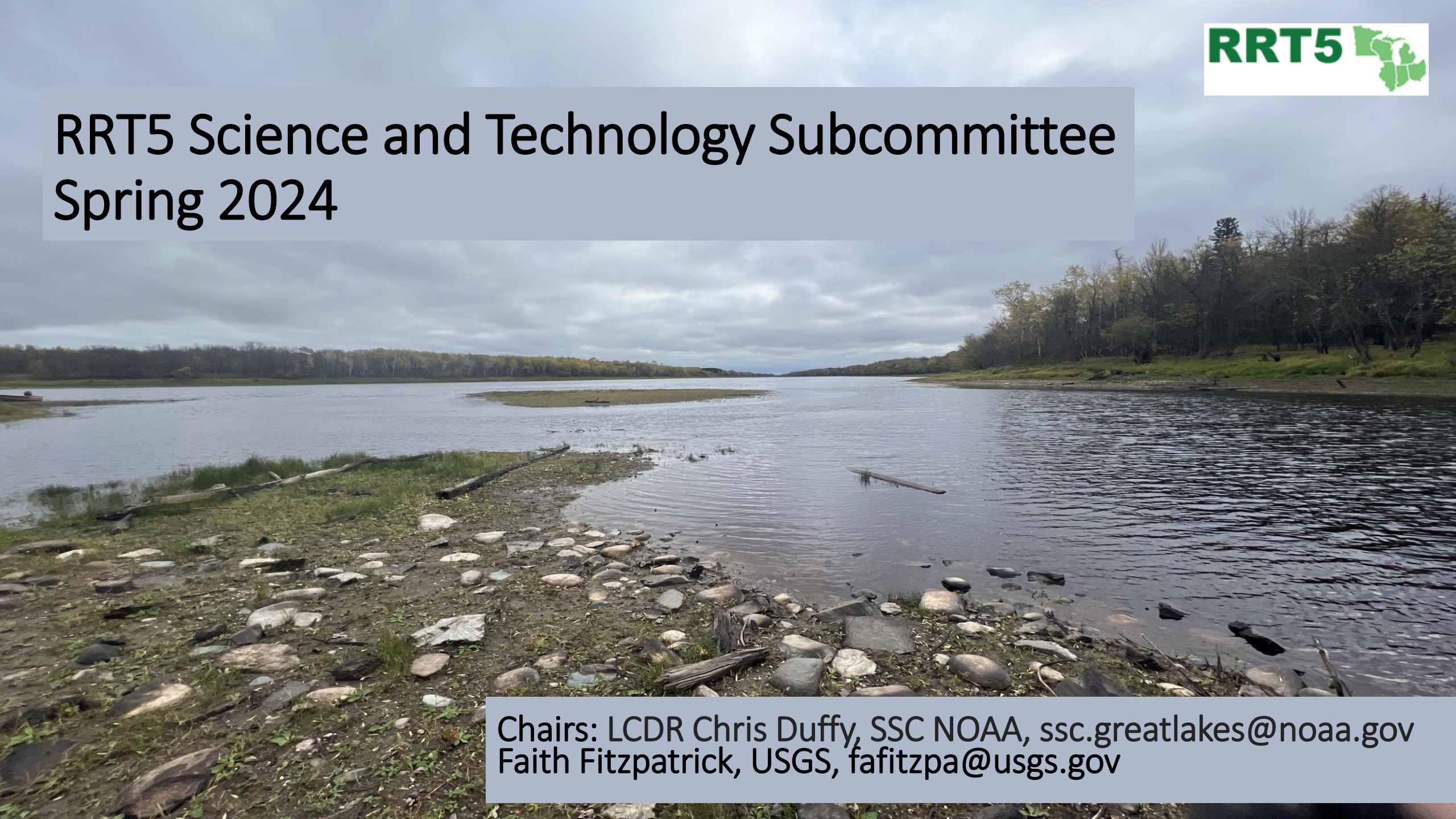
RRT5 Science and Technology Subcommittee Spring 2024



Chairs: LCDR Chris Duffy, SSC NOAA, ssc.greatlakes@noaa.gov
Faith Fitzpatrick, USGS, fafitzpa@usgs.gov

Great Lakes Center of Excellence (Kit Pace)

- Partnering with USCG, NOAA, LSSU, and more out of Sault Ste. Marie and Ann Arbor locations email: SMB-GreatLakesCOE@uscg.mil
- FY25 call for proposals – new 4th theme focused on science
  - Deadline June 6
  - https://www.dco.uscg.mil/GLCOE
- FY24 projects
- MPRI project update and overview of three networks in LSSU's Our Water's of the North (ICOR-OWN)
  - OPI-OWN Oil-particle interactions
  - MONDE-OWN Monitoring and detection
  - BIO-OWN Biological interactions

GLCOE FY24 Projects

Project Description
Transport and Fate of a Non-Conventional Oil Spill in Freshwater Lakes
Uncrewed Detection of Submerged Oil Using UV Fluorometry
Evaluation and Pilot Application of Low-Cost *In Situ* Oil Sensors
High Frequency EMI for Oil Detection in Freshwater Ice Conditions
Training Protocol Development for USCG UAS Pilots
Portable Acoustic Array for Oil Detection and Characterization Under Ice
Development of a Federal On-Scene Coordinator Guide for Oil in Ice Incidents
Improving GNOME oil spill trajectory prediction for the Great Lakes
Oil Detection Canines (ODCs) to Detect and Delineate Submerged, Sunken, and Under Ice Oils

Coast Guard Research and Development Updates (Scott Binko)

- Emerging Pollution Response Technology (mechanical recovery and containment) – Working toward evaluation of findings report June 2024
- Hazardous substances pollution risk – working on GIS layer for sensors/monitoring, focused in New Orleans
- Behavior of diluted bitumen in fresh water (warm/cold) – guidance document on response completed report.
- Nearshore and inland evaluation of the estimated recovery system potential (ERSP) calculator
  - Prototype and user guide (Sep 24)

USEPA updates (Jon Gulch)

- Hazardous substance HQ EPA modeling, looking at what is available for mapping receptors, region 5's mapper is the best example. region 6 is a pilot.
- Region 5 – trained several staff to be able to use ICWater. ICWater going towards a web version. New EPA fact sheet available. Training available through DTRA.
- State-based sites for sensitive info such as species. Restrictions to get it to national level.

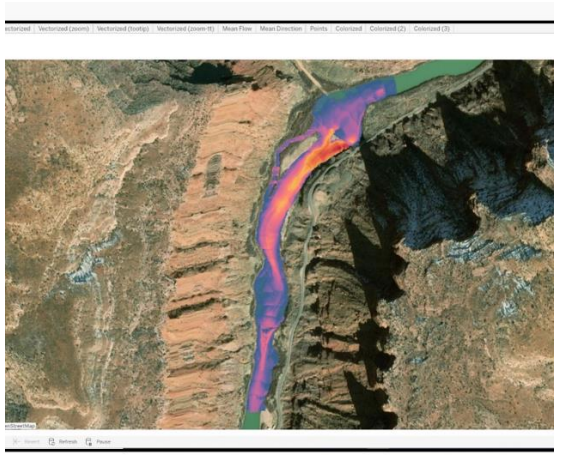
NOAA S+T updates (Chris Duffy)

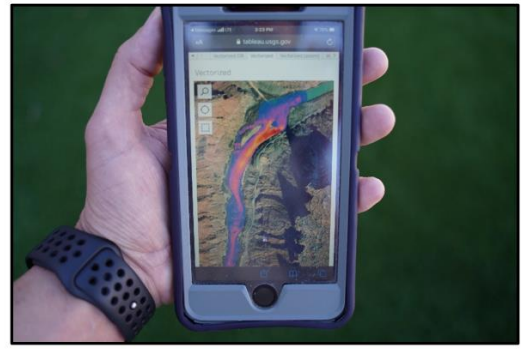
- Several ongoing projects with USCG GLCOE, briefed by GLCOE above.
- Evaluating options for incorporating gravity and surface-tension driven surface spreading in GNOME. Only currents, wind, and an artificial diffusion/mixing constant drive particles currently.
- USCG District 9 utilizing ERMA to facilitate vessel inspections. New layers created by D9 Intel for discharge and freight restrictions.
- CAMEO 3.0 released October 2023
  - Added mapping tool to plot initial isolation and protective action distances from the ERG.
  - Included functionality to allow the mapping tool to export objects to a KML file.
  - Enhanced the Vapor Density and Specific Gravity fields with short phrases to say if the chemical will likely sink/rise in air or sink/float in fresh water, respectively.
  - Updated data from several sources.
  - Other functional improvements including menus, compatibility.
  - Added compatibility improvements for newer operating systems.

DOI and USGS (John Nelson and Faith Fitzpatrick)

Inland Oil Spill Preparedness Program (IOSPP)

- New 2024 Projects
  - Surface velocity mapping with fixed wing – AK
  - Streamstats TOT update with machine learning and gaging station velocity data
  - FY25 preproposals have been submitted.





Multi Partner Research Initiative

- USGS leading OIP-OWN, three subcomponents looking at bitumen weathering (Adewale/Coast Guard), biological interactions (Passow/Memorial University), fate/transport tools (Fitzpatrick/USGS)

Fate & Transport Modeling Workgroup

- RRT5 Planning and S&T subcommittees have workgroup.
- Cover in Planning Subcommittee

Questions/add ’l feedback

For more info contact the chairs or contributors to the slides:
LCDR Chris Duffy, NOAA, ssc.greatlakes@noaa.gov
Faith Fitzpatrick, USGS, fafitzpa@usgs.gov

Add’l supporting slides

FY25 Call for Proposals Themes

see FY25 call for proposals flier for more details

Theme 1: Freshwater Oil Spill Preparedness

- Detection of submerged oil (non-floating or weathered)
- *In situ* oil sensors
- Non-conventional oil
- Other Freshwater Oil Spill Preparedness topics

Theme 2: Freshwater Oil Spill Response

- *In situ* oil sensors
- Uncrewed systems
- Sub-orbital remote oil sensing
- Novel Technologies
- Spill Response Safety
- Cold Weather Response
- Response Equipment Innovation
- Submerged oil
- On Water Containment
- Other Freshwater Oil Spill Response topics

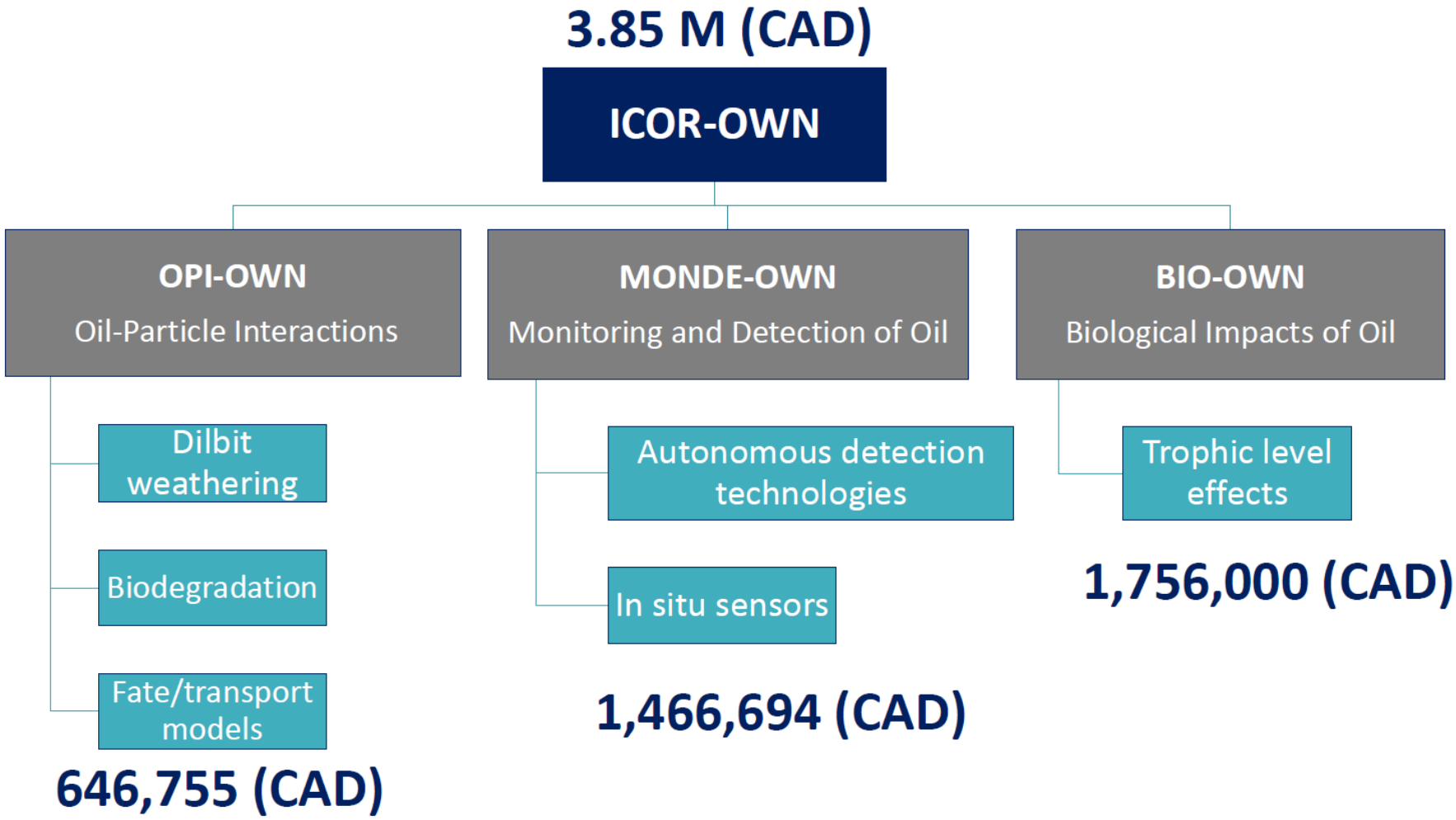
Theme 3: Alternative Response Measures' Application in Freshwater

- Shoreline cleaner
- *In situ* burning
- Bioremediation
- Special Monitoring of Applied Response Technologies
- Other Alternative Response Measure Applications in Freshwater topics

Theme 4: Fundamental Freshwater Oil Spill Science and Response Technology Research

- Oil physiochemistry and freshwater data gaps
- Fundamentals of oil sensing
- Response ramifications
- State of science
- Known unknowns
- Other Fundamental Freshwater Oil Spill Science and Response Technology Research topics

LSSU MPRI Network Overview

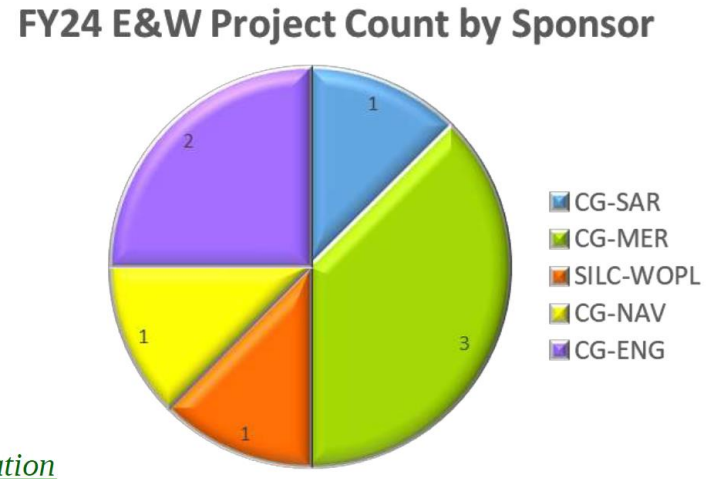


Questions?

Ann Arbor	• 4840 South State Road, Ann Arbor, MI 48108
Sault Ste. Marie	• 100 Salmon Run Way, Sault Ste. Marie, MI 49783
Email	SMB-GreatLakesCOE@uscg.mil

RDC Environment and Waterways (E&W) Branch

Dr. Benedette Adewale	Mr. Joshua Pennington
Mr. Alex Balsley	Ms. Gail Roderick
Ms. Monica Cisternelli	Mr. James Spilsbury
LT(jg) Brian Hwang	Mr. Mike Wurl



- (8) FY2024 projects (2 FY2024 new-start 🏳)
- RDC E&W Branch FY2024 Projects:
  - **1011** *[CG-MER]* : *Emerging Pollution Response Technology Evaluation*
  - **1032** *[CG-ENG]* : *Evaluate Visibility of Colors for CG Approved Lifesaving Equipment in Marine Conditions*
  - **1033** *[CG-MER]* : *Hazardous Substance Pollution Response Technology Analysis*
  - 🏳 **1044** *[CG-NAV]* : *Improve Efficiency and Resiliency in Aids to Navigation (ATON) System Design*
  - 🏳 **1046** *[CG-ENG]* : *Enhance Understanding of Fire Protection and Safety Measures for Alternative Energy in the Maritime Environment*

(On hold pending FY24 funding)

  - **1205** *[CG-SAR]* : *Mass Rescue Lifesaving Appliance*
  - **2703** *[SILC-WOPL]* : *Next Generation Aids to Navigation Buoys & Alternative Moorings*
  - **4710** *[CG-MER* : *Nearshore and Inland Evaluation of the Estimated Recovery System Potential(ERSP) Calculator*
  - **9993A**: *FY23-24 Environment & Waterways (E&W) Branch Support*

Click on project titles for more information

OTHER RDC RESOURCES/ NEWS

- RDT&E FY24 Project Portfolio: *[click here for link]*
- RDC Blog (internal CG only): *[click here for link]*

Emerging Pollution Response Technology Evaluation

1011

Mission Need: Understand the capability of emerging mechanical pollution-response technology.

Objectives

- Conduct market research to identify new and emerging pollution response technologies.
- Conduct independent evaluation of select technologies using the U.S. Coast Guard's (CG) Oil Spill Response Technology Evaluation Process.
- Collaborate with other Federal agencies (Bureau of Safety and Environmental Enforcement (BSEE), Environmental Protection Agency, etc.) to conduct in-water testing of the most promising technologies.
- Provide feedback to equipment providers for consideration in advancing their technologies to enhance the nation's pollution response capability.
- Provide a knowledge product for Federal On-Scene Coordinator (FOSC) awareness of new technologies.

Notes

- Partnership with BSEE.
- Possible use of Cooperative Research and Development Agreements.
- Opportunity to partner with Interagency Coordinating Committee for Oil Pollution Research (ICCOPR) members, Federal Laboratory Consortium members, and academic institutions involved in this area of research.
- Possible collaboration with Blue Technology Center of Expertise (BTCOE) for technology market research.

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Request for Information (RFI) Issued for Sorbents	5 Jan 22 ✓
In-house Technology Evaluation Conducted	17 May 22 ✓
Emerging Pollution Response Technology (Sorbents), Preliminary Evaluation Results/Way Forward (Brief)	**13 Jul 22 ✓ ★**
Ohmsett Testing of Sorbents Complete	28 Oct 22 ✓
Emerging Pollution Response Technology: Adsorbents (Report)	**28 Jun 23 ✓ ★**
Ohmsett Testing of Mech Recovery Complete	31 Oct 23 ✓
Emerging Pollution Response Technology (Mechanical Recovery/Containment), Evaluation Findings (Report)	**Jun 24 ★**
Project Completion: Jun 24	

Sponsor's Rep: CG-MER
Ops Rep: N/A

Stakeholder(s): ICCOPR, CG-721, District Response Advisory Teams, FOSCs, National Strike Force

RDC Research Lead:
Mr. Alexander Balsley, P.E.

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations on Tech Availability & Applicability

Hazardous Substance Pollution Response Technology Analysis

1033

Mission Need: Improve response readiness to hazardous substance pollution release incidents.

Objectives

- Address hazardous substance pollution risk knowledge gaps in Area Contingency Plans.
- Identify and analyze existing hazardous substance response technologies, capabilities, and resources.
- Provide reference guidance for area contingency planners.
- Enhance Captain of the Port (COTP) and Federal On Scene Coordinators (FOSC) response capabilities.
- Support inclusion of hazardous substance release response resources in facility and vessel response plans.

Notes

- Coordinate with area contingency planners to connect project focus with specific field needs.
- Engage with the U.S. Environmental Protection Agency (EPA) emergency response program, CG National Strike Force Coordination Center (NSFCC), firefighters and other local hazardous-materials responders to leverage existing hazardous substance pollution response expertise.
- Engage with D8 and LANTAREA to increase efficiency moving forward in the project.

Sponsor's Rep: CG-MER
Ops Rep: N/A

Stakeholder(s): EPA, NSFCC, FAC, NCR, CG-D8, LANTAREA, CG-721

RDC Research Lead:
Benedette Adewale, PhD

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Recommendations for Tactics, Techniques & Procedures

Project Timeline / Key Milestones

Project Start: 3 Oct 22

Complete COTP/FOSC/Other Agency Information Gathering	15 Aug 23 ✓
Hazardous Substance Pollution for Sector New Orleans Project Status (Brief)	**Feb 24** ★
Hazardous Substance Materials Incident Literature Review and Identification of Hazardous Substance Materials Locations (Report)	**Sep 24** ★
Complete Request for Information Review/Research of Available Technology among Other Agencies and First Responders	Nov 24
Technologies for Hazardous Substance Pollution Incident Response Market Research (Report)	**Jun 25** ★

Project Completion: Jun 25

Nearshore and Inland Evaluation of the Estimated Recovery System Potential (ERSP) Calculator

4710

Mission Need: ERSP calculator to include response systems for nearshore/inland operating environment.

Objectives

- Determine if an enhanced version of the existing offshore ERSP calculator provides improved efficiency for planning and response to oil spills.
- Develop an inland ERSP calculator prototype tool.
- Validate ERSP calculator functionality and usefulness through an independent evaluation by a group of National Academies of Sciences, Engineering, and Medicine reviewers.

Notes

- Partnership with Bureau of Safety and Environmental Enforcement (BSEE).
- Transition partnership with Great Lakes National Center of Expertise.

Sponsor's Rep: CG-MER
Ops Rep: N/A

Stakeholder(s): BSEE, AREAs

RDC Research Lead:
Mr. Alexander Balsley, P.E.

CG-926 Portfolio Manager:
Ms. Karin Messenger

Anticipated Outcome/ Transition: Provide Sponsor/Product Line Tested Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 16	
Feasibility Workshop Completed	21 Jun 17 ✓
Feasibility of Extending the ERSP Calculator for Nearshore and Inland Waterways (Report)	**20 Sep 17 ✓ ★**
Inland ERSP Preliminary Factors, Requirements and Conceptual Model (Report)	**14 Nov 19 ✓ ★**
Inland ERSP Operational Environment Calculator (Design Document)	**29 Jun 20 ✓ ★**
Initial Development of Inland ERSP Calculator Complete	4 Jun 21 ✓
National Academy of Sciences (NAS) Review Complete	9 Sep 22 ✓
NAS Recommended ERSP Calculator Updates Complete	May 24
Inland Estimated Recovery System Potential Calculator (Prototype and User Guide)	**Sep 24 ★**
Project Completion: Sep 24	

Multi-Partner Research Initiative (MPRI) OPI OWN

Project 1 – Bitumen weathering

(Adewale)

- Diluted bitumen tests outdoor mesocosm weathering/oxidation (CRREL)
  - Photooxidation
  - Kaolinite mineral
- Chemistry – aromatic, SARA, PAHs
- OPA characteristics – gap/need to interact and build off, equipment need (UV epifluorescence)
- CEMOR – Boufadel connections

Project 2-Biodegradation

(Passow)

- Biodedgradation insitu – two oils, one or two locations – 2-4 months; combine with other information
- Lab experiment biodegradation as function of particles, algae, phytoplankton, clays; natural source of mix?
- Still working on integration with others in this network and beyond
- CEMOR – Boufadel connections

Project 3 – Fate and transport (Fitzpatrick)

- Models need OPA density, size, settling velocity
- Add new OPA characteristics for FluOil, include biogenic type particles, so far only bitumen/Kzoo sediment based, three OPA types. Feed model from EPA RARE experiments, others
- Add light oil to IDHydroOPA – formation of OPA –need experimental results not done yet, 1 oil types.
- Connect existing SPARROW suspended sediment to great Lakes pour points
- Communicate with Canada modelers
- Conduct training/workshops with Indigenous communities Natural Resources Depts
- CEMOR – Boufadel connections, Katz

ICCOPR and the NRT Science and Technology Subcommittee

ICCOPR

- Legally required under OPA 90 Section 7001. Not part of the NRT.
- Not an operational body that is activated during a response
- Must report out to Congress
- Actions based on requirements in law
- Quarterly meetings are open to public

NRT S&T

- A subcommittee of NRT, but not required by regulations 40 CFR 300
- May be activated during a response
- No reports to Congress
- Actions based upon charter and incident needs
- Meetings of NRT subcommittee member agencies only