

EDUCATING OUR FUTURE ARCTIC PLASTICS RESEARCHERS



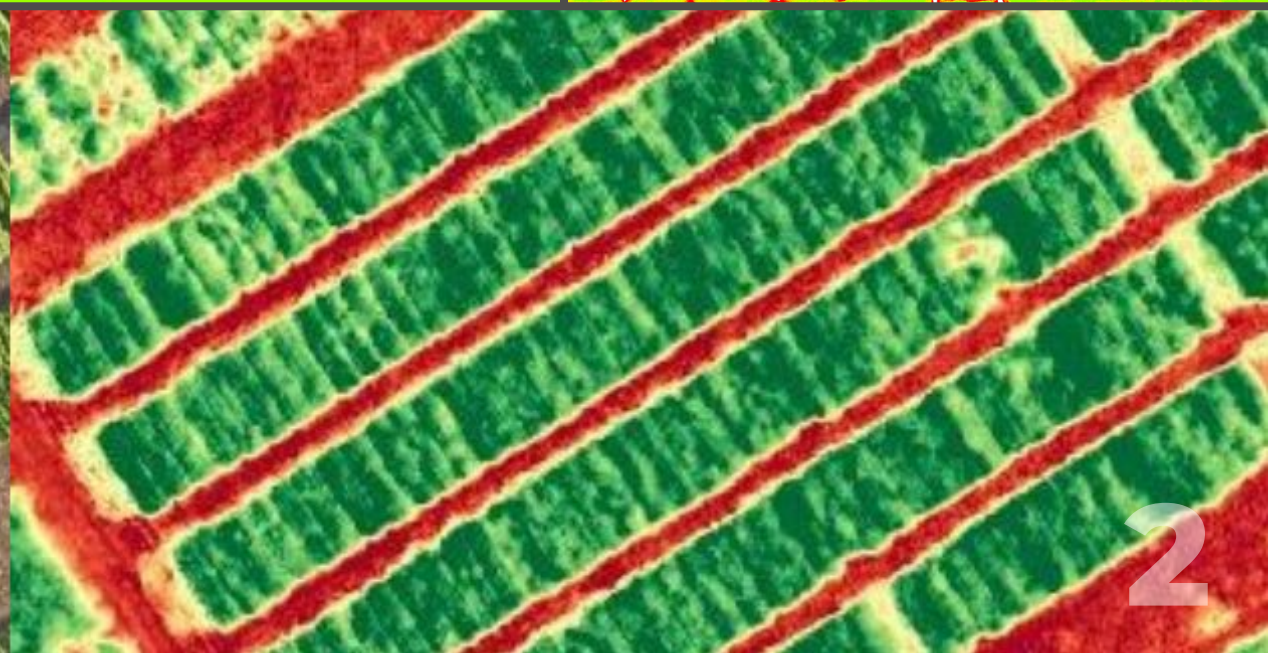
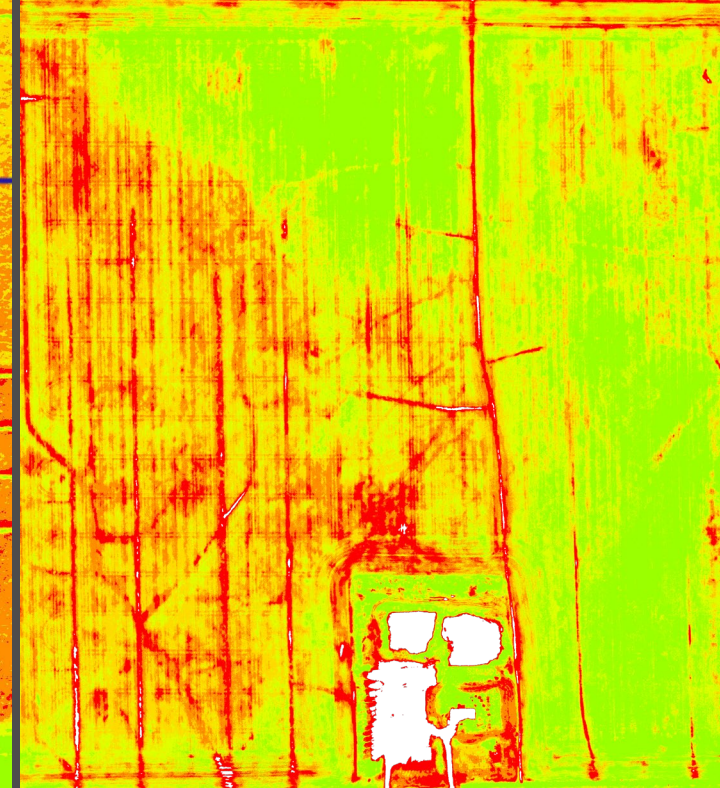
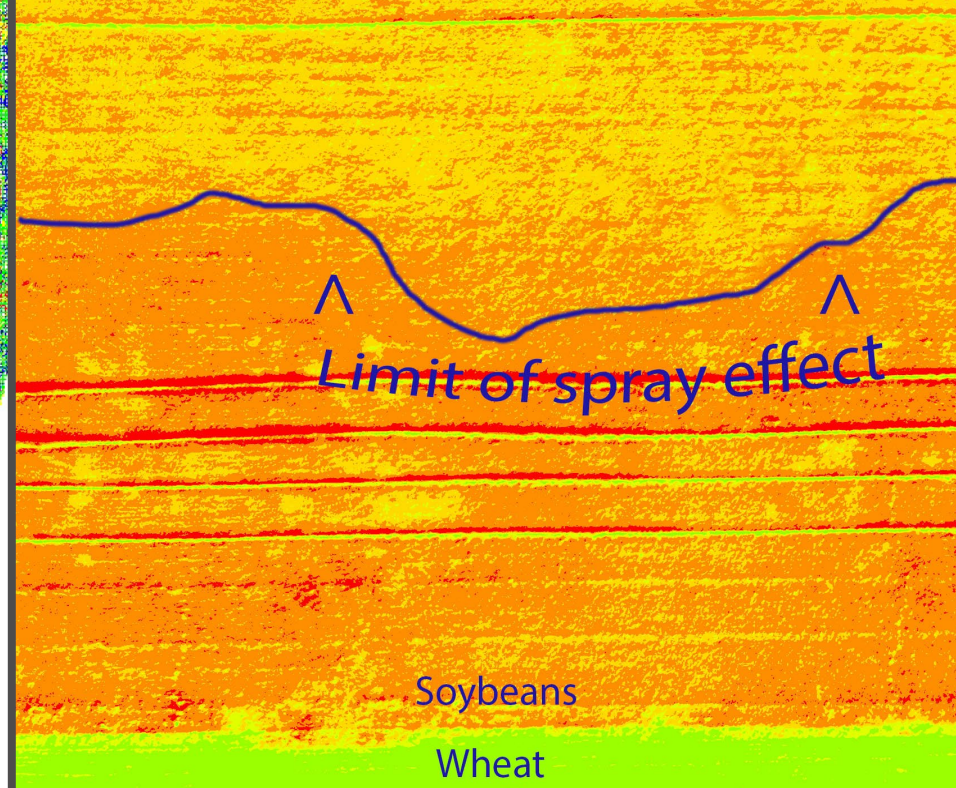
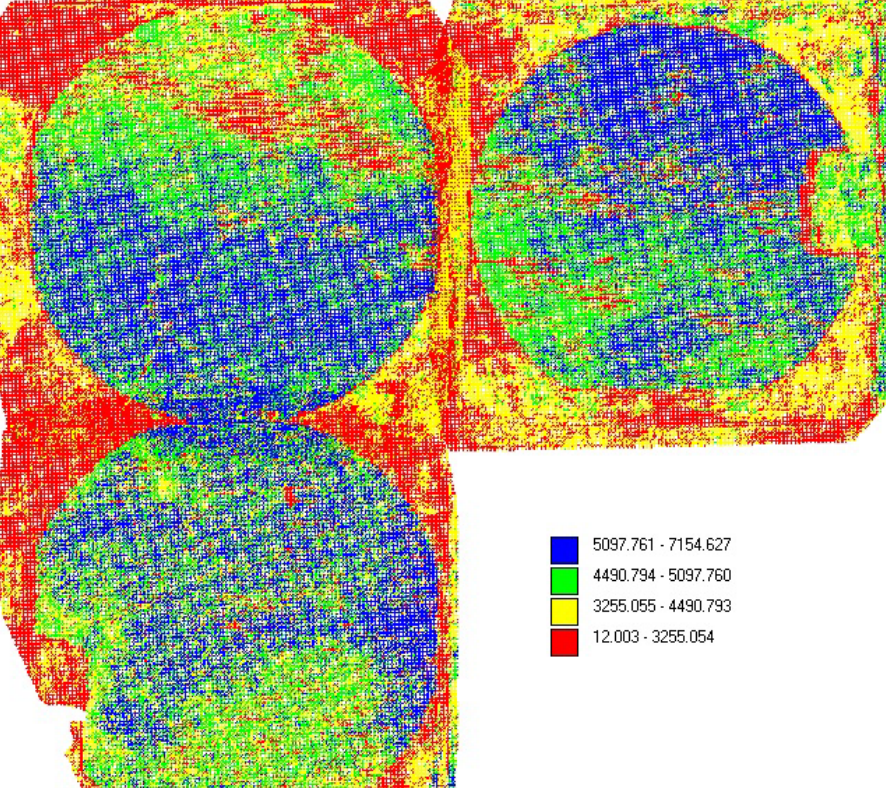
MATTHEW JOHNSON
VICE PRESIDENT, EDUCATION



INT'L SYMPOSIUM ON PLASTICS IN THE ARCTIC AND SUBARCTIC

That's me in 2015





That's me in 2017



ENABLING OUR FUTURE RESEARCHERS TO UTILIZE
DISRUPTIVE TECHNOLOGY

IMPORTANCE OF TEACHING *DISRUPTIVE TECHNOLOGIES*



Why is it so important to integrate disruptive technologies (distech) into the education system?

- ✧ STEM education fosters disruptive thinking and innovation
- ✧ Enhances active participation and learning
- ✧ Distech is well suited for shifting to experiential learning

SEAR *PROGRAM*



Students learn to utilize drone and machine learning technologies while conducting real-world, hands-on academic research activities that could result in new, more efficient technologies or processes.



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THE LITTER *PROJECT*

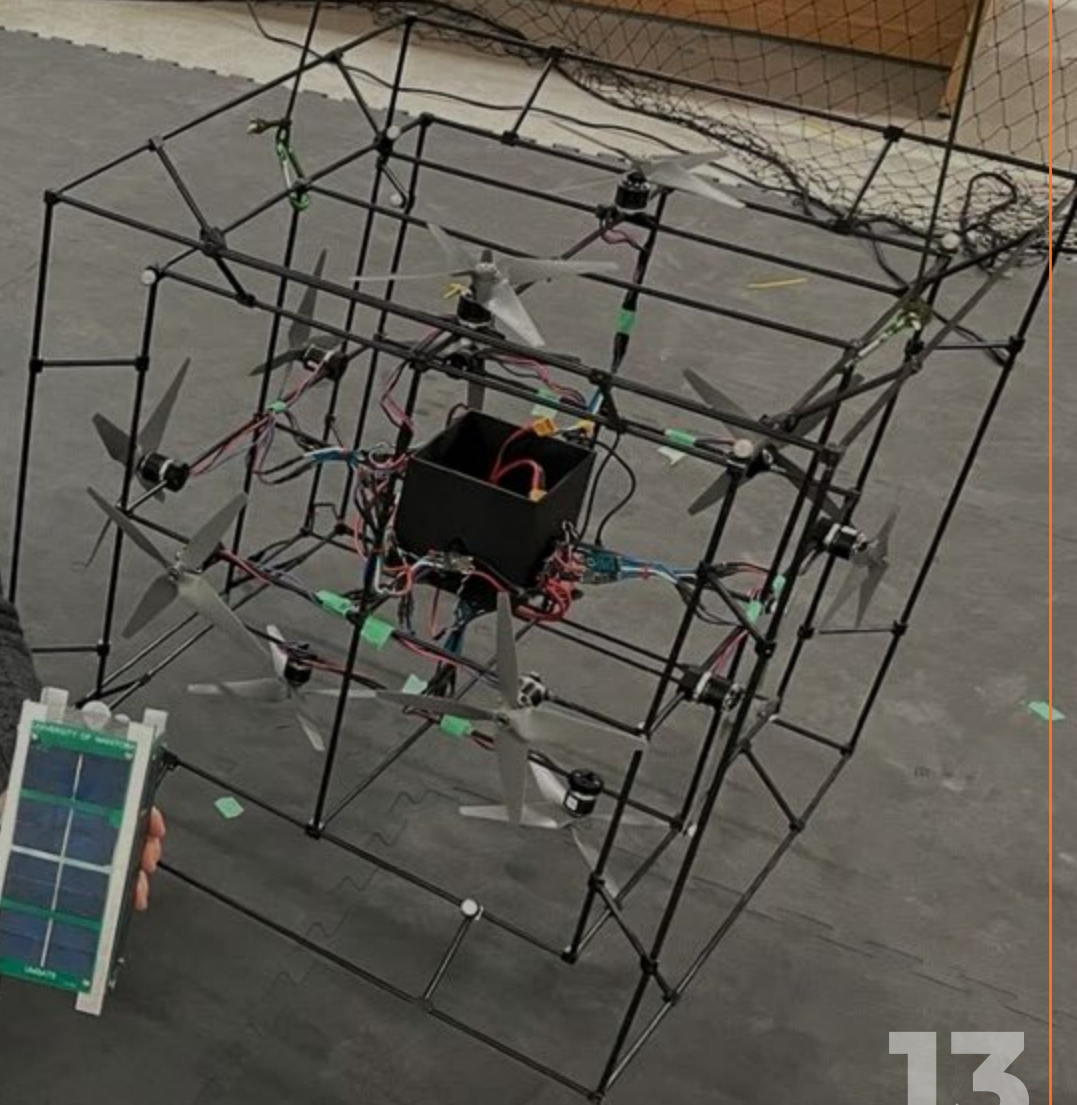
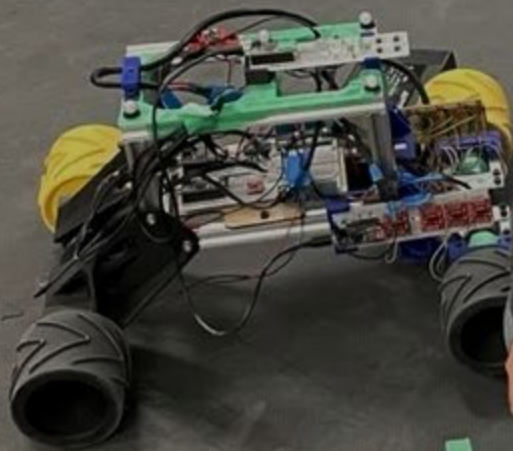


- Collect **drone-based multispectral and RGB data** of beaches, community spaces, riparian zones etc.
- Teach students to **train machine learning algorithms** to identify foreign objects / garbage on beaches or community spaces.
- **Geotag** garbage with GPS co-ordinates for ground personnel or **robotic collection**.

DR. PHILIP *FERGUSON*



University
of Manitoba







MACRO PLASTICS
>2 cm





PARTNERSHIP *OPPORTUNITIES*



- Schools / School Divisions
- Municipal / Provincial Governments
- Academia (University Research)
 - ✓ Drone Pilots to assist with data collection
 - ✓ Drone Pilots to assist with training of students
 - ✓ Research / data analysis activities
- Commercial (Crop Researcher Organizations, Sponsors, etc.)
- Non-profit organizations

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PROGRAM *WORKFLOW*

1. Regional academic partners are established
 - University partners provide regional support for programming and connections with regional school districts that will partake in SEAR
 - Universities benefit by reinforcing pipeline of students to the university to expand on experiences in the SEAR Program
 - Biology / Marine / Environmental Science
 - Forestry / Agriculture / Ecology
 - UAS studies
 - Survey / Geosciences
2. Establish participating regional schools. **25 students per “iteration”**
3. Deliver’s content (sometimes with assistance from universities)
4. Students write federal drone pilot certification exams

PROGRAM *WORKFLOW*



➤ 4 Days, 25 Students, 24 hours of instruction

- Module 1: Drones, Remote Sensors, & Science (Day 1 AM)
- Module 2: Data Processing & Spectral Analysis (Day 1 PM)
- **Module 3: Machine Learning (Day 2 AM)**
- **Module 4: Operations Training (Day 2 PM)**
- Module 5: Data Collection Field Day (Day 3 All Day)
- **Module 6: Feedback / Federal Exam (Day 4 All Day)**





THANK YOU!

FOR MORE INFORMATION:

