Quarterly Project Portfolio FY2025 – Quarter 1

U.S. Coast Guard
Great Lakes Oil Spill Center of Expertise

Table of Contents – GLCOE Project Portfolios

Acronym Key

Acronym	Definition
ATC	Aviation Training Center
CG-MER	Coast Guard Marine Environmental Response Policy
CIGLR	University of Michigan Cooperative Institute for Great Lakes Research
EMI	Electromagnetic Interference
ERMA	Environmental Response Management Application
FOSC	Federal On-Scene Coordinator
GLCOE	U.S. Coast Guard Great Lakes Oil Spill Center of Expertise
GLERL	NOAA Great Lakes Environmental Research Laboratory
LSSU	Lake Superior State University
NOAA	National Oceanic and Atmospheric Administration
OAR	NOAA Office of Oceanic and Atmospheric Research
OR&R	NOAA Office of Response and Restoration
ROV	Remotely Operated Vehicle
RPI	Research Planning Incorporated
UV	Ultraviolet
UAS	Uncrewed Aircraft System
UNH CRRC	University of New Hampshire Coastal Response Research Center
CRREL	Cold Regions Research and Engineering Laboratory
USCGA	U.S. Coast Guard Academy

Enhancing Great Lakes Modeling

FY23 - 1

Theme Alignment: Preparedness

Return to Project Portfolio List

Objectives

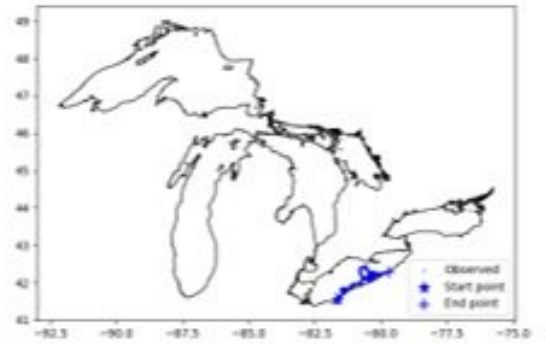
- Enhance Web General NOAA Operational Modeling Environment (GNOME) interconnectivity with Environmental Response Management Application Common Operating Picture (ERMA COP) improvements.
- Facilitate modeling working groups: Part 1 – Broad Working Group & Part 2 – GNOME Evaluation.

Notes

- Part 1: Cross program discussions of modeling capabilities, datasets, data formatting/delivery, modeling enhancement/identify issues/recommendations on enhancements.
- Part 2: Support GLERL's ongoing GNOME evaluation w/ Dr. Ayumi Fujisaki-Manome.
- Summary of Effort and Interpolation Improvements documents submitted to GLCOE.

GLCOE Lead:	**PI:**	**Partners:**
Dr. Matt Alloy	Dr. Lisa DiPinto, NOAA OR&R	UNH CRRC

Anticipated Outcome/Transition: Enhance collaboration and communication on environmental and spill modeling efforts in the region.



Project Timeline/Key Milestones

Period of Performance: 01 JUN 2023 – ~~31 MAY 2024~~ 27 SEP 2024

- Bi-weekly meetings with oil spill modelers to discuss suggestions on potential modeling enhancements.
- Bi-weekly meetings for international working group consisting of 45 participants from several nations.
- Members asked to formalize the challenges, achievements, and deliverables of this effort. Then to provide a list of the prospective next steps/goals of the effort to follow.
- Create spreadsheet of models for reference to quickly compare capabilities and approaches, algorithms, and needed inputs.
- Peer-reviewed publication: Modeling study on oil spill transport in the Great Lakes: The unignorable impact of ice cover
- No-cost time extension to allow for the International Modeling Workshop to be held at GLERL on September 24th – 26th.
- Final Report will be delivered following the Workshop at GLERL.

Project Completion Date: 27 SEP 2024 | **Percent Complete:** 100%

Great Lakes Trajectory Analysis Planner (TAP)

FY23 - 3

Theme Alignment: Preparedness

Return to Project Portfolio List

Objectives

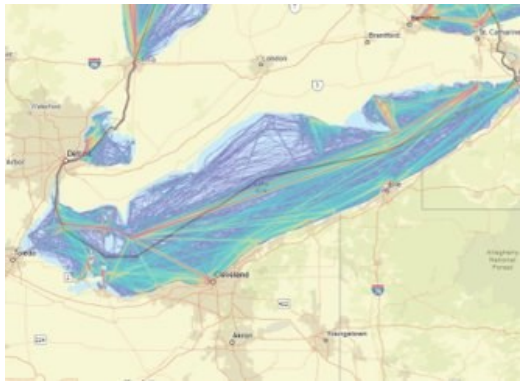
- Develop TAP for Lake Erie and further develop the online WebTAP viewer, including an option to output results in formats compatible with NOAA's ERMA (Environmental Response Management Application).

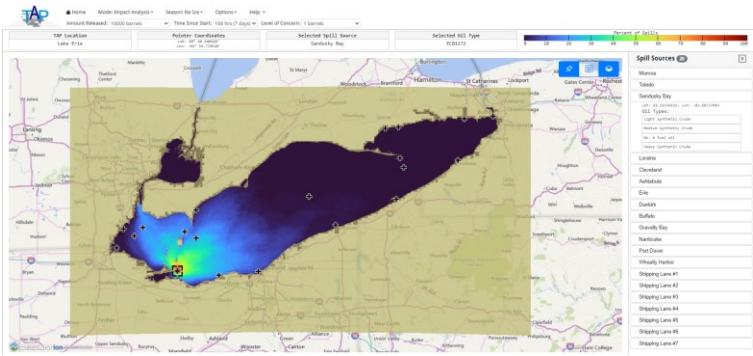
Notes

- Investigated options for long term archives of coupled ice-ocean hydrodynamic models as the Center for Operational Oceanographic Products and Services (CO-OPS) Lake Erie Operational Forecast System has not included a coupled ice model consistently.
- Successful initial test runs and integration of a subset of Lake Erie sources into WebTAP viewer.

GLCOE Lead:	**PI:** Dr.	**Partners:**
Dr. Matt Alloy	Amy MacFadyen, Dylan Righi, NOAA OR&R	N/A

Anticipated Outcome/Transition: Completed Lake Erie TAP.





Project Timeline/Key Milestones

Period of Performance: 01 JUN 2023 – ~~31 MAY 2024~~ 01 SEP 2024

- Gather and transform wind, currents and ice data using long term datasets to be obtained from members of the Great Lakes Modeling working groups (e.g., GLERL, CIGLR institutions) for Lake Erie and the Great Lakes.
- Research (with input from local sources) likely oil spill events in the area and use these to define spill sources and oil types for the GNOME trajectory runs.
- Input the transformed winds and currents data into the GNOME trajectory model for the TAP runs.
- Add code to TAP to output results in a GIS-compatible format (e.g. shapefiles) for ingest to ERMA or other Geographic Information Systems (GIS) (e.g. ArcPro).
- Add the completed Lake Erie TAP to the NOAA WebTAP viewer, which can be found at https://tap.orr.noaa.gov.
- Final functionality will be live on the WebTAP viewer.
- NCTE until end of August to move WebTAP from stage to public page.
- WebTAP fully public at https://tap.orr.noaa.gov/#locations/lake_erie/impact_analysis

Project Completion Date: 01 SEP 2024	**Percent Complete:** 100%

Great Lakes Uncrewed Aircraft Systems (GL UAS) Capacity Building

FY23 - 4

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- Plan and conduct controlled testing for the development and validation of oil thickness algorithms. Testing conducted with:

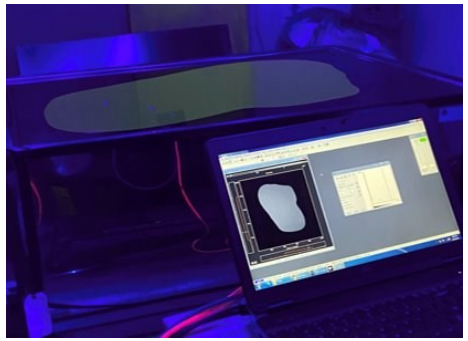
1. KBR Polarized IR sensor: Testing complete, technical report finalized.
2. Polaris Polarized IR sensor: Testing complete, technical report submitted.
3. GLERL Hyperspectral sensor: Testing (indoor and outdoor) complete, report to be submitted.
4. USCG: Testing complete, NOAA/CRRC updated USCG report.

Notes

- GLERL hyperspectral outdoor testing complete.
- Completed outdoor testing of USCG drones/pilots flights with RGB and thermal sensors (once agency receives its FY 24 funding).
- Completed Polaris Pyxis polarized infrared sensor on site for testing of detection capabilities marine diesel & MC20 crude without ice (warmer weather).

GLCOE Lead:	**PI:**	**Partners:**
Dr. Allie Snider	Dr. Lisa DiPinto, NOAA OR&R	UNH CRRC

Anticipated Outcome/Transition: Technical reports that detail utility of each tested sensor for detecting oil.



Project Timeline/Key Milestones

Period of Performance: 01 JUN 2023 – ~~31 MAY 24~~ 01 DEC 2024	
Bi-weekly or monthly virtual meetings with meeting notes and action items in a format to share with working group members.	
Test plan for 2 separate weeks of testing GLERL sensors at UNH.	
Brief (2-4 pp) technical report highlighting findings from GLERL's 2 weeks of UNH high bay laboratory experiments.	
Test plans for 1 week of testing sensors and/or samplers at UNH for individual operators.	
Brief (2-4 pp) technical reports highlighting the findings from 1 week of testing individual operators (e.g., KBR, Polaris) for up to 3 individual operators.	
Outdoor facility testing of USCG drones/pilots flights with RGB (red, green, blue) and thermal sensors.	
Polaris Pyxis polarized infrared sensor on site for testing of detection capabilities marine diesel & MC20 crude without ice.	
Final report evaluating efficacy of the sensors for detection of marine diesel and MC20 crude (precision, accuracy, detection limits, pros/cons for use) and submit manuscript for publication.	
Project Completion Date: 01 DEC 2024	**Percent Complete:** 100%

UAS Guidance & Training

FY23 - 5

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- Job Aid 1: *UAS for Oil Spill Response Guidance and Training*. How to use Short Range UAS (SR-UAS) to collect imagery during emergency response on shorelines and on water.
- Job Aid 2: *Oil Spill Response Data Management, Storage and Delivery Guidance.* How to oversee data management from UAS to common operating picture.
- Training Materials: Core training to provide UAS operators new to oil spill response operations essential information to conduct the mission.

Notes

- Job Aid 1: How to use sUAS to collect imagery during emergency response on shorelines and on water
- Job Aid 2: UAS data management, storage and delivery
- Integrated training products on the job aids and use of UAS for emergency response
- One pager introduction to remote sensing for FOSCRs.

GLCOE Lead:	**PI:**	**Partners:**
CWO Joe Torcivia	Dr. Lisa DiPinto, NOAA OR&R	RPI, D9 UAS manager & CG Aviation Training Center

Anticipated Outcome/Transition: Advance protocols and training for CG-UAS Division in oil response and for Great Lakes SR-UAS operators, agency agnostic.

Project Timeline/Key Milestones

Period of Performance: 01 JUN 2023 – ~~31 MAY 24~~ 30 SEP 2024

- Conduct meeting at CLEANGULF for UAS projects.
- Create outline for Job Aid #1.
- Planning meetings in December, January, & February to discuss progress on the 1st Job Aid..
- First draft of Job Aid #1 by 30 June 2024.
- Draft Job Aid #2 by 15 June 2024.
- Draft Training Materials by 10 September 2024.
- Final Job Aid #2 by 15 September 2024.
- Final Job Aid #1 by 15 September 2024.
- All final deliverables by 30 September 2024.

Project Completion Date: 30 SEP 2024 | **Percent Complete:** 100%

GL Wave Tank & Storage Infrastructure

FY23 – 6
FY23 – 7

Theme Alignment: Preparedness, Response

Return to Project Portfolio List

Objectives

- Construction of a new storage facility to provide enhanced infrastructure and capabilities for US and Canadian researchers within the Great Lakes to support research and response.
- Creation of a new and custom wave tank system (designed by SeaView Systems). The tank will be modular and be portable so that it can be moved outdoors to simulate environmental conditions that will strongly influence oil dynamics (e.g., photo-oxidation, ice development).

Notes

- Storage Infrastructure construction complete.
- Wave tank constructed, adjustments being made. Delivery made in mid-September.

GLCOE Lead:	**PI:**	**Partners:**
Dr. Allie Snider	Dr. Ashley Moerke, LSSU	NOAA OAR

Anticipated Outcome/Transition: Enhance infrastructure and capabilities within the Great Lakes region to evaluate technological developments under controlled, yet real-world conditions.

Project Timeline/Key Milestones

Period of Performance: 01 JUL 2023 – 30 JUN 2024	
Design for wave tank.	
Construct facility to house wave tank.	
Purchase tank construction materials.	
Build tank, complete plumbing to draw river water into tank system and circulate into Center for Freshwater Research and Education's (CFRE) existing water outflow system.	
Building structure in place and internal workshop finishing touches being done.	
Finalize “add-on” designs for wave tank.	
Project Completion Date: 30 JUN 2024	**Percent Complete:** 100%

Electromagnetic Interference (EMI) Oil Detection

FY24 - 1

Theme Alignment: Response

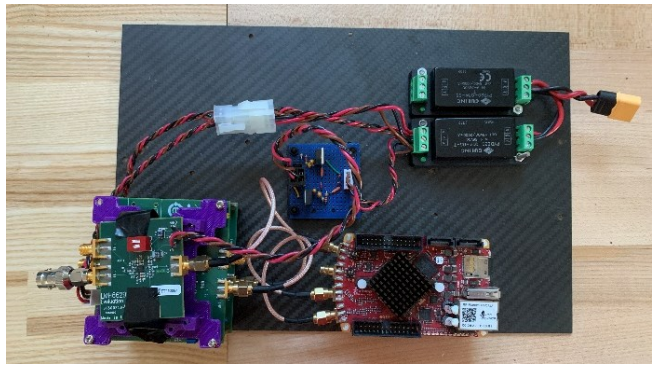
Return to Project Portfolio List

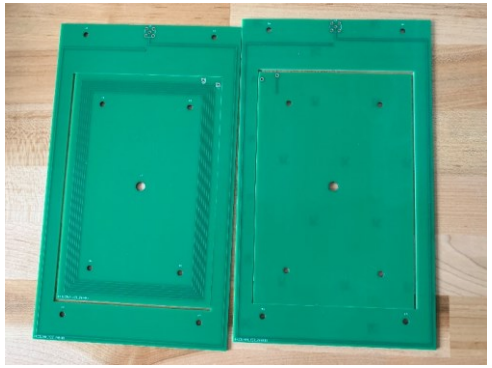
Objectives

- Develop an EMI sensor that can detect the presence of spilled oil or oil products through ice.
- Calibrate sensor to determine various factors including, sensor standoff distance, oil thickness range of detection, signal to noise ratios by oil type, etc.

Notes

- Final report for Phase 1 has been submitted to the GLCOE.
- Promising response with water only and oil only preliminary testing





GLCOE Lead:	PI:	Partners:
Dr. Matt Alloy	Kathryn Trubac, Army Corps Engineers, CRREL	NA

Anticipated Outcome/Transition: Develop the EMI Oil Detector and establish the range of its potential.

Project Timeline/Key Milestones

Period of Performance: 03 JUN 2024 – 30 SEP 2024	
Finalize project documents: Project Management Plan and Data Management Plan.	
Construction of EMI Sensor.	
Basic calibration against various targets, including ferrite, carbon fiber, wire, and oil on water.	
Project Completion Date: 30 SEP 2024	**Percent Complete:** 100%

In Situ Sensors

FY24 - 2

Theme Alignment: Preparedness, Response

Return to Project Portfolio List

Objectives

- Evaluate performance metrics of off-the-shelf sensors, including: reliability of detection, range, signal-noise ratio, and sensitivity
- Testing will be done under a range of conditions to mimic real-world conditions: winter/summer, varying sediment concentrations, wave actions, thermal conditions, etc.
- Oil composition and concentration will be assessed for each experiment using analytical chemistry
- Different types of oil will be evaluated

Notes

- Sensors are in-house, all operating, and research team is finalizing methods for testing standards and oil products,
- Team will meet up at LSSU in December to begin testing.
- Baseline sensor performance in DI water, lake/river water, and in the presence of fluorescent dye will first be tested. These tests will be performed in small 50-gallon bins.
- Testing will resume in March when the large test tank is fully operational and contains wave generator.

GLCOE Lead:	PI:	Partners:
Dr. Allie Snider	Ed Verhamme, LimnoTech	LSSU

Anticipated Outcome/Transition: Evaluation of the strengths and limitations of low-cost, off-the-shelf hydrocarbon sensors in early detection and monitoring of oil spills in cold, freshwater environments.

DI	LAKE	TIME
Low Rhodamine Concentration	Low Rhodamine Concentration	40 Minutes
Low Rhodamine Concentration Low Turbidity	Low Rhodamine Concentration Low Turbidity	40 Minutes
Low Rhodamine Concentration High Turbidity	Low Rhodamine Concentration High Turbidity	40 Minutes
High Rhodamine Concentration High Turbidity	Low Rhodamine Concentration High Turbidity	40 Minutes
High Rhodamine Concentration	High Rhodamine Concentration	40 Minutes

Project Timeline/Key Milestones

Period of Performance: 15 SEP 2024 – 14 SEP 2025

- Start up and testing of the LSSU wave tank.
- Design and build a portable wave generator (and absorbing "beach") for generating waves of specific wavelength, height, and frequency for sensor testing.
- Design and build modifications to support tank use for other sensors (e.g., aerial, AUVs).
- Purchase sensors for testing.
- Develop standardized testing protocol for the sensors following approaches used by the Alliance for Coastal Technologies.
- Connect each sensor to a datalogger to transmit data in real-time, then code each sensor to collect data at high frequency intervals.
- Upon completion of wave tank, begin sensor testing experiments (suspended sediment concentrations, wave action, thermal regimes).

Project Completion Date: 14 SEP 2025 | **Percent Complete:** 5%

Great Lakes Modeling

FY24 - 3

Theme Alignment: Preparedness, Response

Return to Project Portfolio List

Objectives

- Deploy drifters to generate GNOME model validation data and model coefficient data.
- Continue GNOME model development in interpolation and shoreline current refinements.
- Quarterly spill scenario simulations to quantify model advancement.

Notes

- Next Step: Procure drifters to deploy in Lake Erie.
- Workflow is being generated to process and evaluate the models once the drifters are in the water in Lake Erie. Utilizing an older dataset of drifters (2013) from southern Lake Michigan to accomplish this (see figures to the right).

GLCOE Lead:	PI:	Partners:
Dr. Matt Alloy	Dr. David Wright, NOAA OAR	CIGLR

Anticipated Outcome/Transition: Validate GNOME parameters for enhancing Great Lakes modeling.

Project Timeline/Key Milestones

Period of Performance: 01 SEP 2024 – 31 AUG 2025	
Drifter deployment in Lake Erie.	
Last drifter beached/recovered (determined by weather).	
GNOME validation against drifter set.	
Project Completion Date: 31 AUG 2025	**Percent Complete:** 5%

Transport and Fate of a Non-Conventional Oil

FY24 - 4

Theme Alignment: Preparedness

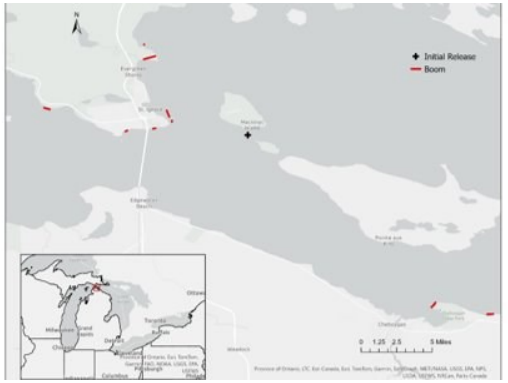
Return to Project Portfolio List

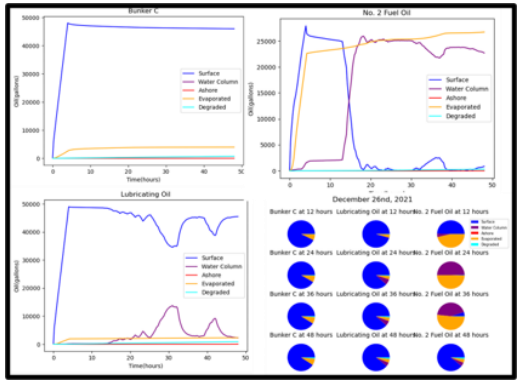
Objectives

- Conduct a spill trajectory analysis using the oil trajectory model OILMAP that is focused on the release of non-conventional oils (for example dielectric oil, mineral oil, or lubricating oil) in the Great Lakes region.
- Oil exposure to each sensitive shoreline in the area will be calculated as well as the impact of the modeled spill to endangered species habitat and the biological impact of different response activities.
- The fate, behavior, and transport of the non-conventional oil will be compared to that of a traditional oil.

Notes

- PI and Cadet(s) attended NOAA/CRRC Modeling Workshop in September 2024 (FY23 – 3 Project).
- Completed the numerical model simulations for conventional and non-conventional oil with comparison of transport and weathering for one geographic location for 12 dates randomly selected to capture seasonal variability of forcing factors (winds/currents).





GLCOE Lead:	**PI:**	**Partners:**
Dr. Allie Snider	Dr. Deanna Bergondo, USCGA	N/A

Anticipated Outcome/Transition: Understanding if there are differences with non-conventional oils will provide insight to the oil spill response community in developing oil spill response plans in the Great Lakes Region.

Project Timeline/Key Milestones

Period of Performance: 18 MAR 2024 – 18 MAR 2025	
Identify spill location and quantity. Configure model and select dates for model forcing (12 dates).	
Run model scenarios for conventional and nonconventional oils for 12 model dates.	
Perform Impact Analysis and Biological Assessment of oil trajectory on sensitive shoreline types and endangered species.	
Report writing and project briefs.	
Cadet participation in oil spill exercise in Great Lakes Area (Pending exercise occurrence).	
Project Completion Date: 18 MAR 2025	**Percent Complete:** 65%

Detection of Submerged Oil - UV

FY24 - 5

Theme Alignment: Response

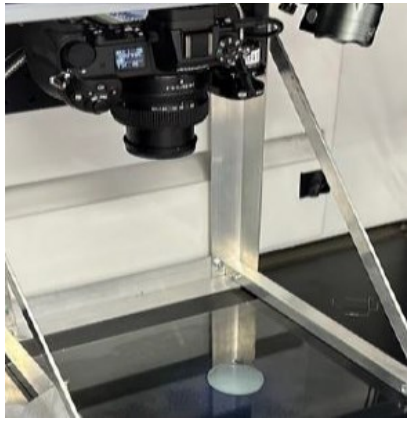
Return to Project Portfolio List

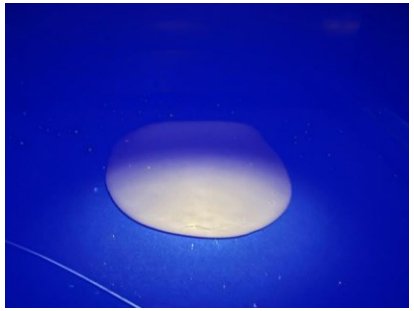
Objectives

- Develop a sensor that can detect the presence of spilled oil or oil products submerged in water or sitting on the lakebed using ultra-violet (UV) fluorescence technology.
- Conduct controlled laboratory bench tests using a variety of oils.
- Field demonstration of combined above and below water oil sensing with airborne and underwater UV fluorescence sensors.

Notes

- Laboratory study on 20 AUG 24 (pictures upper right).
- Laboratory study on the signal loss at the most extreme ends of weathering for simulated dilbit.
- Laboratory study of the signal from various petroleum product targets.
- Field data collection in from natural pond waters, Lake Erie waters, and Lake Michigan waters.





GLCOE Lead:	PI:	Partners:
Dr. Matt Alloy	Dr. Michael Sayers, Michigan Tech Research Institute	Michigan Tech. University

Anticipated Outcome/Transition: Establish the practical range of submerged oil detection in the Great Lakes (detection limits, depth, standoff, oil type/weathering state, and interferences).

Project Timeline/Key Milestones

Period of Performance: 22 JAN 24 – 21 JAN 25

Finalize project documents: Project Management Plan and Data Management Plan.
Conduct a bench laboratory study and demonstrate robustness of the detection method under water conditions representative of the Great Lakes.
Conduct field test for airborne and subsurface light-based active oil detection systems.

Project Completion Date: 21 JAN 2025 | **Percent Complete:** 80%

Weathering of Non-Conventional Oil

FY24 - 6

Theme Alignment: Preparedness, Response

Return to Project Portfolio List

Objectives

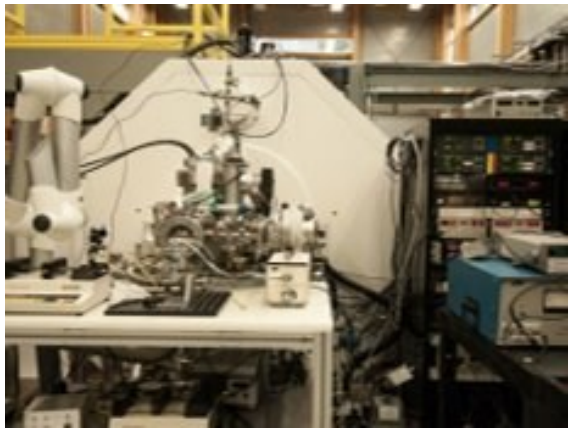
- Determine how photochemical weathering affects the physiochemical properties of non-conventional oils in freshwater environments.
- Investigate the role temperature might play in photochemical weathering.
- Experimentally determine how the above impact how non-conventional oil spreads, becomes entrained, and dissolves photochemical products.
- Investigate if all the above can form a model where simple field measurements of optical and physical properties will predict non-conventional oil weathering state and eventual environmental fate.

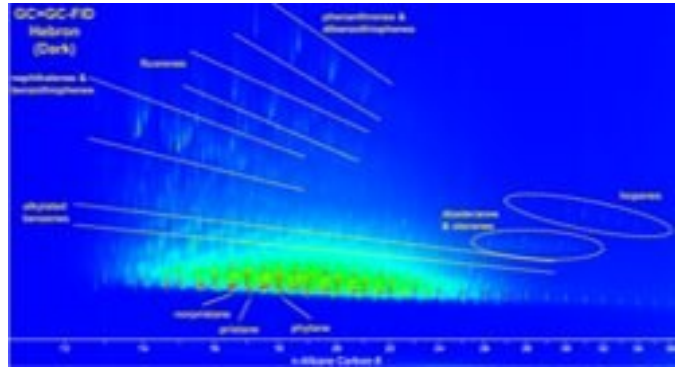
Notes

- Proposal submitted and awarded for FT-ICR MS instrument time at the National High Field Magnetic Laboratory (Top Picture).
- Characterized initial physical, chemical, and optical properties of the oils.
- Initiated evaporative and photochemical weathering experiments for oil property characterization.

GLCOE Lead:	PI:	Partners:
Dr. Matt Alloy	Dr. Collin Ward, Woods Hole Oceanographic Institute	US EPA ORD

Anticipated Outcome/Transition: Data report and peer-reviewed publications. Recommendations on incorporating results into spill modeling.





Project Timeline/Key Milestones

Period of Performance: 01 JUL 2024 – 30 JUN 2025

- Selection of non-conventional oils (Ultra Low Sulfur Fuel Oil, Cold Lake Blend Dilbit, Hibernia, and Hebron crude)
- Photochemical weathering of Ultra Low Sulfur Fuel Oil, Cold Lake Blend Dilbit, Hibernia, and Hebron crude.
- Partitioning behavior of weathered oil Ultra Low Sulfur Fuel Oil, Cold Lake Blend Dilbit, Hibernia, and Hebron crude.
- Characterization of the changes in physical properties in oil Ultra Low Sulfur Fuel Oil, Cold Lake Blend Dilbit, Hibernia, and Hebron crude due to photochemical weathering.
- Chemical characterization of photochemically weathered oil Ultra Low Sulfur Fuel Oil, Cold Lake Blend Dilbit, Hibernia, and Hebron crude.

Project Completion Date: 30 JUN 2025 | **Percent Complete:** 35%

Oil Detection Canines (ODCs)

FY24 - 7

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- Test the capabilities of trained Oil Detection Dogs (ODCs) to detect oil (1) underwater on the lakebed and (2) under freshwater ice.
- Study 1: Sunken oil. Three types of oil product will be sunken on the lakebed at increasingly greater depths to test ODC detection capabilities. This test will be conducted in open (not icy) water.
- Study 2: Oil under ice. Three types of oil products will be placed under surface of ice, using a method selected during a pilot study (two options for oil containment will be tested).

Notes

- Study 1: Sunken oil – field work has been completed, data analysis ongoing and writing is underway
- Study 2: Oil under ice – planning for winter experiment is underway (tentatively planned for February/March)

GLCOE Lead:	PI:	Partners:
Dr. Allie Snider	Dr. Vince Palace, International Institute for Sustainable Development - Environmental Lakes Area	Chiron K9, Owens Coastal Consultants, SLRoss Environmental Research, DF Dickins Associates

Anticipated Outcome/Transition: Expand capabilities of Oil Detection Canines (ODCs) to detect underwater (submerged and sunken) oil and oil under floating ice, adding an efficient tool to response efforts.

Project Timeline/Key Milestones

Period of Performance: 01 APR 2024 – 31 MAR 2025

Submit request to conduct research to IISD-ELA review panel, adjust project plans as needed and confirm with GLCOE. (Completed 4 June 2024).
Finalize experimental designs for Study 1 (May-Aug '24) and Study 2 (Mar-Aug '24).
Set up field experiments for Study 1 (Aug-Sep '24) and Study 2 (Dec '24).
Conduct each experiment. Study 1 (Sep '24), Study 2 (Dec '24-Feb '25).
Data Analysis and Reporting for Study 1 (Oct-Dec '24) and Study 2 (Dec '25-Feb '25).

Project Completion Date: 31 MAR 2025 | **Percent Complete:** 45%

Federal On-Scene Coordinator Guide – Oil in Ice

FY24 - 8

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- The FOSC Guide for oil spills in freshwater ice conditions will provide new information on best practices for responders in the Great Lakes region.
- Objectives of the Guide: 1) Synthesize the behavior of different types of oil in freshwater ice conditions; 2) Identify the best tactics for spill response in freshwater ice conditions; and 3) Promote information transfer for spill planners and responders.

Notes

- Successful project kick off meeting 22OCT24. The project management plan has been successfully submitted. USCG representatives from Sector Northern Great Lakes and Marine Safety Unit Thousand Islands have joined the project team.
- Example graphics are expected to be submitted December 2024

GLCOE Lead:	**PI:**	**Partners:**
CWO Joe Torcivia	Dr. Lisa DiPinto, NOAA OR&R	Research Planning, Inc.

Anticipated Outcome/Transition: Develop a guide for oil spill planners and responders to use as a job aid.

Project Timeline/Key Milestones

Period of Performance: 24 JUN 2024 – 23 JUN 2025	
Draft a detailed outline of the FOSC Guide.	
Draft example graphics for the FOSC Guide.	
Draft FOSC Guide.	
Final FOSC Guide.	
Project Completion Date: 23 JUN 2025	**Percent Complete:** 15%

UAS Training Protocols

FY24 - 9

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- The objective is to develop and refine USCG UAS Standard Operating Procedures, tactics and techniques for spill response missions, integration of orthomosaic software, as well as identifying shortfalls, gaps, and needs for Great Lakes UAS pilots.

Notes

- USCG representatives from ATC and D9 have been included to ensure broadest applicability and regional representation.
- Next steps: Identify USCG District 9 location and select dates for training.

GLCOE Lead:	PI:	Partners:
CWO Joe Torcivia	Dr. Lisa DiPinto, NOAA OR&R	Research Planning, Inc.

Anticipated Outcome/Transition: Enhance training materials and guidelines for USCG Great Lakes UAS pilots.

Project Timeline/Key Milestones

Period of Performance: 24 JUN 2024 – 23 JUN 2025	
Bi-weekly calls with NOAA OR&R and GLCOE staff.	
Draft training materials tiering from previous projects.	
Develop final training materials to be used in training sessions.	
Develop a final summary of both field deployments, to include lessons learns and recommendations.	
Coordinate with GLCOE, USCG Aviation Training Center, and Program Office CG-7114 to refine next steps.	
Project Completion Date: 23 JUN 2025	**Percent Complete:** 5%

Acoustic Oil Detection

FY24 - 10

Theme Alignment: Response

Return to Project Portfolio List

Objectives

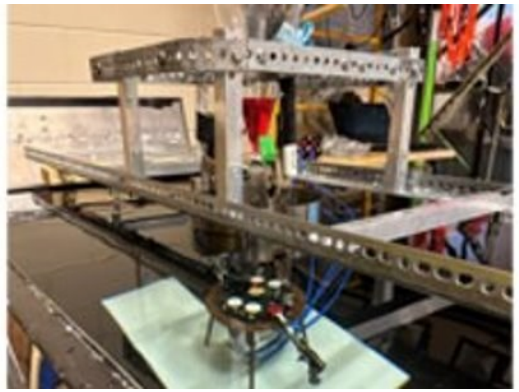
•Experimentally test the AQUAScat 1000L's capability to detect and measure oil thickness under ice. The Aquascat is a commercially available off the shelf acoustic sensor package that could be mounted on an ROV. The capabilities of the acoustic sensor to detect and measure 3 discrete thicknesses each of diesel and No. 6 fuels will be tested.
•After the highbay validation testing, the project will focus on various aspects of sensor use the equipment and algorithms needed to allow the sensor to measure oil thickness: under ice, under an undulating (non-breaking wave) surface, and outdoors. This testing will include different water temperature and turbidities.

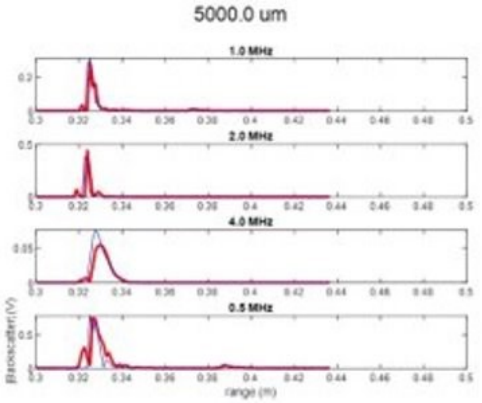
Notes

- Detection limits for floating oil identified for Marine Diesel, will move to Line 5 oil next
- Preparing equipment and planning for under-ice testing, wave tank testing, outdoor testing for both oil types
- First Project Advisory Committee Meeting held: used committee's input to make decisions on temperature, turbidity, slick thickness.

GLCOE Lead:	**PI:**	**Partners:**
Dr. Allie Snider	Dr. Lisa DiPinto, NOAA OR&R	UNH CRRC

Anticipated Outcome/Transition: Assess the capability of an acoustic sensor to detect and measure oil thickness on the water's surface and under ice in fresh waters for use in the Great Lakes and other USCG districts.





Project Timeline/Key Milestones

Period of Performance: 24 JUN 2024 – 23 JUN 2025

- Post Award Brief Meeting & Deliverables Jul 2024 (Completed).
- Project Advisory Committee (PAC) Selection Aug 2024 (Completed).
- Selection of Fuel Thicknesses, Turbidities, Water Temperature & Replicates: Aug & Sept 2024.
- Completion of Highbay Testing Dec 2024.
- Completion of Wave Tank Testing Feb 2025.
- Completion of Ice Tank Testing Mar 2025.
- Completion of Outdoor Testing May 2025.
- Submission of Final Report & Deliverables Archive Jun 2025.

Project Completion Date: 23 JUN 2025 | **Percent Complete:** 16%

Summer 2024 USCGA Internship

FY24 - 11

Theme Alignment: Response

Return to Project Portfolio List

Objectives

- Two U.S. Coast Guard Academy cadets joined the GLCOE for a summer internship, from mid-June through late July.
- Cadets worked with Drs. Britt Ranson Olson and Bo Liu to conduct a biological oil degradation study. It had two parts: (1) Evaluate the native microbial community in sediment from the St. Marys River, then track community changes after oil exposure. (2) Chemical analyses to measure how the oil changes throughout the experiment.
- Due to equipment issues, some data are still being collected and analyzed at LSSU, but cadets were able to conduct preliminary analyses that showed taxa behaving differently to oil exposure.

Notes

- Lab work complete, preliminary results show response to oil exposure varies by taxa.
- *Psuedomonas*, *Aquabacterium*, and *Novosphingobium* all appear to increase in abundance after oil exposure; existing scientific literature shows these groups can degrade hydrocarbons.

GLCOE Lead:	PI:	Partners:
Dr. Allie Snider	Dr. Allie Snider	USCGA, LSSU

Anticipated Outcome/Transition: Understand native microbial community and link that to how they can break down oil. This will help LSSU collaborators prepare for larger-scale oil spill microcosm experiments.

Project Timeline/Key Milestones

Period of Performance: 15 JUN 2024 – 25 JUL 2024

- Literature review and reading to understand the basic question and methods that will be used in this project.
- Learn the necessary lab skills to conduct the chemical and microbial lab work.
- Collect and analyze the data generated, share findings with LSSU collaborators.

Project Completion Date: 25 JUL 2024

Percent Complete: 100%