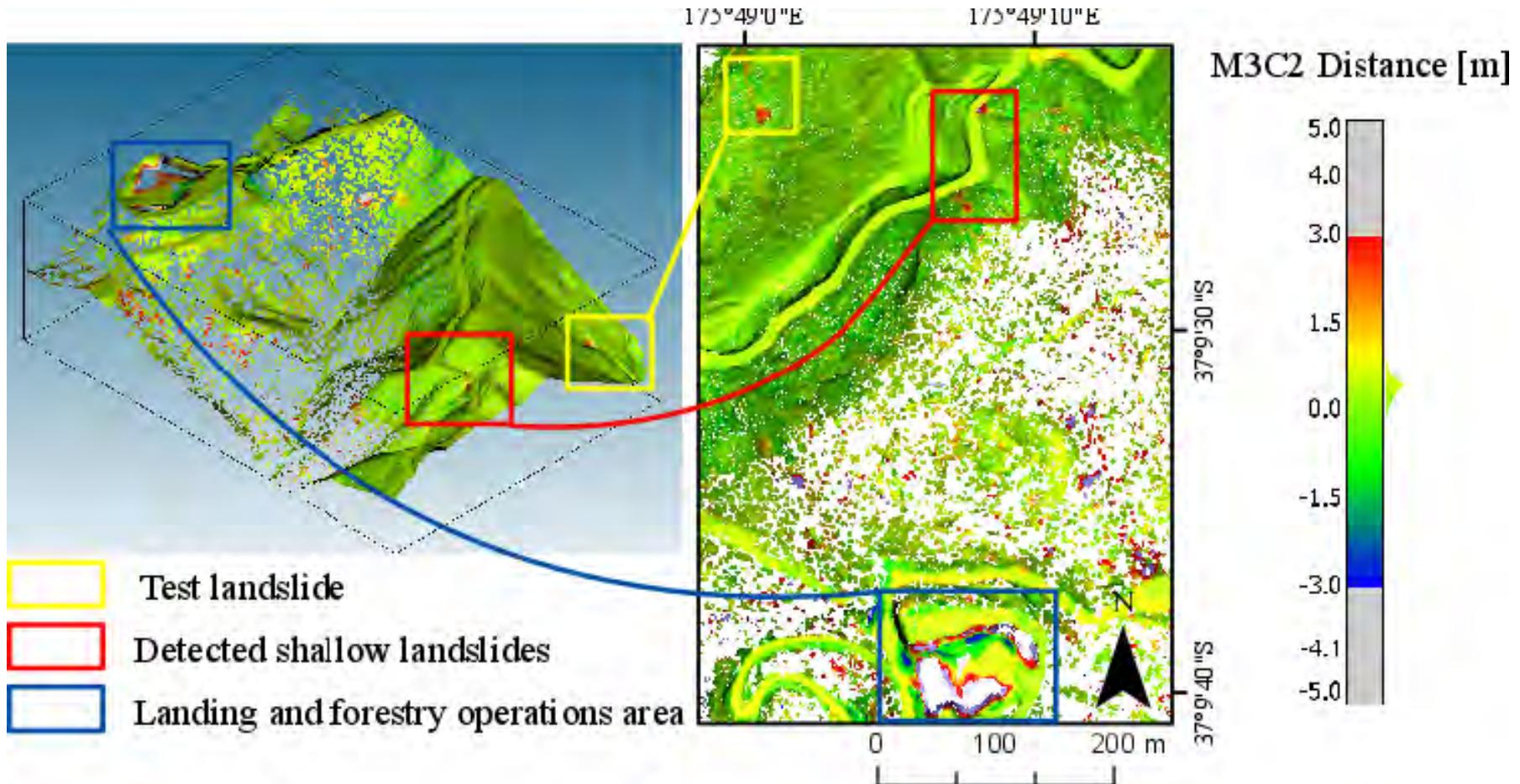
2. measuring: LiDAR time-series comparison

1. Capability to **identify** shallow landslides

2. Quantitative estimation of **displaced volume**



2. measuring: LiDAR time-series comparison

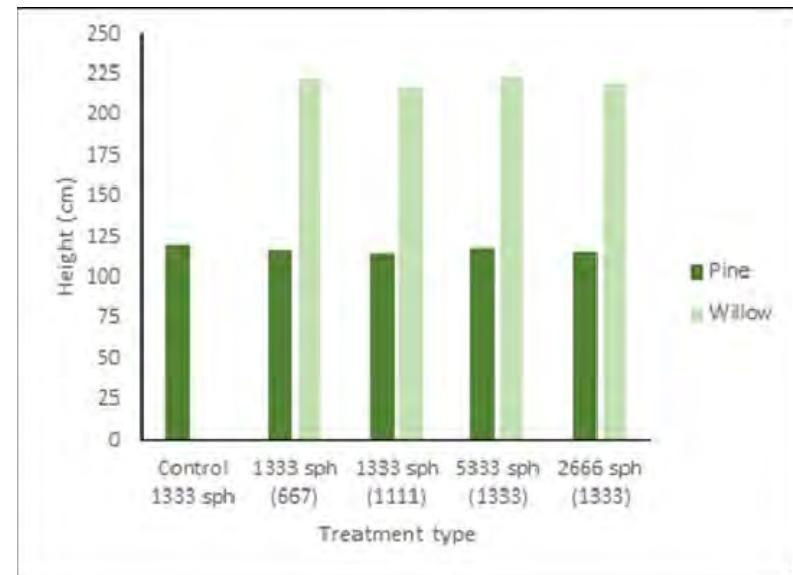


Lumnitz, S. (2016): *Remote sensing for policy implementation: Monitoring erosion in New Zealand's planted forests* (Bachelor's thesis). Ludwig-Maximilians-University, Munich.

3. mitigating: Closing the window of Vulnerability – Willow & Pine trial update

First measurement in November 2015/16:

- Both species > 95% survival rate
- No discernible affect of species or stocking at this stage
- Some damage to willows from deer browsing
- Trial to be remeasured November 2017



4. mitigating:

Best practice of debris flow management

Which measures have already been successfully taken by forestry companies to **protect infrastructure from debris flows?**



Conclusion

The three M's

to erosion information, nation wide data coverage and best practice:





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