YSAR
YOUTH SEARCH AND RESCUE
NEW ZEALAND

2019 NZEUC

Early adopters of innovative technology in search and rescue and emergency management

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Presentation

- YSAR org
- Organisational scaling
- Partners
- Projects
- Roadmap

YSAR NZ Trust

Background

- YSAR NZ non-for-profit organisation in our 11th year
- Recently transitioned into a national charitable trust
- A three year programme, 14-18yr college students
- Run by volunteers from; SAR, EM and ER sectors
- Associate member of LandSAR NZ
- Tauranga est 2009, Auckland est 2018
- 2021 regional expansion

YSAR strategic focus

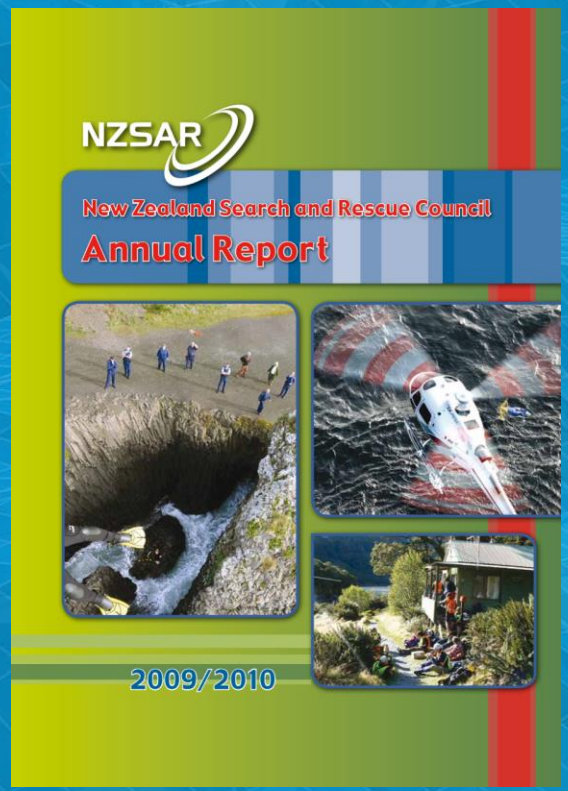
Why we exist

- Succession for SAR and emergency management – addressing aging and decline of volunteers
- Promote ethnic and gender diversity
- Promote a culture of innovation and technology
- Develop science, technology, engineering and math (STEM) pathways for our youth
- YSAR national expansion in collaboration with NZSAR, Coastguard, LandSAR and AREC

Emerging challenges for SAR volunteerism: 2009/10 - 2019

NZSAR Volunteer Report 2009/10

Who are our volunteers?
The study found that volunteers in the NZSAR sector are generally older males – for Coastguard and LandSAR 82% of their volunteers are male, and 67% are over 40 years old. The major exception is Surf Life Saving NZ, which reported that 54% are less than 20 years old, and 40% are female.
This illustrates the need for voluntary organisations to recruit both younger and more female volunteers.
https://nzsar.govt.nz/Portals/4/Publications/NZSAR%20Annual%20Reports/NZSAR%20Annual%20Report%202009-2010.pdf



Emerging challenges for SAR volunteerism: 2009/10 - 2019

LandSAR Volunteer Report

Organisations that are successful in recruiting and retaining **younger volunteers have feeder programmes** and also **recognise the competence and contribution of younger members** (e.g. Surf Life Saving New Zealand and Scouts). With only 23% female members, **work is required to identify why this disparity continues and how to address it.**

NZSAR Volunteer Report

The New Zealand SAR sector **is heavily reliant on males, two thirds of whom are aged over 40 years**. There has **been little change in the demographic** makeup of volunteers in the sector over the past eight years. This contrasts sharply with the demographic changes in New Zealand's population over the same period. Indicators are that **if the current membership demographic trend continues it will create a succession risk in the medium term**.

Internal and external training

Student commitment

- weekly classroom training
- 8 weekend training exercises
- annual 5 day training SAREX
- voluntary community work
- Programme delivery primarily by volunteers - search & rescue, emergency services and civil defence sectors

External training providers for specialist courses;

- Specialist skill competencies SWR, AOTL – Rescue 3 Tai Potini Polytechnic
- Coastguard Day Skipper, Marine Radio - Coastguard Boating Education
- Tracking and clue processing - LandSAR
- Outdoor First Aid – LandSAR
- Outdoor bush instructor – Adventure Works
- Duke of Edinburgh doe@ysar.nz

Scaling YSAR

Challenges

- Address complexities associated with scaling a National youth development – Tech futures
- Continue training SAR and CDEM volunteers - BAU
- Governance transition from operational focused BOT
- Develop tools to enable safe and sustainable growth
- Partnership and sponsorship withtech companies
- Online SMS - visibility and transparency
- Capture Project Base Learning through web-base LMS
- Link to NZQA pathways to maximise student return
- Discover better volunteer management strategies

CANVAS LMS – Lesson Plans

C3SEARCHMETH - Drones - YSAR Lesson plan

Drone deployment in SAR

(This activity may be externally facilitated e.g. representative ESRI / GPS-it)

Aim: What is the aim of the lesson? (Short overview) To build on students' piloting skills and knowledge of UAV technology	
Duration Friday evening – Sunday afternoon	
Learning outcomes By the end of this activity, students will be able to fly drones around a set course to collect visual data **Content** Drone / UAV technology Uses in SAR and Emergency Management. Logging AirShare flights, and flight time Taking aerial photographs and 3D imagery for base maps SitaWare Legislation – Civil Aviation Act	**Resources the teacher requires** • Completed *Activity Intention Plan* • Relevant *Location Guide and Safety Briefing* document • *Attendance and Evaluation* forms • PowerPoint Using drones for SAR, as reference • Drones and equipment **URL Links / Resources for leader planning/revision** • https://www.airshare.co.nz/maps • http://www.esri.com/products/drone2map
How assessed • Completion of all exercises and tasks in the field demonstrating good understanding and practice. • *Attendance and Evaluation* forms completed.	**Hazard associated** Allergic reaction; Back Packs; Burns; Communication Failure; Dehydration; Disorientation; Emotional Harm; Falling off cliffs; Fatigue; Heat Stroke; Hole in the ground/Tomo; Hunters; Hypothermia; Incorrect equipment; Knives; Supplejack; Vehicles - General; Vehicles - Off track staff deployment; Wasp Stings; Waterfalls; Weather; Injury
Applies and practises the following YSAR curriculum topics • Search Methodology, RAMS	**STEM topics** Technology, Geography

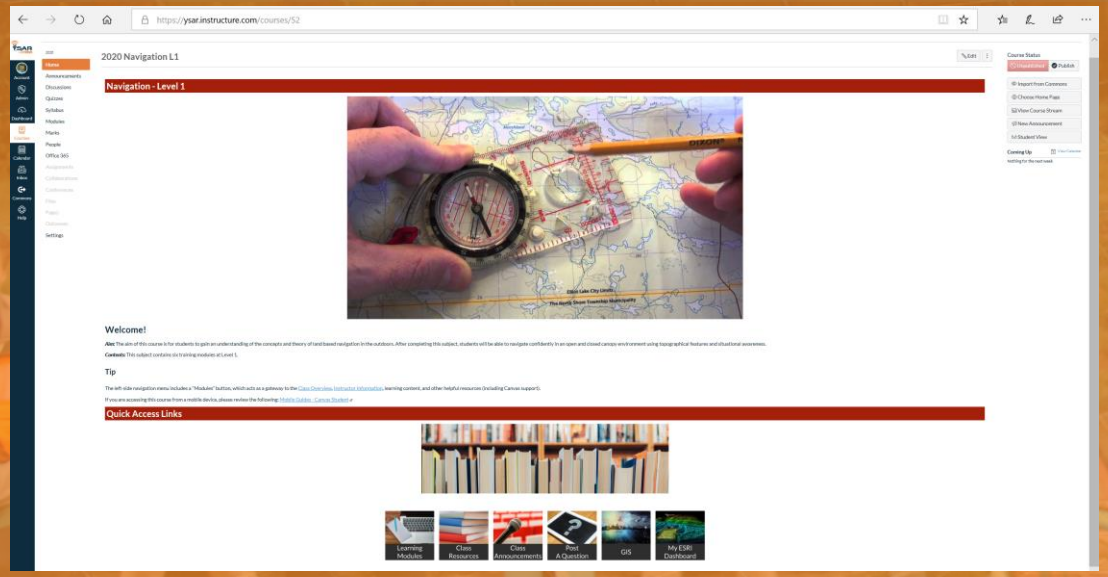
Tasks	Comments / Purpose / Process
• Students undertake a series of activities designed to test and extend their piloting skills • On return from camp, data is uploaded via ESRI software and added to an online map – students can do this task in a mid-week class.	Students can also be tasked to use smart devices for intelligence gathering. Depending on numbers and drones available, the goal is to have 1 hour flight time logged per student.

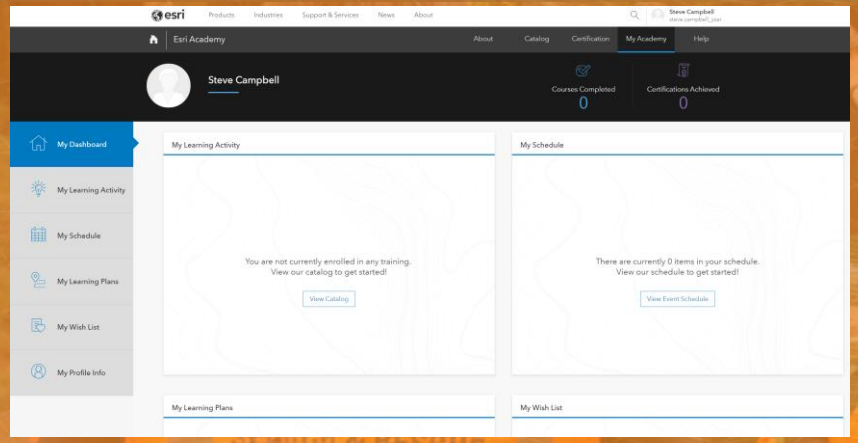
CANVAS LMS - Resources

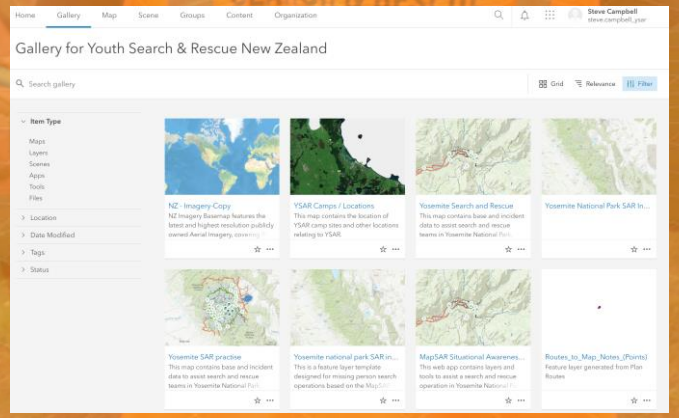
SEARCH TECHNOLOGY

- **Drones**
  - Drones are essentially a flying robot – either remotely controlled or fly through software controlled flight plans using onboard GPS
  - Uses: SAR, surveillance, traffic monitoring, weather monitoring, firefighting, photography, subdivision mapping, agriculture, delivery services, recreational …
- **Robotics**
  - Rescue robots serve as extensions of responders into a disaster, providing real-time video and other sensory data about the situation.
  - Uses: mining accidents, urban disasters, hostage situations, and explosions
- **Geo-spatial analysis**
  - The gathering, display, and manipulation of imagery, GPS, satellite photography and historical data, applied to geographic models.
  - SAR uses: CIMS coordinators for team and resource management

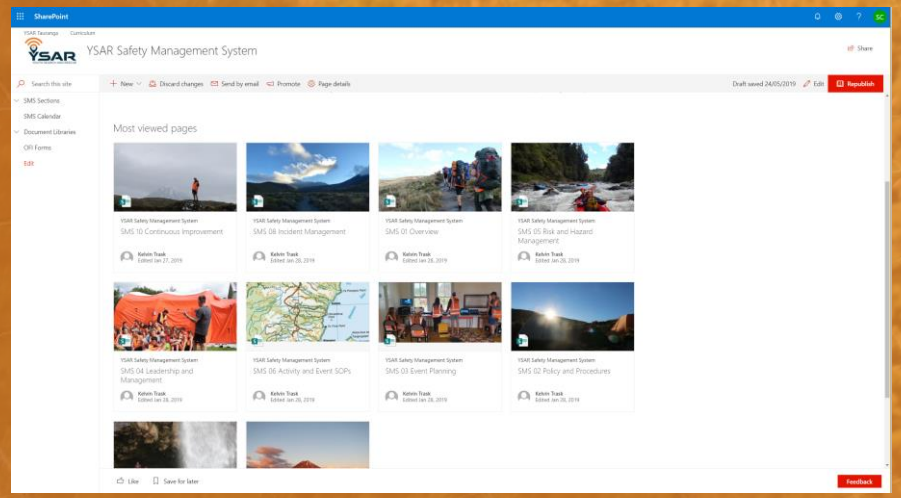
CANVAS LMS - GIS centric

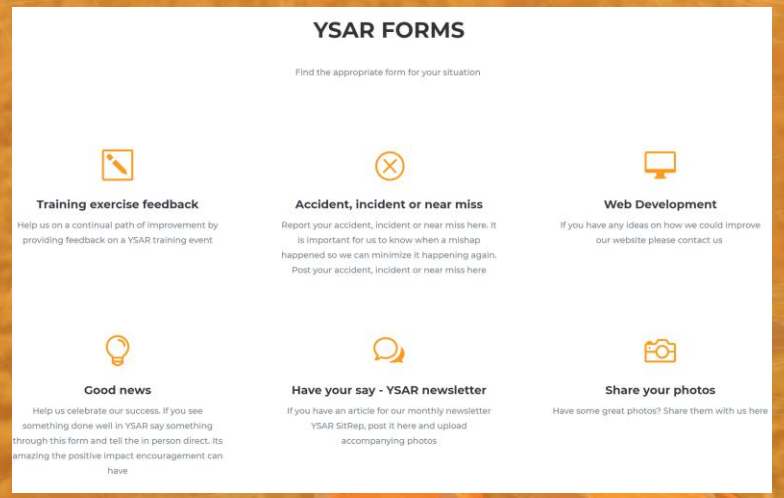


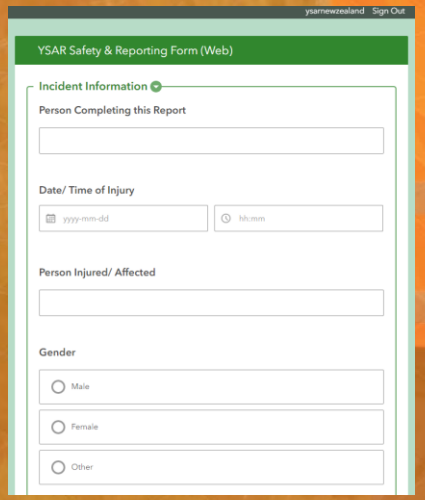




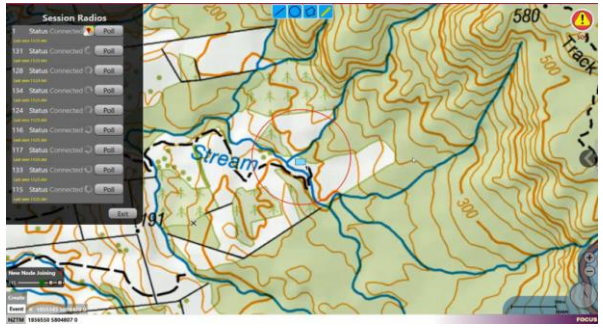
SharePoint SMS integration

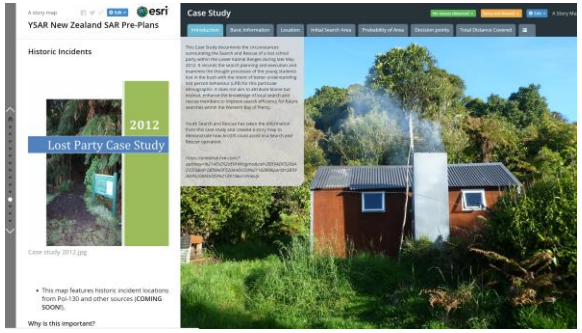






STEM - Projects
Innovation and Technology





Zespri Kiwifruit

wn IoT Internet of Things

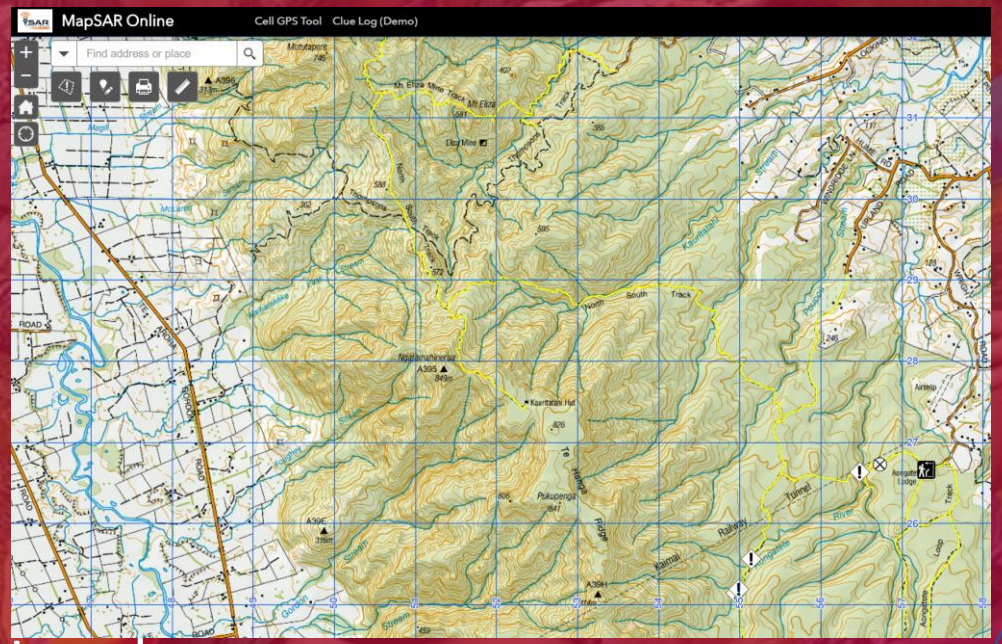
EAGLE TECHNOLOGY

covertex

Partnerships – Eagle Technology

2009 …

- SMS Live tracking
- Predictive analysis LPB
- MapSAR
- RPAS r-jpeg
- Integrated SAR solutions
- SAR Preplanning
- GIS4Schools programme – AGOL and ArcGIS Pro
- Field Force Intelligence



Integrated SAR Systems

1. RADCOM - Radio voice communications

2. TRACK - Live tracking

3. FOCUS - Field Force Management – tasking and coordination

4. INTEL(MAPSAR) - ESRI Geospatial tool for intelligence

Preplanning SAR – what we know before we are call upon. Base on YSAR preplan

Historic SAR operations – Lessons learnt from past events. National Dbase. Change culture to want to learn lessons. Make it an enjoyable and rewarding experience.

Planning

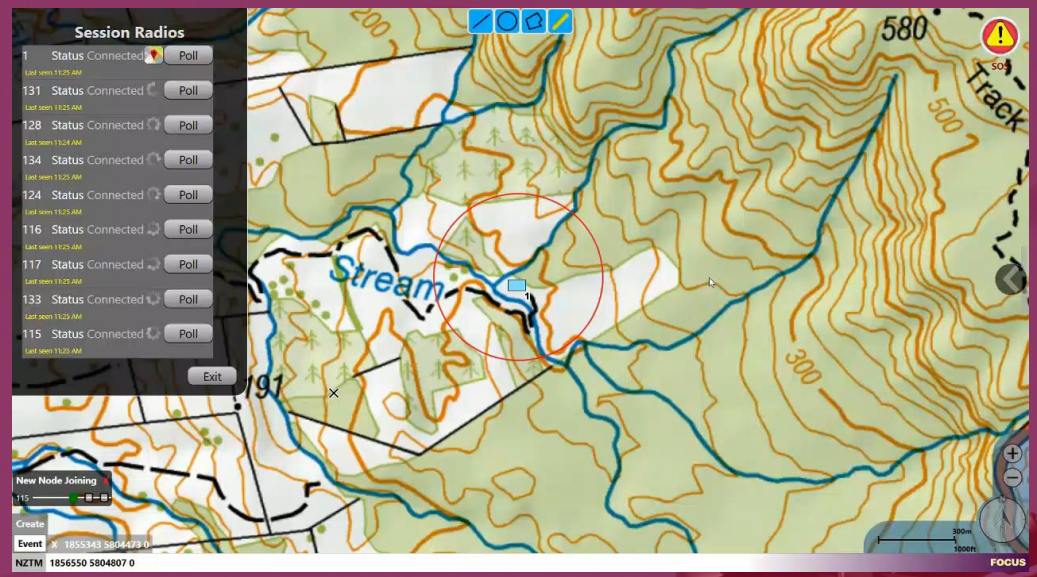
Operational task development

5. SITREP - Integrated IMT reporting and recording SAROP

Field Force Management
Distributed situational awareness - COP

Field Force Intelligence

- Utilise telemetry on existing VHF DMR
- Push and pull intelligence
- Distributed situation awareness; field teams planners and managers
- Mark-ups, save and send layers
- Share GIS capabilities – AGOL and Pro
- Preformatted sitreps and field intel chat
- IMT operational log



EAGLE TECHNOLOGY

esri Official Distributor

ArcGIS Story Maps for SAR and EM pre-planning

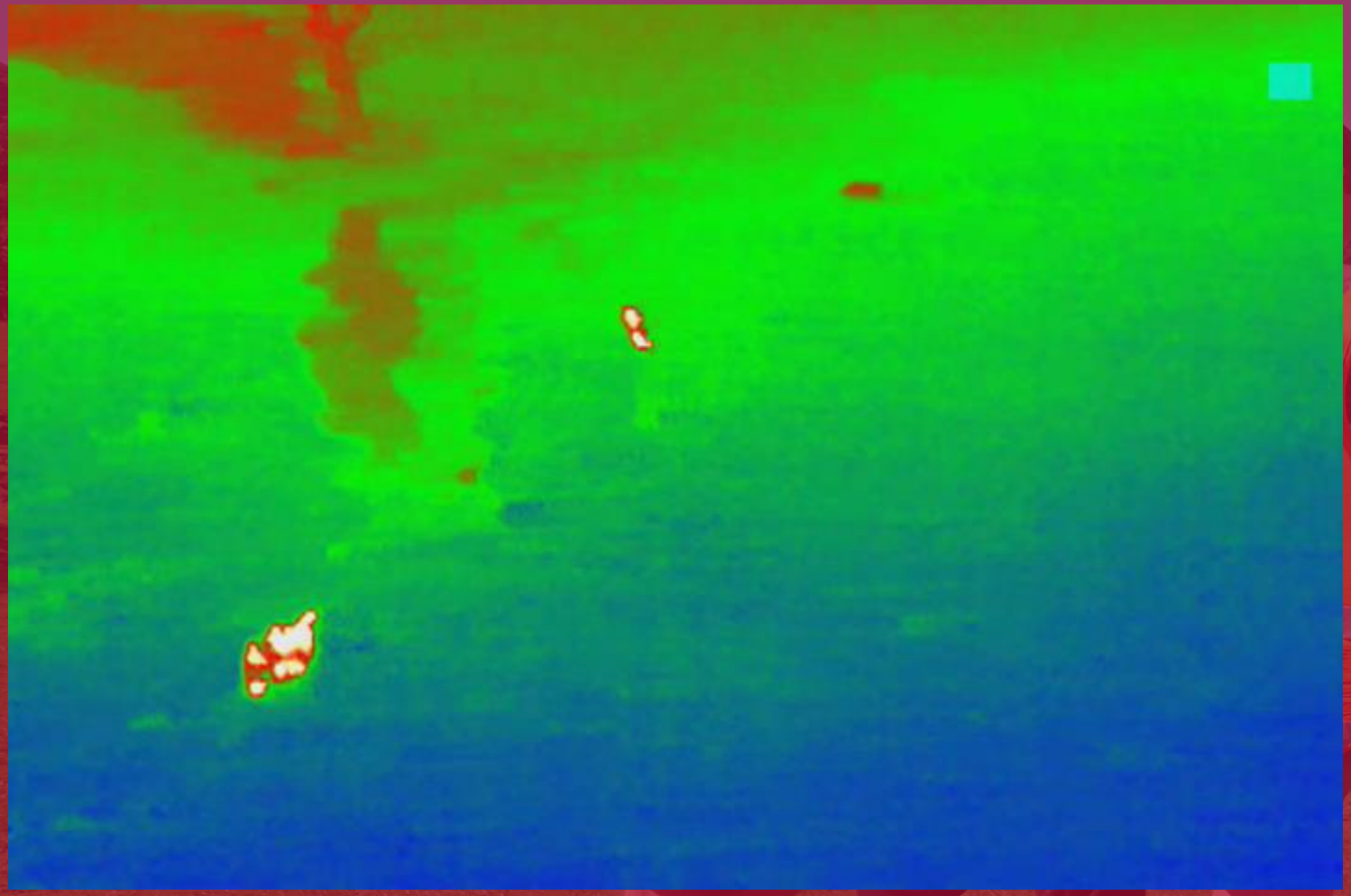
Alex Groos - Auckland YSAR manager

STEM - Projects
Innovation and Technology

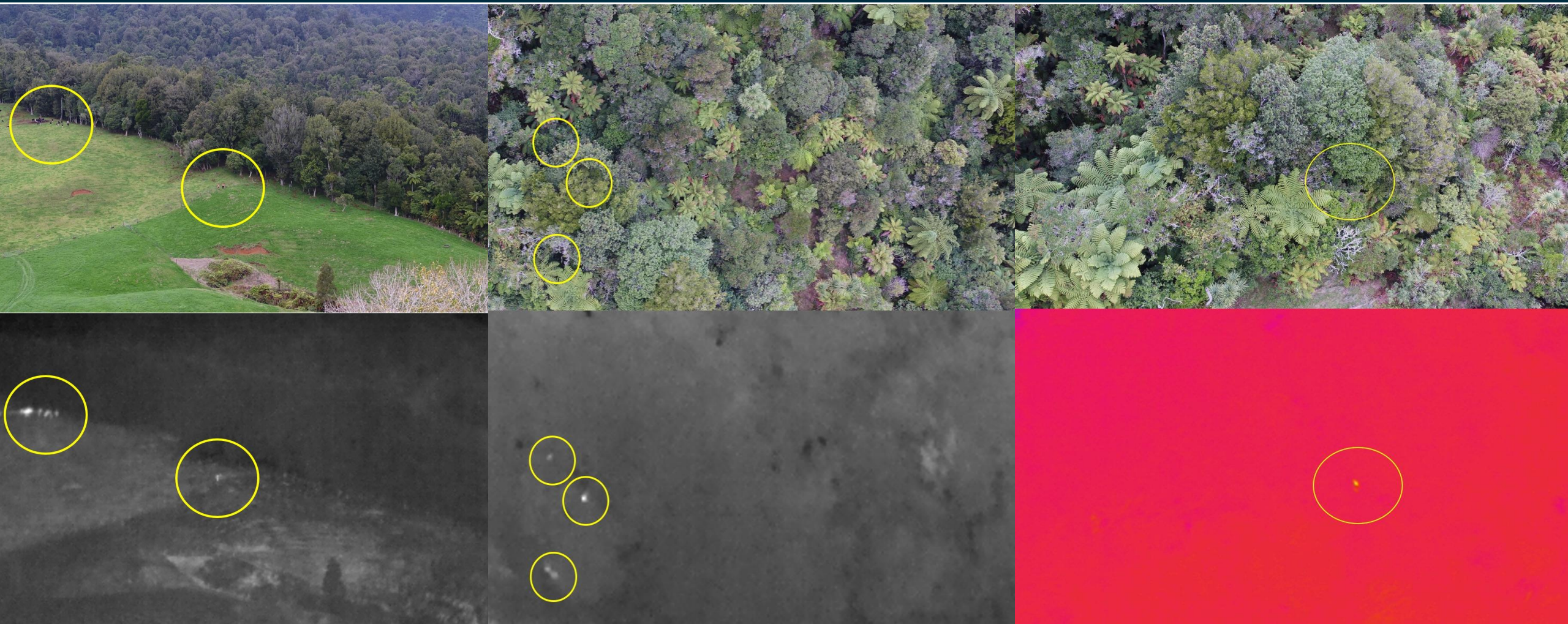
2019/20 projects - project based/authentic learning

1. Predictive analysis utilising Robert Koester LPB and GIS ArcPro
2. Digital mapping - MapSAR Pre-planning on ArcGIS
3. Field Force Intelligence – push and pull field data
4. Dementia tracking on IOT
5. RPAS/UAV in SAR – SOP aerial imagery capture, asset deployment and FLIR, algorithms for analysing radiometric ortho-mosaics
6. Lessons learnt – case study management

FLIR real- time surveillance



FLIR imagery analysis – under bush canopy



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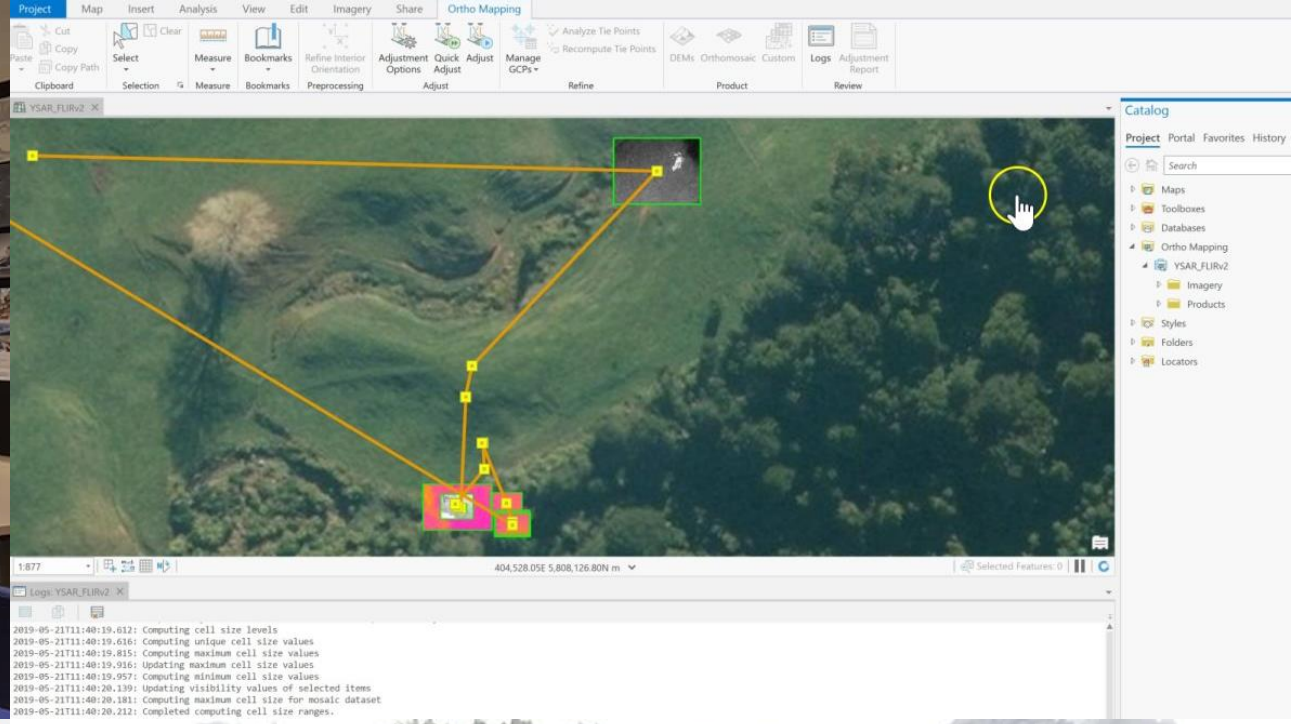
Algorithm development radiometric orthomosaics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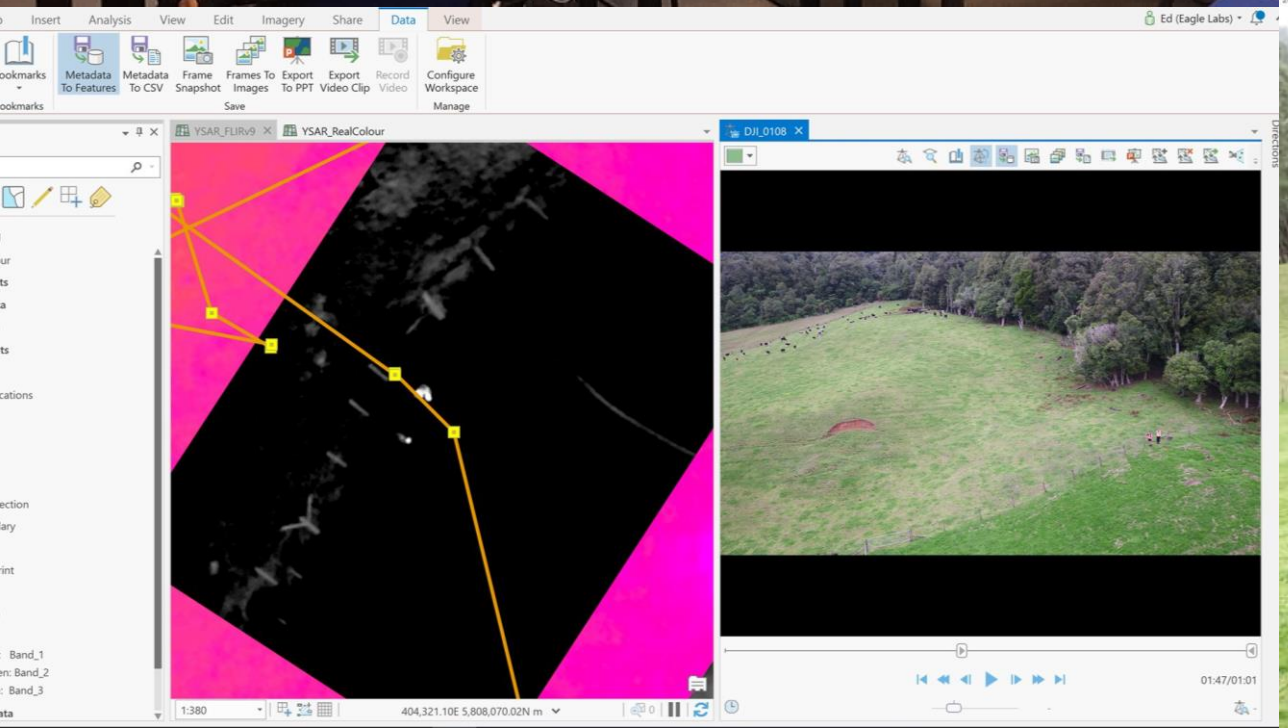
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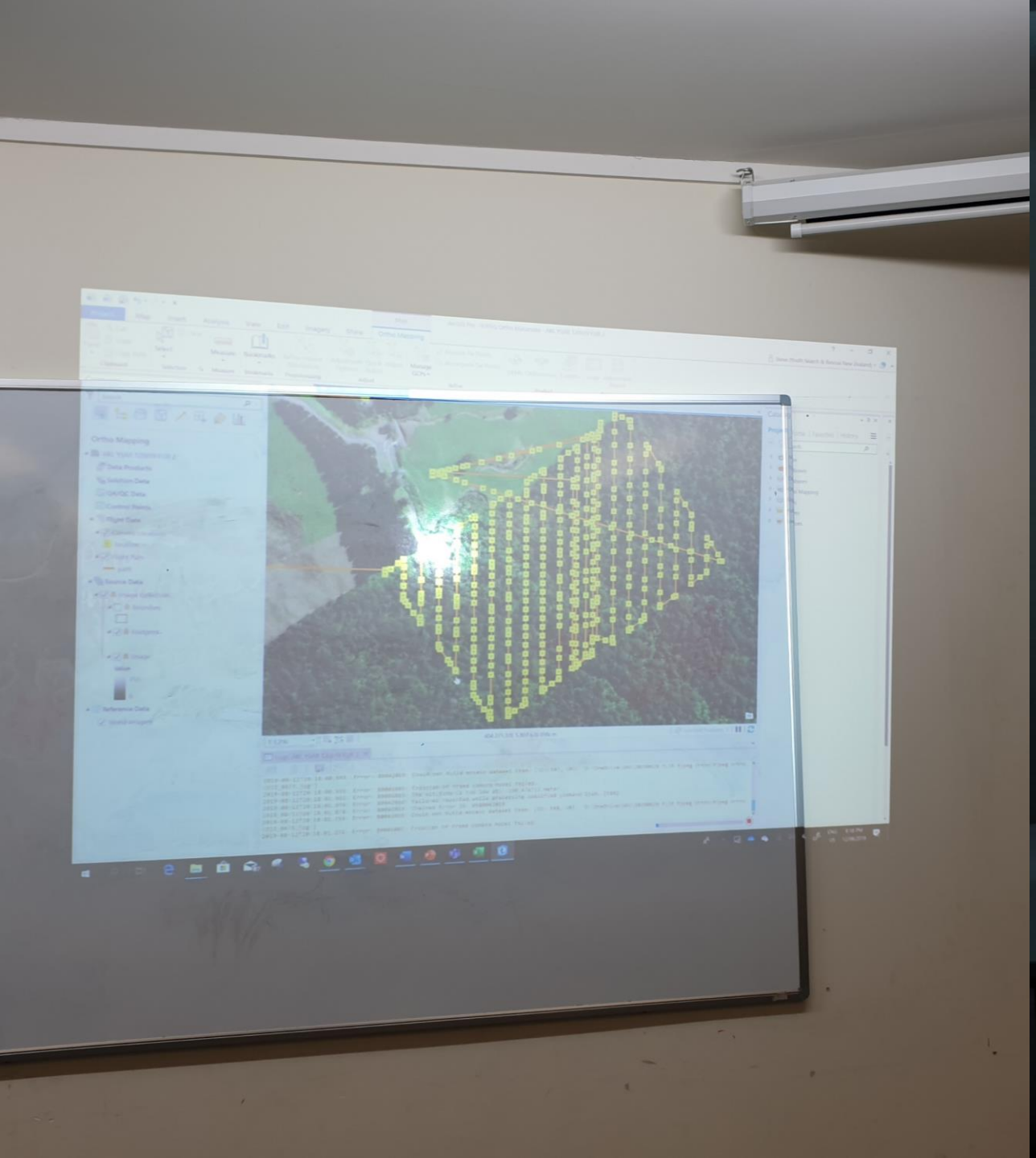

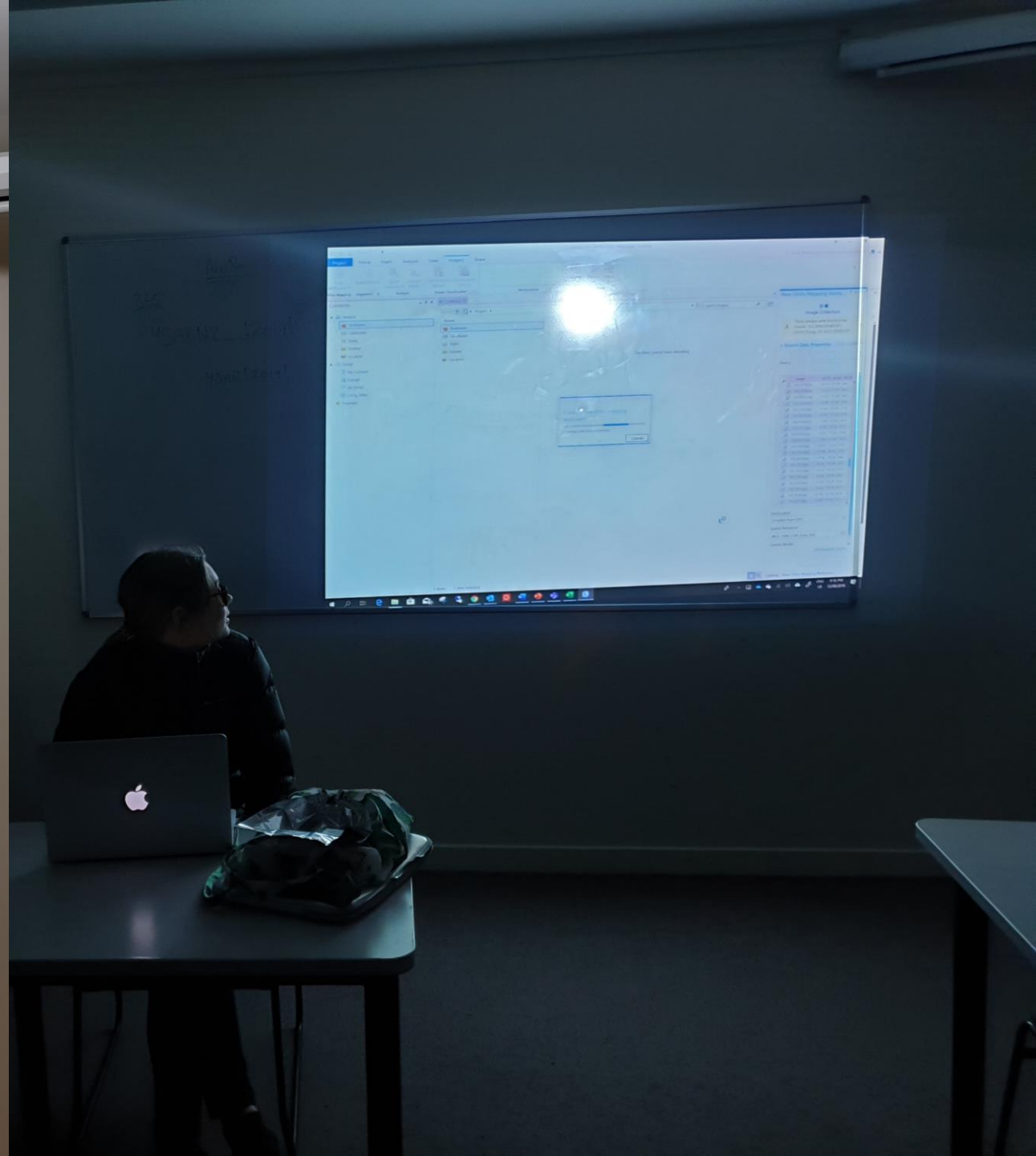

Roadmap

- API between My ESRI – CANVAS LMS
- NZQA/TEC/MOE micro-credential development development
- RPAS SOP 4 SAR
- Regional support for GIS training
- Integrated SAR systems development (FOCUS, MAPSAR, Live tracking, C2)
- Relationship mgt with SAR sector
- Volunteering NZ – youth pathway

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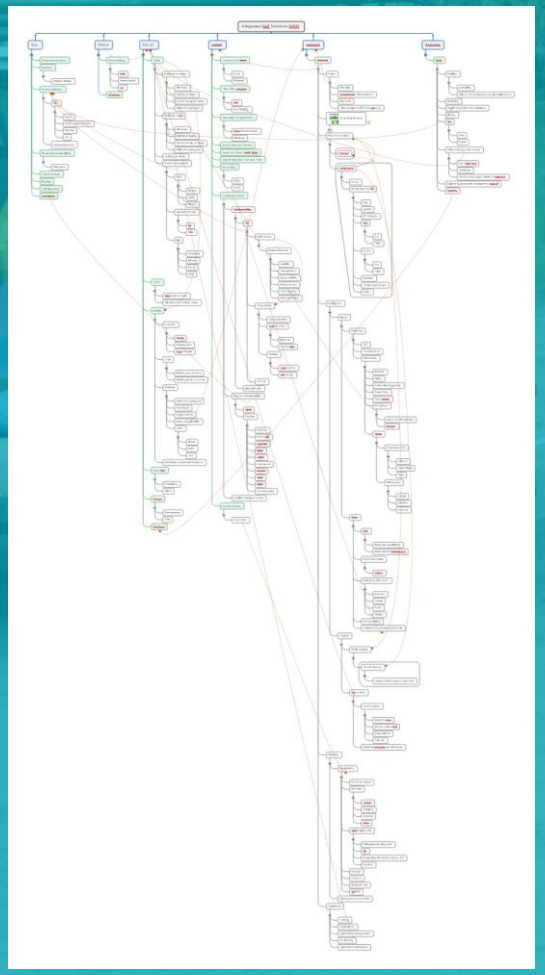

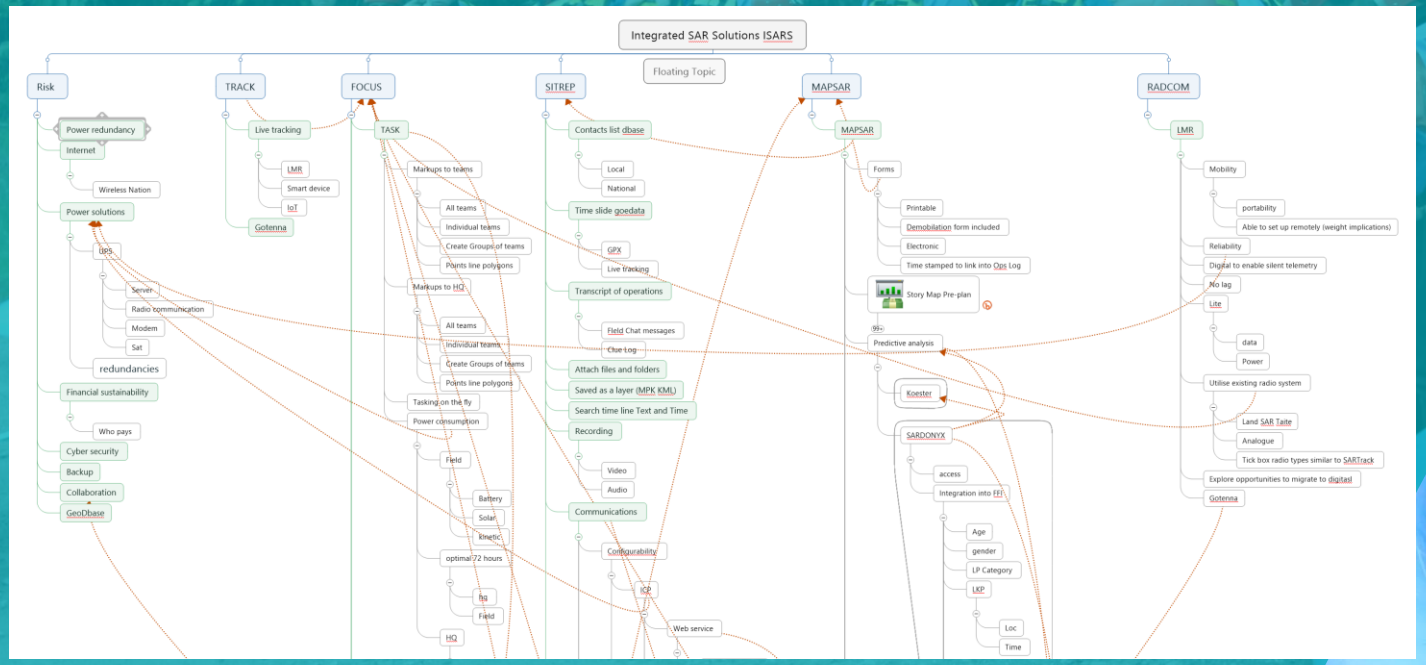


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Thank you