

Who We Are

- Locally owned and operated since 1996
- Focus: Vegetation Management
 - Weed Control: Herbicide Application, Mowing/ Trimming, Soil Blackening
 - Revegetation and Erosion Control: Hydroseeding and Cast Seeding (Drone, SXS)
 - Vegetation Management Reporting: Aerial Weed Identification and Health Vegetation Mapping



Flight planning and strategy



- #1 Rule: Understand what your client is looking for
 - Drones are a means to collect data, if you do not know how to interpret that data into valuable information to the client you have nothing
- Certification
 - Drones are considered aircraft to Transport Canada and carry liability with that (these aren't toy store items)
 - Basic, Advanced, SFOC levels of certification
- Weather
 - Drones are sensitive to weather, mission planning is critical to utilizing proper cameras and specific terrain situations

Flight Safety

- Understanding your industry and environment
 - What is the typical weather (wind, precipitation, temperatures) for your area?
 - Wind is often the most critical and causes the most crashes, user manuals should be strictly adhered to
 - Are there additional safety measures or aeronautical policies that my client has above my current SOPs?
 - many oil and gas companies have developed their own policies and procedures within their own drone programs
 - Landing and flight zones MUST be cleared of by standers and non crew members
 - Size of drones can cause physical harm and structural damage
 - There's a lot of people that think it's "cool" and want to observe, be sure to





Why am I not mentioning much about vegetation yet?

- You need to consider these factors before buying drones for your services:
 - Do they have value in your current service offerings and what are they?
 - Drones are value added and are not often separate services but complimentary services to what you already are doing.
 - Price point is important, what would these services cost in time and machinery if you didn't have drones?
 - Don't sell yourself short
 - Proof is in the pudding what's your safety record, what's your experience in your field and why should your clients value drones?
 - Who are your pilots and how safe are they?



How do drones apply to vegetation management?

- GPS accuracy for identification and reporting purposes
- Different cameras provide diverse applications
 - Multispectral, high resolution, LiDAR, payload delivery (seeding, spraying)
- Annual data analysis and trending
- Zero ground impact (reclamation)
- Time efficiency



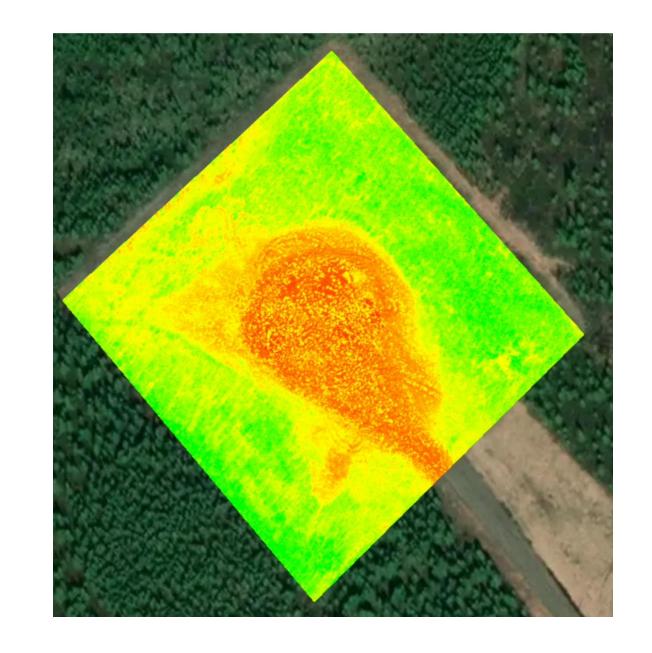
Drone/ Camera Selection:

- Some drones are capable of carrying different camera payloads on the same drone
 - What's your mission? Wildlife monitoring, plant identification, plant health monitoring, slope and erosion ID and monitoring
 - Camera types may include multispectral, thermal, high resolution etc.
- Single use drone Mavic 3M mapping and multispectral, non high resolution
- Multipurpose Matrice 300/350/400 mapping, multispectral, high resolution, thermal, LiDAR (note all cameras are separate high cost)



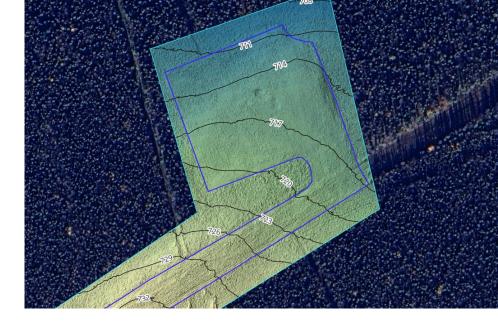
Plant Health and Drones

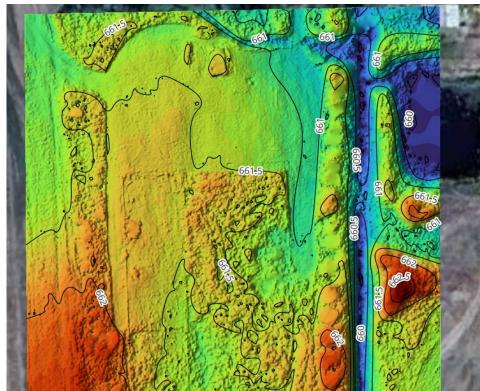
- Multispectral analysis uses light bands to detect infrared reflection and gives value through software to the health of the plant
- Can determine poor growth or soil areas for revegetation or weed management strategies



LiDAR: Contour

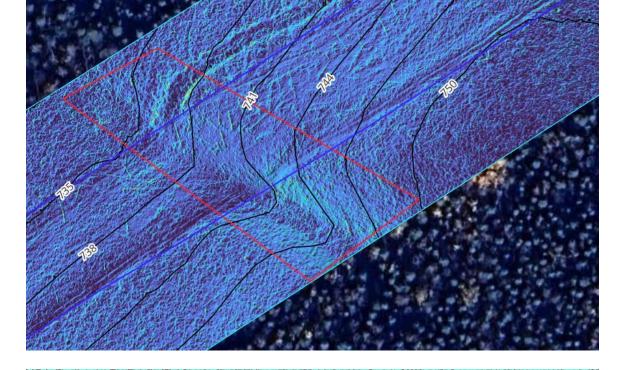
- Elevation and ground level height
 - DEM Digital Elevation Map
- Uses:
 - Drainage, erosion management
 - Site Stability

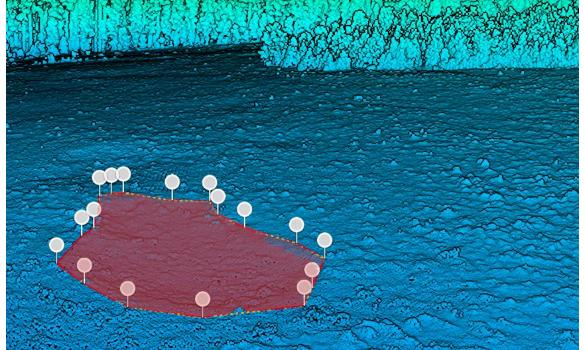




LiDAR: Slope & Volume

- Slope contour
 - Water run, drainage
 - On site to off site erosion management
 - Sediment management
- Volume
 - Pit or Pile cut and fill volumes
 - Potential erosion or weed infestation areas





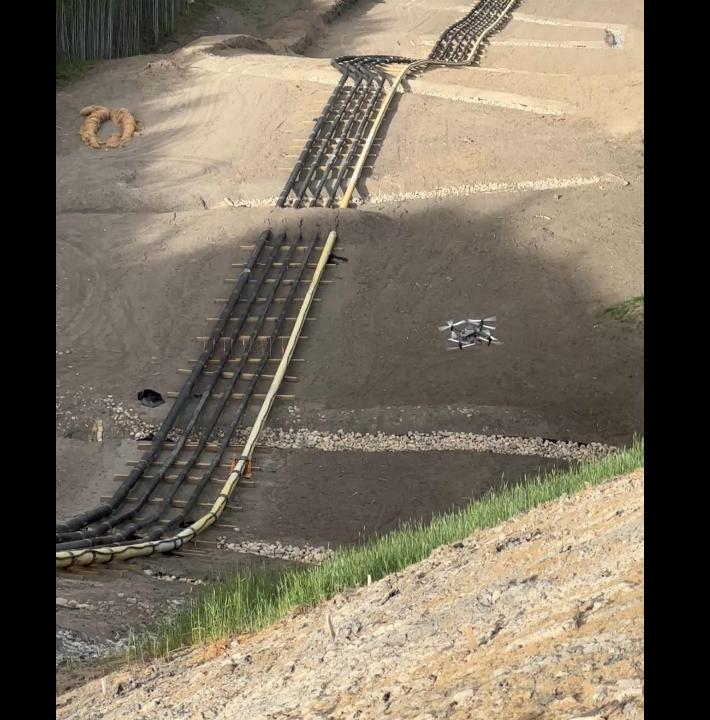


Revegetation and Drones

- There many different sizes of cast seeding drones on the market
- Provides minimal to zero impact options
- Easier access to inaccessible areas for ground vehicles
 - Be aware of battery life!
- Accuracy of seed application and less waste
- RTK satellite accuracy flight paths
- Unaffected by rough terrain







Conclusion

- Remember drones are just tools:
- Where's the value?
- Do you have proper record keeping and safety policies to fly?
- Drones are a large value add in terms of efficiency and data collection for vegetation management
- Camera, drone, and software selection matter for accurate data interpretation
- Plant health, ID and revegetation are assets in proper vegetation management in terms of application accuracy, weed management, and data trending for project strategy and client report deliverables

