The Uptake and Barriers of Geospatial Technologies in New Zealand's Forest Management Sector

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Background

- Geospatial technology is rapidly changing
- Enhanced data precision aids forest management
- Understanding technology adoption and barriers benefits the industry
- Previous study undertaken in 2013 and 2018, highlighting the need for an update

Objectives

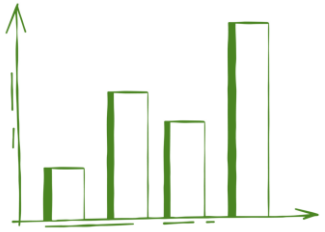
- Identify current geospatial technologies employed in New Zealand's forest management sector
- Identify barriers hindering the adoption of geospatial technologies
- Determine the progress in uptake of geospatial technologies over the past five years

Method – Data collection and Analysis

Literature review and survey creation

Identify survey respondent details

Distribute survey



Analyse results

Present findings

Respondent Demographics

- 27 companies complete the survey
  - 23 companies were forest owners/managers
  - 4 companies were forest consultancies or research institutes
- 1,283,000 ha (74% of New Zealand's plantation forest estate)
  - Forest estates ranged from 7,000 ha to 200,000 ha
- Respondents were primarily in GIS related positions
  - 22 GIS roles, 4 foresters, 1 wood flow manager

Positioning Technology

GNSS receivers (100%)

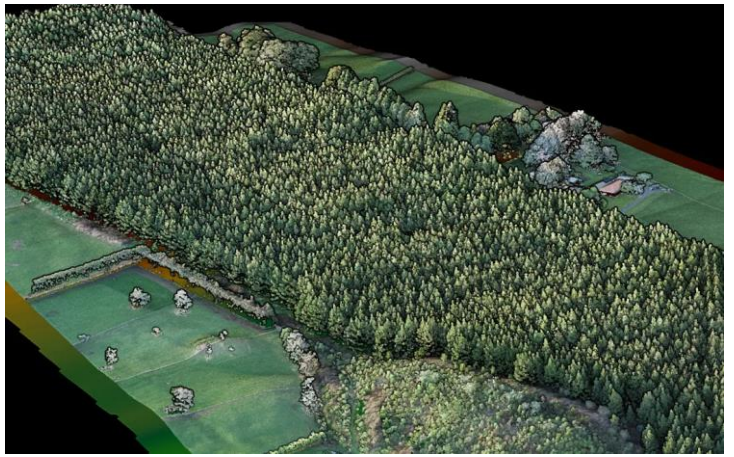
- Receivers built into devices (81%)
- Handheld receivers (70%)
- Mapping grade receivers (26%)
- Survey grade receivers (37%)

- Applications
  - Stand/forest mapping (48%)
  - Field navigation (44%)
  - Ground control points (30%)

Aerial Imagery

Aerial photography (100%)

- Applications
  - Cutover, stand and forest mapping (100%)
  - Harvest planning (96%)
  - Windthrow Assessment (96%)
- Photogrammetry (48%)
  - Digital Elevation Models (DEMs)
  - Stem counts



Aerial Imagery

Aerial videography (56%)

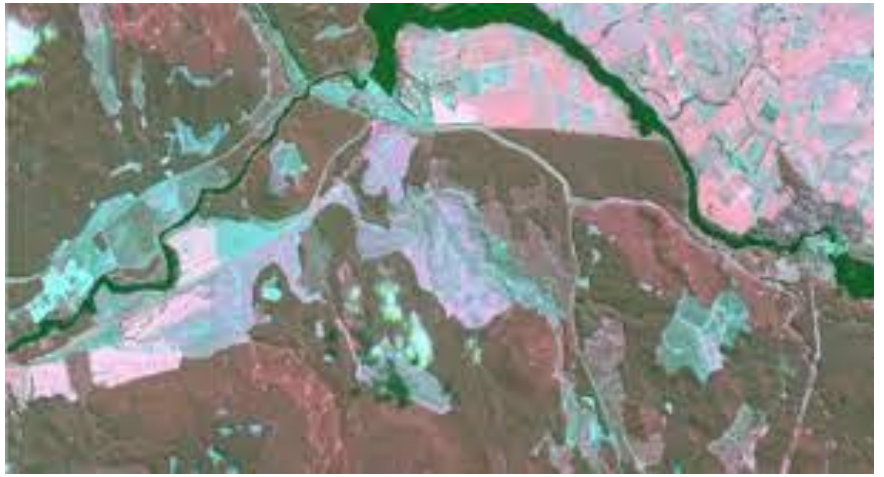
- Applications
  - Environmental Impact Assessment
- Acquisition
  - UAV (100%)
  - Helicopter (20%)
- Barriers
  - No perceived benefits (83%)
  - Lack of staff knowledge and education (42%)

Multispectral Imagery

Multispectral Imagery (67%)

- Barriers
  - No perceived benefits
  - Lack of staff knowledge and education

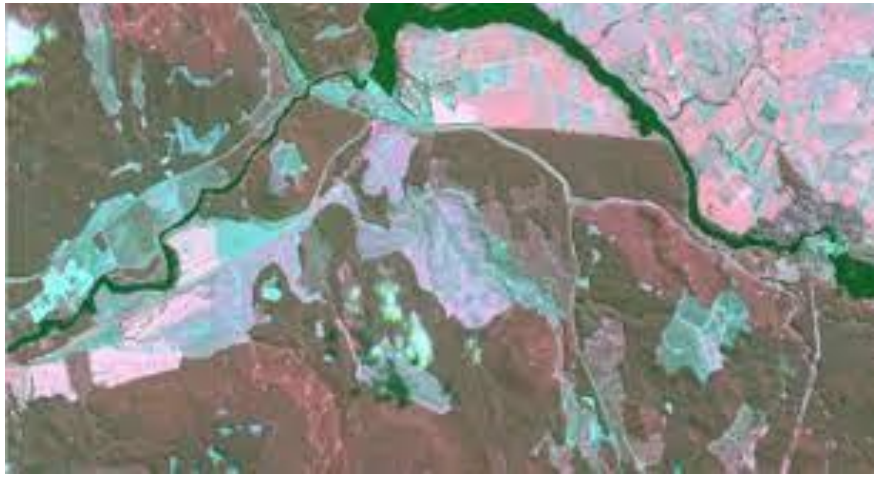
- Key Applications
  - Cutover, stand and forest mapping (72%)
  - Harvest planning (72%)
  - Forest Health Assessment (50%)
  - Windthrow Assessment (44%)



Multispectral Imagery

Multispectral Imagery (67%)

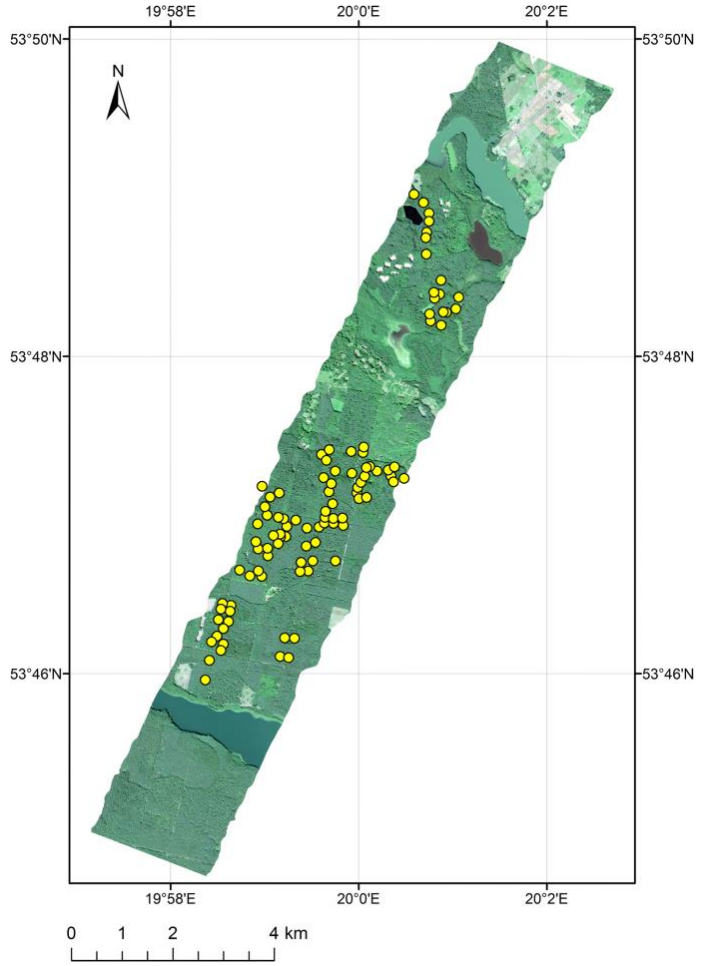
- Acquisition
  - Satellite platforms (89%)
  - Aeroplanes (44%)
  - UAVs (22%)
- Satellite Sensors
  - Sentinel (87%)
  - PlanetScope (53%)
  - Landsat (33%)



Hyperspectral Imagery

Hyperspectral Imagery (4%)

- Barriers
  - No perceived benefits (73%)
  - Lack of staff knowledge and training (42%)
  - Cost (38%)
- Applications
  - Forest health assessments
  - Species identification

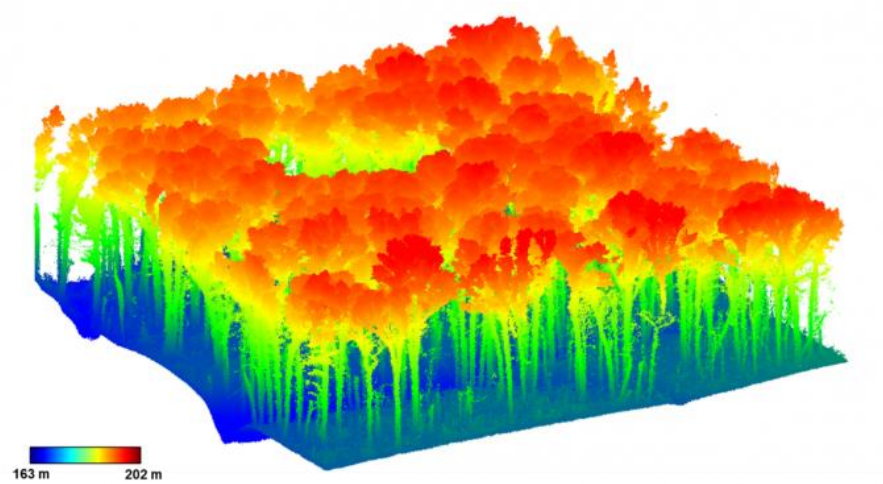


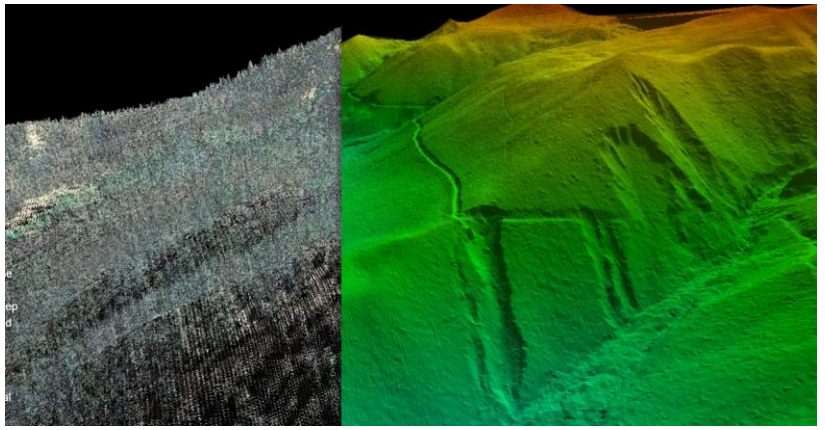
LiDAR

LiDAR (93%)

- Barriers
  - No perceived benefits
  - Cost
  - Lack of staff knowledge and training

- Key applications
  - Road Mapping (60%)
  - Forest Inventory (52%)
  - Stand/Forest Mapping (48%)
  - Hydrological Feature Mapping (48%)

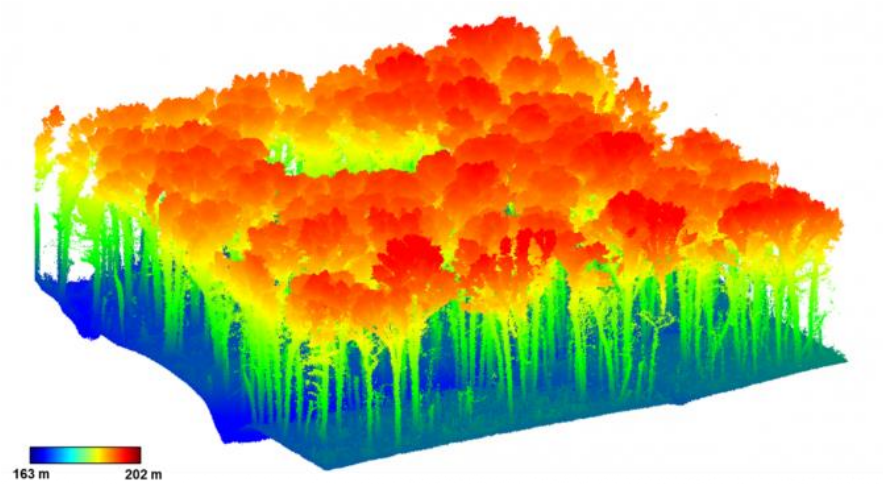


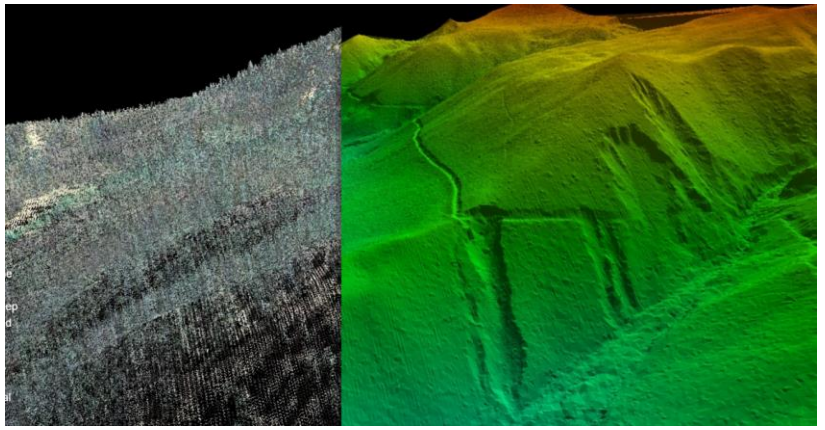


LiDAR

LiDAR (93%)

- Acquisition
  - Aeroplanes (67%)
  - Open data portals (57%)
  - UAVs (29%)
  - Satellite (10%)
- Data processing
  - Third party organisation (68%)
  - In-house (32%)



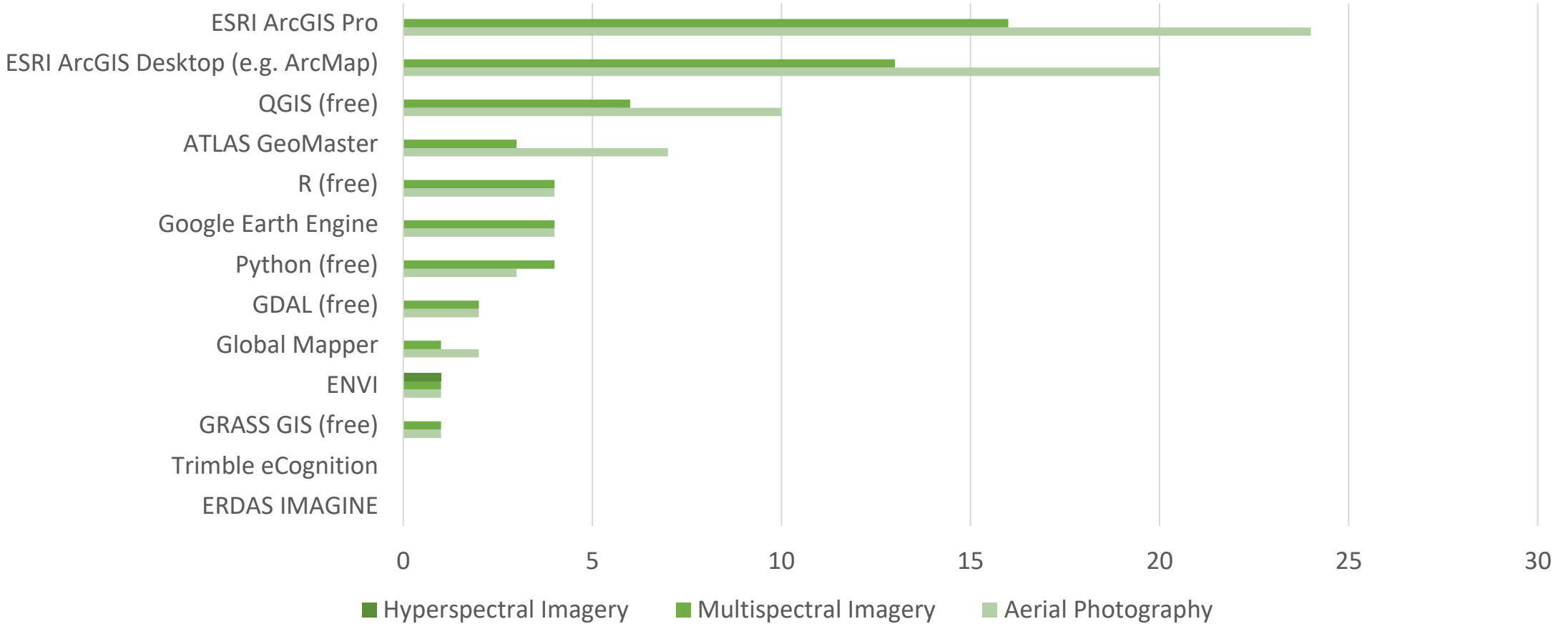


Artificial Intelligence

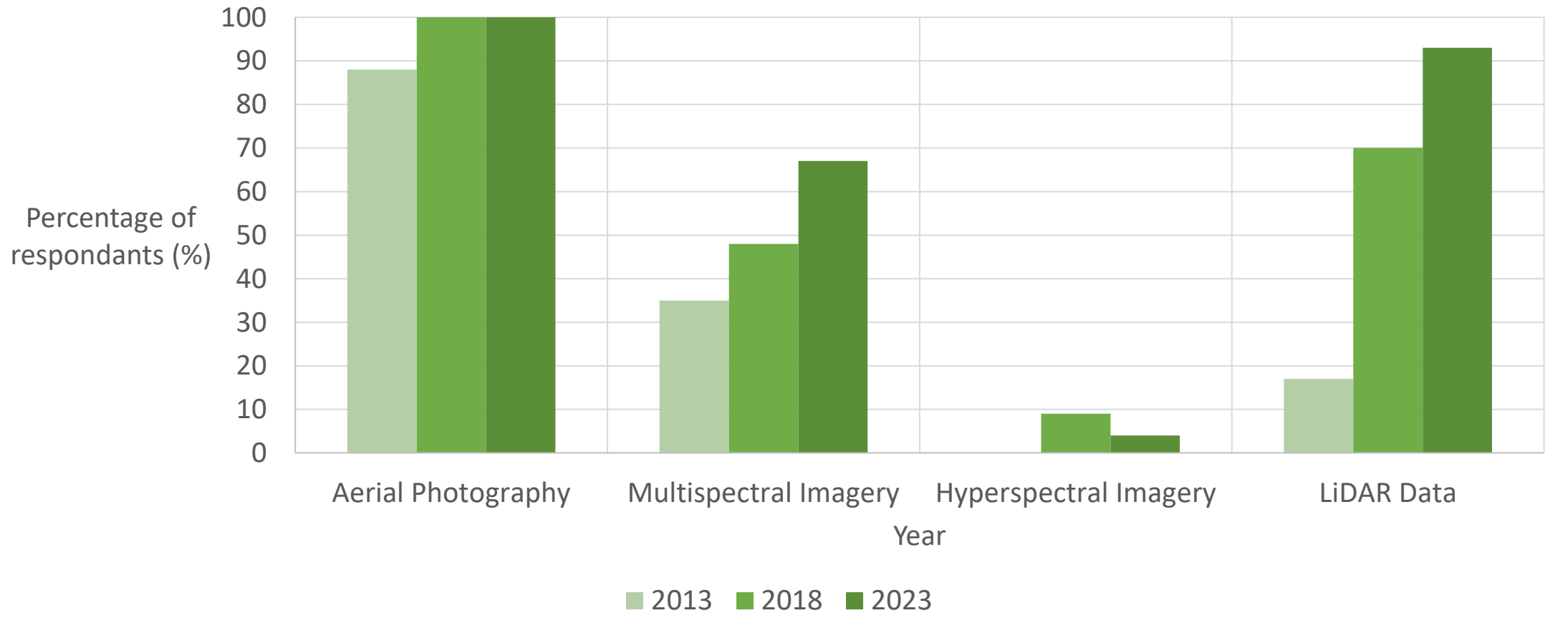
Artificial Intelligence (30%)

- Barriers included
  - Lack of staff knowledge and training (68%)
  - No perceived benefits (21%)
  - Not aware of AI models (21%)
  - Cost (11%)
- Key applications
  - Stand/forest mapping (50%)
  - Forest inventory (50%)
  - Tree detection (38%)

Software – visualise and analyse imagery



Changes in uptake



Conclusion

- The results of this survey show the uptake and continuing use of geospatial technology in the forest management industry

- Identified barriers show the industry should focus on increasing technology exposure, as well as providing training for the latest technology such as AI

- The results from this study will inform
  - The industry on how to fully capitalise on their acquired data
  - Educational institutes for up-to-date teaching material

Acknowledgements

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Survey Respondents

Survey trialists

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