Measuring Wheel Rutting from Close-Range photogrammetry
Problem

Wheel rutting becoming more prevalent in Boreal forests
Shorter winters
Milder winters
More variable weather
Less operations planning
Aim of the study

- Evaluate the use of photogrammetry as a tool for measuring wheel ruts
  - Ease of use
  - Accuracy
- Compare 3 different software programmes for doing the analysis
- Evaluate usefulness of output
Materials and Methods

- Find a site with easily distinguishable wheel ruts
- Excessive vegetation removed
- Ground control points
Measurement

Photogrammetry (Panasonic Lumix pocket camera) vs. Conventional Measurement with ruler (reference system)
Processing

- 56 images used in developing model
  - Agisoft Photoscan (commercial)
  - CMPMVS (open server based)
  - Autodest 123D Catch (open source)
Photogrammetry vs Manual measure
Management output
Software comparison
Conclusions

- Profile estimates coincided closely with manual measures
- Method provides a surface model and not a terrain model so harvesting slash can be a problem
- Free water in the rut provides poorly textured surface which does not represent depth correctly
- The approach is relatively easy to use with only open source resources and consumer grade cameras
- More information in: Measuring wheel ruts with close-range photogrammetry, Forestry 89(4)383-391
Thank you for your attention