UAS/RPAS & SENSORS
In Environmental Management

Graham Anderson

UAVIATION
AERIAL SOLUTIONS

Today's topics…

1. UAViation
2. Regulations
3. RPAS/UAVs
4. Sensors/Payloads
5. Applications
6. Trends

UAVIATION
AERIAL SOLUTIONS

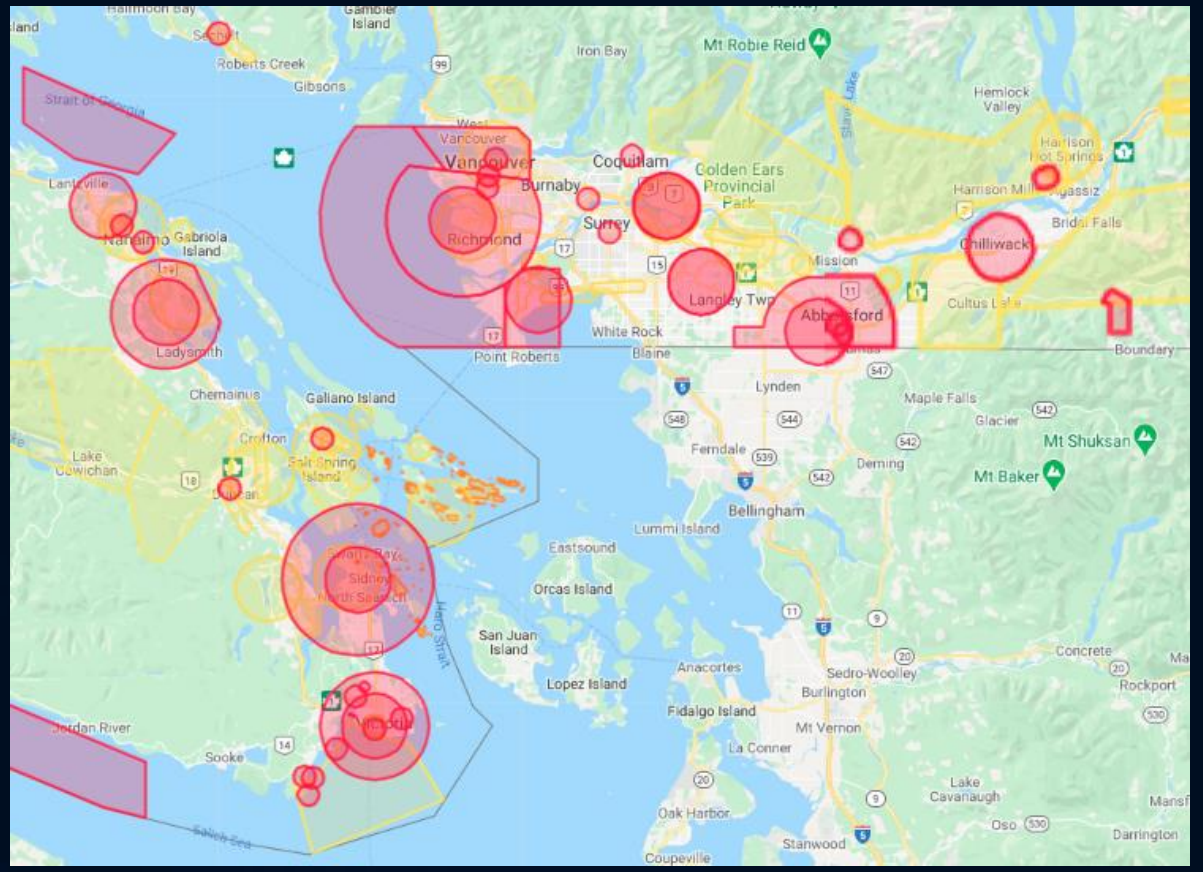
Operations	
Site Locations	500 +
Flights	4000 +
Flying Hours	1000+
UAV Inventory	9
Operators	5

UAS

REGULATIONS

REGULATIONS

- Transport Canada
- Canadian Aviation Regulations
- Licensing
- SFOC's & BVLOS
- Fly Safe!



UAVIATION
AERIAL SOLUTIONS

RPAS/UAV's
(Drones)

The evolution of the Remotely Piloted Aircraft Systems (RPAS)

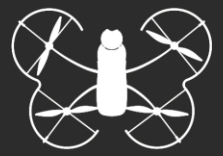
THE PROMISE

- More Information
- Lower "footprint" & cost

THE REVOLUTION ENABLERS

- Computing
- Navigation systems
- Sensors
- Cellular technology
  - Miniaturization
  - Information transmission

Remotely Piloted Aircraft System

		
Projects	Mapping	Small area mapping & inspection
Applications	Land surveying (rural), agriculture, GIS, mining, environmental mgt, construction, humanitarian	Inspection, cinematography/ videography, real estate, surveying (urban), construction, emergency response, law enforcement
Cruising speed	High	Low
Coverage	Large	Small
Object resolution	cm/inch per pixel	mm per pixel
Take-off/landing area	Large	Very small
Flight times & wind resistance	High	Low

© senseFly 2015

Considerations

- Areas or structures you're documenting
- Required resolution
- Weather conditions
- Environment
- Payload

Popular RPAS Systems

SENSORS

- Camera
- Thermal Camera
- Multi Spectral Camera
- Lidar Sensor
- Magnometer
- Microphone
- Sampling Device

GROUND CONTROL

- Survey base stations
- RTK Base
- Ground control points
- Live streaming equipment

SOFTWARE

UAVIATION
AERIAL SOLUTIONS

APPLICATIONS IN ENVIRONMENTAL MANAGEMENT

GETTING THE LAY OF THE LAND

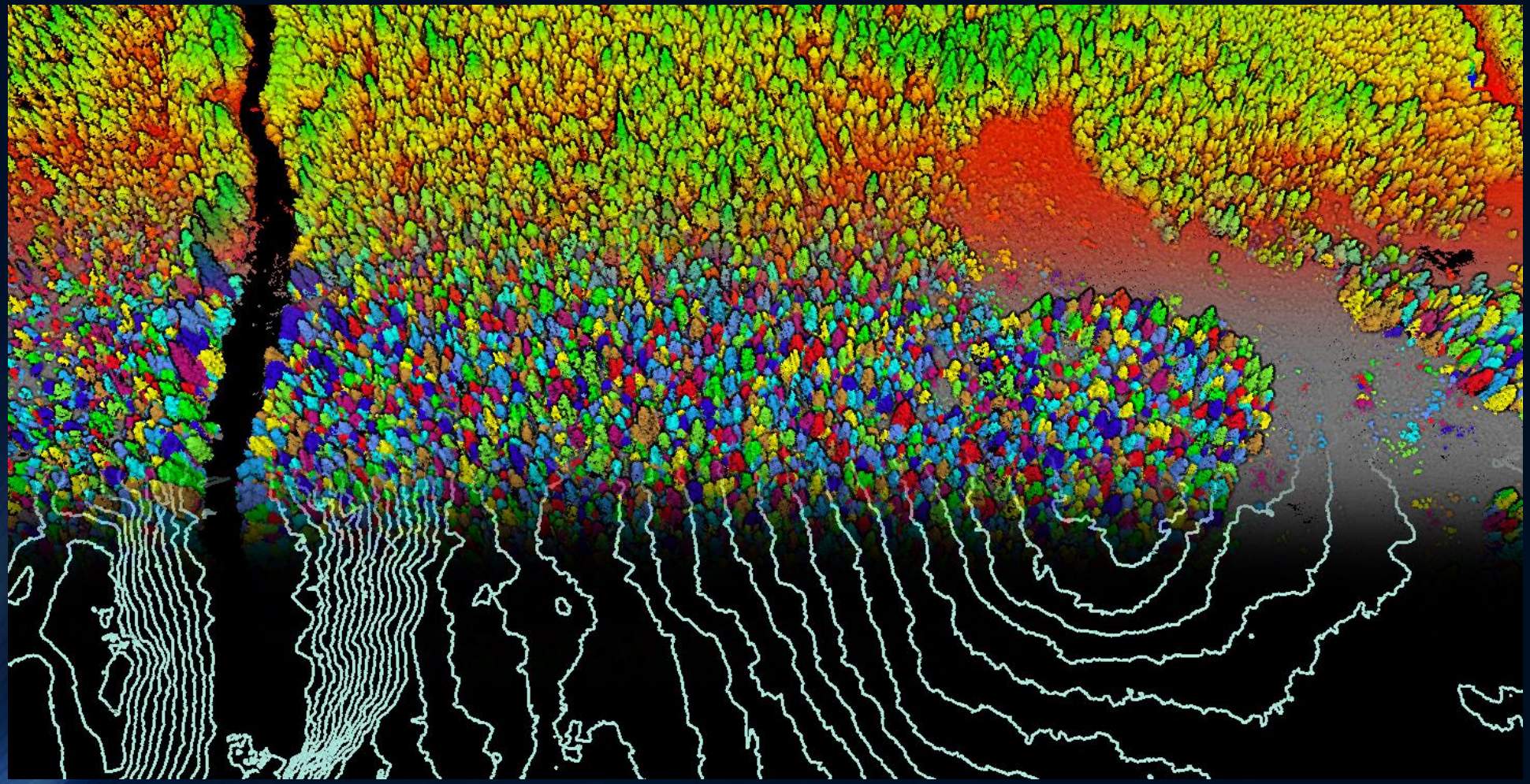
Photo/video

GETTING THE LAY OF THE LAND

Photo/video

MAPPING THE PROJECT

Lidar & photogrammetry



MODELLING & MONITORING

June

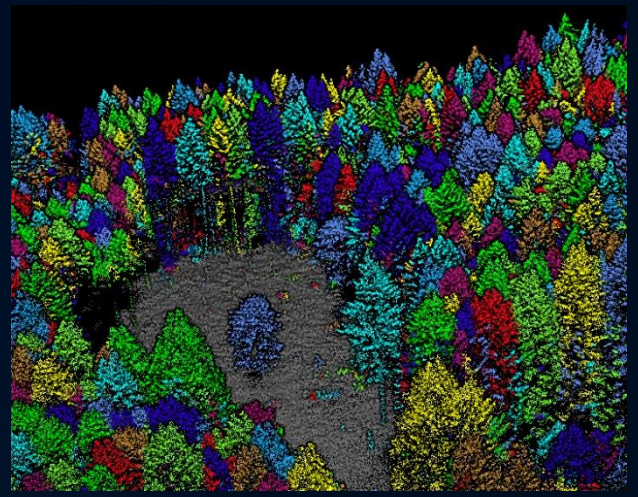
July

Aug

Sept

TRACKING FLORA & FAUNA

Multispectral & Thermal



Individual Tree Segmentation

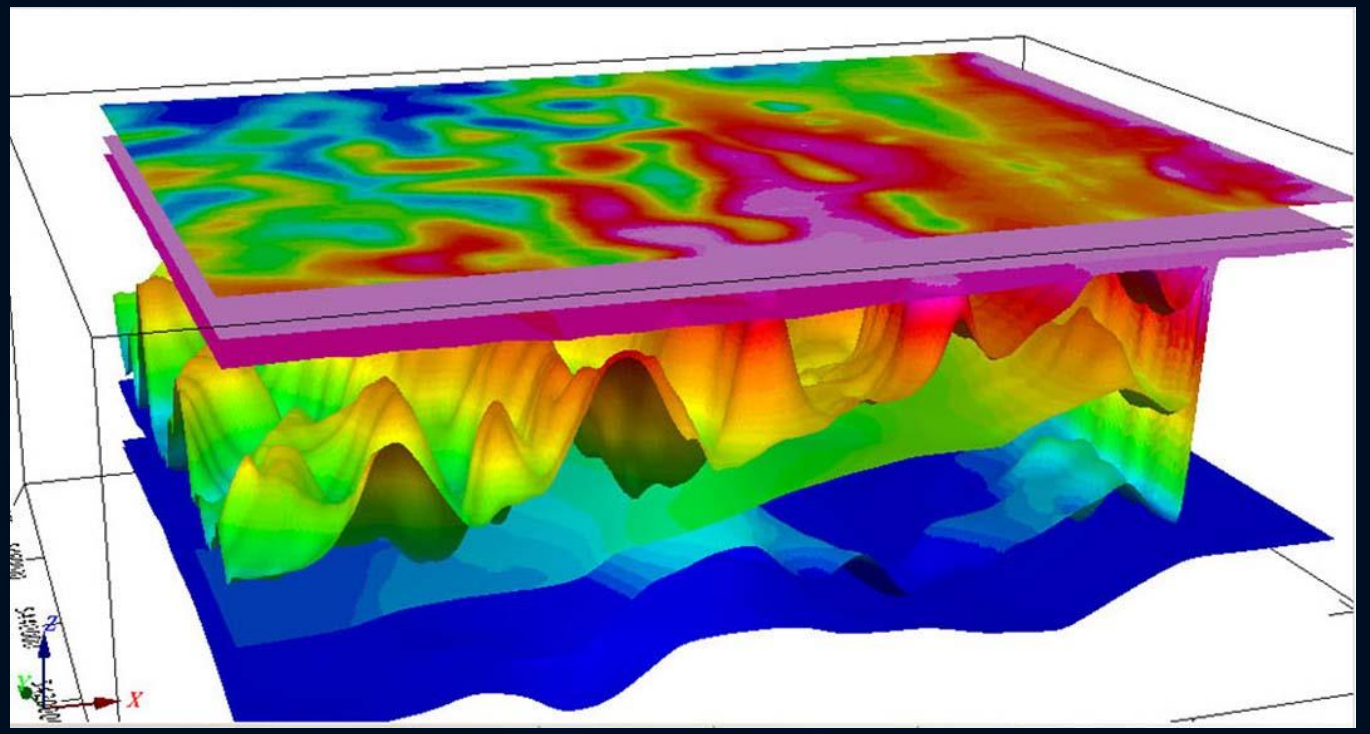
Identify Stressed Trees

TreeID	TreeLocationX	TreeLocationY	TreeHeight	CrownDiameter	CrownArea	CrownVolume
876	531305.7850	5456934.4590	39.5860	3.2270	8.1770	83.3630
788	531277.2860	5456919.6510	42.3270	4.5830	16.4930	82.6160
924	531279.0460	5456952.6300	35.2800	4.0730	13.0320	80.9130
955	531268.5810	5456948.8020	34.8110	3.9840	12.4640	80.7770
941	531280.7550	5456871.5590	37.5130	4.9280	19.0740	79.7490
827	531281.2180	5456875.4770	40.0970	4.1500	13.5280	78.9500
628	531287.6050	5456769.8520	6.0980	6.5820	34.0200	77.1980

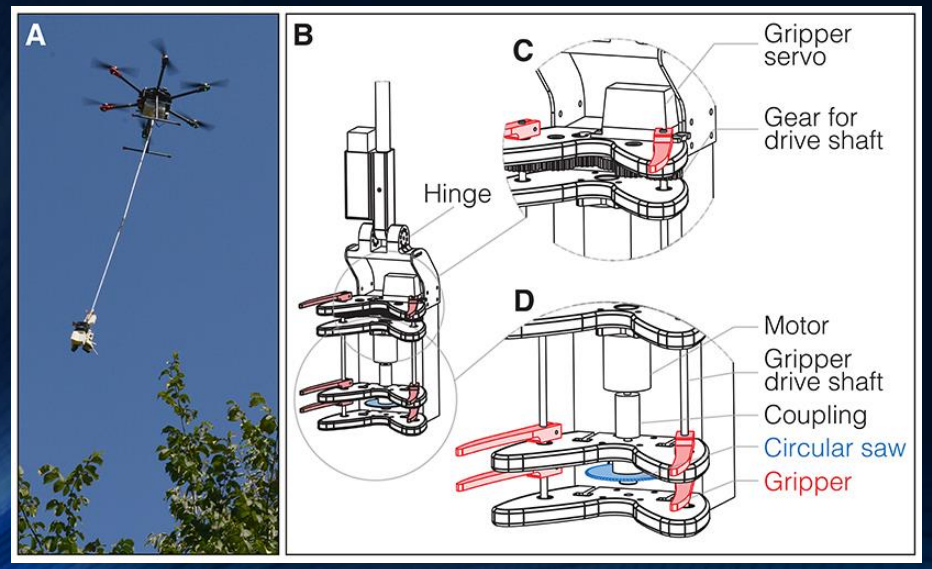
Attribute Table of Stressed Trees

SUBSURFACE SCANNING

Magnetometry



SAMPLE COLLECTION



TRENDS

- Growth
- Automation
- Adaptive regulations
- New use cases

Thank you! QUESTIONS?