

RPAS @ BCIT

Dr. Eric Saczuk

Lead, BCIT RPAS Hub

Lead, Flight Operations at InDro Robotics

Chair, School of Construction and the Environment Research Committee

RPAS Safety

- Take-off/Landing Pad
- Anemometer
- Safety cones
- First aid kit
- Fire suppression blanket
- LiPO battery bag
- VHF radio
- 2-way radios



RPAS @ BCIT



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IENT SPIRIT, MODERN MIND



Nisga'a Lisims Government



HAISLA NATION



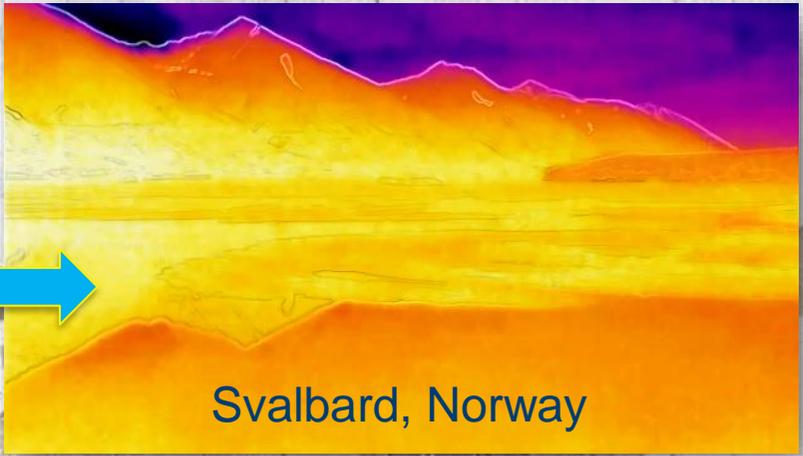
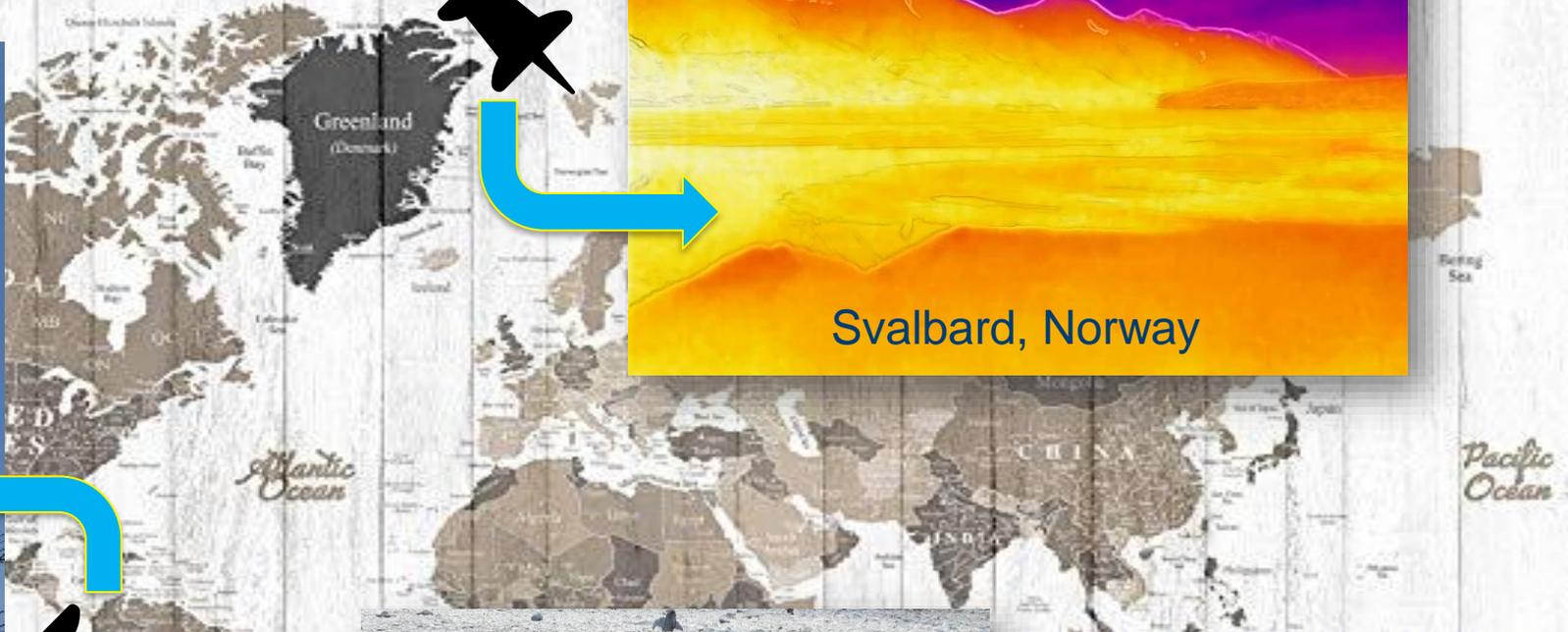
FISH and WILDLIFE



HAIDA NATION



La Paz, Bolivia



Antarctica

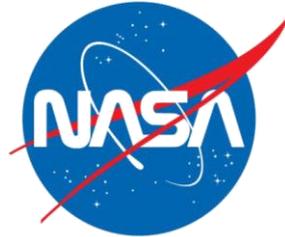
**International
Projects &
Activities**

BCIT RPAS in Svalbard

- **Hearts In The Ice** citizen science **climate change** research project.
- Sunniva Sorby and Hilde Strom overwintered 19 months in trapper's hut.
- **BCIT** provided **training & data** to research partners.



INDRO
ROBOTICS



UNIS

The University Centre in Svalbard



SCRIPPS INSTITUTION OF
OCEANOGRAPHY

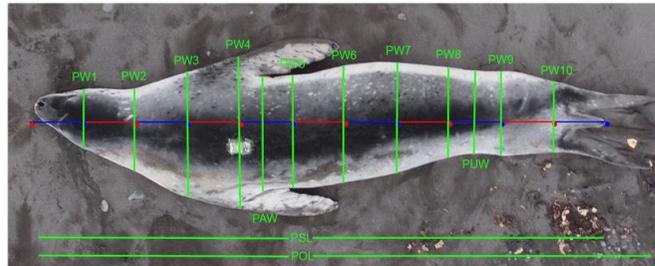
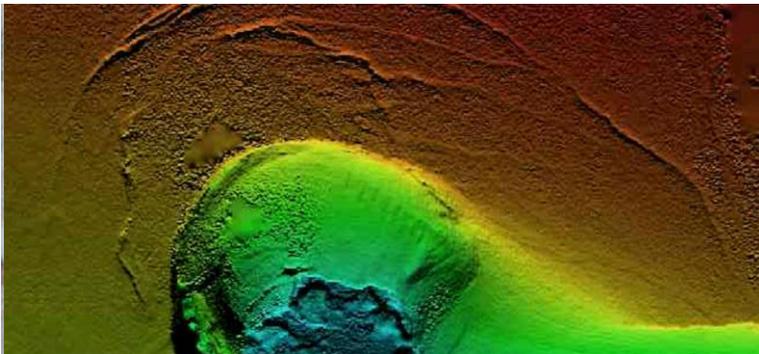
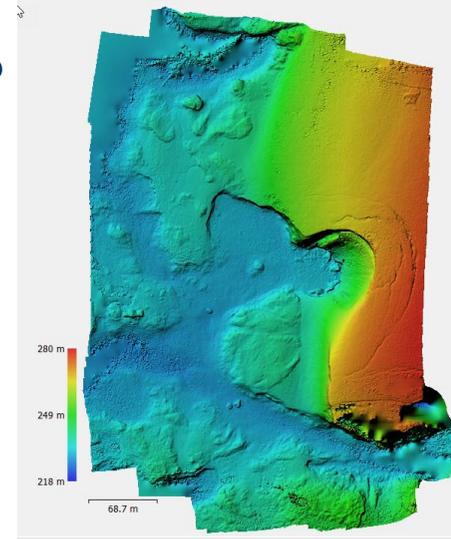
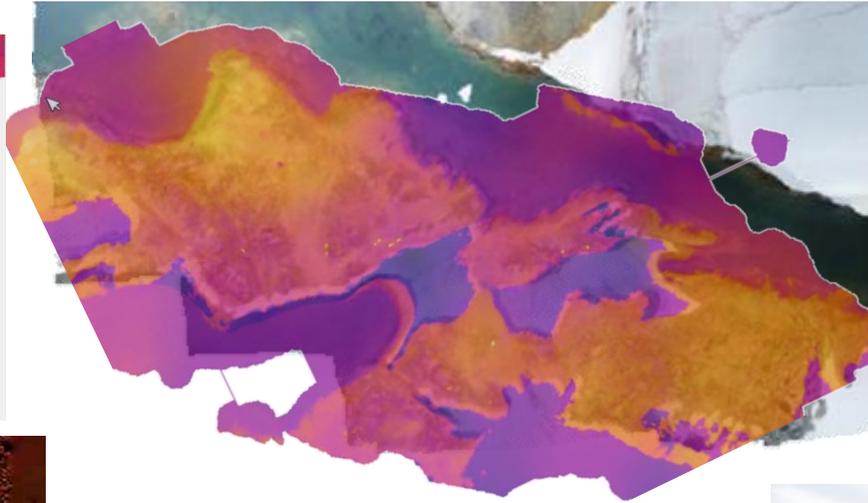
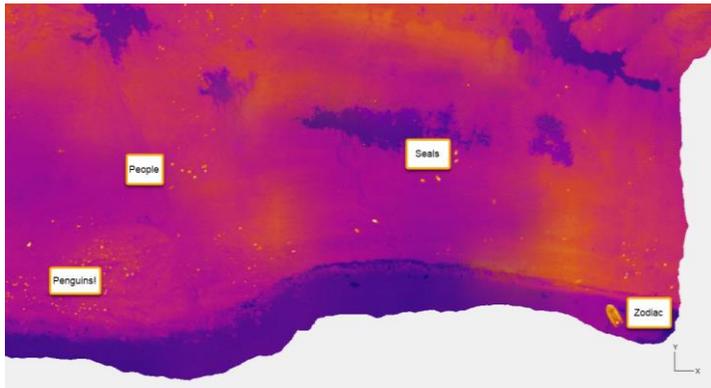


Research Projects

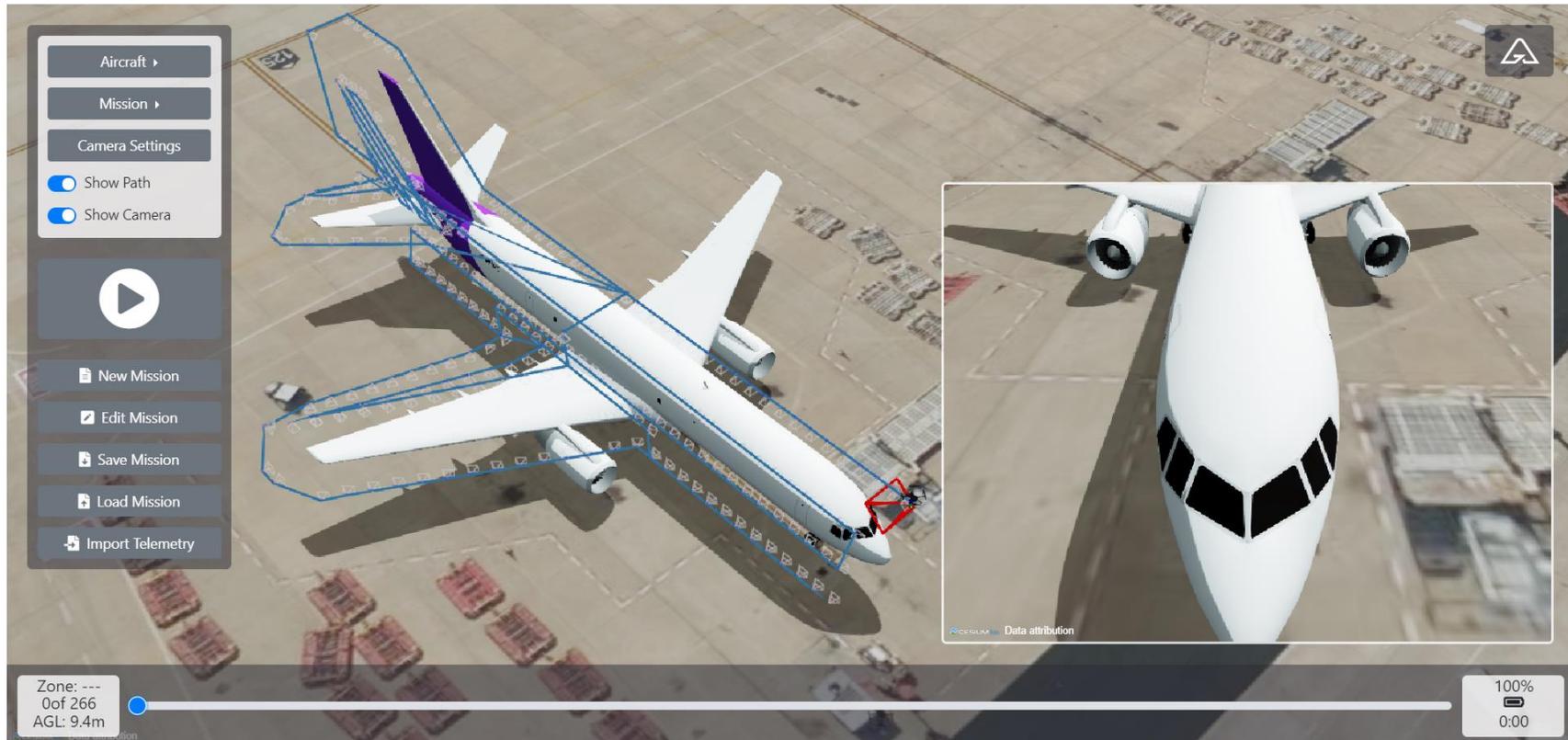
- Monthly pre-programmed flights to support;
 - **Phytoplankton** sampling for **Scripps**.
 - **Ice core** sampling & **polar bear** tracking for **UNIS**
 - **Snow depth** estimation for **NPI**
 - **Aurora Borealis** investigation for **NASA**
- **RPAS** for **ground-truthing satellite data**.

BCIT RPAS in Antarctica

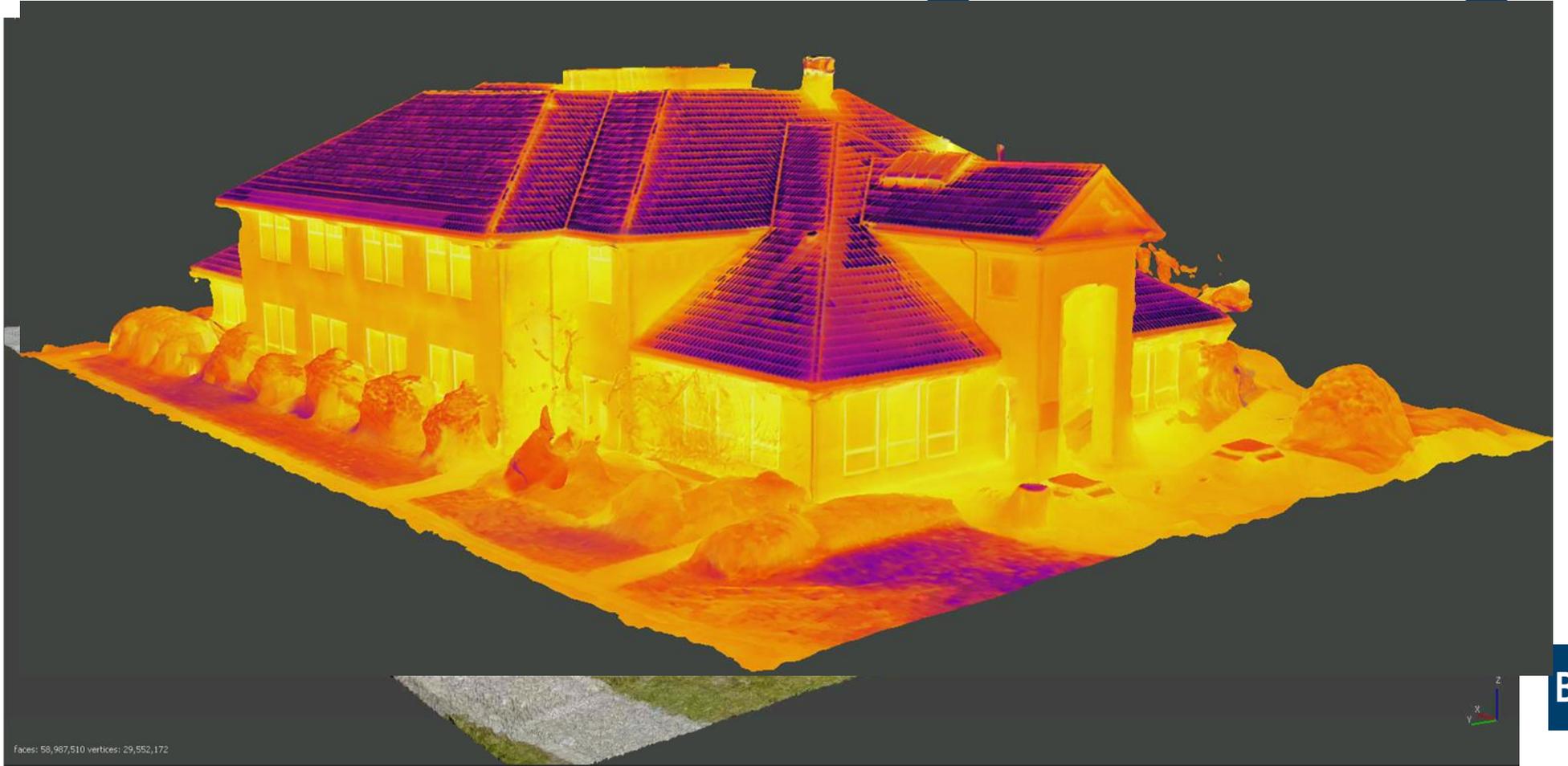
- Are drones **useful data gathering tools** in Antarctica?



Inspecting Aircraft with RPAS



Thermal Building Modeling



Faces: 58,987,510 vertices: 29,552,172

Flying Gas Sniffers!

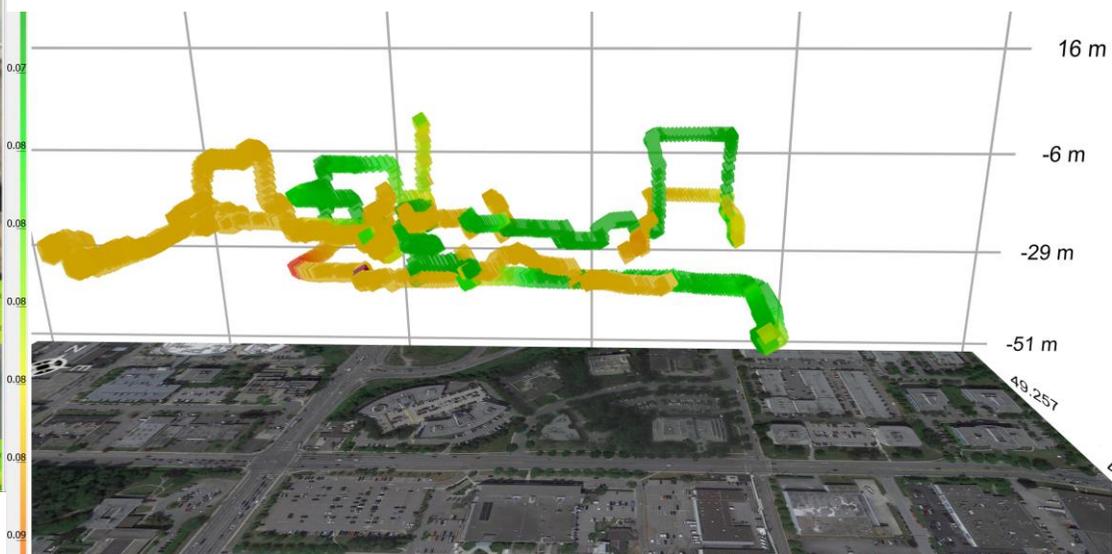
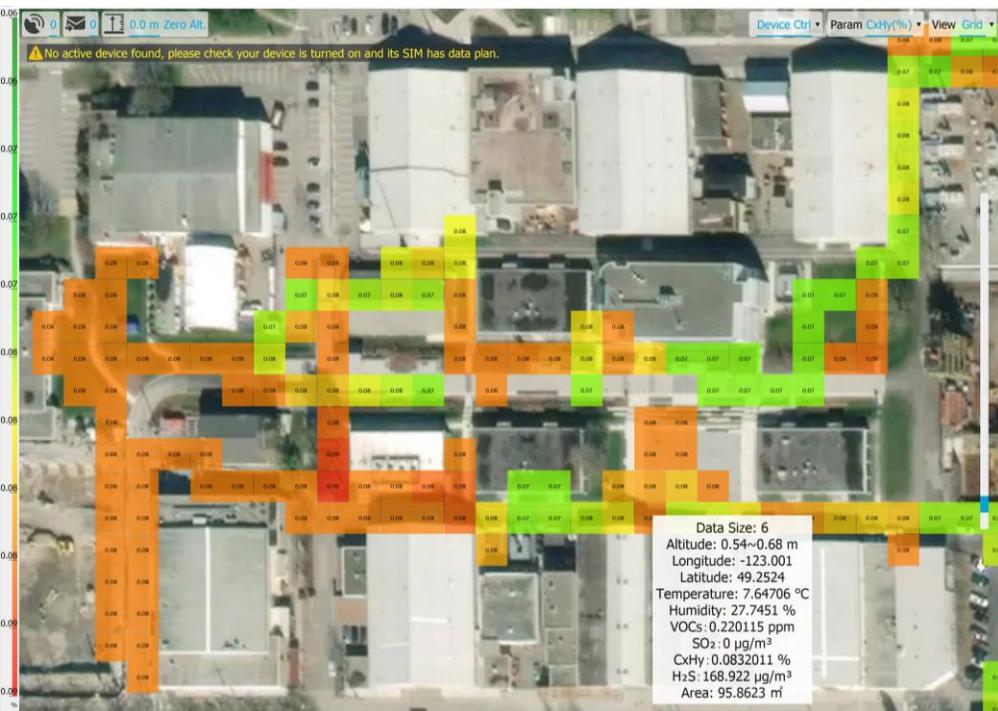


Available Parameters

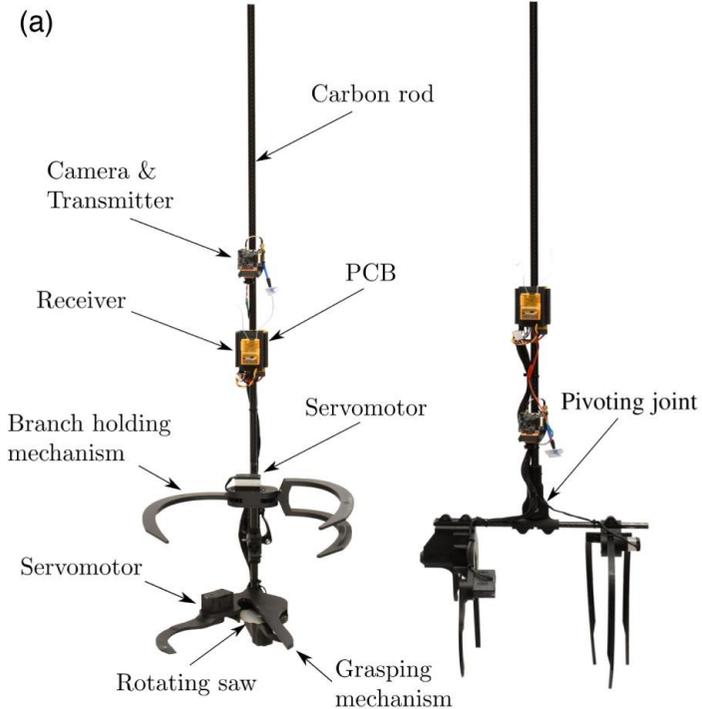
PM2.5	PM10	SO ₂	CO	NO ₂	O ₂	O ₃	VOCs
LEL / CH ₄	CO ₂	H ₂ S	NH ₃	HCl	H ₂	Cl ₂	PH ₃
TSP/ PM100	Gas Sampling	Wind Speed & Direction					
Ionizing Radiation		Other Customized Parameters...					

- **Laser/light scattering detector**
 - PM1.0, 2.5 and 10
 - 1.0 ug/m³
- **Electrochemistry for gases**
 - Resolution = 1ppb
- **Photoionization for VOC** (isobutylene)
 - Resolution 3.8ppb
- **Non-dispersive IR** for hydrocarbons
 - Detection limit 0.01%, $\pm 10\%$ accuracy

Flying Gas Sniffers!



Flying Chainsaws!



Flying Chainsaws!



Summary

- Drones are **fantastic** data gathering tools!
- **Collaborative** approach to **applied** research benefits both **industry** and **academia**.
- **RPAS Hub** coordinates drone research and training across all six Schools at BCIT.
- LiDAR, 3D radiometric thermal models, GPR.



Thank you!
I welcome your questions.