OIL DETECTION CANINES

2024-2025

IISD EXPERIMENTAL LAKES AREA
NORTHWESTERN ONTARIO, CANADA

SUBMERGED/SUNKEN OIL (1ST - 4TH OCTOBER 2024)

OBJECTIVE:
A field study designed and conducted to investigate the capability of an Oil Detection Canine (ODC) to detect submerged and sunken oils at different depths in a freshwater lake.

UNDERWATER OIL TARGETS FIELD TRIALS
- Three (3) oil types
- Placed at depths up to 5m (15 foot)
- Triple replicate targets for each oil/depth
- "Double blind" surveys – canine and handler

SHALLOW SEARCH PATTERN

DEEP SEARCH PATTERN

SUMMARY OF SUNKEN OIL SEARCH RESULTS
The ODC provided:
- Eighteen (18) responses that were interpreted as "alerts"
- Detected seven (7) of the eight (8) Dilbit targets
- Detected five (5) of the six (6) Bunker C targets
- Five (5) cases the alerts were associated with the same target
- The ODC did not detect the three (3) burn residue targets

		Type of Oil		
		Weathered Dilbit	Weathered Bunker C	Burn Residue
Target Depth	1 m	√ √ x	√ √ x	x x x
	3 m	√ √ √	√ √ √	- - -
	5 m	√ √ -	- - -	- - -

COMPARISON WITH OTHER SUBMERGED/SUNKEN OIL DETECTION TECHNIQUES
- ODCs can usually survey an area faster than most other platforms, if not at a similar survey rate
- ODCS have an immediate (real time) data return
- ODCS can detect small deposits
- ODCS can be effective in shallow (< 5-m) water depths

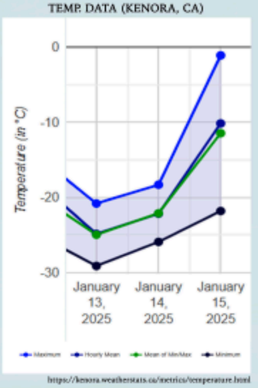
OIL UNDER ICE (13TH - 16TH JANUARY 2025)

OBJECTIVE:
A field study was designed and conducted to investigate the capability of an Oil Detection Canine (ODC) to detect oil under ice in a freshwater lake.

UNDER ICE OIL TARGETS FIELD TRIALS
- Freshwater ice; 1x1m under-ice pockets; ice total thickness 12-14"; ice cap over the oil was 2-3" thick with another 4-6" of snow cover
- Three (3) oil types
- Triple replicate targets for each oil/depth
- "Double blind" surveys – canine and handler

SURVEY TRACKS
BY OIL & WITH ODC ALERTS

DAILY
TEMP. DATA (KENORA, CA)



https://kenora.weatherstats.ca/metrics/temperature.html

SUMMARY OF UNDER ICE OIL SEARCH RESULTS
- ODC Detected all three (3) of the diesel and all three (3) of the condensate/heavy crude sites
- ODC didn't respond to eighteen (18) control (unoiled) sites
- ODC detected one (1) of the three (3) ULSFO sites on two separate searches. Prior to field trials ODC hadn't been trained on this oil type (low content of the volatile components)

		Type of Oil			
		Diesel	Condensate + Heavy Crude Blend	ULSFO	Control
Run #	1st	√ √ √			o o o o o o
	2nd		√ √ √	- - -	o o o o o o
	3rd		- - -	√ x x	o o o o o o
	4th			√ x x	o o o o o o

COMPARISON WITH OTHER UNDER ICE OIL DETECTION TECHNIQUES
- Researchers have been trying to find effective, reliable ways to detect oil spilled under ice in the Arctic for the past 50 years, with limited success
- ODCs now provide a proven new tool that can overcome many of the drawbacks of previous technology-driven solutions that are limited by ice that is too warm or salty and provide results often with an uncertain answer

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EXPERIMENTAL LAKES AREA (ELA), NORTHWESTERN ONTARIO, CANADA

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