Acquisition Directorate

Research, Development, Test & Evaluation

FY19 RDT&E Project Portfolio

Table of Contents – FY19 CG RDT&E Funded

Table of Contents – FY19 CG RDT&E Funded (Cont'd)

Table of Contents – FY19 Non-CG RDT&E Funded

Acquisition Directorate

Research, Development, Test & Evaluation

FY19 Project Portfolio

CG RDT&E Funded Projects

CG R&D Center

U.S. Coast Guard Rotary Wing Covert Study

Mission Need: Improve covert Tactics, Techniques, and Procedures (TTP) for rotary wing aircraft.

Project Objectives:

- Provide the U.S. Coast Guard (CG) rotary wing aviation community with data that documents the recommended TTPs for conducting covert surveillance.
- Determine lateral and vertical distances for the H-65 and H-60 to remain covert from potential targets in the maritime environment.
- Assist Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance community with better understanding for future remote sensor acquisitions that allow for well-defined covert standoff distances.

Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 18 ✓
	Define/Limit Target Vessel Parameters	17 Dec 18 ✓
	Data Collection	28 Apr 19 ✓
	Aircraft Characteristics Modeling and Simulation	30 Aug 19 ✓
	Execute Operational Field Test	Nov 19
★	**Coast Guard Rotary Wing Covert Study (Report & Brief)**	**May 20**
	Project End	Jun 20

Sponsor: CG-711
Stakeholder(s): CG-SAR, FORCECOM, AREA-3, ALC Vibrations Group

Project #: 5601

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

Notes:

- Leverage prior work on CG Research and Development Center Project 8307: Coast Guard Fixed Wing Covert Study.
- KC-130J Aural Detection Information Paper and C-130H Study available as background.

RDC POC:	CG-926 Domain Lead:
Ms. Meg Tusia	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Airborne Use of Force (AUF)

Mission Need: Determine appropriate weapon and ammunition combination to disable non-compliant vessel engines and minimize collateral damage during AUF engagements.

Project Objectives:

- Use computational modeling, limited static and dynamic testing to parameterize secondary effects of various round types when used against representative-sized outboard motors (~75 horsepower and ~200 horsepower) while employing current U.S. Coast Guard (CG) AUF/counter drug techniques, tactics, and procedures.

Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 18 ✓
	Kick-off/Test Design Meeting	28 Nov 18 ✓
	Conduct Model Evaluation and Live Fire Test	09 Aug 19 ✓
	VIP Demonstration	11 Sep 19 ✓
★	**Terminal Ballistic Effects and Threat Environment Parameterization of Outboard Motors to the 7.62 x 51 NATO Round (Report)**	**Dec 19**
	Project End	Dec 19

Sponsor: CG-711

Stakeholder(s): CG-721, ATC Mobile, CG AUF Units, U.S. Army Engineer Research & Development Center

Project #: 5705

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

Notes:

- Leverage prior CG Research and Development Center work.
- Collaborate with Federally Funded Research & Development Center or other U.S. Department of Defense partner for live fire range testing.

RDC POC:	CG-926 Domain Lead:
Mr. Jay Carey	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

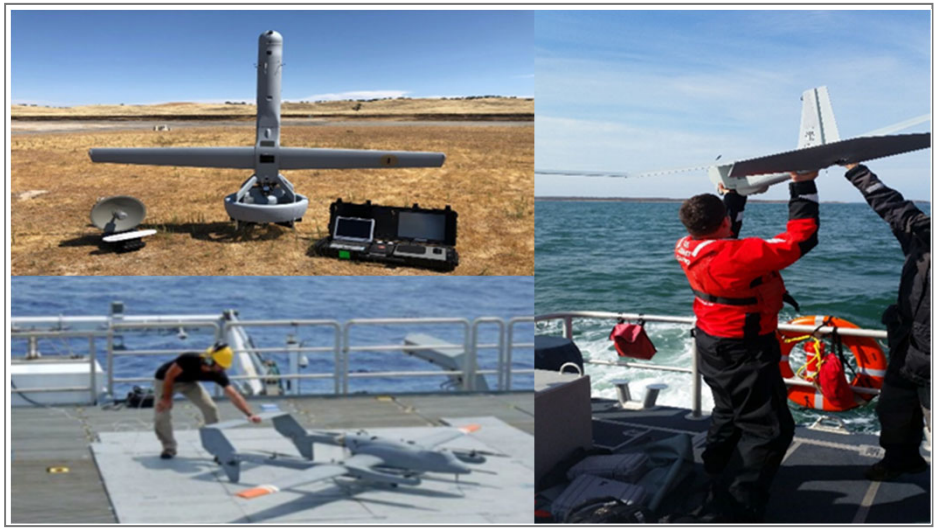
★ Indicates RDC product.

Beyond Visual Line of Sight (BVLOS) Technology for Coast Guard (CG) Unmanned Aircraft System (UAS) Operations

Mission Need: BVLOS operations for CG UAS.

Project Objectives:

- Leverage U.S. Southern Command (SOUTHCOM) efforts to explore Vertical Takeoff and Landing (VTOL) operations from a CG Cutter (CGC).
- Establish Integrated Product Team (IPT) to conduct BVLOS operations from a CGC [sUAS 1st].
- Submit a Request for Information (RFI) for sense and avoid technologies to assist BVLOS operations.
- Integrate sense and avoid technology for conducting BVLOS operations [sUAS 1st].
- Conduct land and vessel based evaluations using sense and avoid technology [sUAS 1st].
- Incorporate sense and avoid technology into VTOL platform.
- Conduct a VTOL BVLOS Limited User Evaluation from a CGC.
- Inform due regard parameters for CG BVLOS UAS operations.
- Establish a BVLOS Certificate of Authorization for Coast Guard operations.



Key Milestone / Deliverable Schedule:

	Project Start	13 Mar 19 ✓
	Establish IPT	Oct 19
	Submit RFI for BVLOS Technologies	Nov 19
	Coordinate VTOL Demonstrations from a CGC	Jul 20
★	**VTOL Operations from a CGC (Brief)**	**Aug 20**
	Integrate BVLOS Technologies into sUAS	Oct 20
	Conduct Land Based BVLOS Tech Demonstration with sUAS	Nov 20
	Conduct Vessel Based BVLOS Tech Demonstration with sUAS	Jan 21
★	**Land and Vessel Based BVLOS Demonstrations (Brief)**	**Feb 21**
	Integrate BVLOS Tech with VTOL Platform	Aug 21
	Conduct BVLOS Limited User Evaluation with VTOL	Nov 21
★	**Beyond Visual Line of Sight UAS Operations (Report)**	**Mar 22**
	Project End	Mar 22

Sponsor: CG-711

Stakeholder(s): CG-753, SOUTHCOM, JIATFS, NOAA

Project #: 7691

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Establish Memoranda of Understanding and Cooperative Research and Development Agreements as necessary with industry partners.
- Leverage efforts of SOUTHCOM, Federal Aviation Administration, National Oceanic and Atmospheric Administration (NOAA), Joint Interagency Task Force South (JIATFS), and other government agencies.

RDC POC:	CG-926 Domain Lead:
Mr. Stephen Dunn	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Robotic Aircraft for Maritime Public Safety (RAMPS)

Mission Need: Better understanding the risks, benefits and limitations of operating existing Commercial off the Shelf Small Unmanned Aircraft System (sUAS) technology in a maritime environment for cutter forces other than the National Security Cutter.

Project Objectives:

- Develop requirements, standards and Concept of Operations.
- Evaluate realistic maritime security and first responder scenarios.
- Create a knowledge resource database.
- Guide future platform and sensor development to meet maritime first responder requirements.
- Evaluate sUAS payloads in different environmental areas focusing on logistics, maintenance, sUAS qualification requirements and data dissemination with CGC assets.
- Conduct an assessment for potential demonstration and evaluation facilities with special use air space establishing an Federal Aviation Administration approved Certificate of Waiver or Authorization for Department of Homeland Security (DHS) use.

Completed

Key Milestone / Deliverable Schedule:

	Project Start	30 Oct 13 ✓
	RAMPS Request For Information (RFI) Release	10 Oct 14 ✓
	RAMPS Course Validation Phase I-A	28 Apr 15 ✓
	RAMPS Phase I-A Demos 01-05	10 Jun 16 ✓
★	**RAMPS – RDC Summary Report (Phase 1A)**	**3 Oct 16 ✓**
	RAMPS Phase I-B Issue Payload RFI	21 Feb 17 ✓
	RAMPS Phase I-B Re-Issue Payload RFI	19 Jul 17 ✓
	RAMPS Phase I-B Payload Demo	16 Jan 18 ✓
	Robotic Aircraft Sensors Program-Maritime (RASP-M) Capabilities Demos 01-05	1 Oct 18 ✓
★	**RASP-M Evaluations (Phase 1B)**	**9 Apr 19 ✓**
	Project End	9 Apr 19 ✓

★ Indicates RDC product

Sponsor: DHS S&T, CG-711

Stakeholder(s): CG-751, CG-761, CG-771, CG-931, JTF-E

Project #: 7807

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Partnership with DHS Science and Technology (S&T) Borders and Maritime Division.
- Establish Cooperative Research and Development Agreements with industry partners for sUAS demonstrations.

RDC POC:	CG-926 Domain Lead:
Mr. Stephen Dunn	Mr. Scott Craig

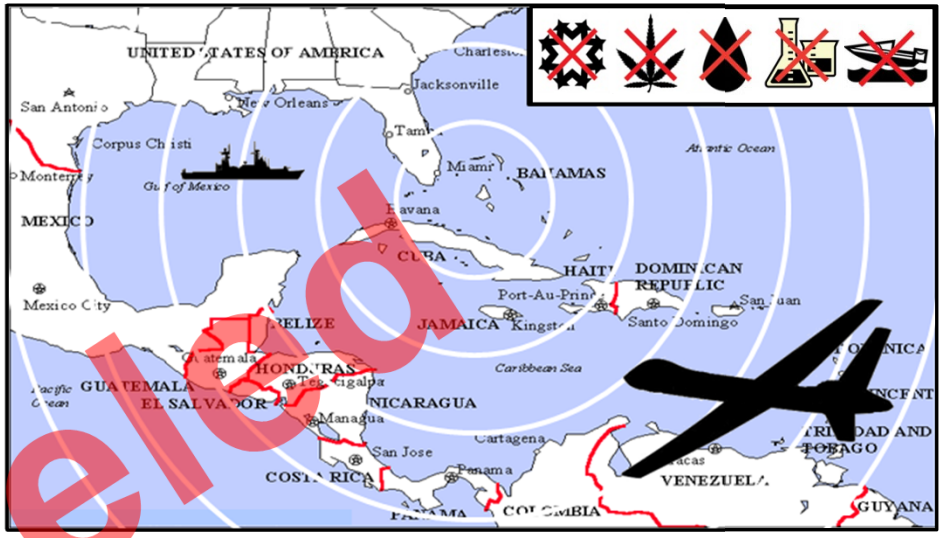
For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Long-Range/Ultra-Long Endurance UAS Analysis

Mission Need: Efficient and effective means of conducting persistent Intelligence, Surveillance, and Reconnaissance (ISR) in transit zones.

Project Objectives:

- Examine the feasibility, costs, and benefits of conducting intelligence, surveillance, and reconnaissance missions in transit zones using Long Range (LR)/Ultra-long Endurance(U-LE), land-based, Unmanned Aerial Systems (UAS).
- Perform an Analysis of Alternatives (AoA) on available LR/U-LE UAS and mission equipment packages.
- Conduct a proof of concept demonstration of selected LR/U-LE UAS.



Key Milestone / Deliverable Schedule:

Project Start	6 Jun 17 ✓
Brief of AoA Plans to Congress	29 Nov 17 ✓
LR/U-LE UAS AoA Draft	16 Jan 18 ✓
Key Decision Point: Market Research Review	31 Jan 18 ✓
Project Canceled	25 Mar 19 ✓

Canceled

Sponsor: CG-711

Stakeholder(s): CG-2, CG-4, CG-5, CG-6, CG-7, CG-8, CG-9

Project #: 7814

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Joint assessment in collaboration with Customs and Border Protection and Department of Homeland Security Science & Technology.
- Supports the Coast Guard Western Hemisphere Strategy.
- Collaborating with Air Force Research Lab.

RDC POC:	CG-926 Domain Lead:
Mr. Evan Gross	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

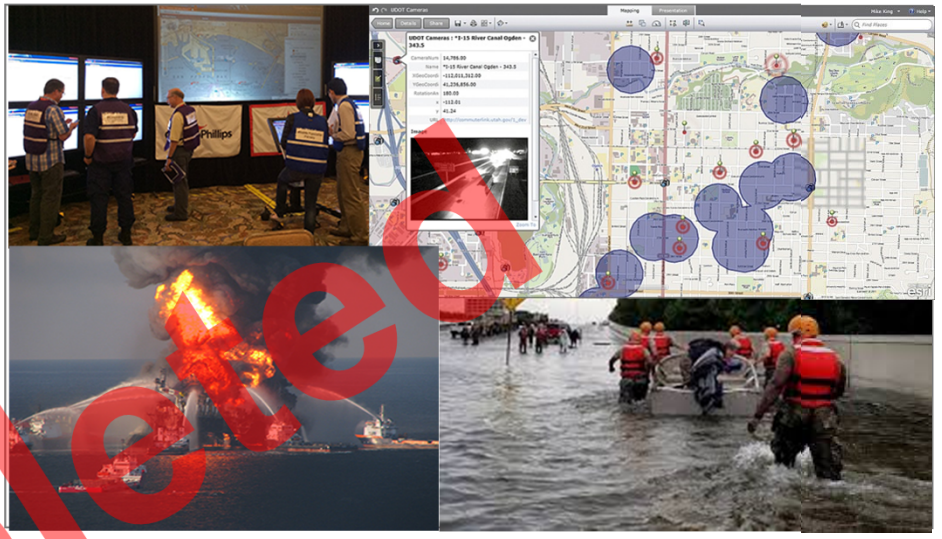
★ Indicates RDC product.

Asset Lay-Down and Tasking System

Mission Need: Comprehensive asset tracking and tasking for CG, Other Government Agencies and volunteers in steady-state and emergency response situations.

Project Objectives:

- Define the current state and future planned efforts of asset tracking and tasking for all CG assets (aviation, afloat, and ashore).
- Identify gaps between asset tracking and tasking needs vs. ongoing efforts.
- Provide recommendations for a path forward.



Key Milestone / Deliverable Schedule:

Project Start	1 Oct 18	✓
Capability Refinement – Stakeholder Summit	Mar 19	✓
KDP: Determine RDC Next Steps	Apr 19	✓
★ **Asset Tracking and Tasking Capability Refinement Summit Report**	**7 Aug 19**	✓
Project End	7 Aug 19	✓

Completed

Sponsor: CG-761

Stakeholder(s): CG-CPE, COMMCOM, C3CEN, ALC, AREA-6, CG-711, CG-751, CG-67, CG-741, CG-731, CG-SAR

Project #: 8118

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

Notes:

Leverage:

- RDC REACT Report: Emergency Response Asset Tracking.
- DHS S&T and U.S. Army Research Lab efforts already in progress.
- Information gained and reported in the 2017 hurricane season lessons-learned.

RDC POC:	CG-926 Domain Lead:
Ms. Meg Tusia	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

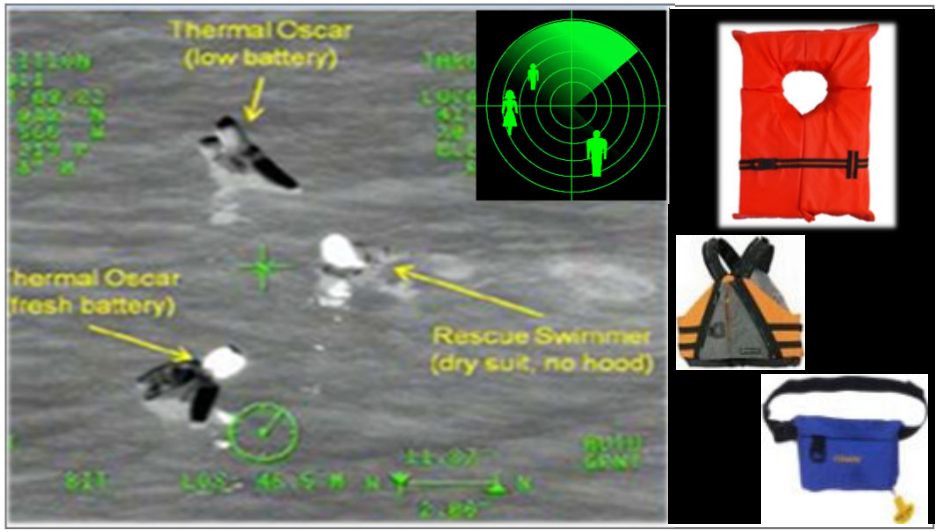
★ Indicates RDC product.

Enhanced Person in the Water (PIW) Detection

Mission Need: Maximize the effectiveness of air and surface asset searches for PIW.

Project Objectives:

- Solicit general public through prize competition for modifications/ enhancements to floatation devices that increase conspicuity and improve detection probability. Potential benefits include:
  - Increase conspicuity of PIW and small targets in an open water environment using existing U.S. Coast Guard assets.
  - Decrease the time required to search a given open water area in various sea-state and weather conditions.
  - Reduce the burden on air and surface asset sensor operators.
- Perform limited user field evaluations of selected technology.



Key Milestone / Deliverable Schedule:

	Project Start	2 Oct 17 ✓
	Prize Challenge Posting Completed	5 Sep 18 ✓
★	**Enhanced Person in the Water: Ready For Rescue Prize Challenge Competition (Report)**	**20 Dec 18** ✓
	RDC Piranha Pool Completed	29 Mar 19 ✓
	Limited User Evaluation Completed	24 Sep 19 ✓
★	**Enhanced Person in the Water Detection (Report & Brief)**	**Jan 20**
	Project End	Jan 20

Sponsor: CG-ENG-4

Stakeholder(s): CG-731, CG-411, CG-SAR, CG-761, ATC, CG-BSX, CG-INV, CG-CVC

Project #: 1103

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Project includes use of the U.S. Department of Homeland Security Science and Technology Directorate Prize Competition process.

RDC POC:	CG-926 Domain Lead:
Ms. Judi Connelly	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Cell Phone Location for Search and Rescue

Mission Need: Cell phone technology to support the precise geo-location of distressed mariners in mayday and Search and Rescue (SAR) scenarios.

Project Objectives:

- Conduct market research, identify, and assess state of the market Commercial/Government off the Shelf (COTS/GOTS) geo-locating system(s).
- Evaluate COTS/GOTS solutions on land and at sea to identify possible enterprise solutions.
- Inform functional requirements and Tactics, Techniques and Procedures (TTP) for cell phone geo-location methods.
- Without distracting from the necessity of carrying VHF-FM equipment, contribute to an awareness campaign educating mariners to provide cell phone numbers in float plans, place cell phones in waterproof sleeves, and carry onboard solar cell phone chargers to extend mobile battery life.

Key Milestone / Deliverable Schedule:

	Project Start	3 Oct 16 ✓
	Document Functional Requirements	30 Dec 16 ✓
	Obtain OTA Agreement with DHS S&T	24 Aug 17 ✓
	Market Research	8 Jan 18 ✓
★	**Cell Phone Location for SAR-Market Research**	**17 Jan 18** ✓
	Obtain COTS/GOTS Solutions for Demonstrations	14 Sep 18 ✓
	Conduct Demonstrations (Lab, Land, and Sea): Commercial Solution Pilot Begin SECLI	10 Jun 19 ✓
★	**Cell Phone Location for SAR (Report)**	**Nov 19**
	Project End	Nov 19

Sponsor: CG-SAR

Stakeholder(s): CG-761, CG-BSX, CG-MLE, LANT/PAC-6, C3CEN, C4IT SC, FORCECOM, CBP, DHS S&T

Project #: 1108

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Use of Cooperative Research and Development Agreement (CRADA)/S&T Other Transaction Authority (OTA)/S&T Small Business Innovation Research (SBIR).
- Rapid deployment COTS solutions will be investigated in parallel to DHS S&T/CRADA efforts.

RDC POC:	CG-926 Domain Lead:
Mr. Sekaran Jambukesan	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

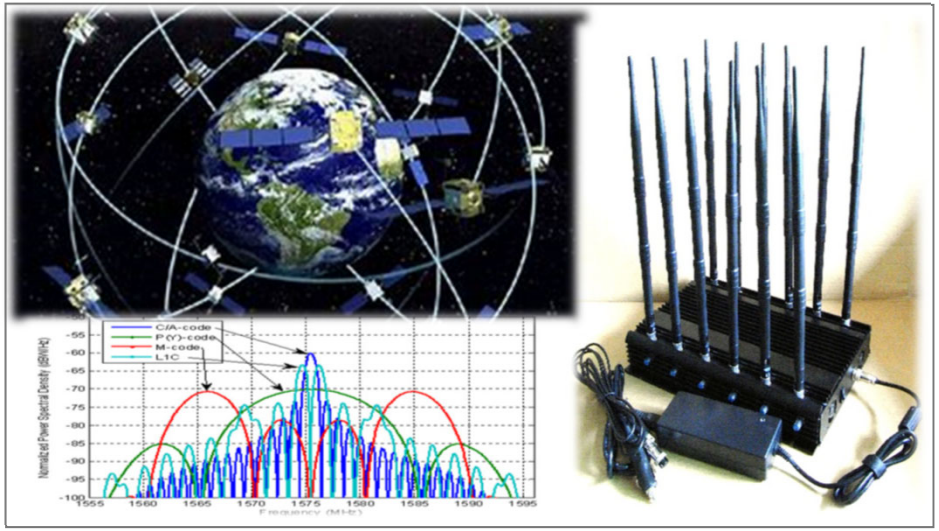
★ Indicates RDC product.

Countering GPS Interference

Mission Need: Develop a means to detect, localize, alert, and mitigate sources of Global Positioning System (GPS) interference in the maritime domain.

Project Objectives:

- Develop wide area GPS interference detection based on existing networks of GPS receivers such as Nationwide Automatic Identification System.
- Investigate GPS interference mitigation technologies to counter effects aboard U.S. Coast Guard (CG) vessels. Investigate tactical GPS interference detection capability for CG units to operate to find GPS interference sources.
- Develop notification methods for maritime users via marine safety information methods such as broadcast notice to mariners, Automatic Identification System application specific messages, and navigation data.
- Bring maritime experience to the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) First Responders & Detection Division (FRD) Position, Navigation and Timing (PNT) efforts.



Key Milestone / Deliverable Schedule:

	Project Start	14 Jun 18 ✓
	DHS S&T 2018 GPS Equipment Tests	21 Sep 18 ✓
	Test CG GPS Units at Live Sky Test Event	15 Aug 19 ✓
	Demonstration of Wide Area GPS Interference Detection	26 Sep 19 ✓
★	**Countering GPS Interference (Brief)**	**7 Oct 19** ✓
★	**Countering GPS Interference (Report & Brief)**	**Mar 20**
	Project End	Mar 20

Sponsor: CG-NAV

Stakeholder(s): CG-68, CG-761, CG-791, C4IT SC, C3CEN, NAVCEN, DHS S&T (FRD)

Project #: 2218

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

Notes:

- Legislative requirement.
- Partner with U.S. Army Communications-Electronics Research, Development and Engineering Center and Air Force Research Laboratory.
- Continue working with DHS S&T (FRD) PNT Program.
- Leverage GPS/AIS results from RDC Project 8502: Cybersecurity Vulnerabilities, Threats, and Risk Mitigation Strategies for Coast Guard Surface and Air Assets.

RDC POC:	CG-926 Domain Lead:
Mr. Jay Spalding	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Maritime Counter Unmanned Aircraft Systems (C-UAS)

Mission Need: Methods to detect, track, identify, and defeat illicit use of unmanned aircraft systems in the maritime environment.

Project Objectives:

- Inform requirements for C-UAS for the U.S. Coast Guard (CG) Ports, Waterways, and Coastal Security and Defense Readiness missions.
- Conduct market research to identify both government off-the-shelf and commercial off-the-shelf technologies that satisfy CG requirements.
- Evaluate system prototypes in an operational maritime environment.
- Integrate successful systems to build an end-to-end layered defensive system prototype, aimed at increasing performance and usability while reducing size, weight and power and manning requirements.
- Provide C-UAS system subject matter expertise in development of tactics, techniques, and procedures for CONUS and OCONUS applications.

Key Milestone / Deliverable Schedule:

	Project Start	3 Oct 16 ✓
★	**Maritime Counter Unmanned Aircraft Systems (Brief)**	**Feb 20**
	Integrated Components Extend User Evaluation	Sep 20
★	**C-UAS Test & Evaluation Report for the PWCS Mission (Report)**	**Nov 20**
	Project End	Nov 20

Sponsor: CG-MSR

Stakeholder(s): CG-711, CG-731, CG-721, CG-751, DCMS-34, CG-2, CG-6, C3CEN, SFLC, AREA-3, DARPA, DHS S&T

Project #: 7812

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- This effort will leverage partnerships with the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), Defense Advanced Research Projects Agency (DARPA), Air Force Research Laboratory, Naval Surface Warfare Centers, the Office of Naval Research, and other government organizations.

RDC POC:	CG-926 Domain Lead:
Ms. Amy Cutting	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Mobile Technology for Operational Efficiency

Mission Need: Enhance field operations by using mobile technology to capture and access operational data.

Project Objectives:

- Prototype a flexible communications/information system with processes, and procedures to enhance the CG's ability to transfer information that will assist personnel during field operations.
- Review Department of Defense (DoD)/Defense Information Systems Agency (DISA) mobility programs.
- Develop processes/procedures to ensure tie-in and compliance with CG Program of Record/System Architecture/System Development Life Cycle.

Key Milestone / Deliverable Schedule:

Project Start..... 6 Mar 15 ✓

Transition Project to FY19 USCG/DoD/DISA Mobile Data Solutions Effort..... 6 Jun 18 ✓

★ **Mobile Technology for Operational Efficiency: Initial Results and Lessons Learned..... 2 Oct 18 ✓**

Project End..... 2 Oct 18 ✓

Completed

Sponsor: CG-761

Stakeholder(s): CG-1B3, AREA-6, CG-6, C4IT-SC, OSC, TISCOM

Project #: 8114

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

Notes:

- Leverage DoD/DISA solutions.
- Leverage past PDA efforts.
- Align with Mobility Integrated Product Team.

RDC POC:	CG-926 Domain Lead:
Mr. Jon Turban, P.E.	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

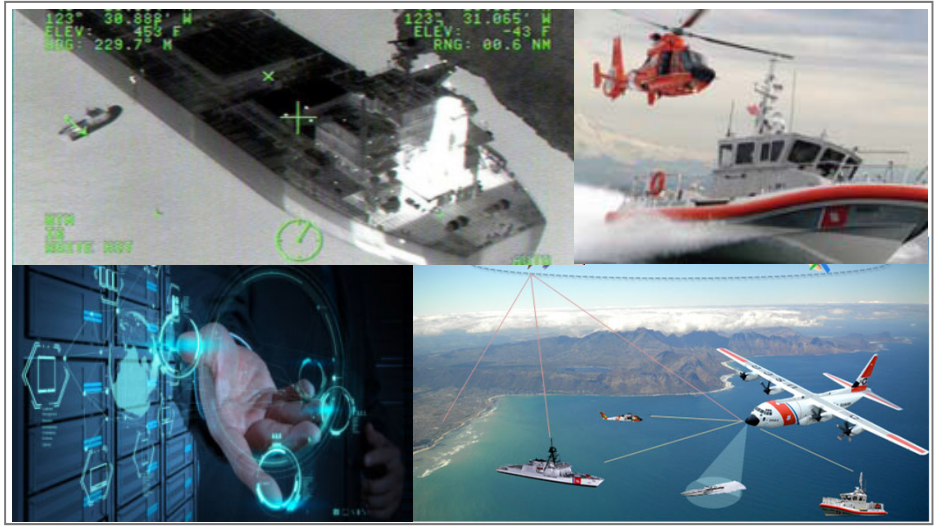
★ Indicates RDC product.

Intelligence, Surveillance and Reconnaissance (ISR) Enterprise Data Network Study and Analysis

Mission Need: Enable intelligence-driven operations and collaboration for continued decision advantage in support of all U.S. Coast Guard (CG) missions.

Project Objectives:

- Establish the necessary cross-component Joint Requirements Council (JRC) chartered team to support the development and deployment of a U.S. Department of Homeland Security (DHS) enterprise ISR data network solution.
- Support all need validation analyses and mission need objectives to successfully obtain Acquisition Decision Event (ADE) 0 and 1 approvals.
- Perform technology demonstrations (shore, surface, air) as needed to inform mission need documentation deliverables.
- Specifically focus on cyber security related requirements as solution alternatives are analyzed.
- Support development of requisite CG resource proposals.
- Ensure the smooth transition into the Analyze/Select phase of the Acquisition Lifecycle Framework.



Key Milestone / Deliverable Schedule:

	Project Start	14 Jun 17 ✓
	Standup ISR Enterprise Data Network Integrated Product Team	24 Nov 17 ✓
	Need Validation Analysis – ADE 0	
★	**Capability Analysis Study Plan Tactical DHS ISR Data Network**	**20 Dec 17 ✓**
★	**ISR Enterprise Data Network Capability Analysis Report (CAR)**	**Oct 19**
	Mission Need – ADE 1	
	Technology Demonstration(s) to Inform Mission Need	Sep 19
★	**ISR Enterprise Data Network Mission Needs Statement (MNS)**	**Jan 20**
★	**ISR Enterprise Data Network Concept of Operations (CONOP)**	**Feb 20**
★	**ISR Enterprise Data Network (Report & Brief)**	**May 20**
	Project End	May 20

★ Indicates RDC product.

Sponsor: CG-26, DHS S&T (BIM)

Stakeholder(s): CG-93, CG-711/731/741/751/761/791/771, CG-671/68, MIFC, ICC, C4IT SC, CYBERCOM, AREA-6

Project #: 8116

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Partner with DHS Science and Technology Directorate (S&T).
- Align with DHS, U.S. Department of Defense, and intelligence community information technology enterprise solutions, including the integrated maritime domain environment.
- Dates for Joint Requirements Integration and Management System documents are contractor deliverable dates and are independent of the JRC timeline for approval.

RDC POC:	CG-926 Domain Lead:
LT Anne Newton	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Document and Media Exploitation (DOMEX) Technology Evolution Capability Research

Mission Need: An agile technology evolution capability to support DOMEX activities to stay ahead of our adversaries.

Project Objectives:

- Research a Centralized DOMEX Derived Data IT solution. Create an implementation plan that includes costs for the development of a centralized CG DOMEX IT infrastructure. This includes facility costs, data backup/redundancy costs, hardware costs, software costs, network infrastructure costs, data storage costs, installation costs, manpower costs and any other information assurance associated costs. Examine opportunities to leverage existing DHS DOMEX infrastructure, government and commercial cloud solutions.
- Aid in the research of Governance for the CG DOMEX Program.
- Lead the DHS Gap 5 Study involving a departmental look at Digital Forensics Tier II and Tier III labs within the sub-component agencies and the possibility of co-location.

Completed

Key Milestone / Deliverable Schedule:

Project Start	2 Oct 17	✓
Assessment of Current State of CG DOMEX Technology/IT Infrastructure	30 Mar 18	✓
DOMEX Technology/IT Evolution Capability Market Research (IT, Tools, Facilities, Human Capital)	31 May 18	✓
Commence DHS Gap 5 Study	1 Jun 18	✓
DOMEX Functional Requirements Development	3 Aug 18	✓
White Paper on Governance w/COA's	30 Jan 19	✓
Formal Presentation to DAB leadership on Governance COA'S	11 Mar 19	✓
Limited User Evaluation	31 Jul 19	✓
★ **DOMEX Technology Evolution Capability Final Report**	**27 Sep 19**	✓
Project End	27 Sep 19	✓

★ Indicates RDC product

Sponsor: CG-257

Stakeholder(s): CG-MLE, CG-68, CGIS, CGCIS, ICC, C3CEN, CG-INV, DHS I&A

Project #: 8309

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Supports CG Intelligence Guidance 2019-2021 (Goal 5c).
- Partner with the Defense Intelligence Agency (DIA) National Media Exploitation Center's Science and Technology Integration Lab and Homeland Security Investigation's Cyber Crimes Center.

RDC POC:	CG-926 Domain Lead:
LT Anne Newton	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Cybersecurity Vulnerabilities, Threats, and Risk Mitigation Strategies for Coast Guard Surface and Air Assets

Mission Need: U.S. Coast Guard (CG) platforms require resistance and resilience to cyber attacks.

Project Objectives:

- Conduct cyber security risk research analysis for Global Positioning System (GPS), Automatic Identification System (AIS) and specific mission oriented systems dependent on position, navigation and timing.
- Partner with the U.S. Department of Homeland Security Science and Technology Directorate to test specific equipment vulnerabilities and derive the impact and consequence of attacks to identify defense strategies.
- Perform a cyber assessment on a CG asset to identify vulnerabilities, threats and risk mitigation strategies.
- Develop and test a cyber risk mitigation strategy that could be used to recover compromised operational technology systems on CG surface and air assets.

Key Milestone / Deliverable Schedule:

	Project Start	3 Oct 16 ✓
	Inventory and Acquire GPS/AIS Units	22 Dec 16 ✓
	Conduct GPS/AIS Testing	22 Jul 17 ✓
	Inventory Surface Systems for Evaluation	26 Oct 17 ✓
★	**GPS/AIS Cyber Assessment (Report)**	**22 Feb 18** ✓
	Conduct Surface Asset Assessment	5 Apr 18 ✓
	Research Cyber Risk Mitigation Systems at Other Labs	31 Oct 18 ✓
	Select CG Surface and Air Assets for Cyber Risk Mitigation	Oct 19
★	**Risk Mitigation Strategy (Brief)**	**Dec 19**
	Develop Cyber Risk Mitigation Strategy in Lab Environment	Jan 20
	Conduct Cyber Risk Mitigation Demonstration on CG Cutter	Apr 20
★	**Cybersecurity for Coast Guard Surface and Air Assets (Report & Brief)**	**Sep 20**
	Project End	Sep 20

★ Indicates RDC product.

Sponsor: CG-791

Stakeholder(s): CG-761, CG-711, CG-751, CG-933, C4ITSC, CYBERCOM

Project #: 8502

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

Notes:

- Leverage research and development efforts of the Office of Naval Research Resilient Hull, Infrastructure, Mechanical, and Electrical Security program; Federally Funded Research and Development Centers; and University Affiliated Research Centers.
- Partner with Johns Hopkins University Applied Physics Lab on U.S. Navy Sea Change initiatives and cyber risk mitigation.

RDC POC:	CG-926 Domain Lead:
Mr. Rob Taylor	Ms. Holly Wendelin

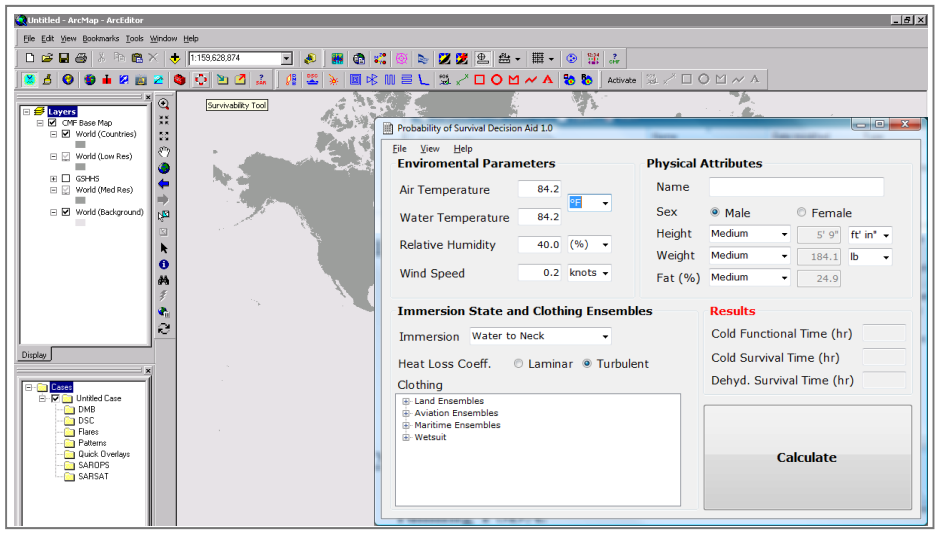
For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Survival Modeling, Reporting, and Statistics

Mission Need: Improve Search and Rescue Optimal Planning System (SAROPS) utility by ensuring appropriate incorporation of better survival modeling and statistics.

Project Objectives:

- Research the state of survival modeling, including the availability of "3rd generation" human-thermal models, and their ability to accurately predict ranges of survival time in waters warmer than 15°C (59°F).
- Determine whether the existing Probability of Survival Decision Aid or other models can account for, or incorporate, factors and parameters beyond heat production and heat loss.
- Identify and implement strategies to adapt model(s) to include additional parameters.
- Develop a survival database to validate model(s) against statistics.
- Deliver a survival-model module for plug-in application to the SAROPS.



Key Milestone / Deliverable Schedule:

	Project Start	1 Nov 17 ✓
	Phase I: Survival Model Investigation and Statistics	
	Investigate Requirements and Applications	30 Apr 18 ✓
	Investigate State of Survival Models	16 Jul 19 ✓
	Conduct Facilitated Workshop	28 Aug 19 ✓
★	**Survival Statistics (Brief)**	**Dec 19**
	Monitor Survival Information Data Collection	Jul 20
	Key Decision Point to Progress to Model Implementation and Validation	Aug 20
	Phase II: Survival Model Implementation	
	Adapt Model with Prioritized Survival Factors	Mar 21
	Validate Survival Model	Jul 21
★	**Enhanced CG Survival Model and Implementation Guidance (Report)**	**Sep 21**
	Project End	Sep 21

★ Indicates RDC product.

Sponsor: CG-SAR

Stakeholder(s): CG-5R, CG-761, C3CEN, AREA-5

Project #: 1008

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

Notes:

- Carries forward U.S. Coast Guard (CG) Research and Development Center survival-related work with U.S. Department of Defense labs.
- Potential efficiencies in saving lives while reducing time on sortie.
- Explore partnerships with National Labs and University Centers.

RDC POC: Ms. Monica Cisternelli

CG-926 Domain Lead: Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Performance of Daytime Distress Signals

Mission Need: Determine effectiveness of existing daytime distress signals.

Project Objectives:

- Provide the Office of Design and Engineering Standards empirically-derived information to update distress signal carriage requirements.
- Determine effectiveness of presently-approved daytime distress signals.
- Determine if an enhanced, 2-color, quick-flashing SOS electronic visual distress signal will be effective in daytime.
- Determine if project results can apply to Safety of Life at Sea (SOLAS) guidelines.

Key Milestone / Deliverable Schedule:

Project Start	2 Apr 18 ✓
Pilot Testing	29 Aug 18 ✓
Field Experiment	7 Nov 18 ✓
Key Decision Point: SOLAS Equivalence	28 Feb 19 ✓
★ **Daytime Distress Signal Effectiveness**	**Dec 19**
Project End	Dec 19

Sponsor: CG-ENG
Stakeholder(s): CG-SAR, CG-BSX

Project #: 11011

Anticipated Transition: **Knowledge Product**
Standards/Regulations

Notes:

- Follow-on to Project 1101, Alternatives to Pyrotechnic Distress Signals Project.

RDC POC:	CG-926 Domain Lead:
LT Liz Murphy	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Develop an Environmentally Friendly Buoy Mooring System

Mission Need: A buoy mooring system for environmentally sensitive areas that would avoid directly damaging nearby delicate plants and animals in the benthic zone.

Project Objectives:

- Conduct market research to determine alternatives to traditional buoy mooring systems.
- Develop and test prototypes to determine best buoy mooring technology for environmentally sensitive areas.

Key Milestone / Deliverable Schedule:

	Project Start	10 Nov 14 ✓
	Conduct Market Research	25 Feb 15 ✓
	Key Decision Point: Broad Agency Announcement or Prize Competition	14 Oct 15 ✓
	Key Decision Point: Prototype Development	2 Jun 16 ✓
	Demonstration Start	3 Apr 18 ✓
★	**Environmentally Friendly Buoy Mooring System Deployment (Report)**	**14 Aug 18** ✓
	Demonstration End	14 Jun 19 ✓
★	**Environmentally Friendly Buoy Mooring System Deployment (Report)**	**Nov 19**
★	**Environmentally Friendly Buoy Mooring System (Report)**	**Dec 19**
	Project End	Dec 19

★ Indicates RDC product.

Sponsor: CG-NAV

Stakeholder(s): SILC-WOPL, D7, LANT

Project #: 2702

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Supports Coral Reef Protection Executive Order 13089.
- Supports the Coast Guard Energy Renaissance Action Plan.

RDC POC:	CG-926 Domain Lead:
Ms. Irene Gonin	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Vessel of Opportunity Skimming System (VOSS) Technology Market Research

Mission Need: State-of-the-market, logistically supportable VOSS technology.

Project Objectives:

- Research state-of-the-market technologies that can potentially replace the current VOSS equipment.
- Ensure VOSS technologies will be operable in D14/D17 Areas of Responsibility (AORs).
- Compile a report for possible future actions related to VOSS equipment replacement.

Key Milestone / Deliverable Schedule:

Project Start	1 Oct 18	✓
Capability Assessment/Mission Needs	18 Mar 19	✓
Revise Tentative Baseline and Desired Functional Characteristics	18 Sep 19	✓
Issue Request for Information (RFI)	Oct 19	
Receive RFI Responses	Dec 19	
Finalize Market Research	Feb 20	
★ **Vessel of Opportunity Skimming System Technologies Market Research (Report)**	**Jun 20**	
Project End	Jun 20	

Sponsor: CG-MER

Stakeholder(s): CG-751, CG-43, National Strike Force Coordination Center, PACAREA

Project #: 4212

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Oil Spill Liability Trust Fund funding.

RDC POC:	CG-926 Domain Lead:
Mr. Alexander Balsley, P.E.	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Oil Sands Products Spill Response

Mission Need: Research and develop enhanced decision-making tools and recovery/mitigation tools for responding to spilled oil sands products.

Project Objectives:

- Analyze and assess behavior, response issues and strategies in fresh and salt waters; and develop tactics and/or technologies that address gaps.
- Provide decision making/job aid tools for U.S. Coast Guard (CG) and commercial responders to aid in response planning and execution for spills of oil sand products in fresh and salt water.

Key Milestone / Deliverable Schedule:

	Project Start	31 Aug 14 ✓
★	**Response to Oil Sands Products Assessment (Report)**	**29 Sep 15 ✓**
★	**Underwater Sediment Sampling Research (Report)**	**19 Jan 17 ✓**
★	**Testing of Oil Sands Products Recovery in Fresh Water (White Paper)**	**2 Apr 18 ✓**
	Bottom Mitigation Techniques Part 2 First Inland Test	26 Apr 18 ✓
	Bottom Mitigation Techniques Part 2 Offshore Test	31 May 18 ✓
	Bottom Mitigation Techniques Part 2 Second Inland Test	4 Apr 19 ✓
★	**Mitigation of Oil Moving Along the Waterway Bottom (Report)**	**Oct 19**
	Consolidate Project Findings	Apr 20
★	**Oil Sands Products Spill Response (Report)**	**Jul 20**
	Project End	Jul 20

★ Indicates RDC product.

Sponsor: CG-MER

Stakeholder(s): EPA, AREA-54, NOAA

Project #: 4705

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

Notes:

- Multiple funding sources including Oil Spill Liability Trust Fund and FY17-18 Great Lakes Restoration Initiative.
- Cooperative Research and Development Agreement with Enbridge Pipeline.
- Leverage research done by academia, U.S. Department of Energy Labs, and international academic institutions.

RDC POC:	CG-926 Domain Lead:
Mr. Alexander Balsley, P.E.	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

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

Mission Need: An ERSP calculator to include response systems for the entire nearshore and inland operating environment.

Project Objectives:

- Research the viability of the current ERSP and the calculator's initial impact in the offshore oil spill response industry.
- With industry and interagency (U.S. Environmental Protection Agency) representatives, assess ERSP as a whole to determine if it effectively rectifies the Economic and Development Review Committee's challenges experienced during Deepwater Horizon.
- Research inland and nearshore oil recovery equipment and efficiencies.
- Research if ERSP can be expanded to include the entire nearshore and inland operating environment.
- Expand ERSP to include inland and nearshore recovery modeling in calculator.

Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 16 ✓
	Feasibility Workshop	21 Jun 17 ✓
★	**Feasibility of Extending the ERSP Calculator for Nearshore and Inland Waterways (Report)**	**20 Sep 17** ✓
	Complete Contract Negotiations. for Calculator Design.	18 Aug 18 ✓
	Start Development of Conceptual Model	1 Apr 19 ✓
★	**Inland ERSP Preliminary Factors, Requirements and Conceptual Model (Report)**	**Oct 19**
★	**Inland ERSP Operational Environment Calculator (Design Document)**	**Jan 20**
	Start Development of Inland ERSP Calculator Software Tool	Sep 20
	Complete Tool and Begin National Academies Review	Apr 21
★	**National Academy of Sciences Review of Inland ERSP (Report)**	**Sep 21**
★	**Inland ERSP Calculator (Software & User Guide)**	**Feb 22**
★	**Nearshore & Inland Evaluation of the ERSP Calculator (Report)**	**Aug 22**
	Project End	Aug 22

★ Indicates RDC product.

Sponsor: CG-MER

Stakeholder(s): BSEE, AREA-54

Project #: 4710

Anticipated Transition: **Product**
Fielded Prototype

Notes:

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

RDC POC:	CG-926 Domain Lead:
Mr. Alexander Balsley, P.E.	Ms. Karin Messenger

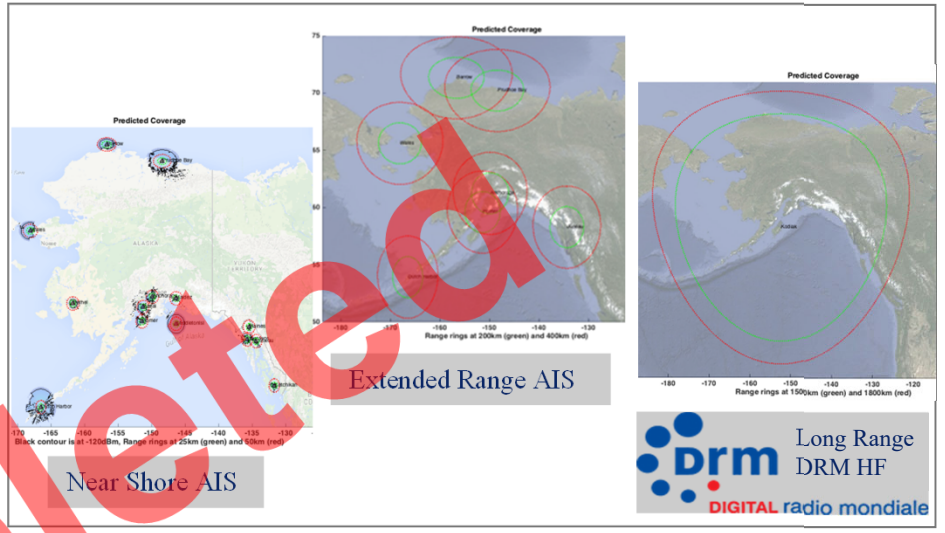
For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Next Generation Arctic Navigational Safety Information System

Mission Need: Reliable critical navigational safety information to identify, assess, and mitigate navigational risks in the Arctic region.

Project Objectives:

- Partner with Marine Exchange Alaska (MXAK) to:
  - Define the prototype near shore system that will be developed under this public/private partnership.
  - Develop the near shore Arctic Navigation Safety Information System (ANSIS) prototype system for the technology demonstration.
  - Install, test, and utilize ANSIS technology demonstration system.
  - Monitor ANSIS technology demonstration system performance and mariner utilization.
- Evaluate/test other technologies to extend range of near shore ANSIS:
  - Extended range Automatic Identification System (AIS) - Enhancements to improve AIS radio-link performance.
  - Long range (Digital Radio Mondiale (DRM) 30 High Frequency (HF)) ANSIS.



Key Milestone / Deliverable Schedule:

	Project Start	4 Nov 13 ✓
★	**ANSIS Functional Design Letter Report**	**9 Sep 14** ✓
	Develop/Test ANSIS Near Shore Tech Demo System	27 Jul 15 ✓
★	**Maritime Geo-Fence Letter Report**	**25 Jul 16** ✓
	Evaluate/Test ANSIS Long Range DRM HF Tech Demo System	24 Oct 16 ✓
	Develop/Test ANSIS AIS Extended Range Tech Demo System	23 Jan 17 ✓
★	**RDC Review/Status of International Maritime Organization Maritime Safety Information Systems**	**19 Oct 17** ✓
★	**Long Range (DRM30 HF) ANSIS Demo Summary Report**	**30 Apr 18** ✓
★	**Researching Technology Improvement of AIS**	**18 Jul 18** ✓
★	**Alaska AIS Transmit Prototype Test, Evaluation, and Transition Summary Report**	**9 Oct 18** ✓
	Project End	9 Oct 18 ✓

★ Indicates RDC product

Sponsor: CG-NAV

Stakeholder(s): CG-761, C3CEN, D17, PAC, CG-5PW, CG-652

Project #: 6211

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Project includes use of a Cooperative Research and Development Agreement.
- Supports development and implementation of CG Arctic strategy and public/private partnerships.
- Leverage other RDC efforts, including Project 2722, 5711, & 8113.

RDC POC:	CG-926 Domain Lead:
Ms. Irene Gonin	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

CG Nearshore Use of FirstNet

Mission Need: Interoperable voice and high speed data communications among Sector Forces and First Responders within Sea Area A1 (within 20 nautical miles of shore).

Project Objectives:

- Leverage a Cooperative Research and Development Agreement (CRADA) to investigate U.S. Coast Guard (CG) operational use of the National Public Safety Broadband Network (commonly called FirstNet).
- Assess the feasibility and effectiveness of leveraging CG infrastructure (e.g., Rescue 21 towers) to enhance FirstNet designs.
- Adapt 4G/LTE technology for the maritime environment to best support the CG, public safety, U.S. Department of Defense, and Other Government Agencies within 20 nautical miles of shore.

  Phase 1: Deploy handsets, FirstNet Enhanced Push To Talk (EPTT), blue force tracking, and Geosuite.

  Phase 2: Optimize radio access network, FirstNet integrated dispatch console, and EPPT enhanced equipment.

  Phase 3: Deploy Band 14 vessel routers.

Key Milestone / Deliverable Schedule:

	Project Start	21 Mar 18 ✓
	Limited User Evaluation Start	1 Feb 19 ✓
	CG FirstNet Maritime Test Range: Phase 1	1 Feb 19 ✓
	CG FirstNet Maritime Test Range: Phase 2	19 Aug 19 ✓
	CG FirstNet Maritime Test Range: Phase 3	Oct 19
★	**Coast Guard Nearshore Use of FirstNet (Brief)**	**Nov 19**
	Limited User Evaluation	Jan 20
★	**Coast Guard Nearshore Use of FirstNet: Test Results and Recommendations (Report & Brief)**	**Mar 20**
	Project End	Mar 20

Sponsor: CG-67

Stakeholder(s): CG-255, CG-721/31/41/51/61/91, C4IT SC LANT/PAC-6, C3CEN, TISCOM, D7, JIATF

Project #: 58041

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Project includes use of a CRADA.
- Partners: FirstNet Program Office, U.S. Customs and Border Protection Office of Air and Marine, and Florida Fish and Wildlife Conservation Commission.

RDC POC:	CG-926 Domain Lead:
Mr. Jon Turban, P.E.	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

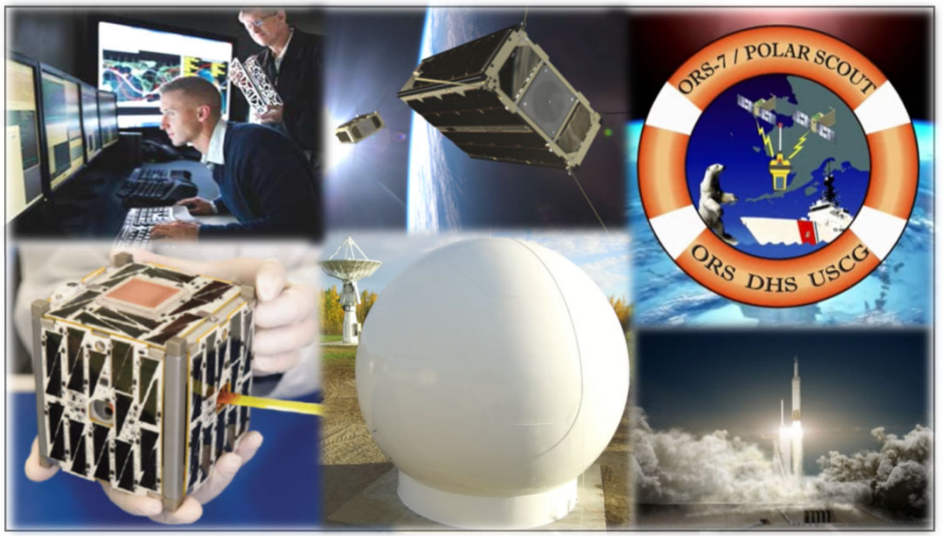
★ Indicates RDC product.

Evaluation of Potential CG Use of CubeSats

Mission Need: Investigation and assessment of the operational utility of CubeSat technology for U.S. Coast Guard (CG) missions.

Project Objectives:

- Develop and deploy two ground stations for the Mobile CubeSat Command and Control (MC3) ground network, test and document the performance of the MC3 ground stations.
- Participate/partner in CubeSat technology development, test and document CubeSat performance during on-orbit test and evaluation of Polar Scout.
- Perform a CubeSat payload mission assessment that includes CubeSat concept of operations scenarios that would support CG mission needs and influence CubeSat requirements.
- Prepare a CubeSat technology roadmap to support the most pressing CG mission needs, including development, deployment and operations and maintenance planning factors.



Key Milestone / Deliverable Schedule:

	Project Start	29 Jun 16 ✓
	Partner Collaboration/Integrated Product Team Establishment	25 Oct 16 ✓
	Deploy MC3 Ground Station (Fairbanks, AK)	26 Sep 17 ✓
★	**Performance Test Results of Fairbanks Polar Scout Ground Station (Report)**	**20 Aug 18** ✓
★	**Coast Guard Use of CubeSat Technology (Brief)**	**24 Nov 18** ✓
	Polar Scout Launch	3 Dec 18 ✓
	Deploy MC3 Ground Station (New London, CT)	26 Jan 19 ✓
	Polar Scout Demonstrations Begin	1 May 19 ✓
★	**Performance Test Results of New London Polar Scout Ground Station (Report)**	**1 Jul 19** ✓
	Polar Scout Mission Concludes	Dec 19
★	**Coast Guard Use of CubeSat Technology Assessment and Roadmap (Report)**	**Aug 20**
	Project End	Aug 20

★ Indicates RDC product.

Sponsor: CG-SAR

Stakeholder(s): DHS S&T (BIM), CG-25, CG-26, CG-761, CG-771, CG-MLE, CG-MER3, IIP, D17, CGA

Project #: 7759

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Partner with U.S. Department of Homeland Security Science & Technology Directorate, U.S. Air Force Space Rapid Capabilities Office, National Oceanic and Atmospheric Administration, Naval Postgraduate School, and CG Academy to launch and evaluate CubeSat technology.
- Collaborate with Air Force Institute of Technology, U.S. Navy Program Executive Office Space Systems, and other agencies.
- Leverage Lawrence Livermore National Laboratory.

RDC POC:	CG-926 Domain Lead:
LCDR Grant Wyman	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Extended Reality (XR) Capabilities for Coast Guard Mission Support

Mission Need: Improve the efficiency and effectiveness of maintenance and training across all U.S. Coast Guard (CG) communities.

Project Objectives:

- Identify maintenance, training, tools, processes, and procedures used by military and industry that will enhance the CG's ability to train personnel and perform maintenance on CG assets with the following goals:
  - Reduce the labor burden of technicians by providing current maintenance information via XR technologies.
  - Increase the availability of assets by improving the efficiency of maintenance and reducing costly errors.
  - Improve the effectiveness of training and reduce the time to train personnel.
- Create a roadmap that will enable sponsor to generate requirements and successfully implement extended reality capabilities throughout the CG to improve the performance of mission support services.

Key Milestone / Deliverable Schedule:

	Project Start	30 Nov 17 ✓
★	**Market Research/Technology Assessment (Brief)**	**19 Dec 18 ✓**
	87' WPB Augmented Reality Maintenance Prototype Delivered	18 Sep 19 ✓
★	**Limited User Evaluation - Surface Community (Brief)**	**May 20**
	Aviation Augmented Reality Maintenance Prototype Delivered	Aug 20
★	**Limited User Evaluation - Aviation Community (Brief)**	**Apr 21**
	Marine Inspection XR Training Prototype Delivered	May 21
★	**Limited User Evaluation - Training Community (Brief)**	**Jan 22**
	Mission Support XR Roadmap	Mar 22
★	**XR Capabilities for CG Mission Support (Report & Brief)**	**Jul 22**
	Project End	Jul 22

★ Indicates RDC product.

Sponsor: FORCECOM

Stakeholder(s): CG-1B3, 41, 45, 5PC, 67, 711, 731, 751, 761, 933 ALC,ATC,ATTC,CGA,SFLC,TRACEN Yorktown

Project #: 8107

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

Notes:

- Includes partnerships with Massachusetts Institute of Technology Lincoln Laboratory, Naval Sea Systems Command Portsmouth Naval Shipyard, Microsoft Technology Center Boston, Avatar Partners, and other U.S. Department of Defense components that have successfully adopted XR technologies in their mission support programs.
- Uses agile scrum development and rapid contracting through Defense Logistics Agency's Tailored Logistic Support Program.

RDC POC:	CG-926 Domain Lead:
Mr. Jon Turban	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

USCG/DoD/DISA Mobile Data Solutions

Mission Need: Leverage DoD mobility solutions to enhance Coast Guard operations and mission support.

Project Objectives:

- Research Department of Defense (DoD)/Defense Information Systems Agency (DISA) mobility programs and architecture.
- Review DoD/DISA mobility capabilities and how they may apply to Coast Guard Operations and Mission Support.
- Develop a technology roadmap and transition recommendations to the Coast Guard Mobility Integrated Product Team (IPT).

Key Milestone / Deliverable Schedule:

Project Start	1 Oct 18	✓
Review DoD/DISA Mobility Programs	29 Mar 19	✓
Capability/Functional Requirements – Stakeholder Summit	28 Jun 19	✓
★ **USCG/DoD/DISA Mobile Data Solutions Final Report and Brief**	**25 Sep 19**	✓
Project End	25 Sep 19	✓

Sponsor: CG-761

Stakeholder(s): CG-68, CG-1B3, AREA-6, C4IT SC, TISCOM, FORCECOM, CG-671

Project #: 8117

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

Notes:

- Partner with Air Force Research Lab Information Directorate.
- Align project goals with CG Mobility IPT.
- Leverage results of RDC Project 8114: Mobile Technology for Operational Efficiency.
- Align with RDC Project 8107: Augmented Reality Capabilities to Improve CG Mission Support and 58041: CG Nearshore Use of FirstNet.

RDC POC:	CG-926 Domain Lead:
Mr. John Maloney	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

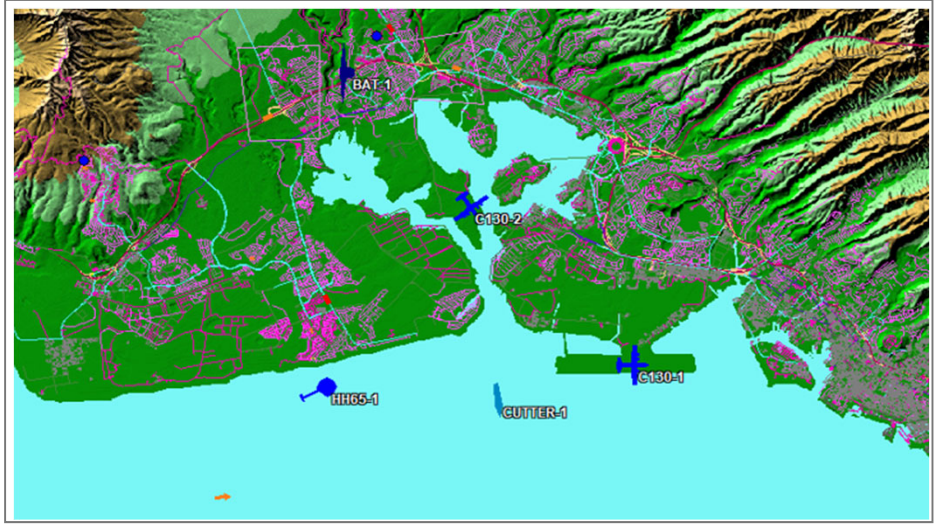
★ Indicates RDC product.

Exploring Machine Learning (ML) for Application In USCG Mission Planning & Disaster Response

Mission Need: Improve the U.S. Coast Guard's (USCG) emergency preparedness and increase response effectiveness.

Project Objectives:

- Phase I:
  - Literature research and review: application of Artificial Intelligence (AI) and ML to CG Humanitarian Assistance and Disaster Response (HA/DR). Assess how the use of AI/ML could enhance the efficiency of CG planning and response process during a crisis.
- Phase II:
  - Naval Postgraduate School conducts ML change detection research.
  - University of Illinois (U of I) conducts ML HA/DR network analysis and natural language processing.
  - University of Southern California (USC)/Harvard Center for Artificial Intelligence develops resource allocation algorithm.
  - Air Force Research Laboratory (AFRL) begins development of HA/DR simulation model.
- Phase III:
  - Test natural language processing and resource allocation impacts in simulated HA/DR environment.
  - Evaluate simulated results to actual results from the 2010 Haiti Earthquake to investigate potential effectiveness.



Key Milestone / Deliverable Schedule:

	Project Start	20 Oct 17 ✓
	Phase I - Conduct Literature Review and Assessment	30 Apr 18 ✓
	Initiate Phase II	30 Apr 19 ✓
★	**Change Detection of Marine Environments Using Machine Learning (Naval Postgraduate School Thesis)**	**Dec 19**
	U of I Natural Language Processing	Jul 20
	USC/Harvard Resource Allocation Algorithm	Jul 20
	AFRL Basic DR Simulation Model	Jul 20
★	**Machine Learning Exploration: Phase II Results (Brief)**	**Aug 20**
	Initiate Phase III	Aug 20
★	**Proof-of-Concept: Case Study Haiti Earthquake Response (Brief)**	**Jun 21**
★	**Machine Learning for Application in USCG Mission Planning & Disaster Response (Report & Brief)**	**Aug 21**
	Project End	Aug 21

★ Indicates RDC product.

Sponsor: CG-OEM

Stakeholder(s): CG-CVC, CG-MER, CG-2, LANT-35, PAC-53

Project #: 3309

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Collaboration with the DHS Center – University of Illinois (Champaign-Urbana), Harvard, USC Center for Artificial Intelligence, and AFRL.
- Collaboration with the U.S. Department of Defense Joint Artificial Intelligence Center.

RDC POC:	CG-926 Domain Lead:
Ms. Christine Hansen	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Risk Based Cruise Ship Safety Score

Mission Need: Improve cruise ship risk assessments through a risk assessment score based on a vessel's exam results.

Project Objectives:

- Evaluate current practices to determine a cruise ship's risk for a safety or security incident.
- Working with subject matter experts, evaluate deficiencies (risk and/or consequence) and appropriately categorize deficiencies and assign appropriate weights.
- Develop a prototype, an automated method, to determine a cruise ship's risk assessment via its deficiency exam results and corresponding deficiency category weights.
- Receive feedback from industry on the effectiveness of the prototype's outputs.

Key Milestone / Deliverable Schedule:

Project Start	1 Oct 18 ✓
Analysis of Current Practices in Place	27 Dec 18 ✓
Categorize and Quantify Deficiency Severity	17 Jul 19 ✓
Develop Weighted Deficiency Scoring System	30 Sep 19 ✓
Prototype Development and Beta Testing	Feb 20
Preliminary Testing and Analysis with Users	Mar 20
★ **Prototype and Graphical User Interface for the Cruise Ship National Center of Expertise (Prototype & GUI)**	**Apr 20**
Project End	Apr 20

Sponsor: CG-5P-TI

Stakeholder(s): Cruise Ship National Center of Expertise

Project #: 3502

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Leverages prior U.S. Coast Guard Research and Development Center work related to vessel inspections.

RDC POC:	CG-926 Domain Lead:
Mr. Sam Cheung	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

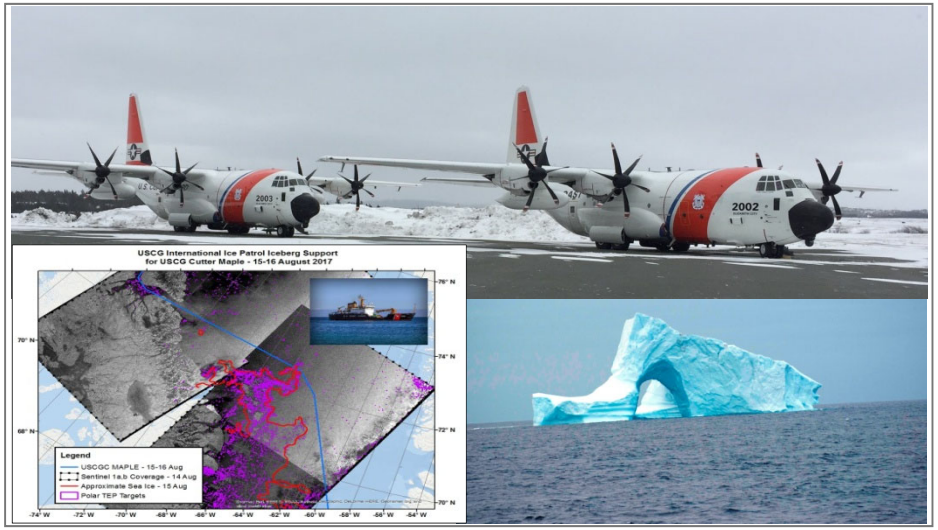
★ Indicates RDC product.

Iceberg Detection and Information Dissemination Methods

Mission Need: Improve quality of iceberg detection using satellite images and improve customer information dissemination.

Project Objectives:

- Research product dissemination methodologies for current International Ice Patrol (IIP) Iceberg Limit product.
- Improve current dissemination and shape requirements/limitations for future products.
- Develop additional products which provide more information to the maritime public regarding navigation risks posed by icebergs.
- Act as the U.S. Coast Guard (CG) Research and Development Center (RDC) liaison to the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) Iceberg Tagging effort.
- Develop understanding of the application of machine learning to iceberg detection in Sentinel 1 satellite images.



Key Milestone / Deliverable Schedule:

Project Start	1 Apr 19 ✓
Effort I Start	1 Apr 19 ✓
Effort II Start	1 May 19 ✓
Document Current Iceberg Product Development	18 Aug 19 ✓
Evaluate output of DHS S&T Iceberg Tagging Effort	30 Sep 19 ✓
Investigate New Distribution Process	Jan 20
Tracking Data Usage	Feb 20
Investigate Machine Learning	May 20
Identify New Products	Jun 20
★ **Iceberg Product Dissemination/Development (Report)**	**Sep 20**
Project End	Sep 20

★ Indicates RDC product.

Sponsor: CG-WWM
Stakeholder(s): IIP, CG-5PW, CG-711, Air Station Elizabeth City, LANTAREA

Project #: 6509

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Supports Safety of Life at Sea.
- Leverage DHS S&T Iceberg Tagging effort.
- Supports CGA Capstone: Machine Learning for Data Dissemination.

RDC POC:	CG-926 Domain Lead:
Mr. Jack Cline	CDR James Small

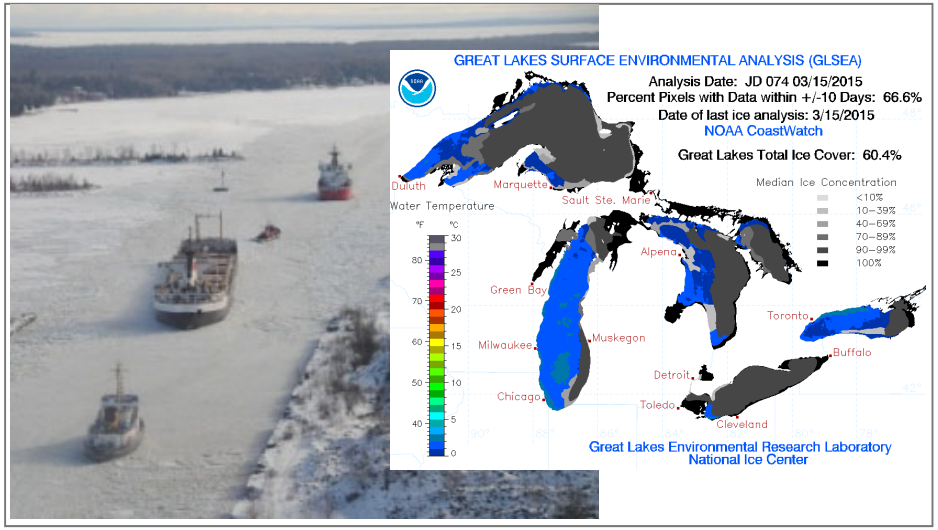
For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Ice Condition (ICECON) Risk Assessment Tool(s)

Mission Need: Method to forecast and share ice conditions.

Project Objectives:

- Develop ICECON classification methodology.
- Develop ship classifications for Great Lakes.
- Validate ice and ship classifications with observed conditions.
- Develop ICECON nowcast and forecast methodology.
- Adjust forecast methodology with icebreaker activity.
- Provide ICECON forecast system for decision support.
- Conduct a feasibility analysis for the development of an Arctic ICECON.



Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 16 ✓
	ICECON Workshop	29 Nov 16 ✓
★	**ICECON Update (Brief)**	**22 Sep 17 ✓**
★	**ICECON Update (Brief)**	**15 Oct 18 ✓**
★	**ICECON Update (Brief)**	**2 Oct 19 ✓**
	ICECON Model Validation	Jun 20
★	**ICECON Forecast Model (Report & Brief)**	**Sep 20**
	Project End	Sep 20

Sponsor: CG-WWM, CG-5PW
Stakeholder(s): National Ice Center, D1, D9, D17, LANT, PAC-5, DHS S&T Office of University Programs

Project #: 6512

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Collaboration with Department of Homeland Security Science and Technology Directorate Arctic Domain Awareness Center (ADAC).
- Leverage ADAC Arctic Ice Conditions Index effort.

RDC POC:	CG-926 Domain Lead:
Mr. Sam Cheung	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

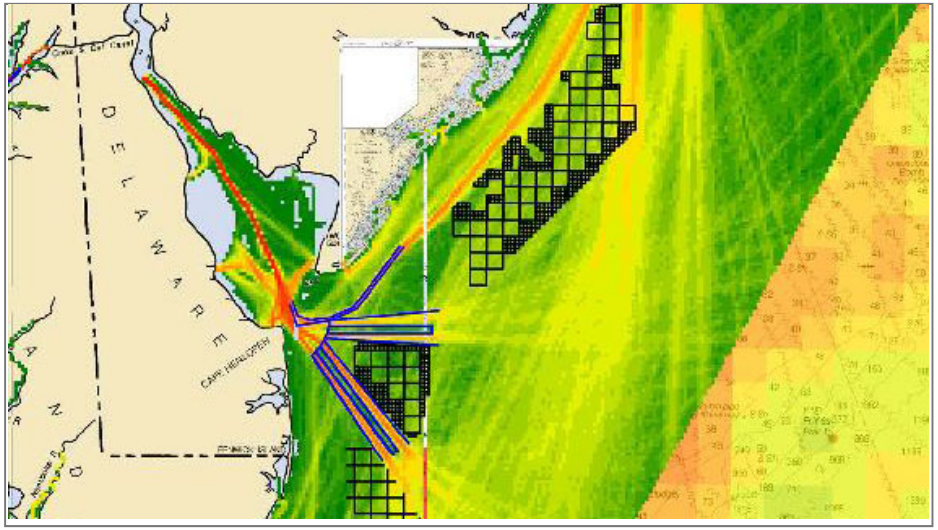
★ Indicates RDC product.

Research into Navigational Safety Risk Modeling and Analysis Tool

Mission Need: Capability to fully characterize the impact of rerouting traffic, funneling traffic, and placement of offshore structures in terms of risk.

Project Objectives:

- Analytical modeling process and analysis tools to predict changes in traffic patterns and determine the resultant changes in navigational safety risk.
- The ability to assess the proposed wind energy areas to further refine appropriate distances between shipping and structures.
- The ability to assess the need to create routing measures to mitigate risk posed by fixed structures.
- Review Pacific Northwest National Laboratory tool.



Key Milestone / Deliverable Schedule:

	Project Start…….……..	3 Oct 16 ✓
	Assessment of Risk Modeling Tools…….……	31 Aug 18 ✓
	Automatic Identification System Risk Modeling Data Package…..5 Dec 18	✓
	Creation of an Offshore Energy Risk Assessment Tool……	31 May 19 ✓
	Test Risk Modeling Package……	26 Jul 19 ✓
★	**ACPARS Risk Assessment (Model & Report)…….…… Oct 19**	
★	**ACPARS After Action Report (Report)…….. Mar 20**	
	Project End…….....	Mar 20

Sponsor: CG-5PW
Stakeholder(s): LANT-54, CG-NAV

Project #: 7529

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

Notes:

- Continuation of the Atlantic Coast Port Access Route Study with requirements as documented in the Interim Report from Jul 2012 and the Final Report from Feb 2016.

RDC POC:	CG-926 Domain Lead:
Mr. Leonard Kingsley	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Use of Modern Data Analytics to Improve Risk Based Allocation of Prevention Resources

Mission Need: Risk based operational resource allocation for improved inspections efficiency.

Project Objectives:

- Improve understanding of risk drivers to streamline Port State Control (PSC) inspection activities.
- Complete comprehensive market research assessment.
- Prioritize resource allocation through careful consideration of risk.

Key Milestone / Deliverable Schedule:

Project Start	16 Oct 17 ✓
Phase 1: Investigation	
Refine List of Risk Drivers	11 Jan 18 ✓
Review Current Use of/Need for Risk Based Decision-making Tools	2 Apr 18 ✓
Data Analysis and Review (Marine Information for Safety and Law Enforcement)	26 Apr 18 ✓
Issue Request for Information/Conduct Market Research of Available Data Analytics/Model Based Risk Management Tools	31 Aug 18 ✓
★ **Port State Control Risk Assessment and Data Analysis**	**30 Oct 18** ✓
Key Decision Point: Decision to Continue to Phase 2	28 Feb 19 ✓
Project End	21 Mar 19 ✓

Sponsor: CG-CVC

Stakeholder(s): CG-5P, CG-741, MFIC, LANT, PAC

Project #: 7531

Anticipated Transition: **Product**
Fielded Prototype

Notes:

RDC POC:	CG-926 Domain Lead:
Ms. Grace Python	Mr. Curtis Catanach

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

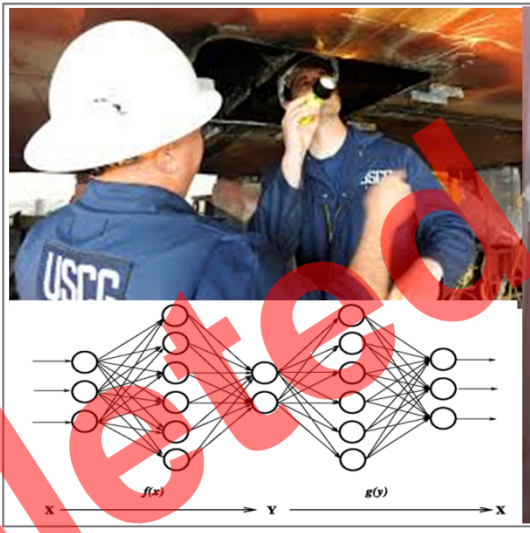
★ Indicates RDC product.

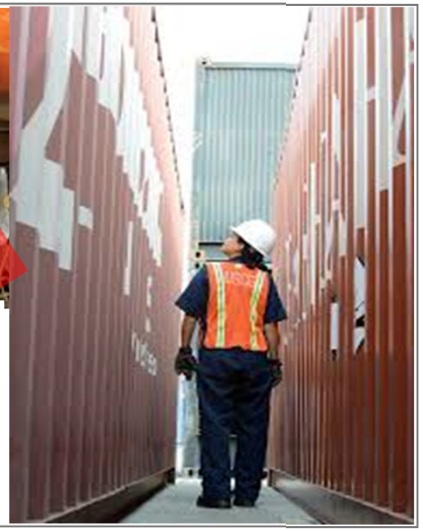
Improved Efficiency in Domestic Inspections

Mission Need: Improve risk based allocation of prevention resources.

Project Objectives:

- Determine factors that influence a vessel's probability of having a safety/security violation.
- Develop an algorithm to predict vessel's risk of non-compliance with safety/security regulations.
- Determine optimal classification decision rule for vessel violation probabilities to optimize detection with limited inspections resources.
- Create a tool with a Graphical User Interface (GUI) to implement force dependent fleet schedules for individual units/Areas of Responsibility.





Key Milestone / Deliverable Schedule:

Project Start	16 Oct 17	✓
Data Analysis and Review (Marine Information for Safety and Law Enforcement)	15 Jun 18	✓
Develop Fleet Risk Assessment Model	31 Jul 18	✓
Develop Optimization of Classification Rule	31 Jul 18	✓
GUI Development and Beta Testing	31 Oct 18	✓
★ **Operational Tool with GUI**	**13 Jun 19**	✓
Project End	13 Jun 19	✓

Sponsor: CG-CVC

Stakeholder(s): LANTAREA, LANT-7, PACAREA, D8

Project #: 7532

Anticipated Transition: **Product**
Fielded Prototype

Notes:

RDC POC:	CG-926 Domain Lead:
Ms. Christine Mahoney	Mr. Curtis Catanach

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Integration of Geographic Information System (GIS) Capability into Coast Guard Tactical Operations

Mission Need: Improve provision of actionable information for tactical decision making.

Project Objectives:

- Test and evaluate the capabilities of commercial off the shelf software to develop actionable information in the form of geo-referenced two dimensional orthomosaic images and three dimensional meshes.
- Investigate methods to incorporate developed imagery products into existing CG information systems to provide situational awareness to inform CG tactical operations.
- Develop a GIS Capability Report summarizing the results of the project and identifying how this capability can contribute to improvements in operational effectiveness.

Images courtesy of DVIDS.

Key Milestone / Deliverable Schedule:

Project Start	2 Oct 17 ✓
Acquire Software	23 Oct 17 ✓
Develop Test Plans	6 Dec 17 ✓
Project Canceled	20 May 19 ✓

Sponsor: CG-26

Stakeholder(s): CG-5R, CG-MER, MFIC

Project #: 7533

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

Notes:

RDC POC:	CG-926 Domain Lead:
Mr. Leonard Kingsley	Mr. Curtis Catanach

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Incorporating Sensor Performance in SAROPS

Mission Need: Time and cost effective methodology to incorporate sensor capabilities in the Search and Rescue Optimal Planning System (SAROPS).

Project Objectives:

- Research and document the SAROPS data requirements related to sensor inputs.
- Identify a resource-effective approach to develop the sensor-specific data required for use in SAROPS.
- Create a prototype of this new approach for developing the sensor-specific data.

Key Milestone / Deliverable Schedule:

	Project Start	2 Oct 17 ✓
	Completion of Work Under Original Project Scope	13 Mar 19 ✓
	Project Re-scoped and Retitled	11 Jul 19 ✓
★	**Required SAROPS Input to Develop Sweep Width (Brief)**	**Nov 19**
	Key Decision Point	Dec 19
	Research Novel Methods to Develop Sensor-specific Data	Apr 20
★	**Incorporating Sensor Performance in SAROPS (Report)**	**Jun 20**
★	**Prototype Tool for Incorporating Sensor Performance in SAROPS (Prototype)**	**Dec 20**
★	**Incorporating Sensor Performance in SAROPS (Report)**	**Feb 21**
	Project End	Feb 21

Sponsor: CG-SAR

Stakeholder(s): LANT, PAC, FORCECOM, D1, D7, D9, D11, D13, Boat Forces

Project #: 7937

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

Notes:

- Leverages U.S. Coast Guard Research and Development Center's previous work with developing SAROPS sensor inputs.

RDC POC:	CG-926 Domain Lead:
Ms. Grace Python	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Condition-Based Maintenance (CBM) for Coast Guard Asset Product Lines

Mission Need: Targeted condition-based maintenance for higher asset availability, better use of resources, and reduced life cycle costs.

Project Objectives:

- Research significant opportunities for using leading indicators and readily available system information to implement condition-based maintenance activities. Use Maritime Security Cutter, Large (WMSL) as focus of initial demonstration.
- Research system characteristics: interfaces, data structure, data analysis, and data display.
- Conduct market research of available commercial and Governmental Off-The-Shelf (GOTS) systems that accommodate identified system characteristics.
- Provide recommendations for systems and steps required to accommodate functional characteristics.

Key Milestone / Deliverable Schedule:

Project Start…… 1 Apr 19 ✓

★ **Condition-Based Maintenance for Coast Guard Asset Product Lines System Characteristics (Brief) ……. Feb 20**

Market Research…….. Apr 20

★ **Condition-Based Maintenance for CG Asset (Report)…… Aug 20**

Project End…….. Aug 20

Sponsor: CG-45
Stakeholder(s): SFLC, ALC

Project #: 9204

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Partner with the U.S. Coast Guard Surface Forces Logistics Center (SFLC) to make recommendations.
- Potential partnership with GOTS providers.

RDC POC:	CG-926 Domain Lead:
Ms. Christine Hansen	CDR James Small

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Mass Migration Modeling and Analysis

Mission Need: Improved planning for a mass migration event.

Project Objectives:

- Develop a modeling suite that would provide a capability for force-on-force modeling and optimization of force package employment for Migrant Interdiction Operations. Create a portfolio of optimized deployment and support options based on the nature and volume of the migrant flow and capability/capacity of the Coast Guard Forces.
- Use existing campaign-level modeling to estimate the effect redeployment of additional assets to mass migration response will have on other missions during the event and recovery period.

Canceled

Key Milestone / Deliverable Schedule:

Project Start	28 Oct 14 ✓
Project Placed On Hold	30 Jun 15 ✓
Project Re-Start	3 Oct 16 ✓
Develop Areas of Responsibility (AOR) 1 Model	30 Nov 17 ✓
Key Decision Point	22 Mar 18 ✓
Project Canceled	20 Mar 19 ✓

Sponsor: CG-MLE
Stakeholder(s): D7, CG-771, Homeland Security Task Force-Southeast

Project #: 9365

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

Notes:

RDC POC:	CG-926 Domain Lead:
Mr. Sam Cheung	Mr. Curtis Catanach

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Diesel Outboard Development

Mission Need: Single fueled fleet.

Project Objectives:

- Research current developmental stage of diesel outboards applicable to U.S. Coast Guard (CG) usage.
- Conduct cost-benefit analysis of implementing diesel outboard engines in the CG.
- Investigate partnership options with manufacturers and other government agencies and test promising diesel outboard engine technologies to better understand performance capabilities.
- Provide recommendations for potential future acquisition initiatives, as appropriate.

Key Milestone / Deliverable Schedule:

	Project Start	27 Feb 14 ✓
	Issue Request for Information	3 Apr 14 ✓
★	**Diesel Outboard Engine Market Survey Results (Brief)**	**8 Sep 14 ✓**
★	**Diesel Outboard Engine Cost-Benefit Analysis (Report)**	**24 Jul 15 ✓**
	Key Decision Point: Determine Path Forward	24 Jul 15 ✓
	Conduct Spark-Ignited Diesel Outboard Engine Testing	31 May 17 ✓
	Conduct Compression-Ignited Diesel Outboard Engine Testing	16 Nov 18 ✓
	Key Decision Point: Cancel High Compression-Ignition Engine Testing	11 Jun 19 ✓
★	**Diesel Outboard Engine Feasibility (Report)**	**Dec 19**
	Project End	Dec 19

★ Indicates RDC product.

Sponsor: CG-731
Stakeholder(s): CG-46, CG-451

Project #: 4110

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Project includes Cooperative Research and Development Agreements.
- Establish partnerships with Joint Task Force-East, U.S. Customs and Border Protection, U.S. Immigration and Customs Enforcement, and U.S. Department of Homeland Security Science and Technology Directorate.
- Continue to leverage partnerships with the U.S. Navy Combatant Craft Division to test diesel outboard engines.

RDC POC:	CG-926 Domain Lead:
Mr. Jason Story	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Safety Parameters for ICE Operations (SPICE Ops)

Mission Need: Technical data for personnel and equipment performance in extreme cold weather during ice operations.

Project Objectives:

- Establish exposure limits for Search and Rescue (SAR) team members wearing dry suits while exposed in open air.
- Evaluate the impact of extreme cold on the SAR vest and other electronic equipment to determine degradation values based on environmental conditions.
- Provide safe guidelines and identify risk mitigation strategies for personnel conducting operations on the ice.

Key Milestone / Deliverable Schedule:

	Project Start…… 1 Dec 17	✓
	Conduct Human Physiological Data Collection at D9 Units…… 8 Feb 18	✓
	Develop and Acquire Electronic Equipment Test Plan ..... 6 Jun 18	✓
	Complete Electronic Equipment Testing ……..……...21 Sep 18	✓
	Develop Personal Protective Equipment (PPE) Test Plan……. 11 Nov 18	✓
	Conduct PPE Testing ……..…….…….. 6 Dec 18	✓
	Conduct Human Modeling ……..…….. 15 Mar 19	✓
★	**Electronic Equipment and Dry Suit Human Modeling (Brief)… 22 Aug 19**	✓
	Personal Locator Beacon Testing …… Oct 19	
	D9 Ice Rescue Committee Facilitated Discussion ……..…….. Oct 19	
★	**Safe Parameters for Ice Operations (Report) ……..……Jan 20**	
	Project End……..... Jan 20	

★ Indicates RDC product.

Sponsor: CG-731

Stakeholder(s): CG-SAR, D1, D9, FORCECOM

Project #: 5301

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

Notes:

- Partnering with U.S. Army Natick Soldier Research, Development & Engineering Center and U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory.
- Cooperative Research and Development Agreement completed for PPE testing.

RDC POC:	CG-926 Domain Lead:
LT Ryan Huebner	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Bromine-Free Water Purification System

Mission Need: Evaluate newer, less hazardous water purification systems.

Project Objectives:

- Install and operate a Bromine-Free Water Purification System (BF-WPS) onboard a U.S. Coast Guard (CG) National Security Cutter based on system advances made by the U.S. Navy.
- Explore potential issues/aspects of transitioning use of BF-WPS to new CG cutters:
  - Identify feasibility of incorporating BF-WPS on various cutter classes.
  - Estimate ownership costs to include procurement, installation/retrofit, operation, and maintenance.
  - Identify potential benefits of utilizing BF-WPS on CG cutters.

Key Milestone / Deliverable Schedule:

	Project Start	27 Jul 19 ✓
	Sponsor/Stakeholders Visit to National Security Cutter	Oct 19
	BF-WPS Install and Begin 3-Month Pilot Study	Mar 20
★	**Bromine-Free Water Purification System (Brief)**	**Apr 20**
	Conclude Pilot Study and Remove BF-WPS	Sep 20
★	**Bromine-Free Water Purification System Pilot Study (Report)**	**Dec 20**
	Project End	Dec 20

Sponsor: Surface Force Logistics Center (SFLC)
Stakeholder(s): CG-45, SFLC-LRE

Project #: 5507

Anticipated Transition: **Product**
Pending Acquisition

Notes:

- Legislative requirement.

RDC POC:	CG-926 Domain Lead:
Ms. D. J. Hastings	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Define and Communicate Exclusion Zones

Mission Need: Capability to physically mark and clearly communicate the boundaries of an area of exclusion, including both fixed and moving security zones.

Project Objectives:

- Review user needs, consider short-term and longer-term solutions.
- Investigate solutions on the market to determine the best possible solutions to evaluate.
- Select and test prototype solution(s) that will unambiguously mark fixed and moving security zones.

Key Milestone / Deliverable Schedule:

	Project Start	4 Feb 14 ✓
	Unit Visit/Market Research Request for Information	6 Aug 14 ✓
★	**Define and Communicate Exclusion Zones (DCEZ): Summary of Current Market Research**	**21 Oct 14 ✓**
	Sponsor Change to CG-721	6 Mar 15 ✓
	Manufacturing Delay of Test Articles	19 Feb 16 ✓
	Demonstration of Capabilities	15 Aug 16 ✓
★	**DCEZ: Short-Term Field Evaluation Report**	**13 Jan 17 ✓**
	Go/No-Go Decision Point	6 Jul 17 ✓
	Conduct Long-Term Solution Field Evaluation	Oct 19
★	**DCEZ: Long-Term Field Evaluation Report**	**Nov 19**
	Project End	Nov 19

★ Indicates RDC product.

Sponsor: CG-721
Stakeholder(s): CG-MSR, MSRT, AREA-3, CG-MLE

Project #: 5921

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Leverages previous work on Project Unambiguous Warning Devices.

RDC POC:	CG-926 Domain Lead:
Ms. D.J. Hastings	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Counter Unmanned Underwater Vehicle (c-UUV)/Anti-Swimmer Technology

Mission Need: Improved detection, tracking, classification, and deterrence of underwater threats to U.S. Coast Guard (CG) assets.

Project Objectives:

- Phase I – Summarize currently available high technology readiness level c-UUV and anti-swimmer technologies that can be demonstrated for CG use cases.
- Phase II – Conduct a limited user evaluation to identify baseline and desired functional characteristics.

Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 18 ✓
★	**c-UUV/Anti-Swimmer Technology (Brief)**	**Mar 20**
	Limited User Evaluation	Sep 20
★	**c-UUV/Anti-Swimmer Limited User Evaluation (Report)**	**Feb 21**
	Project End	Feb 21

Sponsor: CG-721

Stakeholder(s): CG-45, CG-731, CG-761, AREA-3

Project #: 5922

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Build on past RDC anti-swimmer work.
- Coordinate with other government agencies.
- Possible Cooperative Research & Development Agreements for limited user evaluation.

RDC POC:	CG-926 Domain Lead:
Mr. Mike Coleman	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Arctic Technology Evaluation 2018

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

Project Objectives:

- Evaluate unmanned technologies' ability to conduct oil spill identification and notification tasks for the Coast Guard's Oil Response mission.
- Support the Robotic Aircraft for Maritime Public Safety (RAMPS) project conduct payload testing in Arctic environment.
- Nurture joint efforts and interagency cooperation between government sectors and civilian entities on the North Slope.
- Monitor technology progression.

Key Milestone / Deliverable Schedule:

Project Start	30 Nov 17 ✓
Identify Available Assets for Testing	7 Mar 18 ✓
Test Plan Finalized	17 Jul 18 ✓
Conduct Technology Evaluation	29 Jul 18 ✓
★ **Arctic Technology After Action Report 2018**	**30 May 19** ✓
Project End	30 May 19 ✓

Completed

Sponsor: CG-5PW

Stakeholder(s): D17, PAC-5, LANT,

Project #: 62101

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

Notes:

- Project will leverage other organizations with Arctic interests/efforts to the maximum extent possible.
- Follow on to 6210 FY18 efforts.
- Partner with CG-DCO-X for engagement with Arctic Evergreen project.
- Collaborate with Department of Homeland Security (DHS) Science and Technology (S&T) Office of University Programs (OUP) for principle investigator engagement.

RDC POC:	**CG-926 Domain Lead:**
LT Ryan Huebner	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

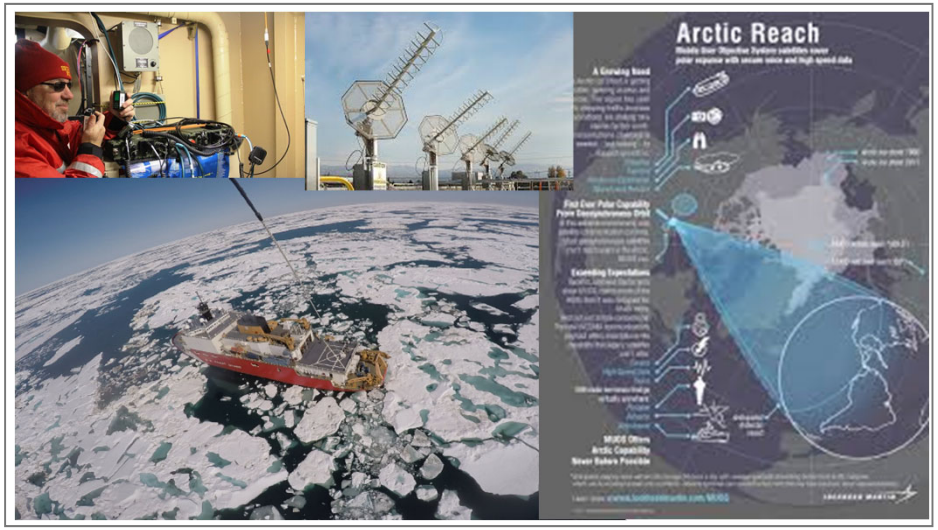
★ Indicates RDC product

Arctic Technology Evaluation 2019-2020

Mission Need: Provide support to relevant research efforts in the Arctic.

Project Objectives:

- Support projects which develop capability improvements in the execution of U.S. Coast Guard (CG) missions in the Arctic.
- Nurture joint efforts and interagency cooperation between government sectors and civilian entities on the North Slope and abroad.
- Facilitate and support other Arctic projects, including Department of Homeland Security Science and Technology Directorate initiatives.
- Monitor technology progression.



Key Milestone / Deliverable Schedule:

	Project Start	3 Dec 18 ✓
	Identify Partners/Technologies/Test Plans (FY19)	14 Jun 19 ✓
	Solicit FY20 Research Efforts/Partners	30 Aug 19 ✓
	Conduct Tests/Demonstrations on USCGC HEALY (FY19)	Oct 19
★	**Arctic Technology Evaluation 2019 (Application Note)**	**Jan 20**
	Identify Partners/Technologies/Test Plans (FY20)	Jun 20
	Solicit FY21 Research Efforts/Partners	Jul 20
	Conduct Tests/Demonstrations on USCGC HEALY (FY20)	Aug 20
★	**Arctic Technology Evaluation FY20 (Application Note)**	**Oct 20**
	Project End	Oct 20

Sponsor: CG-751

Stakeholder(s): D17, PAC-5, LANT-5

Project #: 62102

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Outreach partners include the Bureau of Safety and Environmental Enforcement, the Arctic Domain Awareness Center, Department of Defense Labs, U.S. Northern Command, and National Labs.

RDC POC:	CG-926 Domain Lead:
Mr. Scot Tripp	Ms. Holly Wendelin

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

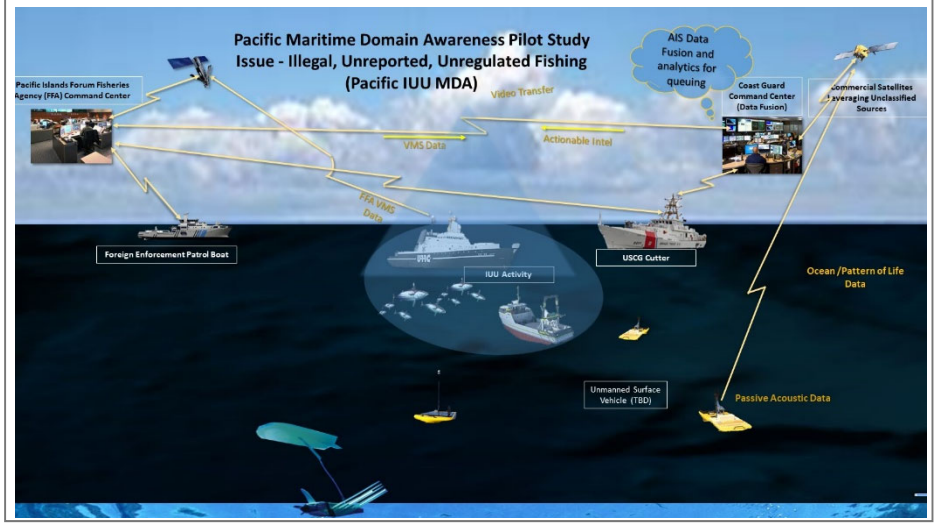
★ Indicates RDC product.

Low-Cost MDA Pilot

Mission Need: Improve Maritime Domain Awareness (MDA) in remote areas.

Project Objectives:

- Conduct a pilot study/assessment to determine the efficacy of using low-cost commercially available unmanned surface systems, in combination with or on existing fleet platforms, to enhance maritime domain awareness.
- Test technology solutions used by small, remote Pacific Island states and other technologies with little or no logistics funding.
- Utilize industry engagement and technology demonstrations, focus on contractor owned and operated technology.



Key Milestone / Deliverable Schedule:

	Project Start	6 Jun 18 ✓
	Issue Request for Information for Industry Engagement	30 Sep 18 ✓
	Issue Request for Proposal for Industry Owned and Operated Solutions	Oct 19
★	**Low-Cost Maritime Domain Awareness Demonstration Plan (Brief)**	**Dec 19**
	Award Contract(s)	Jan 20
	Field Demonstration Complete	Aug 20
★	**Low-Cost Maritime Domain Awareness Pilot Study (Report)**	**Apr 21**
	Project End	Apr 21

Sponsor: CG-26

Stakeholder(s): CG-711, CG-721, CG-761, CG-MLE, LANTAREA, D14, PACAREA, D17

Project #: 7210

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Legislative requirement.
- Include the U.S. Coast Guard (CG) Auxiliary if applicable.

RDC POC:	CG-926 Domain Lead:
Mr. Scot Tripp	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

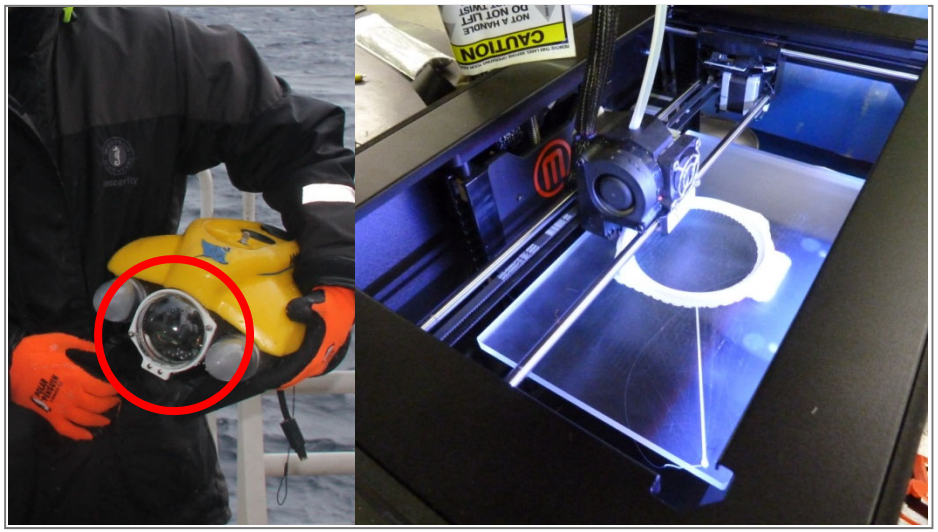
★ Indicates RDC product.

Evaluation of Three-Dimensional (3D) Printing Technology for Coast Guard Applications

Mission Need: Assessment of the potential for 3D printers to improve mission readiness by reducing logistical support lead times.

Project Objectives:

- Research the advancements made with the spiral development of 3D printing technology with respect to Coast Guard applications.
- Identify CG units that are best suited to implement additive manufacturing, conduct training, and trial 3D printing technologies.
- Research cost, logistical, and performance issues that could be addressed with 3D printing and additive manufacturing.
- Work with Surface Forces Logistics Center and Aviation Logistics Center to develop the required process for approving 3D printed parts for operational use.
- Document findings and provide recommendations for decision makers.



Key Milestone / Deliverable Schedule:

Project Start……..…….. 11 Jan 16 ✓

Identify Units for 3D Printing Trial……..……23 Feb 16 ✓

★ **Evaluation of 3D Printing Technology for Coast Guard Applications ……..…… 26 Apr 17** ✓

Underway Additive Manufacturing Demonstration …… 29 Jun 17 ✓

★ **Roadmap for Integration of Additive Manufacturing…… Dec 19**

Project End……..... Dec 19

Sponsor: CG-44

Stakeholder(s): CG-11, CG-41, CG-43, CG-45, CG-731, CG-751, CG-DOL, DIUx

Project #: 7758

Anticipated Transition: **Product**
Fielded Prototype

Notes:

- Partnering with the Chief of Naval Operations' Rapid Innovation Cell, Naval Warfare Development Command.
- Partner with Oak Ridge and Lawrence Livermore National Labs.

RDC POC:	CG-926 Domain Lead:
Mr. Jason Story	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

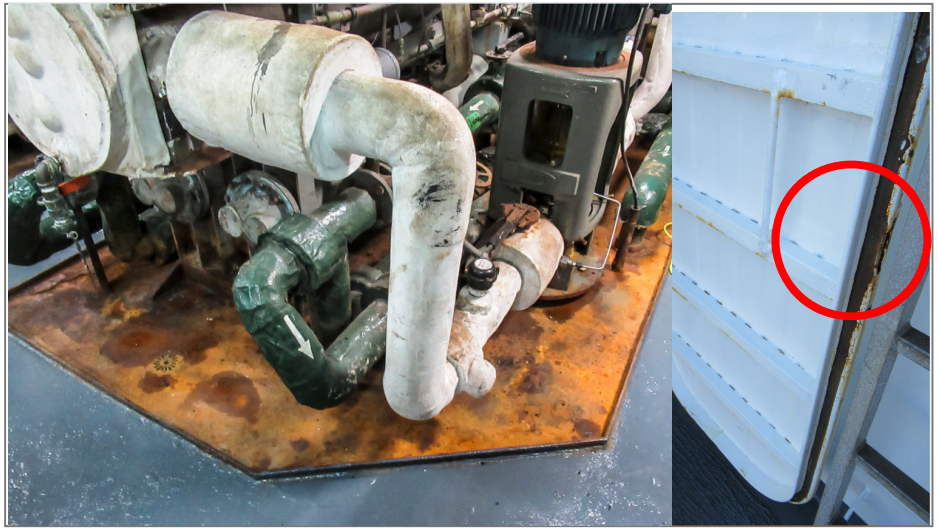
★ Indicates RDC product.

Corrosion Control and Monitoring

Mission Need: Research and mitigate corrosion impacts on cutters by increasing mission support efficiencies and reducing costs.

Project Objectives:

- Identify and benchmark current U.S. Coast Guard (CG) corrosion mitigation strategies.
- Research the recent advancements in commercial anti-corrosion coating technologies with respect to CG surface fleet applications.
- Coordinate with U.S. Navy and other government/military services to gather their corrosion mitigation strategies.
- Stand up a CG Corrosion Integrated Product Team (IPT) to down-select promising corrosion technologies.
- Based on the research, compile a report and provide recommendations in a Corrosion Roadmap.
- Conduct Limited User Evaluations (LUE) of selected technologies.
- Research CG cutter hull blasting and recoating intervals.
- Research remote buoy corrosion monitoring systems.



Key Milestone / Deliverable Schedule:

	Project Start	3 Oct 16 ✓
	Benchmark CG Corrosion Strategies	15 May 17 ✓
	Conduct Market Research	1 Jul 17 ✓
	Review Request for Information Results	15 Oct 17 ✓
	Review Research Results and IPT Efforts	8 Nov 17 ✓
★	**Corrosion Control Roadmap (Report)**	**24 Apr 18** ✓
	CGC MOHAWK Fluidized Bed Coated Watertight Doors Installed	15 Oct 18 ✓
	One Component (1K) Polysiloxane Tests Begin	Dec 19
	Limited User Evaluations	Jul 20
★	**Corrosion LUE (Report)**	**Sep 20**
	Project End	Sep 20

★ Indicates RDC product.

Sponsor: CG-45

Stakeholder(s): SFLC, CG-41, CG-43, CG-44, CG-751, AREA-3

Project #: 7760

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

Notes:

- Partnerships with the Office of Naval Research and CG Surface Forces Logistics Center (SFLC).
- Test articles scheduled for incorporation onboard 210' and 270' Medium Endurance Cutters.
- Includes Fluidized Bed Coating and One Component (1K) Polysiloxane treatments.

RDC POC:	CG-926 Domain Lead:
Mr. Mike Coleman	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Assessment of Unmanned Maritime Systems for CG Missions

Mission Need: Economical, effective, persistent Maritime Domain Awareness to support CG missions.

Project Objectives:

- Understand state-of-the-market autonomous sensors and platforms.
- Evaluate effectiveness of sensors and platforms for CG mission support.
- Model and evaluate full-scale application.
- Prepare rough order of magnitude business case.
- Conduct technology demonstration.
- Identify system development needs (C2, sensors, processors, and vehicles) for CG application.

Completed

Key Milestone / Deliverable Schedule:

	Project Start	4 Nov 13 ✓
	Market Research Report	24 Jul 14 ✓
★	**The Applicability of Persistent Unmanned Maritime Vehicles to Coast Guard Missions**	**30 Oct 14 ✓**
	Technology Demonstration/Execution of Plan	27 Jun 16 ✓
★	**Unmanned Maritime Systems for Coast Guard Missions Test Report**	**31 Jan 17 ✓**
	Evaluate UMV Sensors and Systems	14 Sep 17 ✓
★	**Persistent Unmanned Maritime Vehicle System Capability Requirements for USCG Missions**	**28 Sep 17 ✓**
	Develop UMS Development Roadmap for CG Applications	31 May 18 ✓
★	**UMS Developmental Requirements for USCG Applications**	**19 Oct 18 ✓**
	Project End	19 Oct 18 ✓

★ Indicates RDC product

Sponsor: CG-761

Stakeholder(s): CG-25, CG-731, CG-MLE, DHS S&T OUP, DHS S&T BMD, JIATF-S, JTF-E

Project #: 7808

Anticipated Transition: **Knowledge Product**
Future Technology

Notes:

- Partner with ONR/Naval Undersea Warfare Center or National Oceanic and Atmospheric Administration.
- Project derived from Congressional language.
- Anticipate leveraging/partnering with new Department of Homeland Security Science & Technology Office of University Programs Center for Maritime Research.

RDC POC:	CG-926 Domain Lead:
Mr. Mark VanHaverbeke	LT Steve Hager

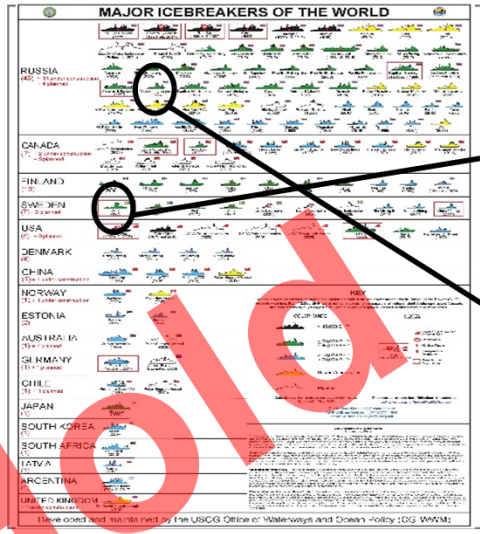
For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Research Existing Vessels Capable of Icebreaking

Mission Need: A short-term backup plan to support existing polar icebreaking capabilities.

Project Objectives:

- Conduct market analysis in accordance with U.S. Coast Guard (CG) Headquarters (HQ) Icebreaking Technology Working Group (ITWG) Plan of Action and Milestones (POAM).
- Evaluate cost and operating potential of identified vessels.



Key Milestone / Deliverable Schedule:

Project Start	20 Jun 18	✓
Flag Approval of CGHQ ITWG POAM	13 Nov 18	✓
Icebreaker Expert Working Group Meeting	Feb 20	
★ **Existing Vessels Capable of Icebreaking (Report)**	**Mar 20**	
Project End	Mar 20	

Sponsor: CG-751

Stakeholder(s): CG-WWM, CG-933, CG-459, CG-932

Project #: 6503

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Legislative requirement.
- Flag-level Executive Management Team briefed on updated POAM on 4/16/2019.

RDC POC:	CG-926 Domain Lead:
LTJG Ryan Major	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

On Hold

★ Indicates RDC product.

FY19 Science & Technology Innovation Center (CG-STIC) Tasks

Purpose: To establish a collaborative relationship between the U.S. Coast Guard Innovation Center and the Department of Homeland Security Science and Technology Directorate to share and advance technologies that will be mutually beneficial to both parties.

Task	Title	Objective	Office Supported	Funding Type	RDC POC	CG-926 Domain Lead	Due/ Delivery Date
99952005	**D14 Operational Planning Tool**	*Identify optimal operational effectiveness of the limited resources within D14.*	D14	DHS S&T	LT Ben Walsh	CDR James Small	25 Mar 19 ✓
99952023	**TANB Communications Gap**	*STIC Note detailing user survey results of a distributed tactical communications system after six months of use.*	CG-761	DHS S&T	LT Carl Brietzke	CDR James Small	25 Mar 19 ✓
99952007	**Unmanned Maritime Vehicle Sensors**	*Summary of background information, test results, and conclusions relating to the Outpost versus SOUTHCOM "Go-Fast" Vessel demonstration.*	CG-731	DHS S&T	Mr. Jason Story	CDR James Small	26 Mar 19 ✓
99952002	**Underwater Imager within the Marine Transportation System (MTS)**	*STIC Note detailing the performance and utility of an installed underwater imager after one year of use.*	Sector Buffalo, NY	DHS S&T	Mr. Scot Tripp	CDR James Small	8 Apr 19 ✓
99953	**Laser Eye Protection: Green X ® Glasses**	*Examine Laser Eye Protection Technology and investigate previously unknown or untried techniques for operational use*	CG-731	DHS S&T	LT Carl Brietzke	CDR James Small	6 May 19 ✓
99952022	**Enhanced Firearms Training System**	*Examine Enhanced Firearms Training Systems and investigate previously unknown or untried techniques for operational use.*	CG-2, CG-721, CG-731	DHS S&T	LCDR Anderson Ogg	CDR James Small	25 Sep 19 ✓
99952021	**Low Cost ROV Solutions**	*Research low cost ROV solutions as an additional tool to conduct hull and running gear inspections prior to contracting a diving team.*	SFLC	DHS S&T	LCDR Anderson Ogg	CDR James Small	30 Sep 19 ✓

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

FY19 Short Term Analytical Support Efforts

Purpose: Provide short term analytical support to CG decision makers with a means to access quick, inexpensive analyses to investigate a wide range of technology issues relating to current or planned CG operations or procurements. Larger analytical support projects will typically require funding to cover the cost of RDC labor & overhead and other direct costs.

Branch	Title	Objective	Office Supported	RDC POC	CG-926 Domain Lead	Due/ Delivery Date
MSCOE	**Application Note: Deployable Specialized Forces Data Standardization**	*Evaluate the deficiencies that exist in the methods of electronic documentation.*	CG-7213	CDR Meghan Steinhaus	Mr. Curtis Catanach	16 Oct 18 ✓
Aviation	**REACT Report: USCG Rotary Wing Hoist System Analysis**	*Summary of open source research that may assist stakeholders in determining the state of knowledge/technology of rescue hoist systems that can better adapt to or accommodate the unpredictable forces that occur between CG helicopters and vessels.*	CG-41 CG-711	Mr. Sean Lester	Mr. Scott Craig	28 Nov 18 ✓
MSCOE	**An Exploratory Data Analysis of Historical SAR Data in D8**	*Exploratory data analysis of 10.5 years (2008-2018) worth of SAR data in D8.*	D8	CDR Meghan Steinhaus	Mr. Curtis Catanach	29 May 19 ✓

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

Acquisition Directorate

Research, Development, Test & Evaluation

FY19 Project Portfolio

Non-CG RDT&E Funded Projects

CG R&D Center

Support of Alternatives Analysis for the Waterways Commerce Cutter

Mission Need: Support replacing the outdated fleet of inland cutters.

Project Objectives:

- Support Sponsor's Integrated Project Team tasked to:
  - Identify replacement options for the inland fleet.
  - Review new design options for replacement hulls.
  - Review the cost and consequences of buying, leasing, or contracting other boats to perform similar missions.
- Support drafting the Alternatives Analysis Study Plan (AASP) for the Waterways Commerce Cutter.
- Support execution of the AASP by the Naval Sea Systems Command (NAVSEA).

Key Milestone / Deliverable Schedule:

Project Start…….. 1 Jun 17 ✓

★ **Waterways Commerce Cutter Alternatives Analysis Study Plan (AASP)……..…… 2 Oct 18** ✓

AASP Liaison Support to NAVSEA…… Feb 20

★ **Support of Alternatives Analysis for the Waterways Commerce Cutter (Closeout Memo)…… Mar 20**

Project End……..... Mar 20

Sponsor: CG-932
Stakeholder(s): CG-751, LANT-5, D8

Project #: 6812

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Direct support to Procurement, Construction, and Improvement.
- Leverage all previous approved and signed Acquisition documents.

RDC POC:	CG-926 Domain Lead:
LTJG Ryan Major	LT Steve Hager

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Operational Test Agent (OTA) for the sUAS for NSC Program

Mission Need: Independent and objective evaluation of Small Unmanned Aerial Systems (sUAS) operational suitability and effectiveness.

Project Objectives:

- Generate sUAS test plan for the National Security Cutter (NSC) Program.
- Perform Operational Testing & Evaluation (OT&E) of sUAS.
- Provide OT&E report to the sponsor program office.

Key Milestone / Deliverable Schedule:

	Project Start	27 Jun 18 ✓
	Develop Test Plan	2 Apr 19 ✓
	Conduct OT&E	Nov 19
	Summary Report of OT&E	Jan 20
★	**NSC Program sUAS OT&E (Report)**	**Mar 20**
	Project End	Mar 20

Sponsor: CG-931
Stakeholder(s): CG-711

Project #: 7702

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

- Direct support to Procurement, Construction, and Improvement.

RDC POC:	CG-926 Domain Lead:
LTJG Ryan Major	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

H60T Sustainment Alternatives Analysis

Mission Need: Analyze the most efficient and effective avenue to maintain current MH-60T capabilities without operational gaps.

Project Objectives:

- Conduct site visits to collect data on MH-60T sustainability alternatives, including costs and benefits for a Service Life Extension Program and a Navy airframe rebuild.
- Develop an Alternatives Analysis (AA) Study Plan that outlines the ground rules and assumptions by which the analysis will be bounded.
- Conduct the AA based on the approved Study Plan including cost benefit analysis and rough order of magnitude life cycle costs for each viable alternative.

Completed

Key Milestone / Deliverable Schedule:

	Project Start	27 Feb 18 ✓
	Interim AA Study Plan	31 May 18 ✓
	Final AA Study Plan	16 Jul 18 ✓
	Data Collection/Site Visits	1 Oct 18 ✓
	Interim AA Report	30 Nov 18 ✓
★	**MH-60T Sustainment Alternatives Analysis**	**9 Apr 19 ✓**
	Project End	9 Apr 19 ✓

Sponsor: CG-931
Stakeholder(s): ALC

Project #: 9203

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

RDC POC:	**CG-926 Domain Lead:**
LTJG Ryan Major	Mr. Scott Craig

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product

Fleet Performance Analysis

Mission Need: Determine the impact of not implementing the Crew Rotation Concept for Major Cutters and the relative performance of various cutter fleets.

Project Objectives:

- Exercise alternative fleets of cutter and aircraft in the CGMOES 3.0 model to compare and assess the impacts of asset quantity and capabilities in the expected environment (weather and sea state).
- Focus on modeled performance in the Counter Drug (CD), Alien Migration Interdiction Operations (AMIO), Living Marine Resource (LMR), and Other Law Enforcement (OLE) mission performance.
- Search and Rescue (SAR) and Port, Waterways And Coastal Security (PWCS) missions will also be modeled but are not the major measures of effectiveness for this study.
- The relative performance of the varied fleet will be contrasted to provide information on future fleet mix acquisition recommendations.

Key Milestone / Deliverable Schedule:

	Project Start	1 Aug 18 ✓
	Draft Fleet Performance Analysis Report	14 Feb 19 ✓
★	**Final Fleet Performance Analysis Report**	**28 Feb 19** ✓
	Project End	28 Feb 19 ✓

Sponsor: CG-771
Stakeholder(s): CG-8

Project #: 7534

Anticipated Transition: **Knowledge Product**
Acquisition Milestone Support

Notes:

RDC POC:	CG-926 Domain Lead:
CDR Meghan Steinhaus	Mr. Curtis Catanach

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product

Shipboard Compliance of Ballast Water Discharge Standards (BWDS)

Mission Need: The tools to quickly and reliably determine vessel compliance with the BWDS.

Project Objectives:

- Determine the availability and capabilities of existing technologies that could be utilized for compliance verification of the BWDS.

Merged

Key Milestone / Deliverable Schedule:

	Project Start	12 Jan 11 ✓
★	**Proceedings of Ballast Water Discharge Standards Compliance Subject Matter Expert Workshop**	**7 Sep 11** ✓
★	**Market Research Assessment: Verification Technologies for BWDS Compliance**	**17 Oct 12** ✓
	Prototype Development of Compliance Tools	15 Mar 14 ✓
	Protocol for the Independent Testing of Compliance Tools	8 May 15 ✓
	Independent Testing of Compliance Tools	15 Jul 16 ✓
★	**Performance Evaluations of Fluorometry-Based Tool:**	**27 Sep 17** ✓
	Project Merged for FY20	30 Sep 19 ✓

Sponsor: CG-OES-3, Great Lakes National Program Office
Stakeholder(s): CG-CVC

Project #: 410131

Anticipated Transition: **Knowledge Product**
Standards/Regulations

Notes:

- Funded by Great Lakes Restoration Initiative.

RDC POC:	CG-926 Domain Lead:
Ms. Gail Roderick	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Analysis Support for the Mandated Periodic & Practicability Reviews of Ballast Water Standards

Mission Need: To determine the practicability of implementing Ballast Water Discharge Standards (BWDS) more stringent than the current standards.

Project Objectives:

- Develop a plan for determining the practicability of implementing more stringent ballast water discharge standards.
- Carry out the plan by evaluating the current capabilities of ballast water treatment technologies and of current testing methods.

Completed

Key Milestone / Deliverable Schedule:

	Project Start	28 Jan 13 ✓
	Phase I: BWDS Practicability Planning Meeting	22 May 14 ✓
	KDP: Conduct BWDS Practicability Review	13 Jun 14 ✓
★	**Recommendations for Evaluating Multiple Filters in Ballast Water Management Systems for U.S. Type Approval**	**7 May 15 ✓**
★	**Plan for the Practicability Review of a more Stringent U.S. Ballast Water Discharge Standard**	**24 Aug 16 ✓**
★	**A Review of Available Performance Data for Ballast Water Management Systems**	**30 Oct 17 ✓**
★	**Applicability of Non-maritime Treatment Approaches to Shipboard Ballast Water Treatment**	**13 Dec 18 ✓**
	Project End	13 Dec 18 ✓

Sponsor: CG-OES

Stakeholder(s): USEPA - GLNPO

Project #: 410133

Anticipated Transition: **Knowledge Product**
Standards/Regulations

Notes:

- Funded by Great Lakes Restoration Initiative.

RDC POC:	**CG-926 Domain Lead:**
Ms. Gail Roderick	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product

Illinois Waterway Marine Safety Risk Research

Mission Need: Provide technical support in determining marine safety risks; recommend mitigation strategies.

Project Objectives:

- Assist in developing appropriate safety tests for new Aquatic Nuisance Species control measures at Romeoville (Chicago Sanitary & Ship Canal CSSC)) and Rockdale (Brandon Road Lock and Dam (BRLD)) Illinois.
- Participate in United States Army Corps of Engineers (USACE) prototype-related testing as CG technical lead.
- Analyze results and determine marine safety-related risks.
- Develop marine-safety risk assessment model and determine appropriate risk-mitigation measures.
- Make recommendations to CG operational commanders.

Key Milestone / Deliverable Schedule:

Project Start..... 1 Jun 16 ✓

★ **Preliminary Marine Safety Risk Assessment, Brandon Road Lock & Dam Invasive Species Control Measures.....5 Dec 16 ✓**

★ **Illinois Waterway Risk Research - Summary Report..... 25 Apr 19 ✓**

Project End..... 25 Apr 19 ✓

Sponsor: USEPA-GLNPO, CGD9

Stakeholder(s): MSU Chicago, CG SLM, USACE, LANT

Project #: 410136

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

Notes:

- Potential ad hoc follow-on efforts, including technology familiarization and coordination meetings will be covered under Project 9993.

RDC POC:	CG-926 Domain Lead:
Mr. M. J. Lewandowski	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

Research and Development of Quality Assurance (QA) Protocols for Ballast Water Testing Independent Laboratories (IL)

Mission Need: CG needs to assure that the ILs are meeting established scientific standards for Ballast Water Management Systems (BWMS) Type Approval (TA).

Project Objectives:

- Research how audit procedures and protocols are used by other Federal Agencies, Industry, and Academia to ensure Quality Assurance (QA)/Quality Control (QC) programs of contracted laboratories maintain a high standard of quality.
- Develop robust, science-based technical QA protocols that can be used as by the sponsor to verify the efficacy of ILs' QA/QC programs supporting BWMS TA.
- Evaluate the QA protocols by auditing CG-accepted laboratories and make minor adjustments as necessary.
- Document research activities and test results.

Merged

Key Milestone / Deliverable Schedule:

Project Start	7 Jun 16 ✓
Literature Review	29 Mar 17 ✓
Subject Matter Experts Workshop	13 May 17 ✓
Initial QA Protocol Development	18 Oct 17 ✓
Initial Trial QA Protocol Test at Naval Research Laboratory	30 Oct 17 ✓
Audit Protocol Test at International CG-accepted IL	28 Jun 19 ✓
Project Merged for FY20	30 Sep 19 ✓

Sponsor: CG-OES-3

Stakeholder(s): USEPA-Great Lakes National Program Office

Project #: 410146

Anticipated Transition: **Knowledge Product**
Standards/Regulations

Notes:

- Partnering with Great Lakes Restoration Initiative under the Clean Water Act 33 USC 1251-1387.
- Collaborating with the Naval Research Laboratory.

RDC POC:	CG-926 Domain Lead:
Ms. Gail Roderick	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

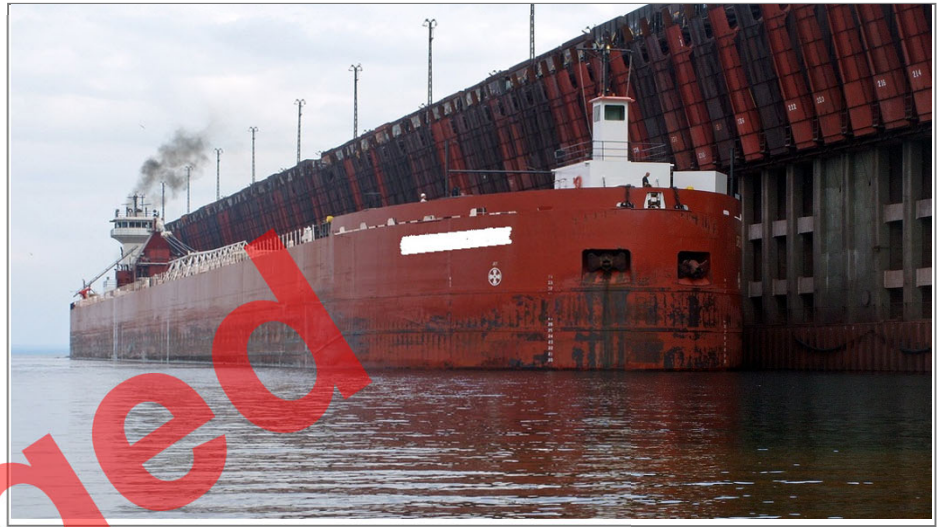
★ Indicates RDC product.

Ballast Water Management Alternatives for Lakers

Mission Need: Reduce aquatic nuisance species transport risks by confined vessels (Lakers) carrying untreated ballast water within the Great Lakes.

Project Objectives:

- Determine the most practical ballast water management practices that Laker operators can use to reduce the risks of transporting invasive organisms from one region of the Great Lakes to another when they are introduced from the outside by ocean-going shippers.
- Inform the Coast Guard Office of Operating and Environmental Standards of possible actions and policy decisions to reduce transport of aquatic nuisance species within the Great Lakes ecosystem.



Merged

Key Milestone / Deliverable Schedule:

Project Start	2 Apr 18 ✓
Begin Literature Review and Research of Alternative BWM Practices	11 Sep 18 ✓
Literature Review/Research Results	11 Apr 19 ✓
Project Merged for FY20	30 Sep 19 ✓

Sponsor: CG-OES

Stakeholder(s): USEPA-GLNPO

Project #: 410147

Anticipated Transition: **Knowledge Product** Standards/Regulations

Notes:

- Partnering with Great Lakes Restoration Initiative under the Clean Water Act 33 USC 1251-1387.
- RDC will investigate potential:
  - Partnership with DOT MARAD.
  - International collaboration with Canadian counterparts.

RDC POC:	CG-926 Domain Lead:
Mr. Alexander Balsley, P.E.	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil

★ Indicates RDC product.

In-Situ Burn (ISB) Research

Mission Need: Improve ISB techniques, technology and monitoring to make ISB a more effective, practical and safe option for oil spill response.

Project Objectives:

- Determine best practices for operational use of ISB.
- Develop and test procedures to support freshwater ISB of heavy oils with and without contaminated vegetation.
- Conduct literature review to investigate remote air-monitoring technologies.
- Execute field tests to measure/understand product consumption, residue production and fate, particulate/chemical constituents of smoke plume, and remote sensor performance.
- Report results for reference by U.S. Coast Guard (CG) federal on-scene coordinators, regional response teams, agency partners, academia, national labs, and international stakeholders that addresses ability of technology to improve responder safety and increase sampling accuracy.

Key Milestone / Deliverable Schedule:

	Project Start	1 Oct 18 ✓
	Mesoscale Freshwater Burns	19 Jul 19 ✓
	Large-scale Freshwater Burns	Oct 19
	Remote Air Monitoring Market Research	Feb 20
★	**Fresh Water ISB (Report)**	**Mar 20**
	Develop Remote Air Monitoring Process Framework	May 20
★	**Review Initial Air Monitoring Evaluation (Brief)**	**Jun 20**
	Develop Test Plan for Remote Air Monitoring	Sep 20
	Remote Air Monitoring During ISB	Feb 21
★	**Remote Air Monitoring Technology Evaluation (Report)**	**Aug 21**
	Project End	Aug 21

★ Indicates RDC product.

Sponsor: Great Lakes National Program Office, CG-MER

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

Project #: 47041

Anticipated Transition: **Knowledge Product**
Future Technology

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.

RDC POC:	CG-926 Domain Lead:
LT Liz Murphy	Ms. Karin Messenger

For more information, call (860) 271-2600 or e-mail RDC-Info@uscg.mil