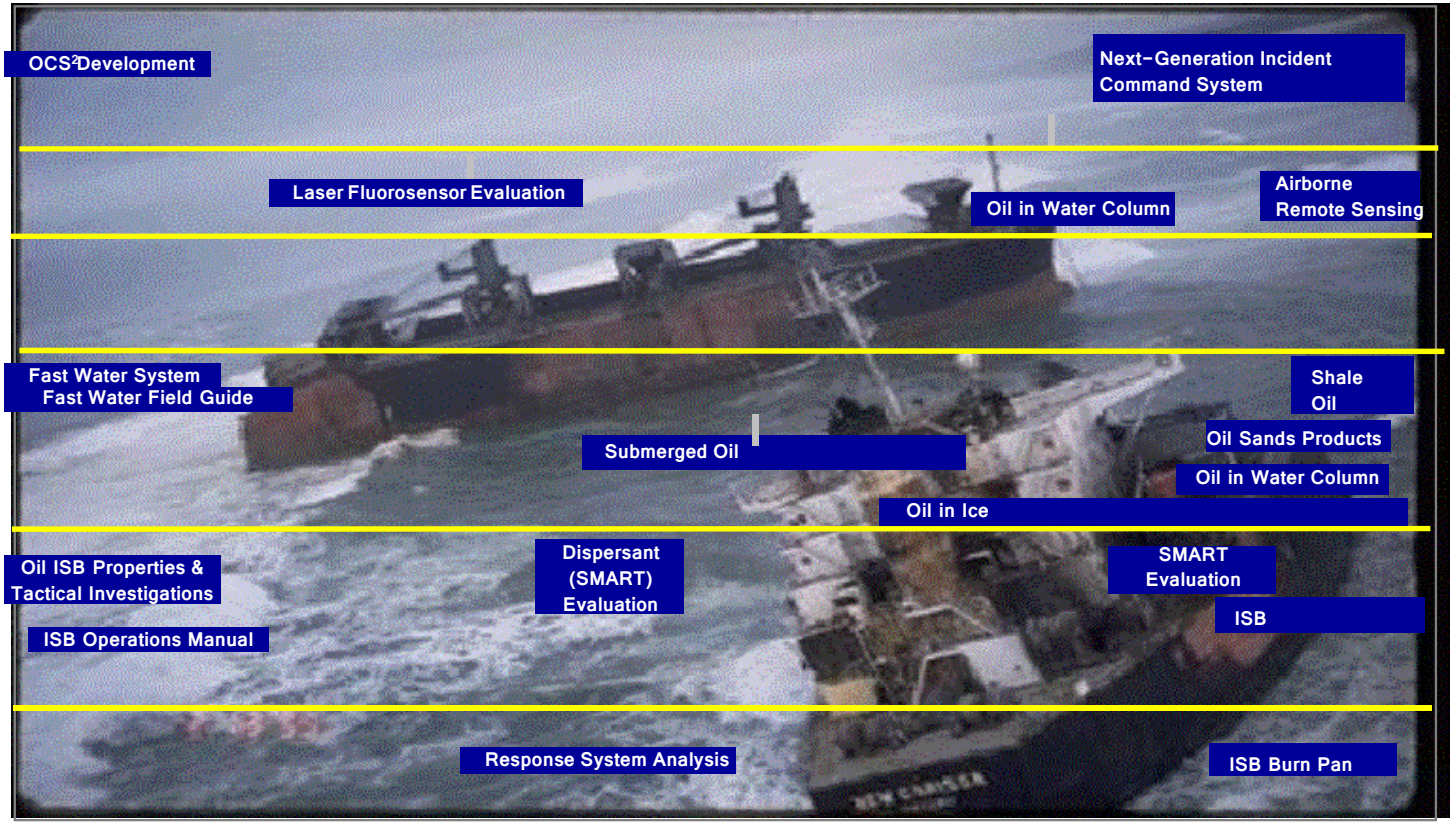
Acquisition Directorate
Research & Development Center

CG Research Update

RDC | Kurt Hansen (UNCLAS)
OSPR/Chevron Oil Spill Response Technology Workshop, February 28, 2017

RDT&E Funded Projects 2000-Present



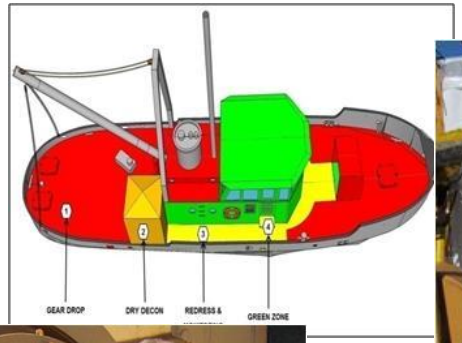
Response to Oil In Ice (Project 4701)

Mission Need: A group of methodologies to minimize the damage to the environment caused by spilled oil in extreme cold regions of the Arctic and Northern U.S.

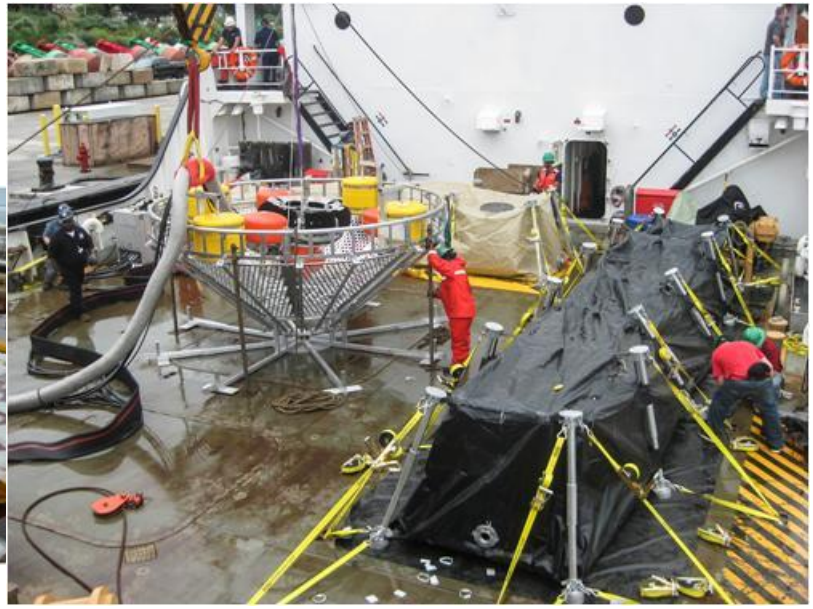
- Completed 3 demonstrations in Great Lakes
- Completed support of 3 demonstrations in Arctic
- Co-sponsored National Academy of Science report on Arctic
- Completed 3 research projects on personal contamination, ice management and temporary storage
- Project closeout May 2017

Final Developmental Tasks

DECON



Temporary Storage

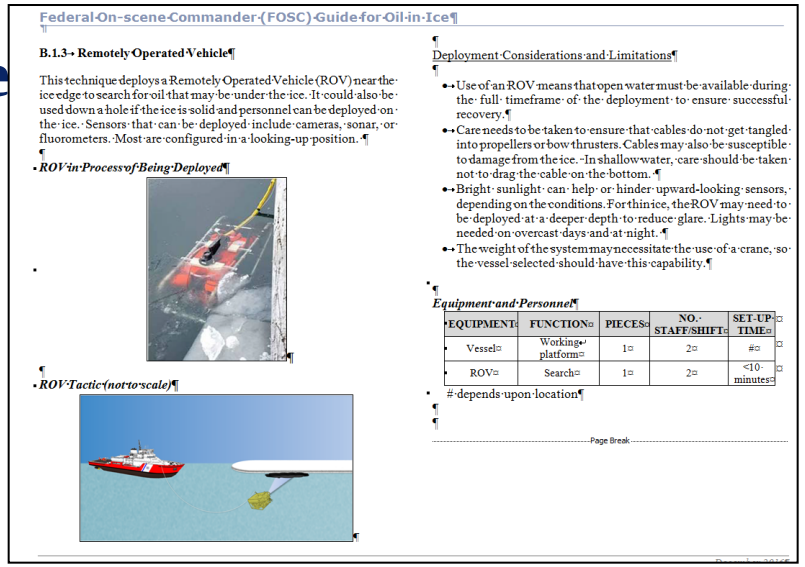


Ice Management

Project 4701 On-Scene Coordinators Information
(with EPA Great Lakes Restoration Initiative GLRI)

Completion of Field Demonstrations

Draft Guide



Federal On-scene Commander (FOSC) Guide for Oil in Ice

B.1.3 Remotely Operated Vehicle

This technique deploys a Remotely Operated Vehicle (ROV) near the ice edge to search for oil that may be under the ice. It could also be used down a hole if the ice is solid and personnel can be deployed on the ice. Sensors that can be deployed include cameras, sonar, or fluorometers. Most are configured in a looking-up position.

- *ROV in Process of Being Deployed*

- *ROV Tactic (not to scale)*

Deployment Considerations and Limitations

- Use of an ROV means that open water must be available during the full timeframe of the deployment to ensure successful recovery.
- Care needs to be taken to ensure that cables do not get tangled into propellers or bow thrusters. Cables may also be susceptible to damage from the ice. In shallow water, care should be taken not to drag the cable on the bottom.
- Bright sunlight can help or hinder upward-looking sensors, depending on the conditions. For thin ice, the ROV may need to be deployed at a deeper depth to reduce glare. Lights may be needed on overcast days and at night.
- The weight of the system may necessitate the use of a crane, so the vessel selected should have this capability.

Equipment and Personnel

EQUIPMENT	FUNCTION	PIECES	NO. STAFF/SHIFT	SET-UP TIME
Vessel	Working platform	1	2	#
ROV	Search	1	2	<10 minutes

depends upon location

Page Break

Detection and Mitigation of Oil within the Water Column (Project 4702)

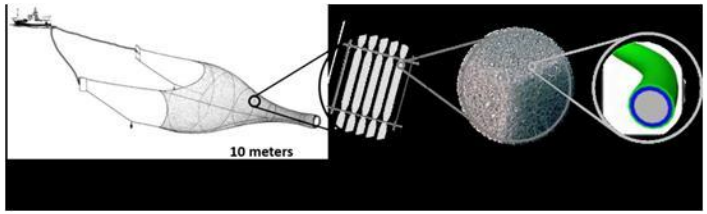
Mission Need: Accurately detect and mitigate subsurface oil within the water column to 10,000 feet

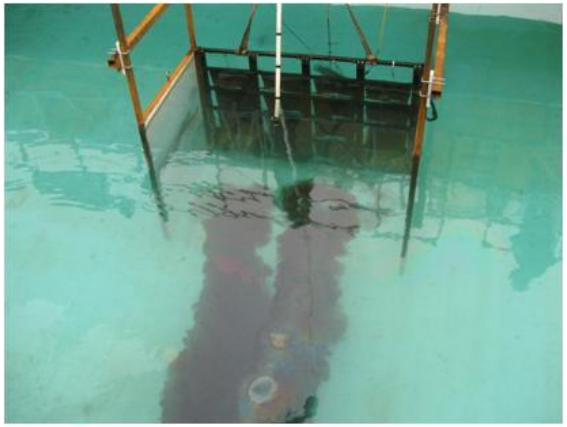
- Investigated and test 2 detection systems at Ohmsett
- Investigated and tested 2 mitigation systems at Ohmsett
- Project Completion July 2017

Mitigation within Water Column

Argonne National Lab: Reusable, Environmentally Benign Absorbent Foams for Oil Spill Pollution Mitigation

- Uses patented process to develop better hydrophobic/oleophilic materials

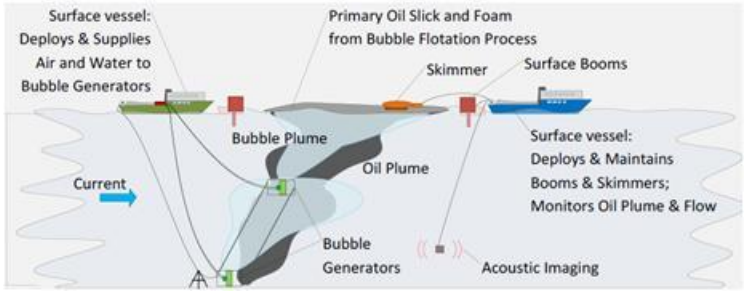


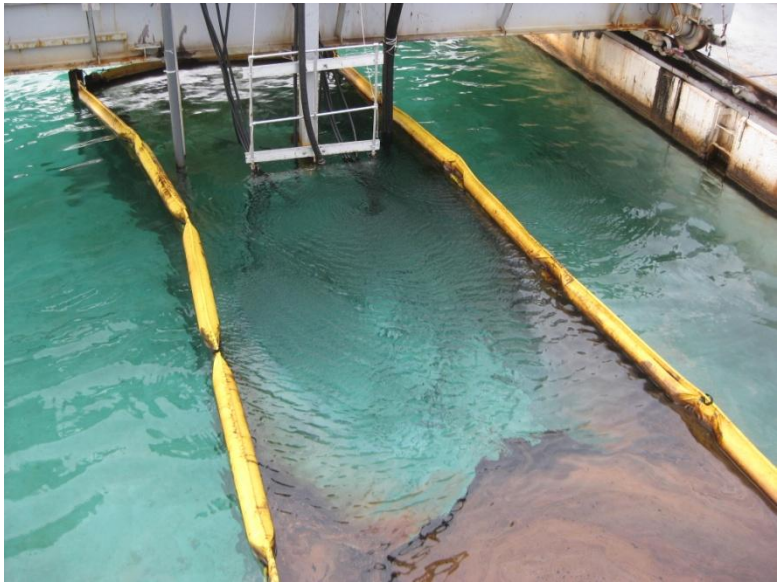


Mitigation within Water Column

Dynaflow, Inc: Subsurface Oil Recovery Using Microbubble Floatation

- Uses cavitation and acoustics to create bubble field that could bring oil to surface



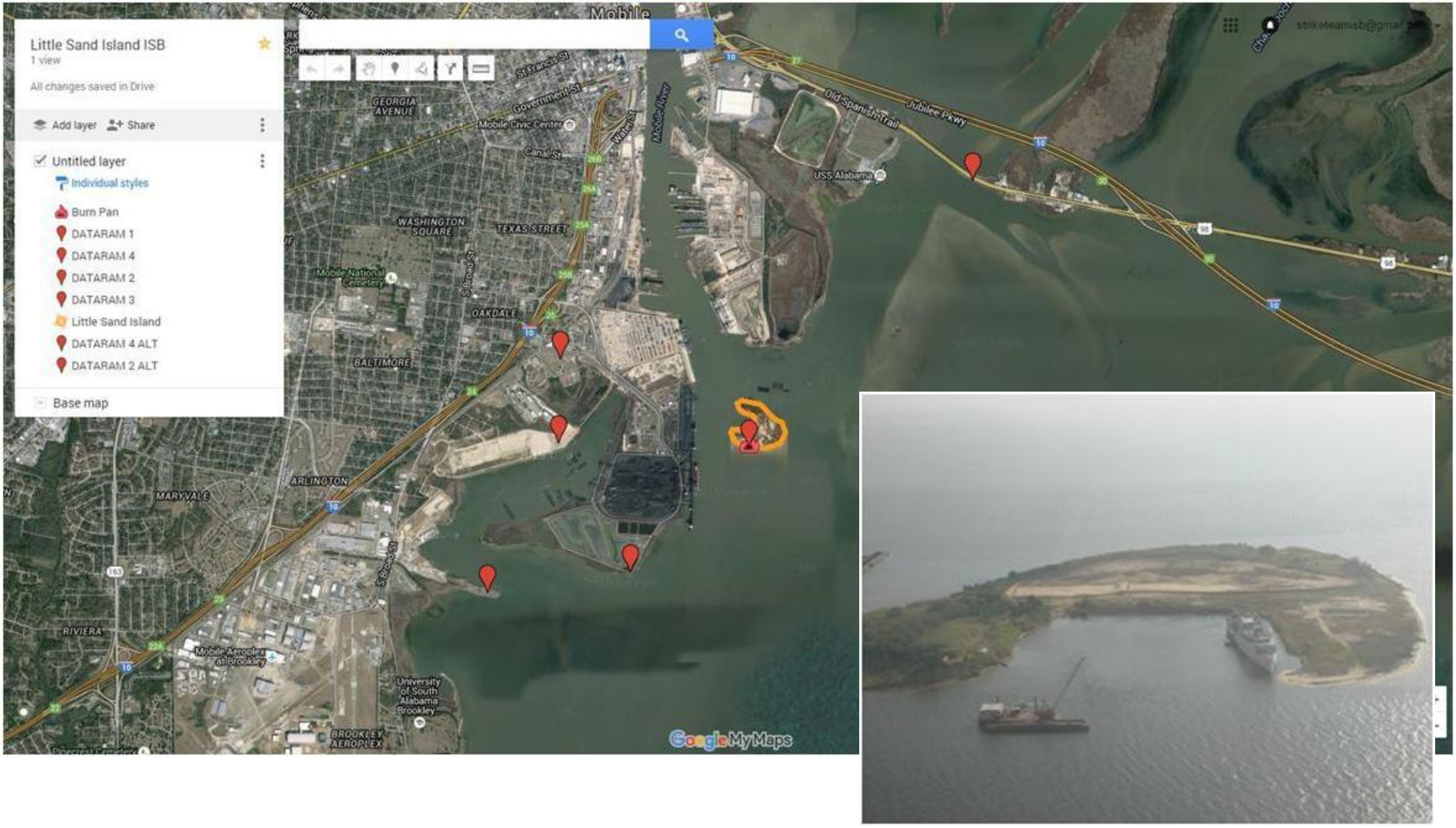


Improved In-Situ Burning (ISB) for Offshore Use (Project 4704)

Mission Need: Better decision-making and operational tools for using ISB as a response option

- ISB Assessment Report (CG-D-01-15)
- Refurbishment of Little Sand Island
- BSEE Sponsored tests
  - Pacific Northwest Laboratory (PNNL)
  - Worcester Polytechnic Institute (WPI)
  - Wave Maker
  - Future TBD

Little Sand Island, Mobile, AL



Improved ISB

Old View

New Views

Wave Maker Installation April 2017

Improved ISB

Two SMART Systems

Video

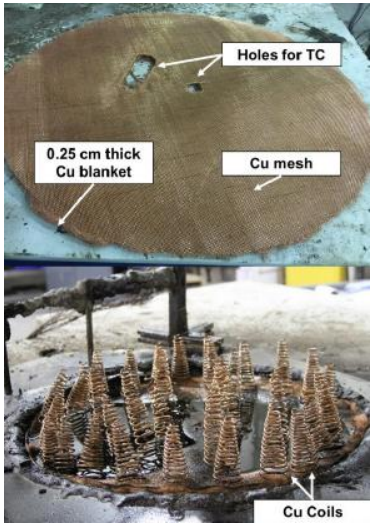
Oil Loaded

Improved ISB (with BSEE)

Full Burn for ASTM Standard

Pacific Northwest National Lab

Boom After



Worcester Polytechnic Institute

Oil Sands Products Response (Project 4705)

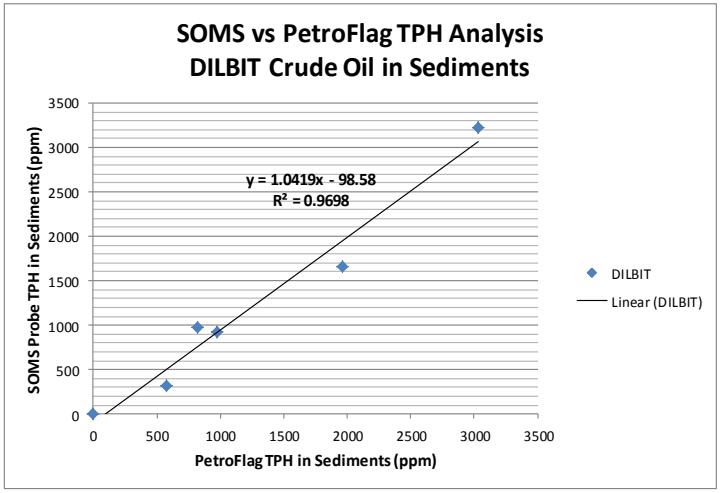
Mission Need: Develop enhanced decision tools and recovery/mitigation tools for responding to spilled oil sands products.

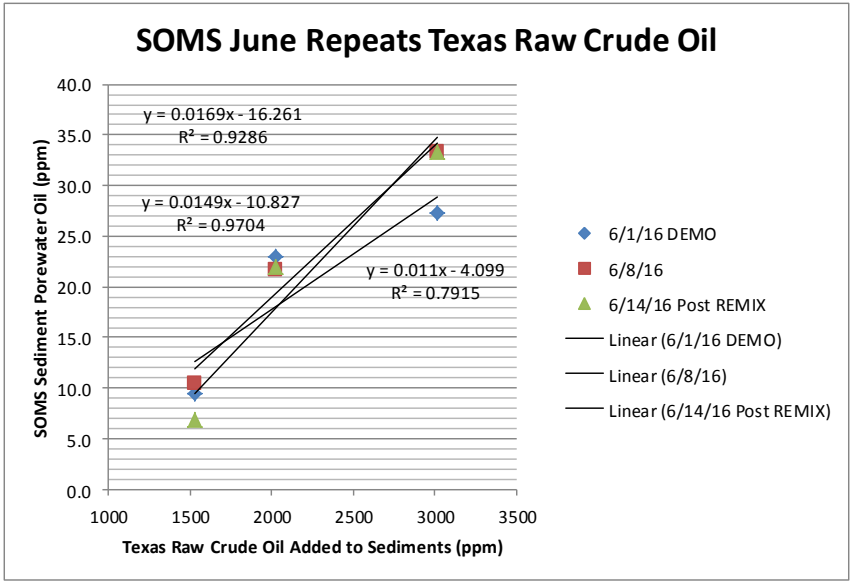
- Initial Assessment (Report CG-D-16-15)
- Requirement Recommendations for Underwater Sediment Sampling
- Freshwater Testing at Ohmsett February 27
  - Replicate Gainsford, Alberta Tests
- Mitigation of sunken oil moving along the bottom
  - 3 Contracts

Oil Sands Response

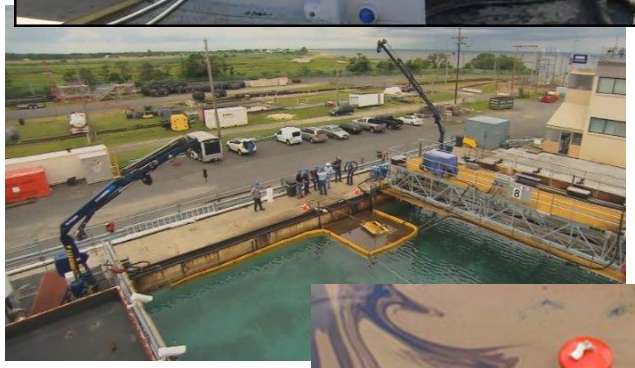
Turner Designs Cyclops-7 Probe

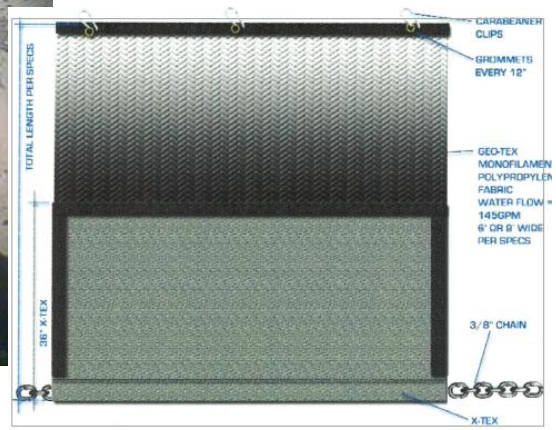
Test Mixture





Next Research on Oil Sands Products (Offshore and Inshore)





Shale Oil & Gas Preparedness and Response (Project 4707)

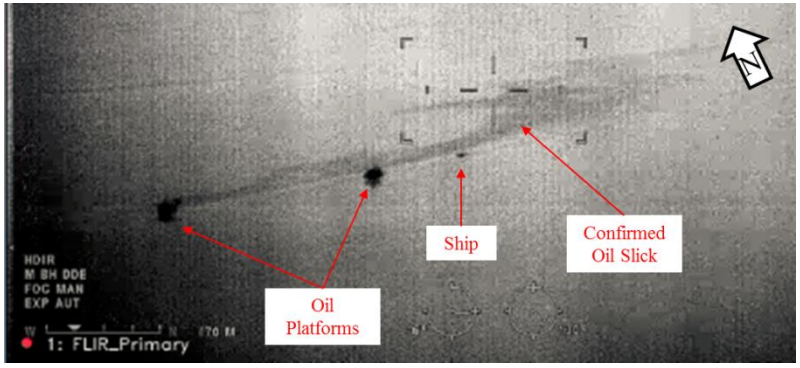
Mission Need: Responders need best strategies, tactics, and equipment for preparedness and response to spills of shale oils and Shale Gas Extraction Wastewater (SGEWW).

- Assessment for shale oil and SGEWW
  - Identified a couple of issues but mostly policy
- Helping to provide policy guidance

Airborne Oil Spill Remote Sensing and Reporting (Project 7609)

Mission Need: Tactics, Techniques, and Procedures (TTP) for optimizing the use of existing CG airborne C4ISR systems to support oil spill response operations.

- May 2015 and July 2016 remote sensing exercises executed with a significant volume of quality imagery collected from handheld sensors, radar, EO/IR, and ESS systems.
- HC-130 and HC-144A Fixed wing, MH-60T and MH-65 helicopters and USCGC Blackfin in exercises off of Santa Barbara.
- The majority of the recommendations are intended to inform updates to aircraft operations and sensor TTPs for future MER operations Limited data dissemination capability
- Limited data available due to FOUO designation
- Project completed



Mobile Asset Tracking and Reporting During an IONS (Project 8105)

Mission Need: A flexible ad hoc interoperable communication/information system to enhance the Coast Guard's ability to respond to Incidents of National Significance (IONS).

- Initial assessment completed in 2014
- Mobile applications developed and briefed to ICCOPR in 2015
- Portable Handheld Integrated Next Generation Incident Command System (PHINICS) developed and tested based on California Fire (CALFIRE) efforts
- Check integration for Incident Action Plan (IAP) software
- Intended to be installed behind Homeland Security Network (HSN)
- Project complete in late 2017

Oil Spill Response Emerging Technology Assessment (Project 4708)

Mission Need: Mission Need: A process for the evaluation of proposed oil spill response technologies for the Coast Guard's use and determination of their technology maturity and economic feasibility.

- Started October 2016
- Performing initial assessment to use Technical Readiness Levels (TRL) developed by BSEE
- Plan to use general technologies to evaluate process

Nearshore and Inland Evaluation of the Effective Recovery System Potential (ERSP) Calculator (Project 4710)

Mission Need: An Estimated Recovery System Potential (ERSP) calculator to include response systems for the entire nearshore and inland operating environment.

- Started October 2016
- With industry and interagency representatives, assess ERSP as whole and determine if it effectively rectifies the EDRC challenges experienced during Deepwater Horizon.
  - Workshop in April 2017 to determine potential parameters for inland and nearshore
  - Determine if current software can be modified
  - Expand and validate as needed

Equipment Surge Risk Assessment Tool (Project 7935)

Mission Need: A consistent and repeatable methodology for determining the level of risk associated with moving oil spill response resources from donor areas to a Spill of National Significance (SONS).

- Develop requirements and concept model by interviewing stakeholders Multiple Districts and Sectors and CGHQ
- Surge Equipment Risk Assessment Tool (SERAT) initial development
  - Trying to identify risks if equipment is moved

Arctic Operations Support (Project 6210)

Mission Need: Provide support for expanded operational and resource capabilities assessments in the Arctic.

- Demonstrations in 2014, 2015 and 2016.
- Use of CGC Healy: Summer 2017
- Oil Spill Centric –
  - Unmanned surface vehicle detection and communications to D17
  - Unmanned aerial vehicles
  - Skimmers TBD

2018 RDC Portfolio Development

Assessment of Prospective Portfolio (APP) for FY18

at RDC: 3/29/2017 – 3/30/2017

Questions?

Questions?

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