



Quarterly Project Portfolio FY2024 – Quarter 3

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

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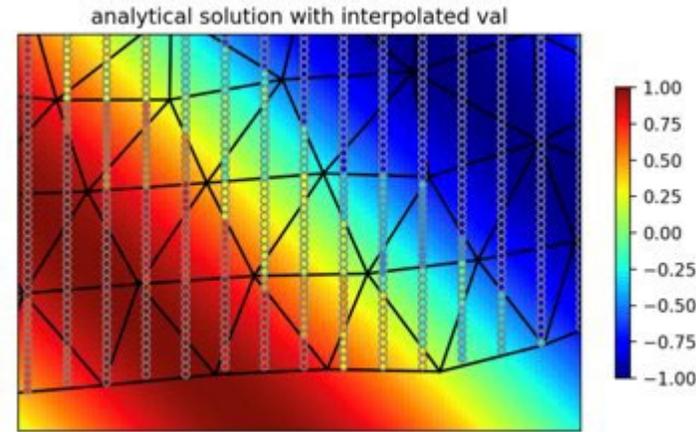
Acronym Key

Acronym	Definition
CG-MER	Coast Guard Marine Environmental Response Policy
CIGLR	University of Michigan Cooperative Institute for Great Lakes Research
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
PODS	Polaris Oil Detection System
UAS	Uncrewed Aircraft System
UNH CRRC	University of New Hampshire Coastal Response Research Center
USCGA	U.S. Coast Guard Academy

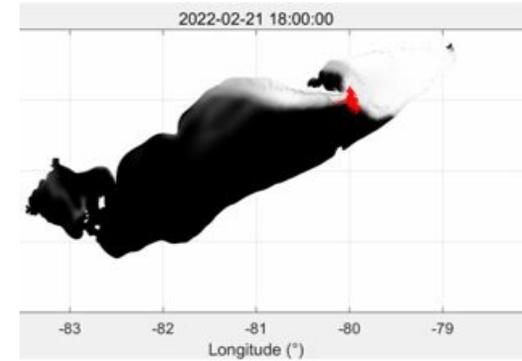
Theme Alignment: Preparedness

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Objectives	<ul style="list-style-type: none"> Evaluate General NOAA Operational Modeling Environment's (GNOME) performance as an oil spill trajectory model in the Great Lakes. Incorporate the high-resolution Great Lakes Coastal Forecasting System into GNOME. Convene workshop to discuss Great Lakes freshwater gaps. Determine remedies for areas of GNOME underperformance.
Notes	<ul style="list-style-type: none"> Project initiation delayed until FY23. Time step analysis conducted using experimental version Great Lakes Operational Forecasting System to inform time steps that are appropriate for GNOME simulations. Submitted a manuscript to Journal of Environmental Management. - Song Y. et al. "Modeling study on oil spill transport in the Great Lakes: Significant ice cover". Another manuscript on model calibration in preparation – Song Y. et al. "Introducing a convex hull method to calibrate Lagrangian oil spill models using drifter trajectories."



Below: Simulated Oil Spill Particles (red dots) in a hypothetical spill event in the ice-covered Lake Erie.



GLCOE Lead: Dr. Matt Alloy	PI: Dr. David Wright, NOAA OAR	Partners: N/A
Anticipated Outcome/Transition: GNOME improvements using Lake Erie as a validation area. Continuation and iteration with the other Great Lakes.		

Project Timeline/Key Milestones	Period of Performance: 09 SEP 2021 - 31 MAR 2024
	Identified GNOME underperformance area: shorelines and other edge/border areas.
	Initiated efforts to remedy the above: Investigation and testing of new interpolation algorithm.
	Initiated investigation to diffusion and uncertainty coefficients that match drifter data for Lake Erie.
	Initiated metrics of measuring GNOME performance with drifter data for validation.
	Presented preliminary oil in ice simulations at International Association for Great Lakes Research 2023 conference titled "Modeling Study on Oil Spill Transport in the Great Lakes: Significant Ice Cover".
	Manuscript in preparation for peer-reviewed journal. – Song et al. "Modeling study on oil spill transport in the Great Lakes: Significant ice cover".
	Drafted Great Lakes Modeling Summary of Effort Report.
	Attended and presented a poster at the IOSC in New Orleans, LA, 13-16MAY2024.
	Project Completion Date: COMPLETE

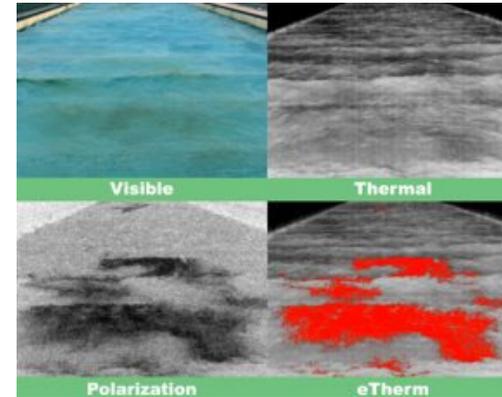
Pyxis Oil Spill Detection System (PODS)

FY22 - 2

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> Assess oil detection technology: Purchased Pyxis camera and data analysis software.
Notes	<ul style="list-style-type: none"> Project completed. Future use of Pyxis camera is tentatively planned at Lake Superior State University's outdoors tank in both warm and cold conditions with ice.



GLCOE Lead: Dr. Allie Snider	PI: Dr. David Wright, NOAA OAR	Partners: N/A
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Anticipated Outcome/Transition: Evaluate the Pyxis Long Wavelength Infrared High Definition (LWIR HD) 30Hz camera system's ability to detect oil in freshwater and ice-affected waters.

Project Timeline/Key Milestones	Period of Performance: 16 SEP 2022 – 31 MAR 2024
	Literature review of additional types of oil detection technology, including Costal Dynamics Experiment (CODE) drifters to mimic oil transport for modeling applications. Provide report.
	Determine best management practices for using Pyxis and conduct USCG field-based training.
	Exploring gimbal options for deployment on a drone for further testing.
	Attending MPRI conference to begin planning tests that will include the Pyxis test.
Project Completion Date: COMPLETE	Percent Complete: 100%

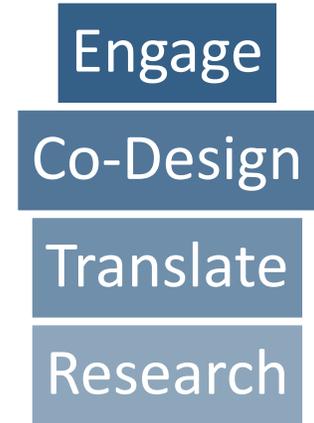
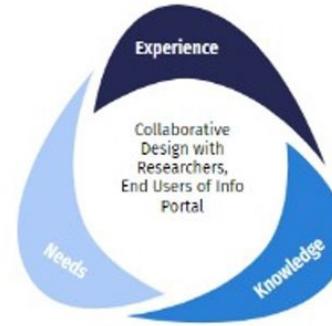
Theme Alignment: Preparedness

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Objectives	<ul style="list-style-type: none"> Assess the GLCOE needs for a public-facing website for the public, stakeholders, USCG, GLCOE partners, and for general information dissemination. Interview possible users and assess similar websites to determine the functionalities desired. Produce a report of recommendations given several different scopes to the GLCOE.
Notes	<ul style="list-style-type: none"> Two engagement specialists have been hired. Exploratory literature review has been conducted. Identified potential end-users to interview and created guidelines for the interviews. Conducted internal and external interviews. Synthesizing the interviews based on transcripts and recordings. Submitted an Executive Summary on the timeline to produce final report.

GLCOE Lead: LT Ali Gates	PI: Dr. David Wright, NOAA OAR	Partners: N/A
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Anticipated Outcome/Transition: End-User surveys and interviews to produce base level website



Project Timeline/Key Milestones	Period of Performance: 12 SEP 2022 – 31 MAR 2024
	Project reallocation of effort. The focus is to generate a Report of Info Portal Recommendations.
	Initial draft of work plan revised to reflect refocusing of the project.
	Initial draft of user needs assessment interviewee list and interview questions.
	Finalized list of interview questions.
	Executive summary on current state of project & work plan addressing remaining project timeline.
	Produce a report of potential website upgrade functionalities by SEPT 2024.
Project Completion Date: COMPLETE	Percent Complete: 100%

Federal On-Scene Coordinator (FOSC) Ice Guide

FY22 - 4

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> Research the differences in oil behavior in freshwater ice as opposed to saltwater ice. Produce an annotated bibliography for GLCOE use and to be incorporated into the final FOSC Oil in Ice Guide (FY24).
Notes	<ul style="list-style-type: none"> Final deliverable received by GLCOE. Research Planning Inc. (RPI) will be producing the FOSC Guide with input from this project and it's deliverable.



GLCOE Lead: CWO Joe Torcivia	PI: Dr. David Wright, NOAA OAR	Partners: N/A
Anticipated Outcome/Transition: RPI will produce a field guide for responses to oil under ice.		

Project Timeline/Key Milestones	Period of Performance: 22 SEP 2022 – 31 MAR 2024
	Project has been initiated, several meetings with Subject Matter Experts (SMEs) and NOAA Scientific Support Coordinator (SSC) to give input into the guide's structure and content.
	Steps have been taken by CIGLR to subcontract the guide to RPI (discussion held 12 Oct 2023)
	RPI will come onboard in January w/ Kickoff Meeting in February.
	Meet regularly with RPI to stay on track with the project deadline.
	Provide literature review to GLCOE as final deliverable.
	Final report delivered.
Project Completion Date: COMPLETE	Percent Complete: 100%

Optimizing Uncrewed Aircraft Systems (UAS)

FY22 - 5

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> Advance the capabilities to develop and test oil spill response equipment, techniques and technologies to better respond to and evaluate impacts of oil spills in freshwater environments. Draft written procedures for using USCG UAS systems. Conduct USCG Pilot & responder field training.
Notes	<ul style="list-style-type: none"> Add addendum to USCGs small UAS Flight Operations Standard Operating Procedures – “Marine Environmental Response Oil Mission Guidelines”. Comparative analysis of Commercial Off The Shelf orthomosaic software packages. Final meetings held with USCG UAS pilots to discuss feedback and future recommendations. Final project meeting completed. Final report delivered: Link



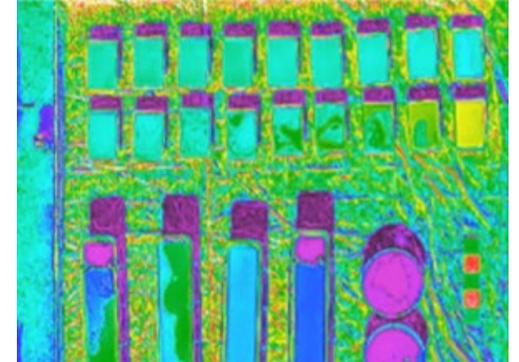
GLCOE Lead: LT Ali Gates	PI: Dr. Lisa DiPinto, NOAA OR&R	Partners: WaterMapping Inc.
Anticipated Outcome/Transition: Consistent data collection that can be easily uploaded into DIVER/ERMA for supporting environmental response.		

Project Timeline/Key Milestones	Period of Performance: 20 JUN 2022 – 29 SEP 2023
	Develop draft written procedures for using USCG UAS to collect data in support of oil pollution events in the Great Lakes.
	Conduct USCG pilot and responder field-based training: Conducted July 2023.
	Develop final, detailed written procedures.
	Evaluate options for orthomosaic mapping offshore.
	Recommendations for moving forward for future USCG investments in uncrewed systems, including sensor/sampler/accessories for Remotely Operated Vehicles.
	Final report delivered.
Project Completion Date: COMPLETE	Percent Complete: 100%

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> Refine detection limits based on actual time in field. Advance our understanding of the relationship between percentage of ice cover and thermal sensor-based oil thickness characterization. Develop faster workflows to allow for production of mapping.
Notes	<ul style="list-style-type: none"> Preliminary results presented at 24 AUG 2023 quarterly meeting. Conducted additional testing and analyses to determine “container effect” on test results. Developed technique to overlay sensor, photographic, and UV oil images to determine sensor capabilities. Determined impact of ice on oil thermal characteristics is limited to small area adjacent to ice. Final report delivered: Link



GLCOE Lead: LT Ali Gates	PI: Dr. Lisa DiPinto, NOAA OR&R	Partners: WaterMapping Inc., UNH CRRC
Anticipated Outcome/Transition: Improve UAS mapping workflows, understanding of relationship between ice cover/oil thickness characterization		

Project Timeline/Key Milestones	Period of Performance: 20 JUN 2022 – 29 SEP 2023
	Completed shore-based field trials at Lake Superior State University (March 2023).
	Completed drill of UAS operations in ice from a USCG vessel (March 2023).
	Project report summarizing the testing and scientific findings, potentially suitable for peer reviewed publication is underway.
	Write up protocols for flying and characterizing ice cover for application during incidents, including data collection, intake and development of faster workflows.
Project Completion Date: COMPLETE	Percent Complete: 100%

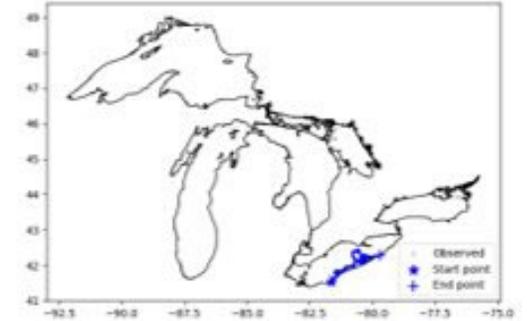
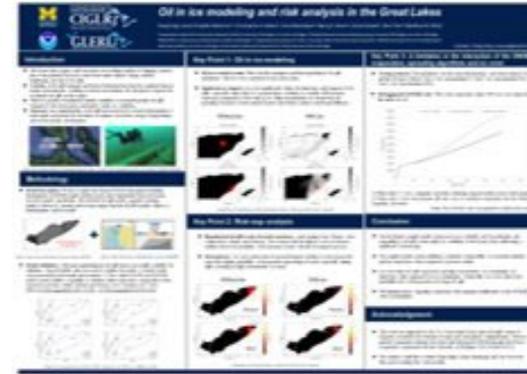
Enhancing Great Lakes Modeling

FY23 - 1

Theme Alignment: Preparedness

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Objectives	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. A No Cost Time Extension was agreed upon to allow for the International Modeling Workshop to be held in September.



GLCOE Lead: Dr. Matt Alloy	PI: Lisa DiPinto, NOAA OR&R	Partners: UNH CRRC
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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
	Monthly meetings with Yang Song updating the group and ending with action items for group members.
	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.
	Bi-weekly meetings with oil spill modelers to discuss suggestions on potential modeling enhancements.
	Create spreadsheet of models for reference to quickly compare capabilities and approaches, algorithms, and needed inputs.
	Bi-weekly meetings for international working group consisting of 45 participants from several nations.
	No-cost time extension to allow for the International Modeling Workshop to be held at GLERL on September 24 th – 26 th .
	Final meeting of GNOME group will be 30th June 2024.
Project Completion Date: 30 NOV 2024	Percent Complete: 75%

Environmental Response Management Application (ERMA) Enhancements

FY22 - 9
FY23 - 2

Theme Alignment: Preparedness

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Objectives	<ul style="list-style-type: none"> FY22 – 1: Support Environmental Sensitivity Index (ESI) efforts in the Great Lakes region by adding two new atlases; the St. Mary’s River and the St. Lawrence River. Integrated into ERMA TOC and Query tools. Update EPA Inland Sensitivity Atlases in ERMA. FY23 – 2: Support the identification and creation of a set of sensitive habitats/species layers in the ERMA Common Operating Picture (COP) throughout the Great Lakes. Expand the use of UAS and other remote sensing technologies (enhanced image support, upload and download). Bookmarks, Dashboard, and Security.
Notes	<ul style="list-style-type: none"> FY22 - DRAFT ICS 232 report generated by ERMA available now, functionality will be in production end of March 2024. ERMA 5.3 Release - ERMA Update Blog Feb 2024 FY23 – Improved data search functionality. New filter tool for user customization and immediate filter display on maps and dashboards. Zoom to data that has been selected. Consolidated Table of Contents functionality and implemented human readable names for attachments. Improvements to easily jump into bookmark views and see table of contents. Continued leverage DIVER/ERMA interoperability for upload/download/package creation.

1. Incident Name	2. Operational Period (Date/Time) From: [] To: []	RESOURCES AT RISK SUMMARY ICS-232-05
3. Environmentally Sensitive Areas and Wildlife Issues		
Site Name and/or Physical Location		Site Considerations
Narrative:		
<p>ESA Listed Species (E = endangered; T = threatened)</p> <p>Type Name T/E Concentration Stage Periods</p> <p>Birds Least tern State Threatened Federal not listed 15 FWRES Nesting May-Aug</p> <p>Birds Peregrine Falcon State not listed Federal Threatened Nesting Feb-Jun Hatching Sep-Oct</p> <p>Fish Habitat Atlantic Sturgeon State-E Federal E Adults Jan-Dec</p> <p>Fish Habitat Shortnose sturgeon State E/E Federal E WREAK RUN Juveniles Jan-Dec Adults Jan-Dec</p>		
<p>Shoreline (general types) Miles</p> <p>1) Armored 09.2</p> <p>2) Rocky and Steep Shorelines 0.2</p> <p>3) Beaches (sand/gravel) 1.1</p> <p>4) Flats (meadow) 1.3</p> <p>5) Vegetated 20.3</p> <p>Full shoreline class lengths are in the appendix</p>		
4. Archaeo-cultural and Socio-economic Issues		
Historical sites are present in the area. See the appendix for the full list. Contact the state historic preservation office for exact locations		



GLCOE Lead: CWO Joe Torcivia	PI: George Graettinger, NOAA OR&R	Partners: N/A
Anticipated Outcome/Transition: Advancing ERMA		

Project Timeline/Key Milestones	Period of Performance: 03 FEB 2022 – 31 MAY 2024
	FY22 – Draft ICS 232 report generated by ERMA available now, functionality will be in production end of March 2024.
	ERMA Application version 5.2 released September 2023.
	Finalize ERMA application testing (NOAA).
	FY23 – DRAFT ICS 232 will be available for review by the USCG GLCOE and designated partners.
	Improved ESI data presentation (Threatened & Endangered species).
	Implement dashboard tabs – allow users to view map/charts by different metrics.
	ERMA application version 5.4 release scheduled for June 2024.
Project Completion Date: COMPLETE	Percent Complete: 100%

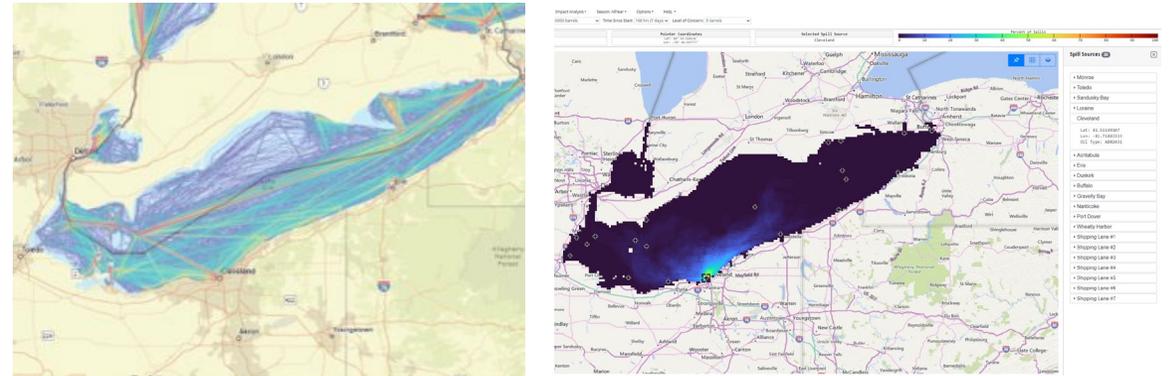
Great Lakes Trajectory Analysis Planner (TAP)

FY23 - 3

Theme Alignment: Preparedness

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Objectives	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. Model forcing data (winds, currents, ice) from CIGLR have been downloaded and prepared for GNOME model runs. Successful initial test runs and integration of a subset of Lake Erie sources into WebTAP viewer. A No Cost Time Extension was agreed upon to allow final functionality to be implemented live on WebTAP viewer.



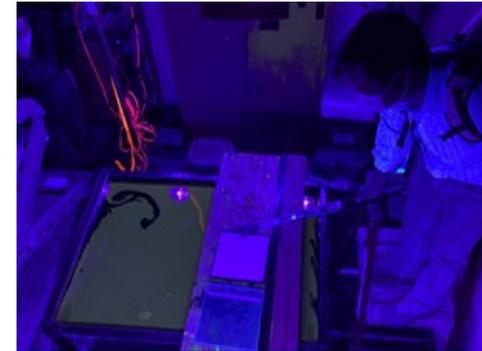
GLCOE Lead: Dr. Matt Alloy	PI: Amy MacFadyen, Dylan Righi, NOAA OR&R	Partners: N/A
Anticipated Outcome/Transition: Completed Lake Erie TAP will be integrated into the NOAA WebTAP viewer.		

Project Timeline/Key Milestones	Period of Performance: 01 JUN 2023 – 31 MAY 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.	
Project Completion Date: 30 JUN 2024		
Percent Complete: 90%		

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> Plan and conduct controlled testing for the development and validation of oil thickness algorithms. Testing conducted with: <ol style="list-style-type: none"> <u>KBR Polarized IR sensor</u>: Testing complete (indoor testing with diesel), technical report finalized NLT July 30. <u>Polaris Polarized IR sensor</u>: Tested week of April 1 (indoor and outdoor testing, diesel and MC20 crude planned with and without ice), technical report finalized NLT July 30. <u>GLERL Hyperspectral sensor</u>: TBD, CRRC is awaiting confirmation of test week dates. Testing plans are for outdoor testing (indoor testing completed in 2023). <u>USCG</u>: Pilots testing USCG drones 3-7 June, 2024. 	
Notes	<ul style="list-style-type: none"> A No Cost Time Extension was agreed upon to allow for USCG pilots to participate in the experiment and additional testing for GLERL. Delays in USCG pilot travel were due to Federal budgeting challenges. 	
GLCOE Lead: Dr. Allie Snider	PI: Dr. Lisa DiPinto, NOAA OR&R	Partners: UNH CRRC
Anticipated Outcome/Transition: Technical reports that detail utility of each tested sensor for detecting oil		

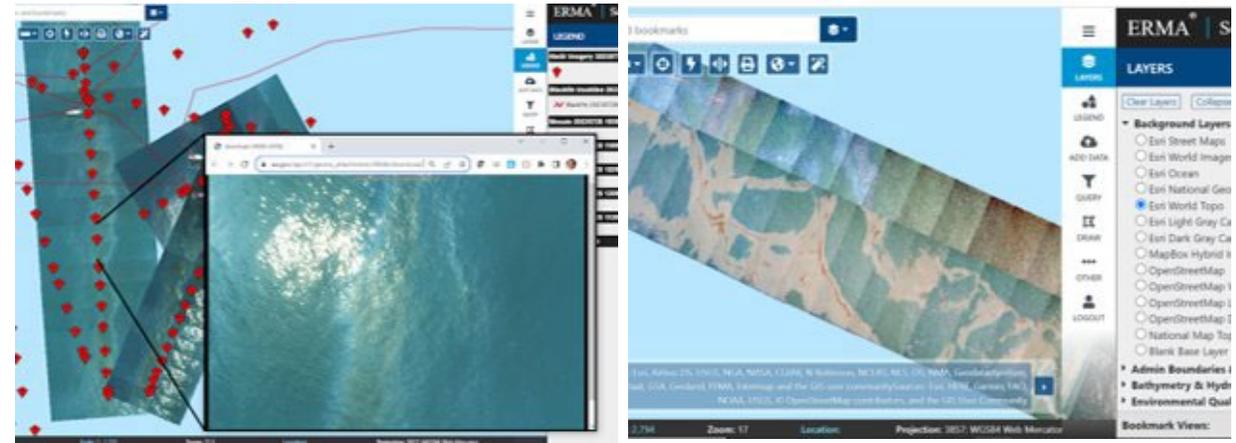


Project Timeline/Key Milestones	Period of Performance: 01 JUN 2023 – 31 MAY 24	
	Bi-weekly or monthly virtual meetings with meeting notes and action items in a format to share with working group members.	
	Test plan for GLERL for 2 separate weeks of testing sensors at UNH.	
	Brief (2-4 pp) technical 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 (operators TBD by USCG) for up to 3 individual operators.	
	Outdoor facility testing of USCG drones/pilots flights with RGB 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: 80%		

Theme Alignment: Response

[Return to Project Portfolio List](#)

Objectives	<ul style="list-style-type: none"> • Job Aid: How to use small UAS (sUAS) to collect imagery during emergency response on shorelines and on water. • Job Aid: Data management, storage, and delivery • Integrated training materials will be developed for the use of both job aids.
Notes	<ul style="list-style-type: none"> • Created detailed outline for 1st job aid that provides safety measures and guidance on how to use sUAS for specific response operations, including which sensors to use and when to use optional equipment.



GLCOE Lead: CWO Joe Torcivia	PI: Dr. Lisa DiPinto, NOAA OR&R	Partners: WaterMapping, Inc., D9 UAS manager & ATC
Anticipated Outcome/Transition: Advance protocols and training for CG-7114 in oil response		

Project Timeline/Key Milestones	Period of Performance: 01 JUN 2023 – 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.	
	Final Job Aid #2 by 15 July 2024.	
	Draft Training Materials by 1 August 2024.	
	All final deliverables by 14 September 2024.	
Project Completion Date: 30 SEP 2024		
Percent Complete: 50%		

GL Wave Tank & Storage Infrastructure

FY23 – 6
FY23 – 7

Theme Alignment: Preparedness, Response

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Objectives	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Construction complete, finishing touches on interior ongoing. Preliminary design for wave tank is in hand; adjustments will be made and production will begin when design is finalized. Tank contract finalized; final design and construction phase.



GLCOE Lead: Dr. Allie Snider	PI: Dr. Ashley Moerke, LSSU	Partners: NOAA OAR
Anticipated Outcome/Transition: Enhance infrastructure and capabilities within the Great Lakes 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 has already been completed and secured from SeaView Systems.	
	Construct facility to house wave tank (planning in progress with external funding).	
	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 (within 6 months of SOW finalization).	
	Building structure in place and internal workshop under construction now.	
	Finalize “add-on” designs for wave tank.	
Project Completion Date: 30 JUN 2024		
Percent Complete: 70%		

Electromagnetic Interference Oil Detection

FY24 - 1

Theme Alignment: Response

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Objectives	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Conducted Post Award Brief in early JUNE24. Army Corps of Engineers IRWA limitations have truncated the project to a POP of 4 months, deliverables and award budget have been amended to reflect this.



GLCOE Lead: Dr. Matt Alloy	PI: Kathryn Trubac, Army Corps Engineers, CRREL	Partners: NA
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Anticipated Outcome/Transition: Submit a successor project to develop the EMI Oil Detector and establish the range of its potential.

Project Timeline/Key Milestones	Period of Performance: 03 JUN 24 – 30 SEP 24	
	Finalize project documents: Project Management Plan and Data Management Plan.	
	Construction of EMI Sensor.	
	Basic calibration.	
Project Completion Date: 30 SEP 2024		
Percent Complete: 0%		

Transport and Fate of a Non-Conventional Oil

FY24 - 4

Theme Alignment: Planning

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Objectives	<ul style="list-style-type: none"> The goal of this project is to 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 ESI 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	



GLCOE Lead: Dr. Allie Snider	PI: Dr. Deanna Bergondo, USCGA	Partners: N/A
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Anticipated Outcome/Transition: Understanding if there are differences 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 24 – 18 MAR 25
	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 ESI shoreline type 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: 20%

Detection of Submerged Oil - UV

FY24 - 5

Theme Alignment: Response

[Return to Project Portfolio List](#)

Objectives	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Conducted Post Award Brief in JAN24. Created Project Management Plan and Data Management Plan. Laboratory study, update on 07 JUN 24.



Figure 2: Fluorescence of a variety of oil samples. Also present is a chlorophyll sample.



GLCOE Lead: Dr. Matt Alloy	PI: Dr. Michael Sayers, Michigan Tech Research Institute	Partners: 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: 40%

Oil Detection Canines

FY24 - 7

Theme Alignment: Response

[Return to Project Portfolio List](#)

Objectives	<ul style="list-style-type: none"> • 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	



<p>GLCOE Lead: Dr. Allie Snider</p>	<p>PI: Dr. Vince Palace, International Institute for Sustainable Development - Environmental Lakes Area</p>	<p>Partners: Chiron K9, Owens Coastal Consultants, SLRoss Environmental Research, DF Dickins Associates</p>
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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: 5%		

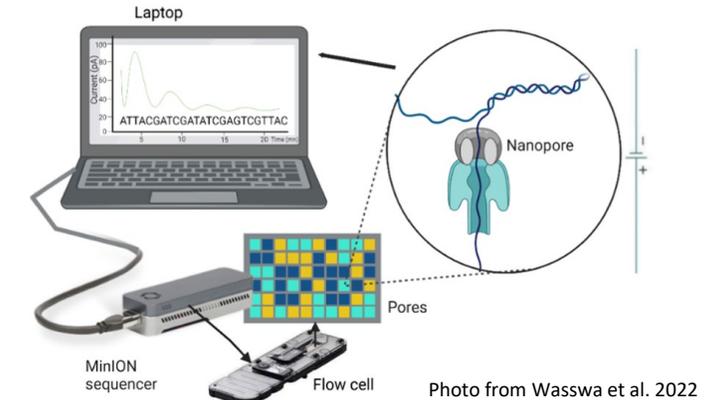
Summer 2024 USCGA Internship

FY24 - 11

Theme Alignment: Response

[Return to Project Portfolio List](#)

Objectives	<ul style="list-style-type: none"> Two U.S. Coast Guard Academy cadets will join the GLCOE for a summer internship, from mid-June through late July. Collaborate with Drs. Britt Ranson Olson and Bo Liu to conduct a biological oil degradation study. It has two parts planned: (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.
Notes	<ul style="list-style-type: none"> Cadets will engage in other professional development opportunities while at the GLCOE, including: a tour of Sector Northern Great Lakes, a virtual call with a former cadet who is now in grad school (to learn about the opportunity and ask questions), and a tour of LSSU's fish hatchery to help gain a contextual understanding of the fishery and recreational industry in the Great Lakes system.



GLCOE Lead: Dr. Allie Snider	PI: Dr. Allie Snider	Partners: USCGA, LSSU
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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: 0%