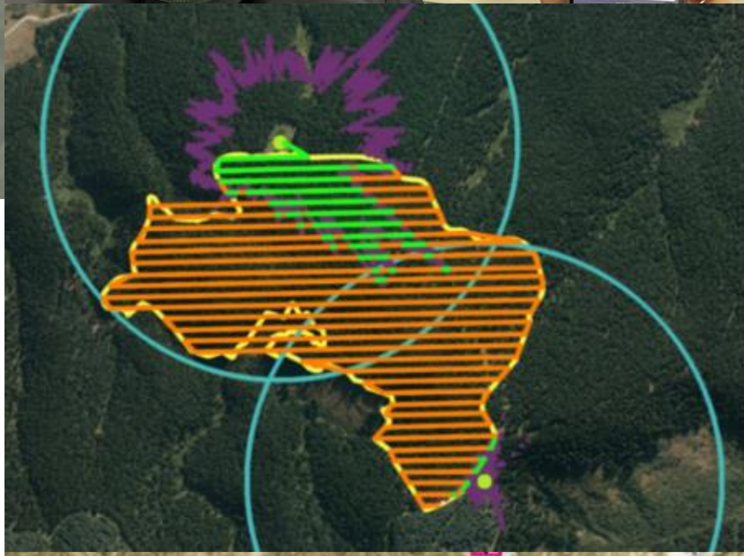
Tools for foresters

Annual Update 2020-2021



forest tech2022

Remote Sensing • Inventory Management • Mechanised Silviculture

Remote Sensing Cluster Group

The TFF Vision

“Eyes in the air, reducing the boots in the blackberry”

“We play a leadership role helping industry and science come together to progress forestry through easier implementation of technology.

We aim to remove technical hurdles and roadblocks to get useful technology into the hands of forest users. In doing so, we aim to help attract the next generation of forest workers, upskill workers, reduce downtime, costs and trouble shooting and improve forest profitability. These technologies can provide a sense of kaitiaki through the monitoring of our forests from above and below”

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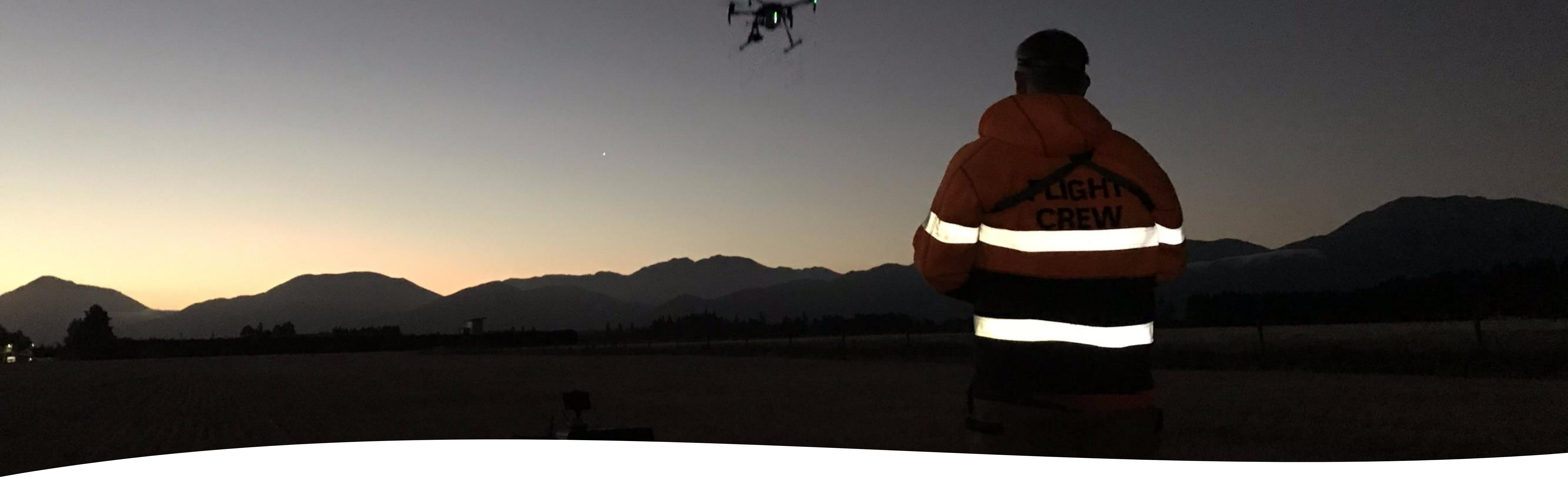

Aims

- Create a network
- Disperse knowledge
- Be an advocate for tech users
- Instigate trials
- Familiarise technology
- Democratise technology
- Drive stretchy research
- <u>Standardise & professionalise UAV operation</u>

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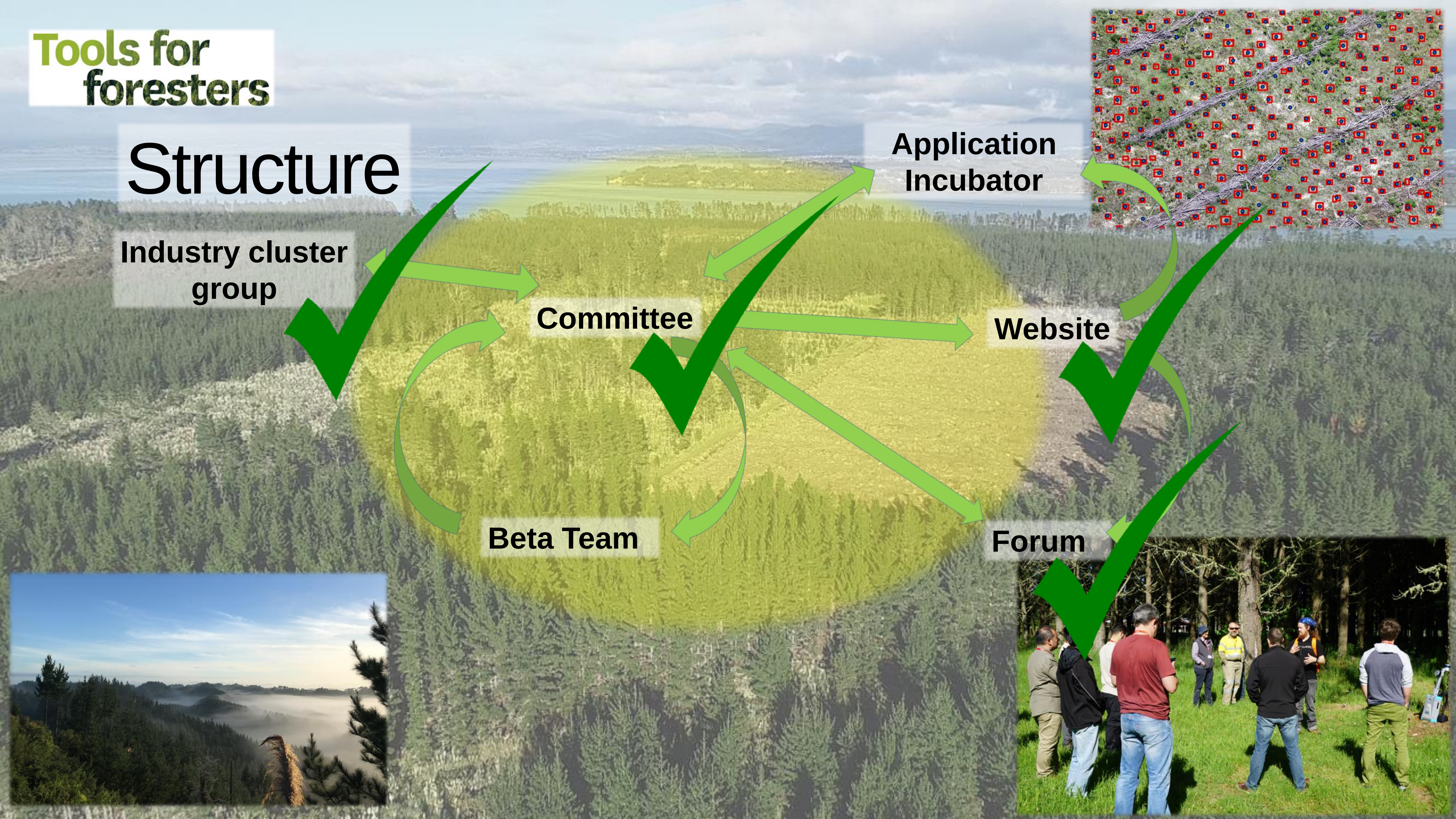
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Structure
Industry cluster group
Committee
Application Incubator
Website
Beta Team
Forum

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Update

- Where are we at?
- Forum
- Publications
- Applications (SOPs)
    - Structure
    - Update
    - Masters Study
- Funding
- Website update
- Mailing list update
- Next steps

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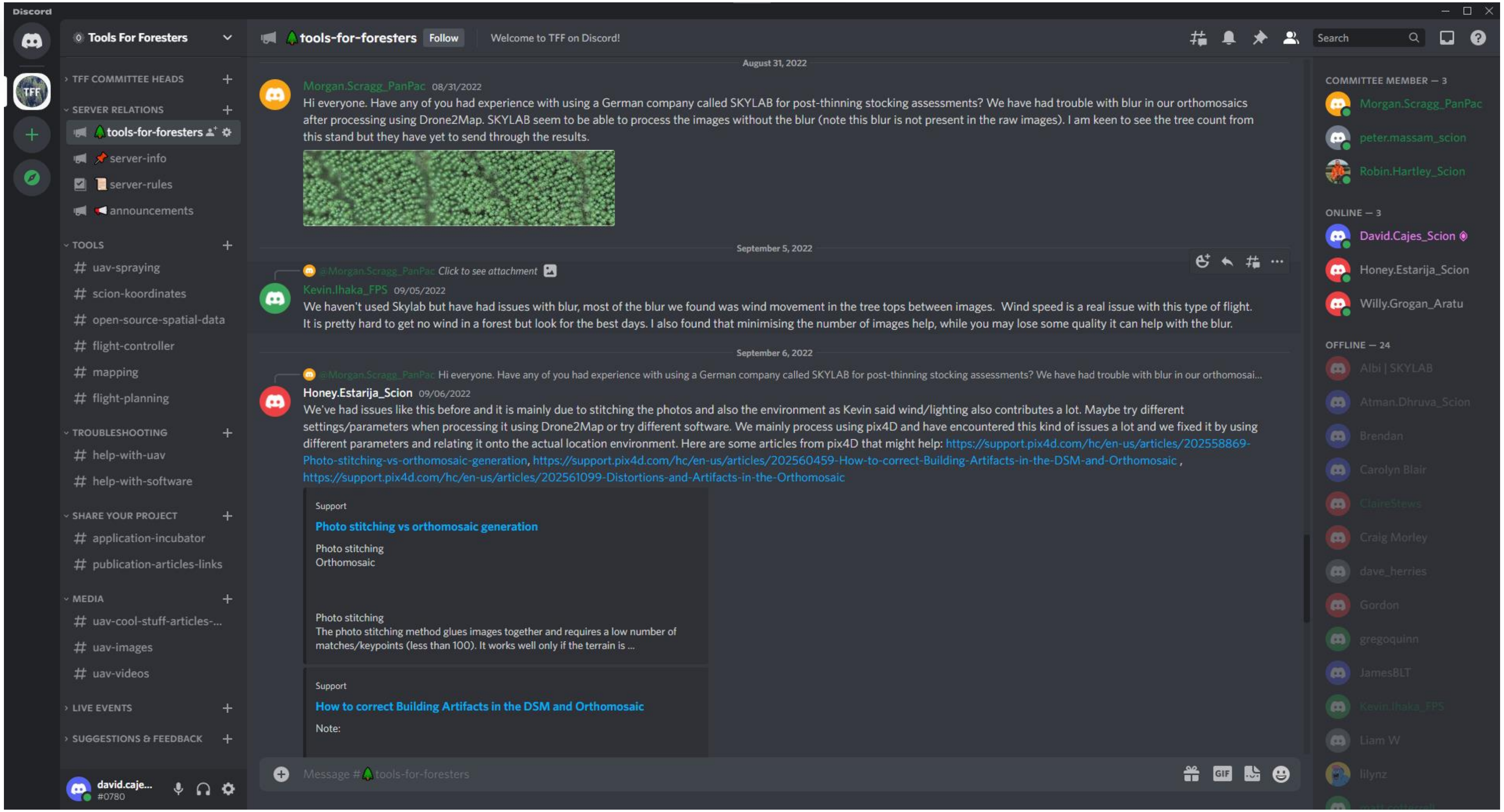
Forum

- Earlier this year we launched a new forum
- Using the Discord platform
- Little introduction to what's on there
- Encouraging users to use this forum to ask advice RE issues/queries to get started



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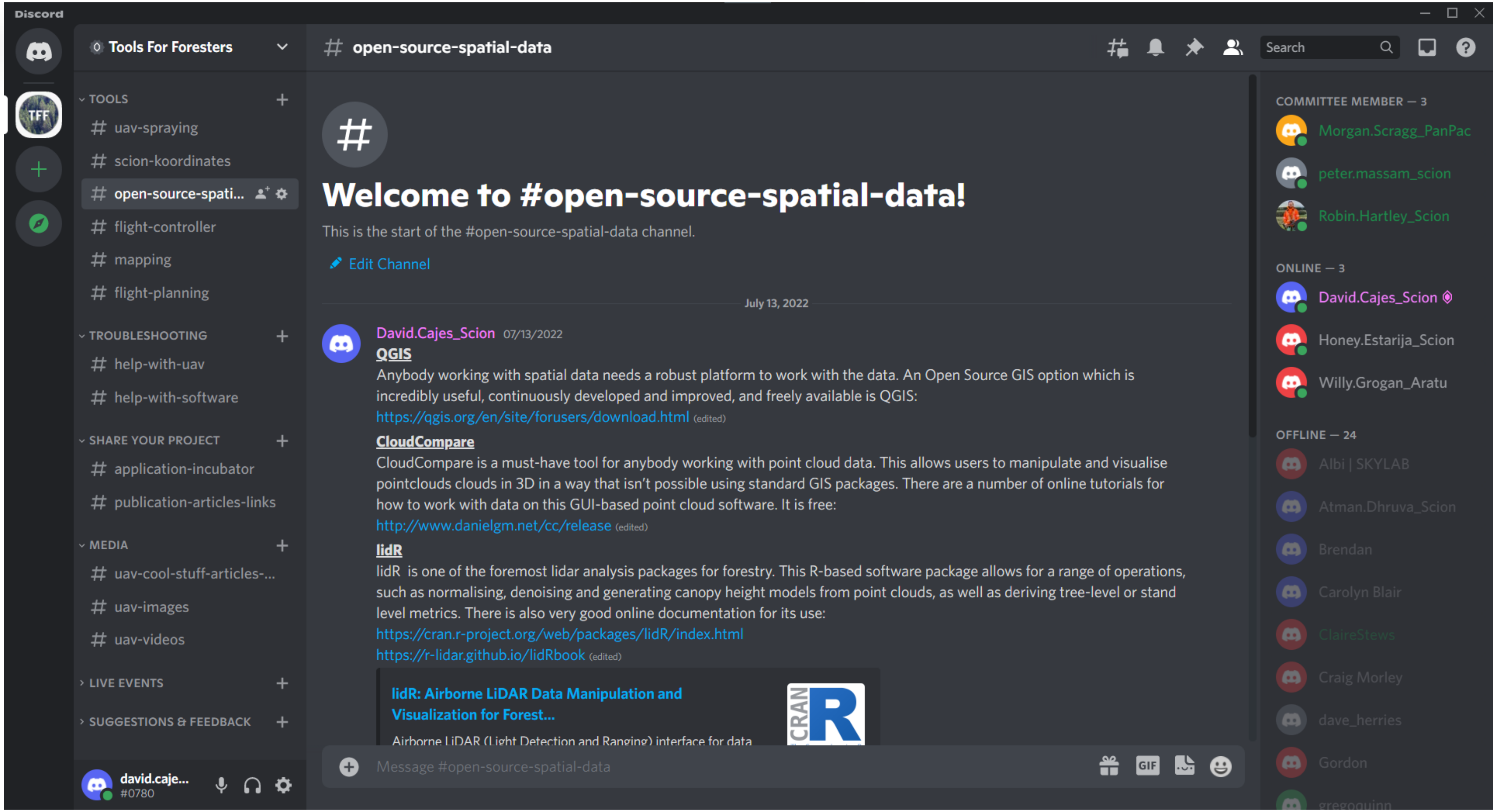

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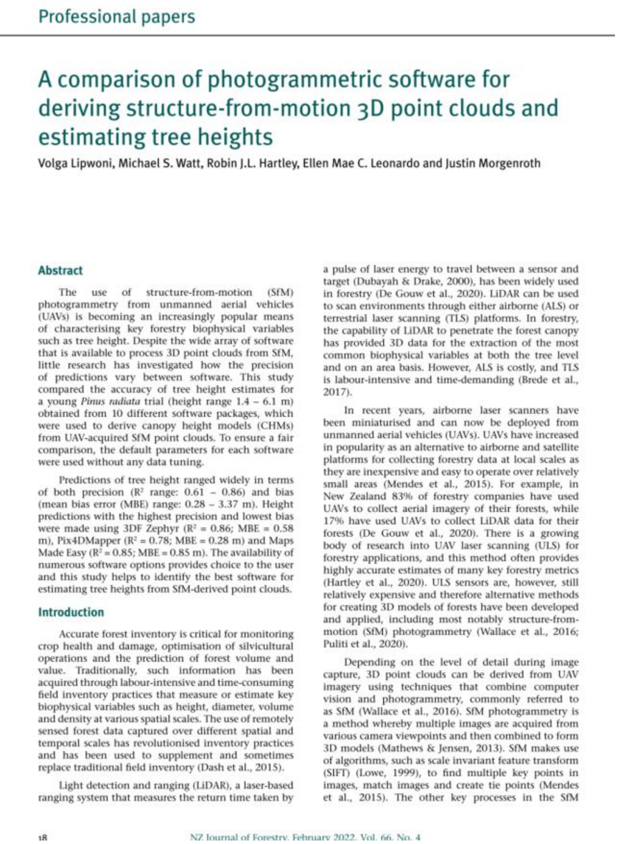

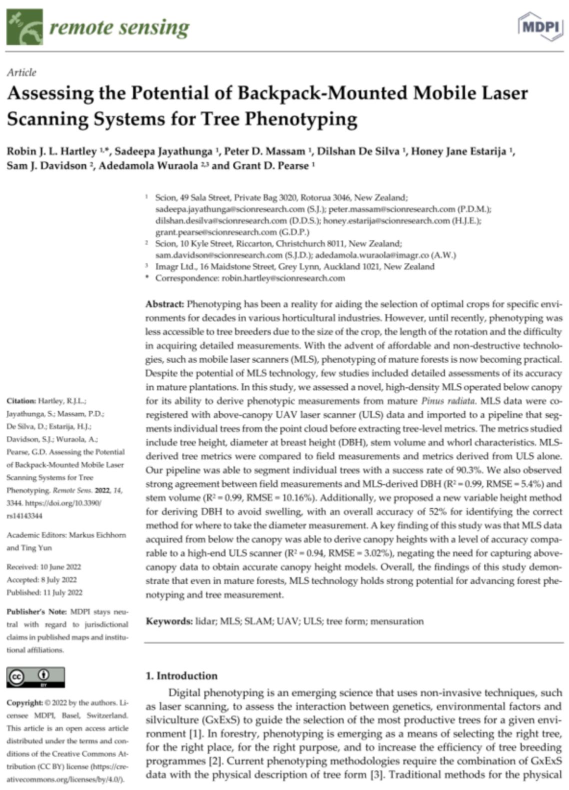

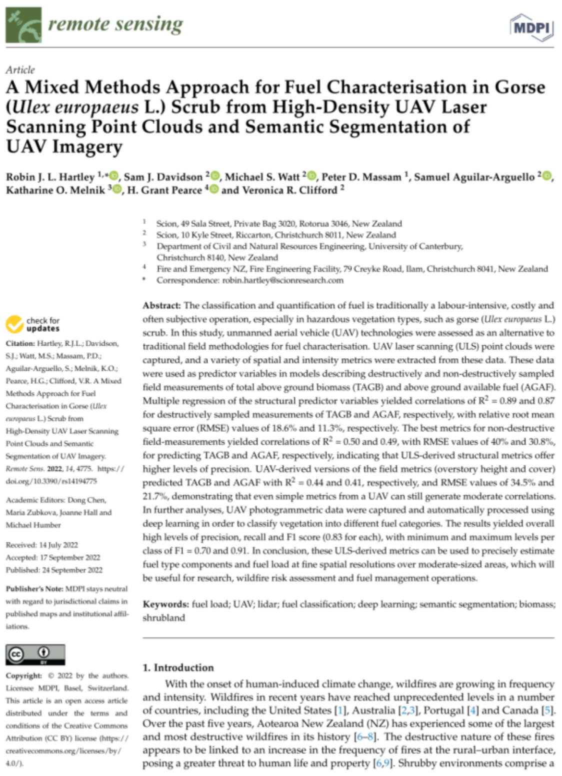

Publications

- **SfM Software publication**
- **BVLOS publication (funded by TFF project)**
- **Hovermap Publication**
- **Fuel Mapping**

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UAV Applications

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- **We are developing SOPS in 3 areas:**

TFF Essentials

- Basic operational procedures for beginning operations with UAVs in forestry

TFF Operations

- Specific applications of UAVs to different forestry operations

TFF Processes

- Instructions for how to carry out opeational data processing on UAV data

UAV Applications

- **TFF Essentials**

1. How to plan UAV operations in forestry
2. How to carry out UAV operations in forestry
3. Pre-flight checks
4. TFF hazard register
5. How to establish ground control
6. How to match SfM DSM to a lidar DTM

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UAV Applications

- **TFF Operations**

- Post-thinning assessment
- Tree growth
- Post-plant
- Survival surveys
- Crop health assessments
- Disease Monitoring

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UAV Applications

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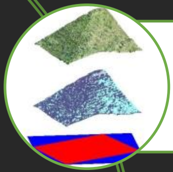
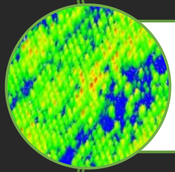
- **TFF Processes**


Deriving a DTM


Deriving a CHM


Deep Learning for stocking

Applications Launch

- **We have recently compiled a number of SOPs which are freely available to download from Toolsforforesters.co.nz**
- **SOPS with * have been endorsed by UAVNZ – the professional body for UAV operators in NZ**

TFF Essentials

- *How to plan UAV operations in forestry
- *Pre-flight checks
- TFF hazard register
- How to establish ground control

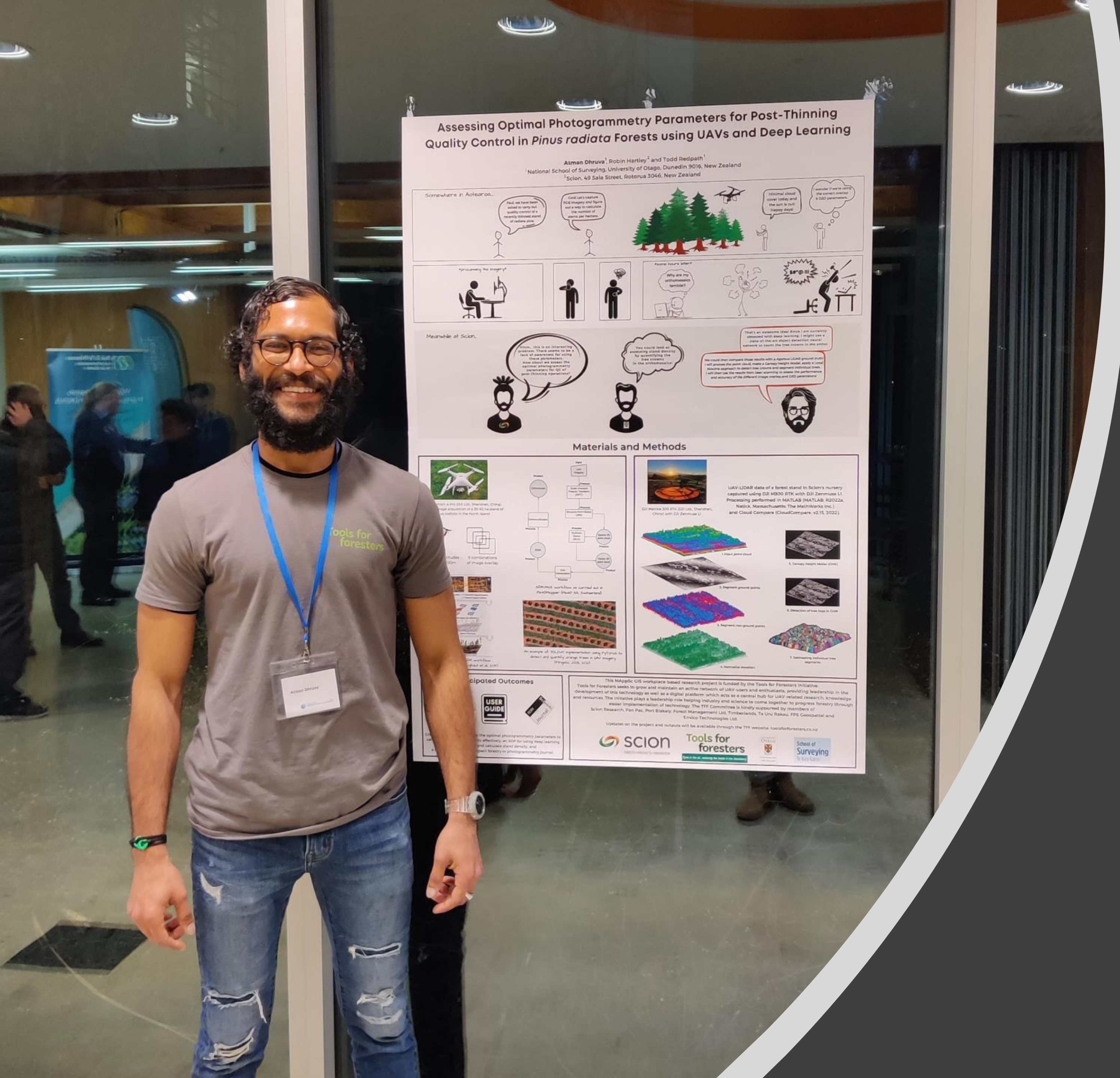
TFF Operations

- Post-thinning Assessment

TFF Processes

- Deep Learning for stocking assessment
- Peak Detection for stocking assessment

Coming soon!



Masters study: optimal flight parameters for post-thinning assessment using UAVs

Atman Dhruva

Studying MAppSc GIS at University of Otago

Optimal flight parameters for conducting SfM surveys of stands post-thinning

Using UAV lidar as ground truth (DJI Matrice 300 with DJI L1 sensor)

Collected data with a DJI P4 Pro

18 flights in a 30ha stand in challenging terrain

Production thinned “flat”/thin-to-waste steep

Working on SOP for using ESRI DL tools for stocking counts

Delivering a workshop on this at ForestTech

Funding

- So far, only funding from Scion to move things forward
  - 2021-2022:
    - Helped us get the website up and running
    - Got our branding sorted
    - Publication of a paper on BVLOS in forestry
  - 2022-2023:
    - Get newsletter up and running
    - Get forum up and running
    - Fund MSc student to develop a SOP for carrying out post-thinning assessments with UAVs
    - Workshop at Forest Tech
- Now out of funding…
  - Applied to FGR to fund the Deep Learning shared data sets
  - Presented TFF initiative to FGR to try to fund more applications
- <u>Without more funding we are unable to do much more…</u>

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Toolsforforesters.co.nz

- **In the past 6 months:**
  - **3000 visits**
  - **20% visits to the main page**
  - **5% to tools page**
  - **4% to publications**
  - **4% to sign up page**
- **Big jump after newsletter**
- **Will be looking at ways to increase traffic and make the website more interactive**

Mailing list

- 64 members
- NZ and international
- Forest growers, contractors, consultants, government, research, academia
- Not as many as we would like!
- Please sign up and encourage your staff to sign up at Toolsforforesters.co.nz
- Upon subscription, you get your welcome email with a link to our forum!

Subscribe to TFF!

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Next steps

- Get more involved
  - Sign up for beta testing!
  - Start using the SOPS!
  - Get a login for the forum and start asking questions and sharing images!
- Funding
  - We will be applying for funding again this year
  - Open to suggestions for funding options
  - We cannot maintain/gain momentum without it.
- Committee will be meeting quarterly this year to keep things pushing along

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Acknowledgements

- TFF Committee for all their time dedicated to the cause
- David Cajes for his hard work getting the forum set up!
- Rina Joy (Scion) for the web design and support
- Claire Stewart for funding and committee work
- Mike Watt, Aaron Gunn and RSCG for continued support
- Innovatek for their support and help with the workshop
- Everyone in industry who has supported us so far

www.scionresearch.com
www.toolsforforesters.co.nz

SCION
FORESTS ▪ PRODUCTS ▪ INNOVATION

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Prosperity from trees *Mai i te ngahere oranga*

Scion is the trading name of the New Zealand Forest Research Institute Limited