

Welcome

RRT5 Science and Technology Subcommittee Meeting Fall 2021

Chairs: Faith Fitzpatrick, USGS, fafitzpa@usgs.gov
LT. Rachel Pryor, NOAA, Rachel.L.pryor@noaa.gov

Agenda 10:15-11:00

10:15 - 10:20	Introductions
10:20 - 10:30	Scott Binko, USCG Research & Development update
10:30 - 10:40	Faith Fitzpatrick, USGS Fate & Transport
10:40 - 10:50	Jon Gulch, USEPA Inland Sensitivity Atlas update
10:50 - 10:55	Rachel Pryor, NOAA UAS Job Aid
	John Nelson, DOI Satellite Imagery for Freeze/Thaw
10:55 - 11:00	Questions/feedback/new topics?

Behavior of Diluted Bitumen (Dilbit) in Fresh Water

4204

Mission Need: Enhanced decision-making for response to dilbit spills in the fresh water environment.

Objectives

- Provide the U.S. Coast Guard (CG) Federal On-Scene Coordinators with decision-making guidance as they relate to the fate and transport of dilbit in the freshwater environment.
- Study the behavior (density and weathering) and response tools of dilbit spills in the freshwater environment.



Notes

- Supported by Great Lakes Restoration Initiative and Oil Spill Liability Trust Fund resources.
- Leverage CG Research and Development Center Project 4705: Oil Sands Products Spill Response.
- Collaborate with the International Institute for Sustainable Development's Experimental Lakes Area and U.S. Department of Energy labs.

Sponsor: CG-MER, CG D9

Stakeholder(s): EPA Great Lakes Nat'l Program Office/Pollution Response Office, LANT-54, NOAA

RDC Research Lead:
Benedette Adewale, PhD

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Knowledge Product
Influence Tactics, Techniques & Procedures

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Literature Review Complete	Feb 21
Literature Review – Diluted Bitumen in the Fresh Water Environment (Report)	Mar 21 ★
Dilbit Test Plan Complete	Apr 21
CRREL Dilbit Weathering Warm Weather Test Complete	Jun 21
CRREL Dilbit Weathering Cold Weather Test C	Nov 8-21 CRREL
Dilbit Oil Analysis Complete	Jan 22
Guidance Document - Behavior of Diluted Bitumen in the Fresh Water Environment (Report)	May 22 ★
Project Completion: May 22	



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Indicates RDC Product ★

December 2020

Behavior of Diluted Bitumen (Dilbit) in Fresh Water

Literature Review Report Highlights

- 12 Studies from 1992 – 2020 (7 studies involving fresh water)
- ID's & summarizes physical properties & chemical data from those studies
 - Standard Dilbit, Synbit, Lightened, Dilbit w/ Naptha and DiSynbit
- Literature Review – Describes studies reviewed & key findings
 - Physical & Chemical weathering, Containment & Recovery, historical spills
- Summary of Review – 3 most common (AWB, CLB, WCS, Synbit)
 - Properties, Weathering, Containment & Recovery
- Conclusion of Review – Knowledge & Knowledge Gaps
- Future Research Initiatives (Nov 8-21 CRREL)
 - Field experiments on weathering of dilbit w/ agitation, w/ & w/out sediment
 - Analyze influence of suspended sediment
 - ID physical & chemical properties (CLB, WCS) & time to sink
 - ID characteristics to detect & recovery OSP
- Appendices: In Depth (Analysis of Literature Review, Summary of Studies & Case Studies)

47041

Freshwater In-Situ Oil Burn Research

Mission Need: Improve In-Situ Burn (ISB) knowledge base to supplement oil spill response options.

Objectives

- Evaluate best practices for operational use of ISB in multiple environments, including fresh water and areas with vegetation.
- Develop methods to conduct ISB smoke-plume monitoring that improve sampling accuracy and responder safety.
- Provide reference guidance for Federal On Scene Coordinator and Regional Response Team use.

Notes

- Multiple funding sources including Oil Spill Liability Trust Fund and Great Lakes Restoration Initiative.
- Partner with academia and national labs to ensure result visibility and access.

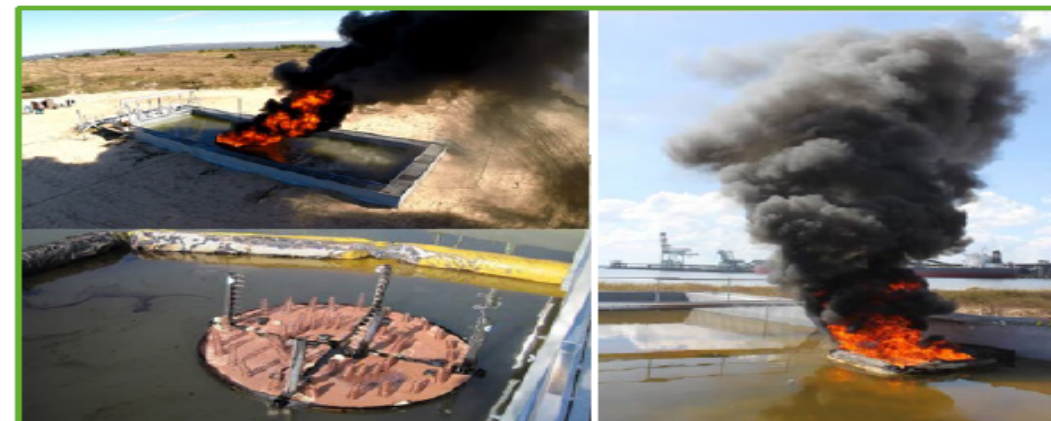
Sponsor: EPA Great Lakes
Nat'l Program Office, CG-MER

Stakeholder(s): CG-721, NSF, EPA, BSEE, D9,
RRT5

RDC Research Lead:
LT Liz Murphy

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Knowledge Product
Influence Tactics, Techniques, & Procedures



Project Timeline / Key Milestones

Project Start: 1 Oct 18	
Mesoscale Freshwater Burns Complete	19 Jul 19 ✓
Large-scale Freshwater Burns Complete	25 Oct 19 ✓
Freshwater In-Situ Oil Burning (Report)	Jan 21 ★
Remote Air Monitoring Market Research Complete	Jan 21
Remote Air Monitoring Process Framework Complete	Feb 21
Test Plan for Remote Air Monitoring Complete	Mar 21
Air Monitoring During ISB – Event 1 Complete	Apr 21
Air Monitoring During ISB – Event 2 Complete	Oct 25-28 CRREL
Remote Air Monitoring Technology Evaluation (Report)	Feb 22 ★
Project Completion: Feb 22	May 2022



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December 2020

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.
- Validate ERSP calculator functionality and usefulness using a prestigious national panel to conduct an independent review of the enhanced calculator.

Notes

- Oil Spill Liability Trust Fund funding.
- Partnership with Bureau of Safety and Environmental Enforcement (BSEE).



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	May 21	
National Academy of Sciences (NAS) Review Complete	Nov 21	
NAS Response Review of Inland ERSP (White Paper)	Apr 22	★
NAS Recommended ERSP Calculator Updates Complete	May 23	
Inland Evaluation of the ERSP Calculator (Prototype & User Guide)	Aug 23	★
Project Completion: Aug 23		

Sponsor: CG-MER

Stakeholder(s): BSEE, AREA-54

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

CG-926 Domain Lead:
Ms. Karin Messenger

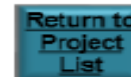
Anticipated Transition: Product
Fielded Prototype



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Indicates RDC Product ★
Current Status Report

Advancing UAS and AUV Capabilities to Characterize Water Column and Surface Oil in Ice Environments

Mission Need: Technologies to detect and characterize oil spills in ice environments.

Objectives

- Coordinate and conduct multi-agency lab and field tests to gain better understanding of aerial and underwater sensor capability in characterizing oil on the surface or in the water column in ice conditions.
- Determine remote vehicle telemetry capability to transfer sensor data to on-scene responders or Incident Command as actionable information.



Notes

- Oil Spill Liability Trust Fund funding.
- Partnerships with Cold Regions Research and Engineering Laboratory (CRREL), Woods Hole Oceanographic Institute (WHOI), U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) Office of University Programs (OUP), National Oceanic and Atmospheric Administration, Bureau of Safety and Environmental Enforcement, and U.S. Environmental Protection Agency.

Sponsor: CG-MER

Stakeholder(s): CG-5RI, D1, D9, D17, ADAC, NOAA OR&R, WHOI, MBARI, DHS S&T OUP

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

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 23 Jan 20		
Interagency Reimbursable Work Agreement with NOAA Complete	3 Jun 20	✓
Phase 1: Unmanned Aircraft System (UAS)/Autonomous Underwater Vehicle (AUV) Tests at CRREL Complete	Apr 21	
Laboratory Results and Way Ahead (Brief)	Jun 21	★
UAS/AUV Lab Experiments Results (Report)	Aug 21	★
Field Exercise Planning Complete	Nov 21	
Phase 2: UAS/AUV Systems Field Testing in Great Lakes or Arctic Complete	Dec 21	
Data Schema for Data Stream Export Complete	Mar 22	
UAS/AUV Systems Field Exercise Integration (Report)	May 22	★
Project Completion: May 22		



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Current Status Report

Faith Fitzpatrick, USGS

- USGS Ice Jam Hazard Mobile-Friendly website prototype (this would be great to link to the to HIVES) - <https://test.wim.usgs.gov/icejams/#/home>. – Montana Silverjackets has funded a pilot, especially geared toward working with Tribal Partners. USACE's CRREL will import data. Contact: Kathy Chase, USGS
- USGS Streamstats time of travel beta release <https://streamstats.usgs.gov/tot-beta/>
- USGS Streamstats Fire Aware and Watershed Alert test app <https://test.streamstats.usgs.gov/fire-hydro-demo/>
- USGS monitoring stations with cameras (HIVES) --- linked to water levels: <https://apps.usgs.gov/sstl/>
- Sediment for USCG Center of Excellence bitumen studies – -- maybe some opportunity from 2021 samples collected from EPA Great Lakes Program Office lake sampling campaigns. Email exchange ongoing with Benedette Adewale.
- Inland Riverine Oil Spill Collaboration Area (IROS) next meeting November 18, 2021 1:00 pm central and change from web to Microsoft teams – Faith working on getting a speaker for the National Water Model Overview

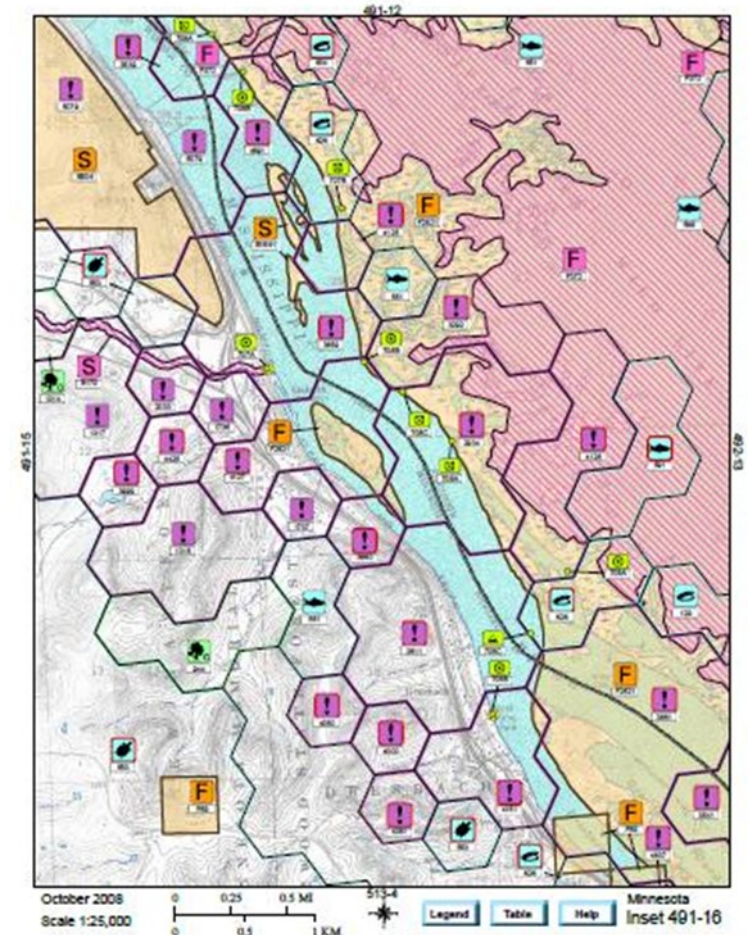
Faith Fitzpatrick, USGS

- USGS real-time flood impact map <https://test.wim.usgs.gov/thresholds/#/>
- USGS Flood event viewer/short term network -- <https://stn.wim.usgs.gov/FEV/>
- USGS geospatial information response team (GIRT) https://www.usgs.gov/core-science-systems/ngp/user-engagement-office/geospatial-irt?qt-science_support_page_related_con=3#qt-science_support_page_related_con
- Lastly the USGS is in the process of moving some of its older applications to the National Water Dashboard <https://dashboard.waterdata.usgs.gov/app/nwd/?aoi=default>

Jon Gulch, USEPA

- Natural Features Inventory/Natural Heritage Data call
- Improve identification of endangered species & habitats

<i>Evaluated Data Layers</i>	<i>Available?</i>	<i>Affordable?</i>	<i>Detailed enough for ISA needs?</i>
<i>NatureServe species data</i>	✓		✓
<i>USFWS IPaC</i>	?	✓	Unlikely
<i>USFWS National GIS Data</i>	✓	✓	
<i>USFWS Critical Habitat</i>	✓	✓	
<i>IUCN Redlist Spatial Data</i>	✓	✓	
<i>Species data from States</i>	Varies by state	Varies by state	✓





Uncrewed Aircraft Systems Oil Spill Response Job Aid

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Emergency Response Division



<https://response.restoration.noaa.gov/jobaid/UAS-oilspill>

John Nelson, DOI



- USGS examining use of synthetic aperture radar (SAR)
- Project will develop a machine learning model to characterize physical properties of ice (type of ice, thickness, potential gaps or discontinuity, potential for an ice jam and potential resulting outburst flood on major rivers, etc.)
- Inform planning for a response to potential oil spills

Questions/add 'l feedback/new topics?

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