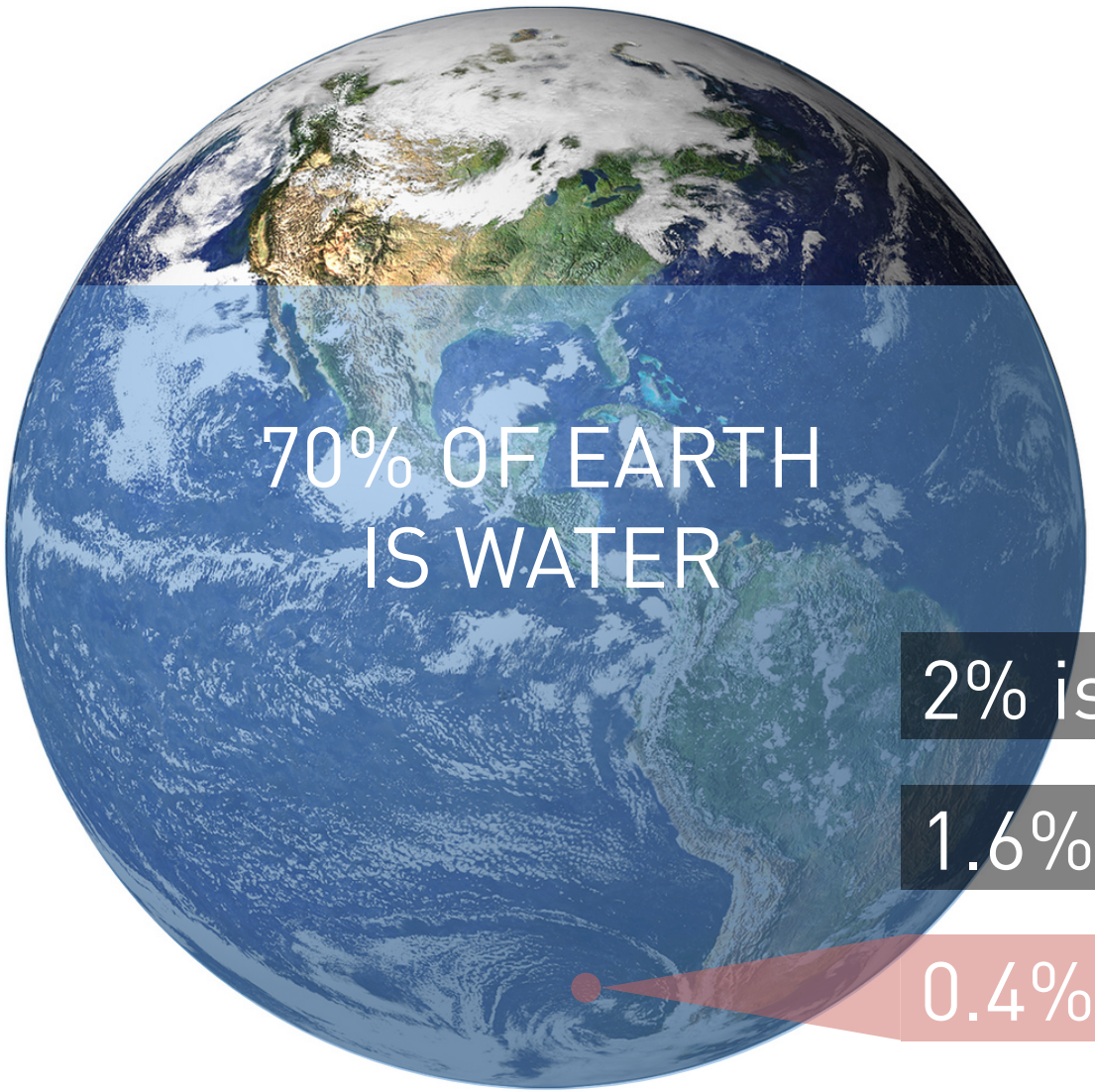
CLEARPATH ROBOTICS™

CLEARPATH ROBOTICS, INC.

ROBOTS MAKING A SPLASH IN TAILINGS PONDS

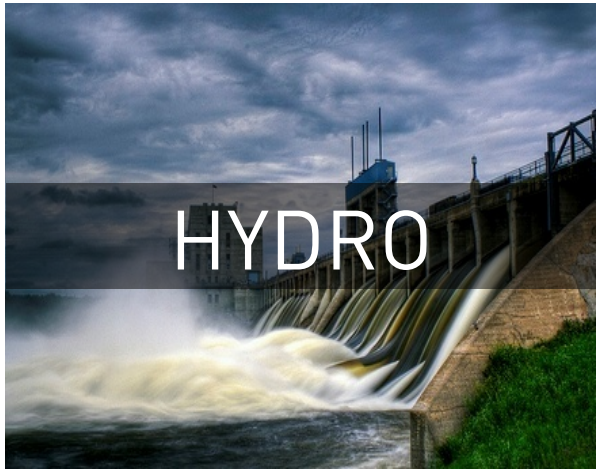


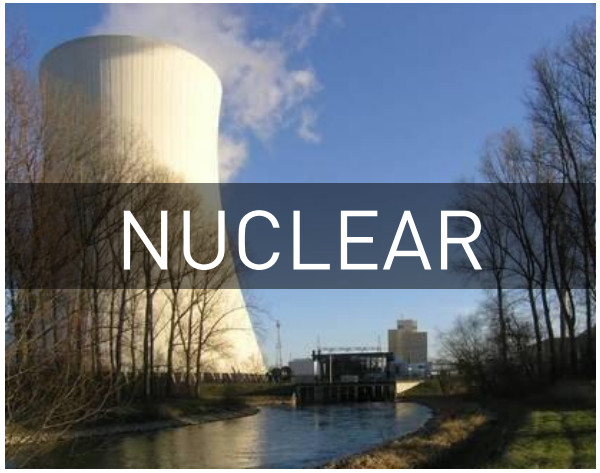
2% is Fresh Water

1.6% is Frozen

0.4% Remains

WATER - A CRITICAL INPUT





TAILING STORAGE FACILITIES

NEED TO KNOW:

INTEGRITY FOR
COMPLIANCE

CAPACITY FOR
PRODUCTION

VOLUME NEEDED!

MEASURING VOLUME – OLD WAY

WARNING!

UNSAFE FOR WORKERS

UNREPEATABLE FOR ANALYSIS

A BETTER WAY?

MEASURING VOLUME – NEW WAY

CLEARPATH ROBOTICS™

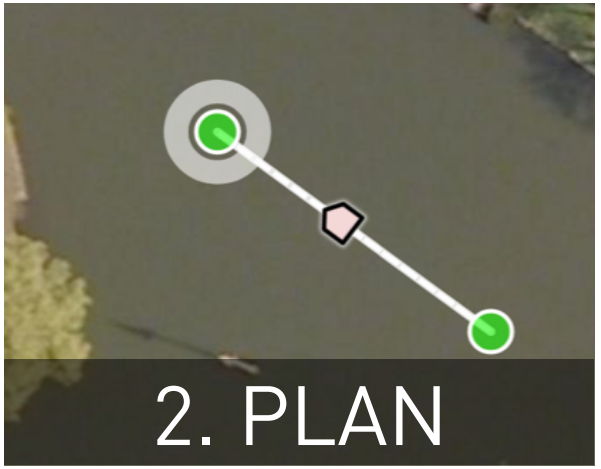
KINGFISHER
UNMANNED VEHICLE

FOR

BATHYMETRY IN
SAFETY SENSITIVE
ENVIRONMENTS

SAFETY FIRST

HOW IT WORKS



OLD WAY VS. NEW WAY

CASE STUDY - PotashCorp

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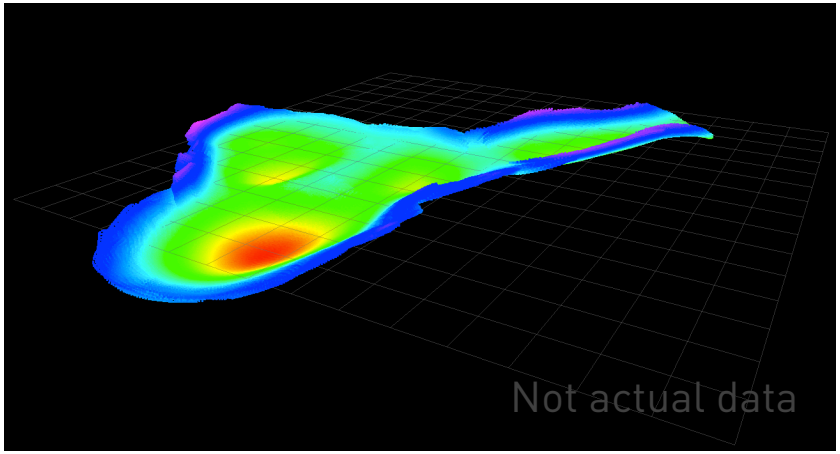


Largest producer of fertilizer.
Safety is #1 Priority.

Challenge:
Safety concerns and a complex sensing environment

Result:
Minimal worker exposure
12hrs (vs 300hr estimate)
89,000 data points
1/3rd cost
Happy client

CURRENT CHALLENGES

1. CAUSTIC ENVIRONMENTS
2. ECONOMIC CYCLE
3. LARGE SCALE VALIDATION

BENEFITS

1. MAXIMUM SAFETY – MINIMUM HUMAN EXPOSURE
2. ACCURACY & REPEATABILITY – TIME SERIES ANALYSES
3. SMART INVESTMENT – DESIGNED FOR RETURN

OPPORTUNITY

Safety:	"Priceless"
Speed improvement:	1.5-2.5x
Cost savings per ha:	20-50%

Can we improve mining process by increasing frequency?

Current bathymetry refresh is approx. 1/year

What additional insights could be extracted at 4/year?

Can we improve timing on Tailings Storage expansion?

Tailing Storage Upgrade:	$75,000,000
Risk-free rate:	5%
Monthly opportunity:	$312,000

DIRTY WORDS IN MINING

Due to financial pressure in natural resources sector:

"INNOVATION RISK" = BAD!

Budget allocated for pilot programs

Transfer of innovation risk

"CAPITAL ASSETS" = BAD!

Get off the balance sheet!

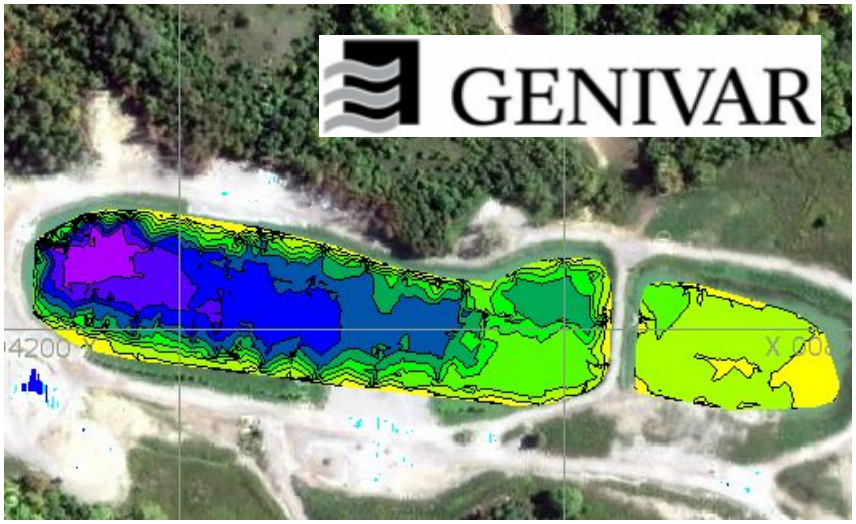
Service and leasing models

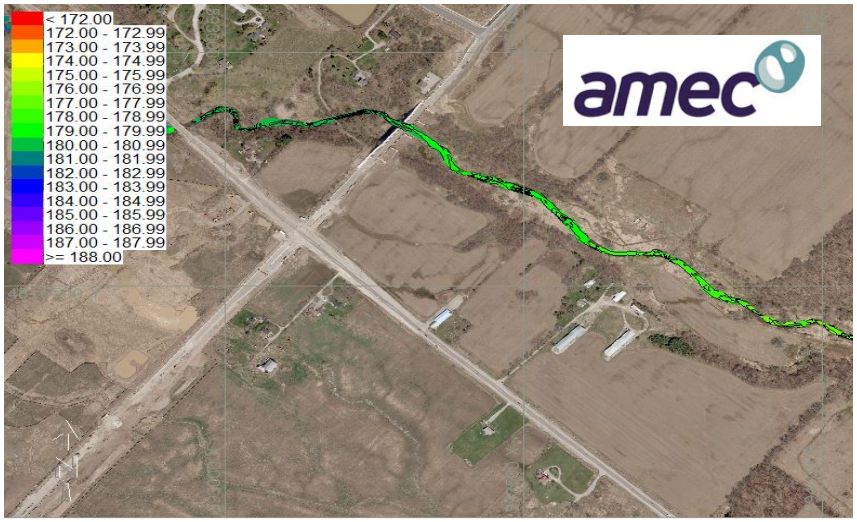
CALL TO ACTION

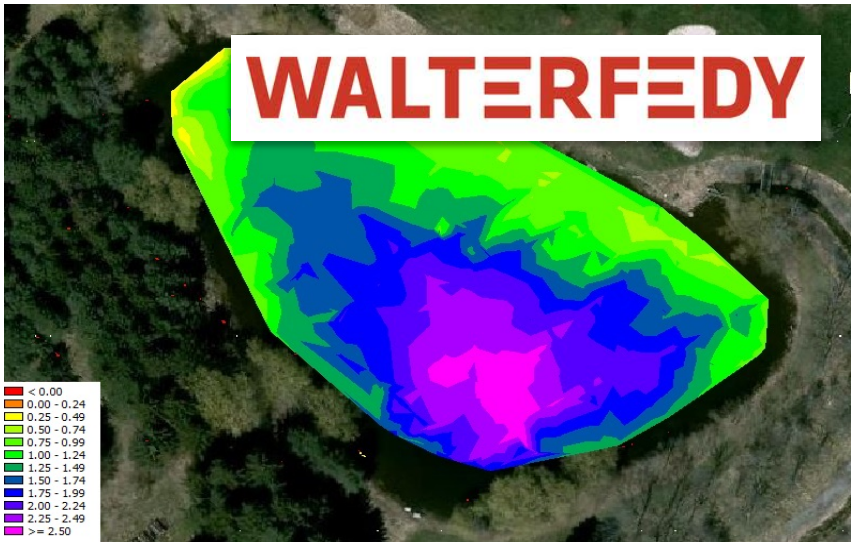
BE SAFE, USE ROBOTS.

MATT RENDALL, CEO
mrendall@clearpathrobotics.com
1 (519) 513-2416 x801

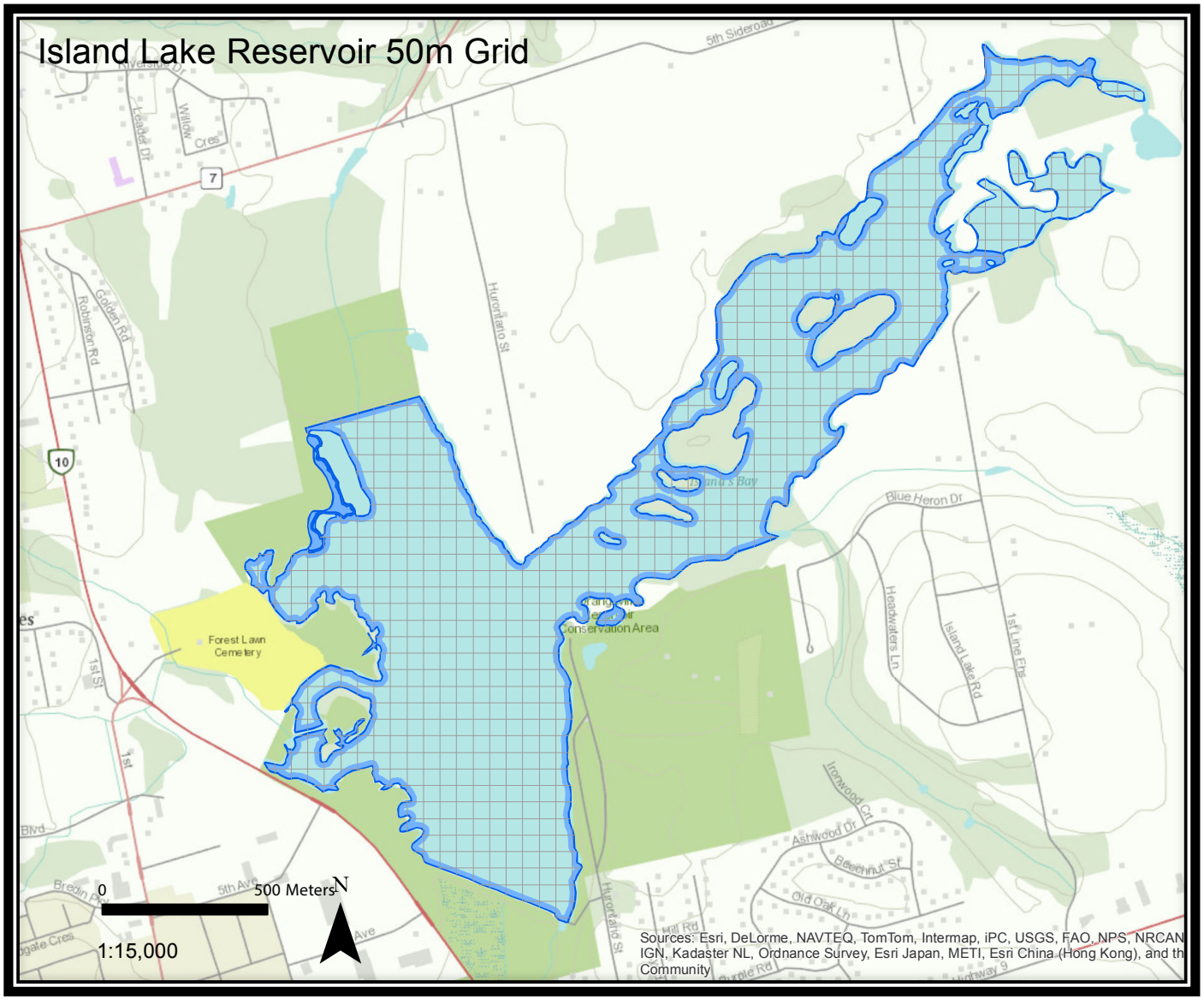
CASE STUDIES – MUNICIPAL







CASE STUDY – LARGE RESERVOIR



CREDIT VALLEY CONSERVATION

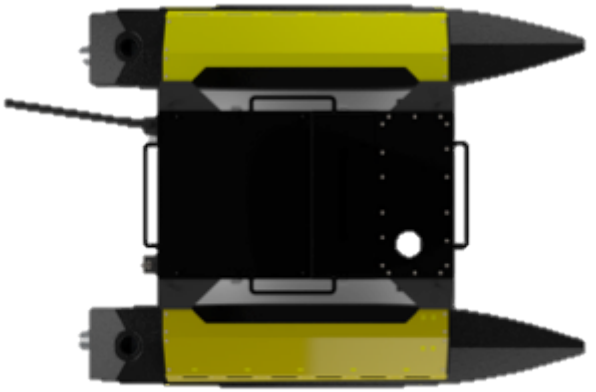
Orangeville, ON

Size: 160 ha
Time: 6 days

TECHNICAL OVERVIEW

SIDE

FRONT



TOP

KINGFISHER
REMOTE BATHYMETRY SYSTEM

SIZE:	1.4m x 1.2m x 0.5m
SPEED:	2 m/s
POWER:	Electric
RUNTIME:	2-3 hrs
RANGE:	350 m (Line of sight)

PAYLOAD OPTIONS:

- SINGLE BEAM SONAR
- MULTI-BEAM SONAR
- SIDESCAN SONAR
- ADCP

WE WORK WITH WORLD LEADERS

Google

National Defence / Défense nationale

U.S. AIR FORCE

Massachusetts Institute of Technology

QinetiQ

UNIVERSITY OF WATERLOO

Carnegie Mellon University

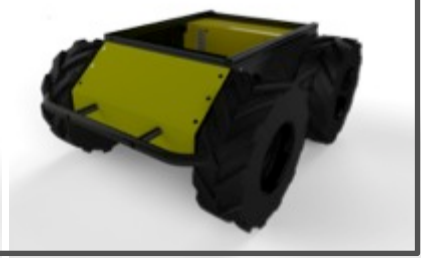
WHAT WE DO BEST

Clearpath Robotics offers proven intelligent mobile robot products, services and IP to accelerate commercialization.

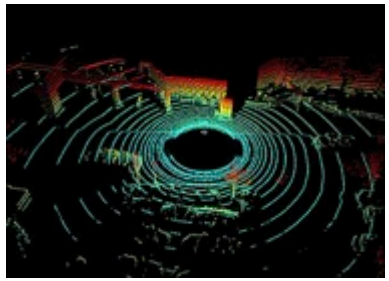
We partner with R&D teams to get complex robotics products to market faster with less risk by providing the technology building blocks to allow mobile robots to move from A to B.

4 years old, now 35 employees and >350 private and public R&D clients in >25 countries.

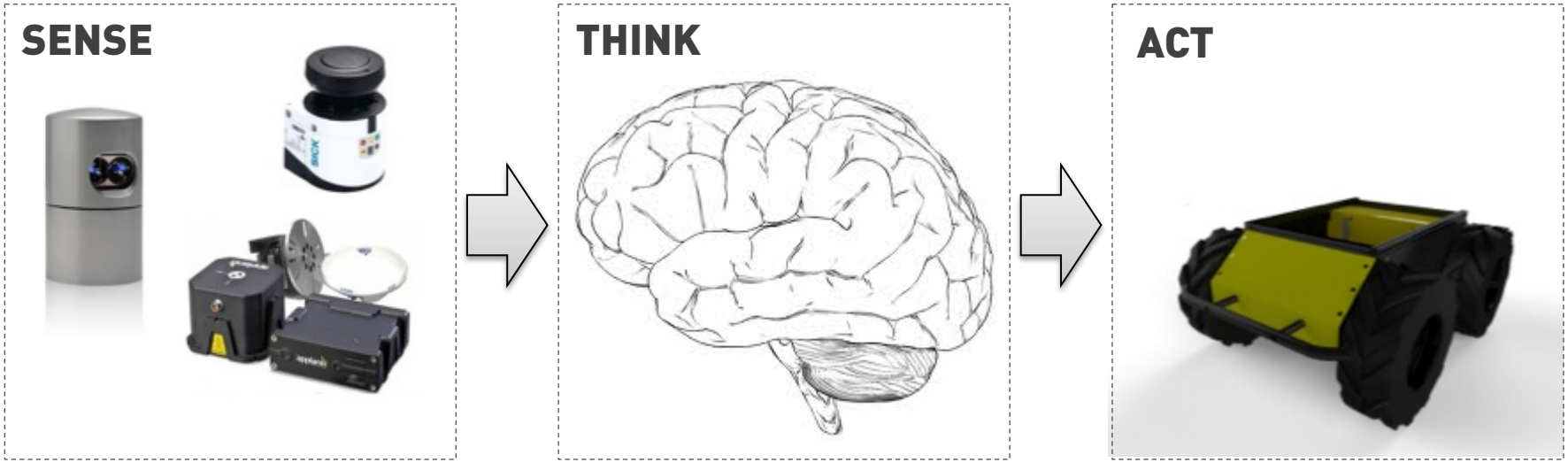
Products



Services



WHAT WE DELIVER



END-TO-END AUTONOMOUS VEHICLE CAPABILITIES

Autonomous vehicles are complex multi-disciplinary systems that extend well beyond our unmanned vehicle platforms. We also offer professional services to complete the "**sense-think-act**" chain resulting in cost-effective and built-to-spec robotic systems.

EX #1 – TURNKEY DESIGN-BUILD

UTILITY VEHICLE

CONFIGURED FOR TRANSPORT, NO SENSORS

REMOTE SURVEYOR

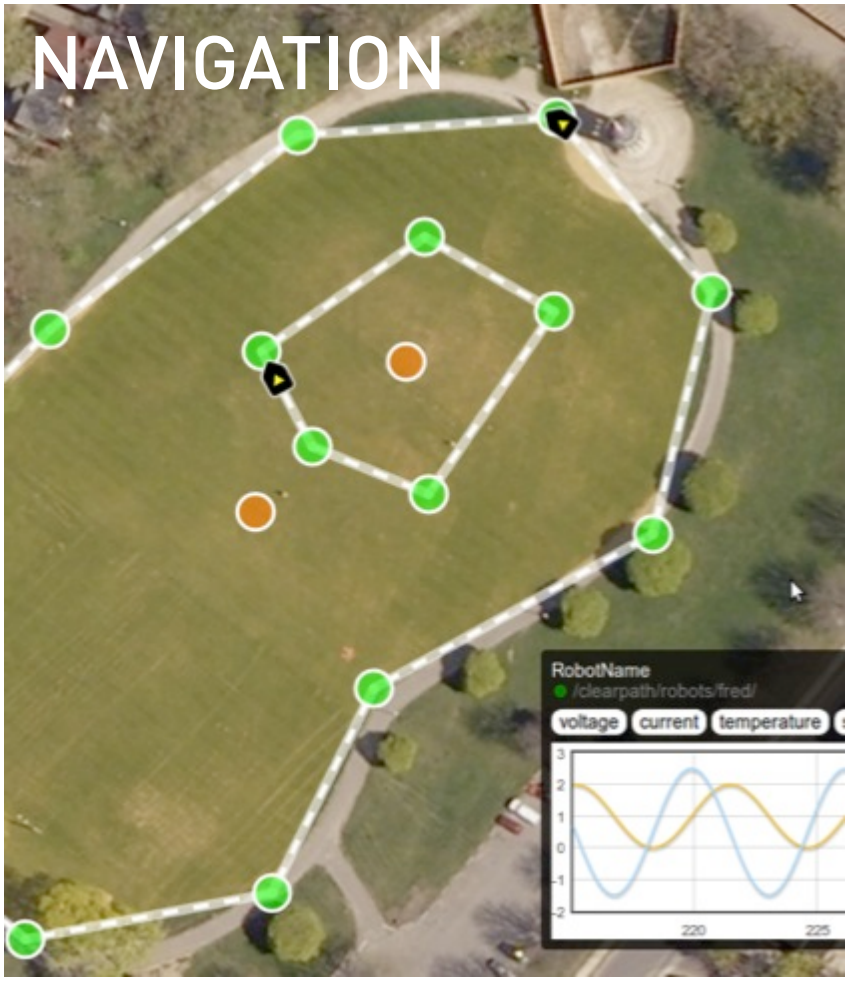
CONFIGURED FOR BATHYMETRIC SURVEY

EX #3 – VEHICLE CUSTOMIZATION

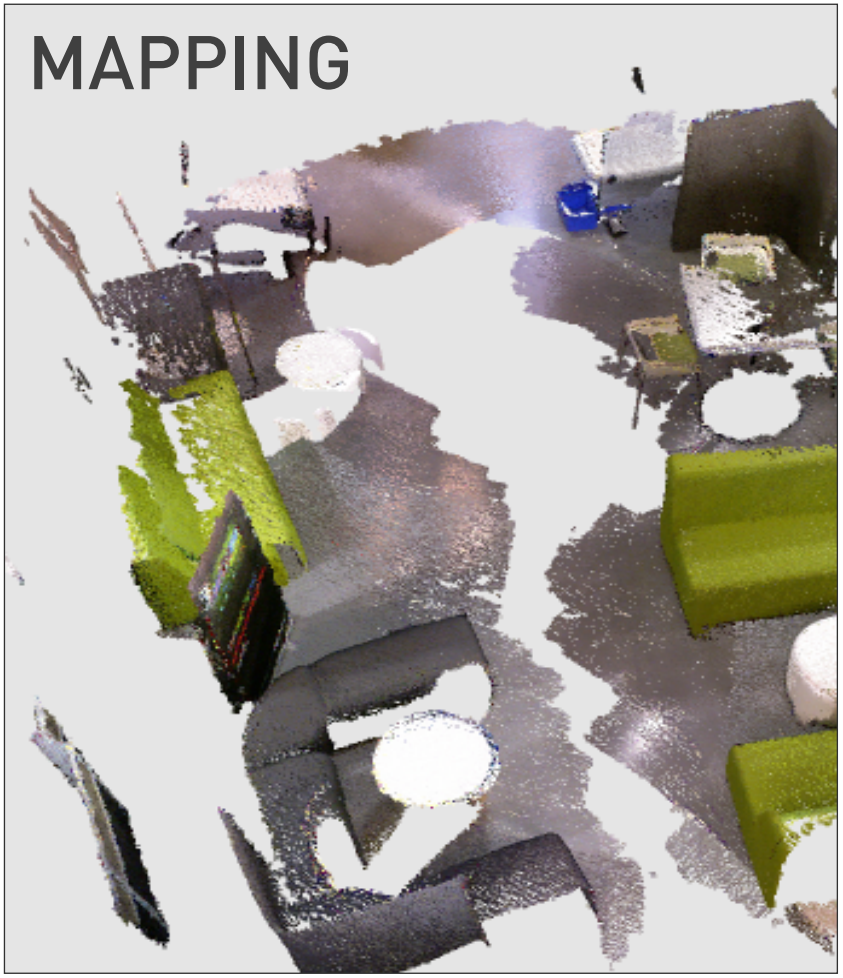
FRONT-END LOADER & UTILITY TRUCK

FOR COORDINATED AUTONOMOUS LOAD-HAUL-DUMP OPERATIONS

EX #4 - AUTONOMY SOFTWARE



GPS WAYPOINT GUI
FOR MULTI-ROBOT CONTROL



LOW COST 3D SLAM
WITH COLORIZED POINT CLOUDS

CASE STUDY

Project:	Location	Scope of Work	Duration	Project Benefits
6 SWM Ponds	Milton, Ontario	**6 LARGE SWM POND bathymetry ranging from 0-1.8m deep**	**Estimated: 2 days Actual: 2.5 days (technology hurdles)**	$6,215.00

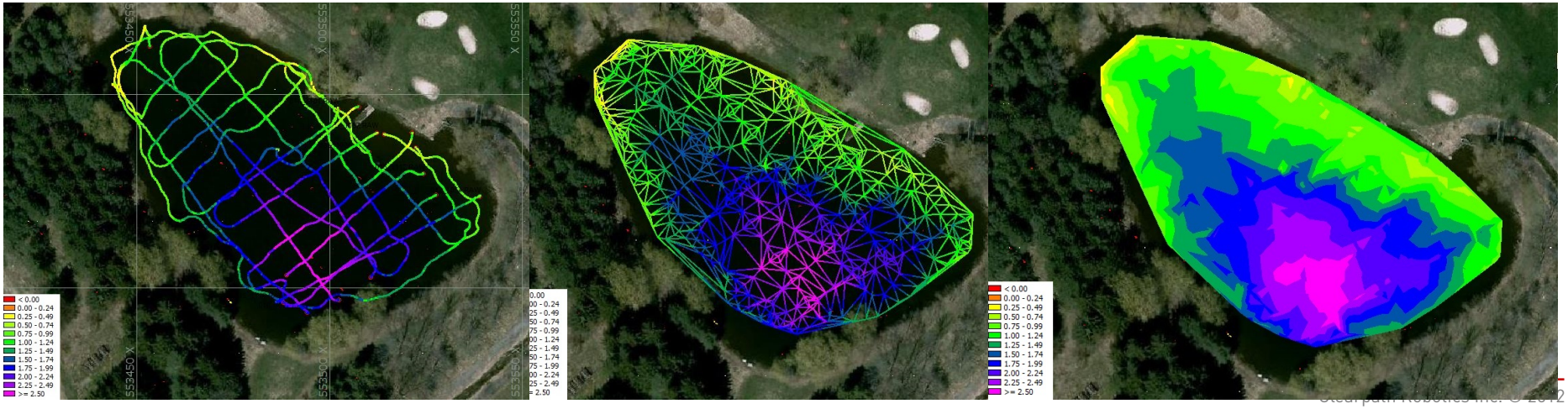
Project:	Location	Scope of Work	Duration	Project Benefits
3 SWM Ponds	Kitchener, Ontario	**3 PONDS**	**Estimated: 1 day Actual: 1 day**	$3,406.00
16 Mile Creek	Milton, Ontario	**4 Kilometers of shallow creek bathymetry ranging from 0-1.8m deep**	**Estimated: 3 days Actual: 4 days (very shallow conditions)**	$8,898.00 Case study for shallow, low flow studies Benchmark of 1 km per day.

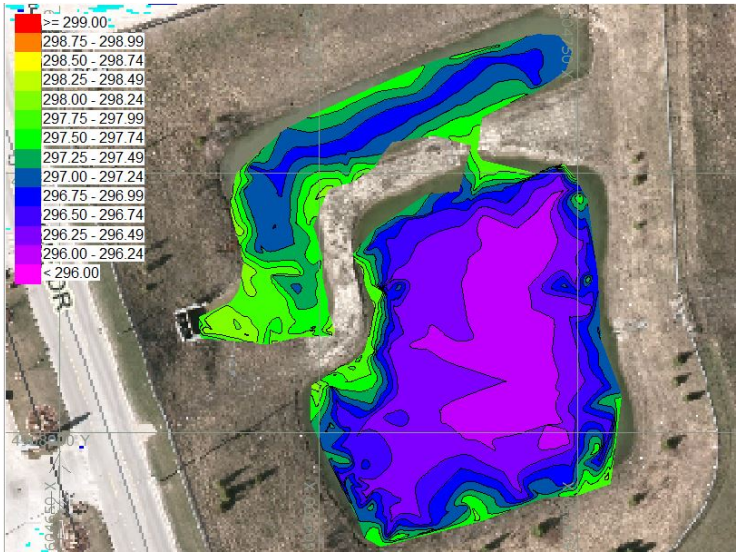
Project:	Location	Scope of Work	Duration	Project Benefits
Hamilton SWM Ponds	Hamilton, Ontario	**14 SWM POND**	**Estimated: 2 days** **Actual: 2.5 days (technology hurdles)**	$3,955.00 More work for Guelph RFP
Project Manager:		**"Much, much faster!"**		
Data Analyst		**"Data was very easy to work with"**		
Field Technician:		**"Would be happy to let a robot do this job for me"**		

WALTERFEDY

CLEARPATH ROBOTICS™

Contact	Position	Project Benefits
Mark Hartley (TECHNOLOGY CHAMPION)	Senior Project Manager	2 Projects = Total: $3,280 Case Study with Data Comparison



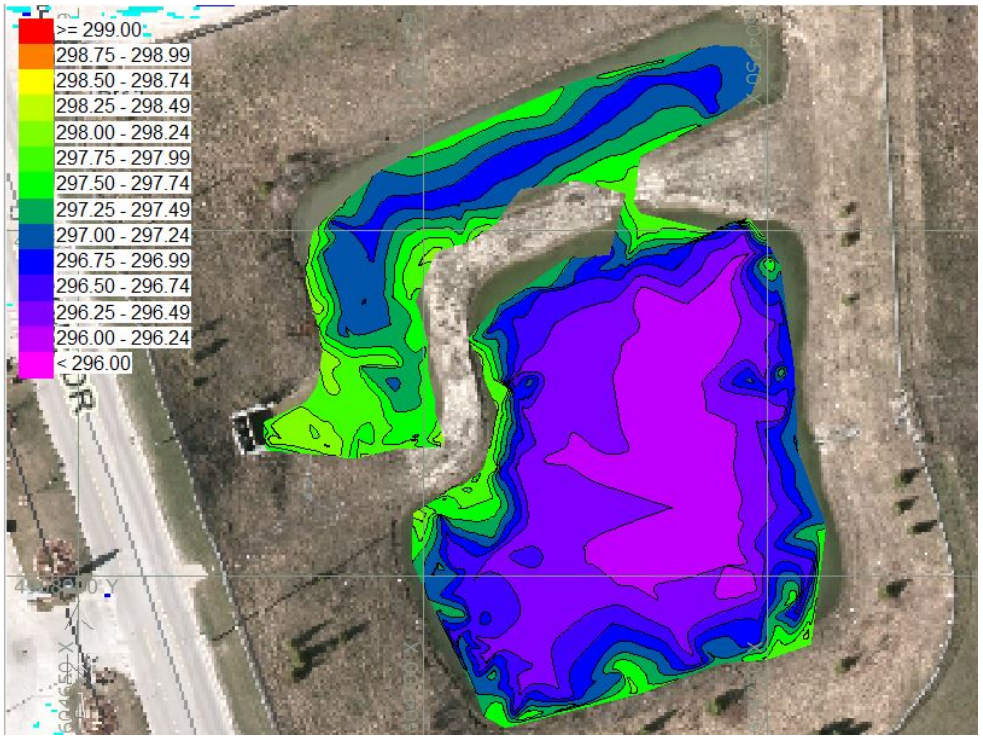


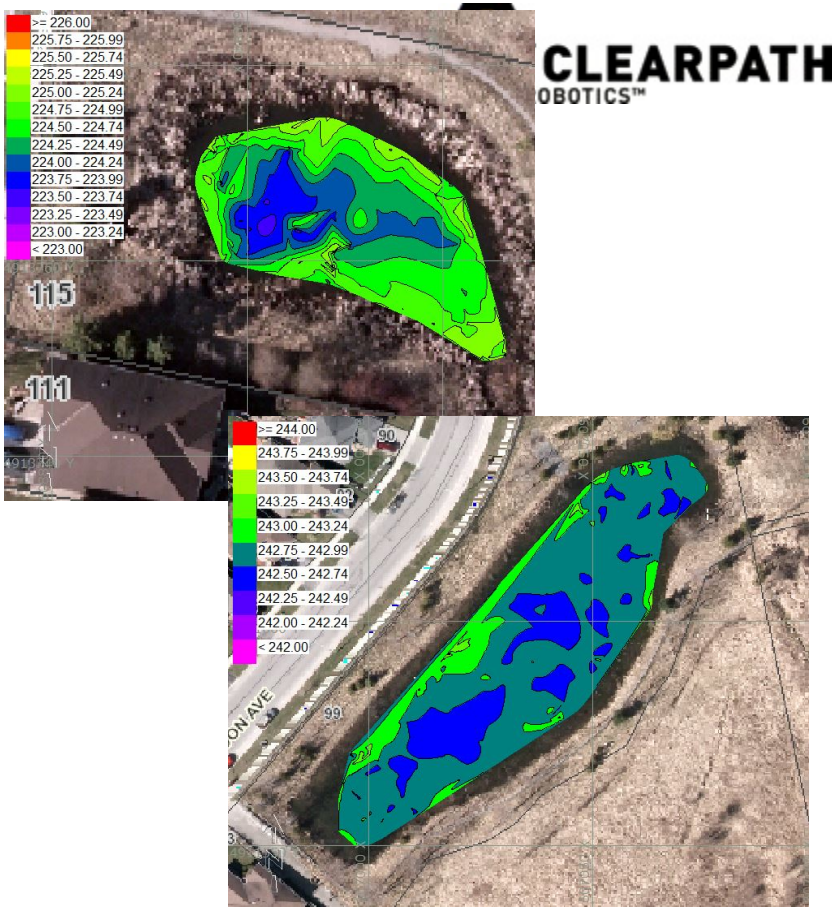
Project Manager: “Cost savings are huge”
Data Analyst: “Very happy with the data”

Survey Coordinator:
“It’s amazing technology that can survey a pond in 20 min!”
Survey Technician: “This is by far a better method”

BARRIE
ONTARIO · CANADA

CLEARPATH
OBOTICS™





Project:	Location	Scope of Work	Duration	Project Benefits
Barrie SWM ponds	Barrie, Ontario	**3 SWM ponds of varying sizes**	**Estimated: 1 day** **Actual: 1 day**	$3,510 Pre-and Post surveys Case Study
Project Manager:		**“Speed, cost savings are huge”**		
Data Analyst		**“Very happy with the data”**		

BRAMPTON
Flower City
brampton.ca

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Project:	Location	Scope of Work	Duration	Project Benefits
Brampton DEMO	Brampton, Ontario (140 SWM PONDS)	**3 SWM ponds surveyed before being dredged**	**Estimated: 1 day Actual: 1.5 days (demo + tech challenges)**	Follow up survey after dredging Technology Champion for Municipalities
Survey Coordinator:		**“It’s amazing technology that can survey a pond in 20 min!”**		
Data Analyst		**“Very happy with the data”**		
Survey Technician		**“You’ve convinced anyone who’s ever had to do a bathymetric survey that this is by far a better method”**		

Project:	Location	Scope of Work	Duration	Project Benefits
Woolwich Dam	Elmira, Ontario	**2 ha survey area in front of dam and fore bay**	**Estimated: 2 hours** **Actual: 2 hours**	$3,672 Safe from shore – cold, frigid temperatures NO ONE ON A BOAT!
Director of Engineering:		**"Technology is superior than anything else available"**		
Data Analyst		**"Very happy with the data"**		