CG RDC

Acquisition Directorate
Research, Development, Test & Evaluation

U.S. Coast Guard
FY22 RDT&E
Project Portfolio

UNCLAS | FY22 RDT&E Project Portfolio
CG-926 RDC | A. Arsenault | April 2022

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Flight Deck Launch, Recovery & Traversing System for MH-60T

1004

Mission Need: Safely secure and traverse the MH-60T onboard flight deck equipped cutters.

Objectives

- Investigate, identify, and document prospective flight deck securing and traversing options for the MH-60T helicopter.
- Support ongoing work related to investigating MH-60T Secure and Traverse systems.
- Support the Medium Range Recovery Helicopter Operational Requirements Document 2019.

Notes

- Leverage past U.S. Coast Guard (CG) Research and Development Center efforts and other military (domestic/foreign) and commercially implemented systems.

Sponsor: CG-711

Stakeholder(s): CG-41, CG-451, CG-459, CG-751

RDC Research Lead:
LT Tony Armijo

CG-926 Domain Lead:
Mr. Scott Craig

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

Project Timeline / Key Milestones

Project Start: 1 Oct 21

MH-60T Cutter Securing and Traversing Capability Working Group Requirements Obtained	19 Nov 21	✓
Request for Information Submitted for MH-60T Secure/Traverse System	21 Dec 21	✓
Market Research for MH-60T Secure/Traverse System Conducted	1 Mar 22	✓
MH-60T Flight Deck Launch, Recovery & Traversing System Alternatives (Report)	**May 22**	★

Project Completion: May 22

Advanced Maritime Counter-Unmanned Aircraft System (C-UAS) Technologies

7815

Mission Need: Operationally effective C-UAS force protection capability.

Objectives

- Assess new developments in kinetic C-UAS solutions in the open market and with other government agencies as technologies mature.
- Automate object detection and classification based on Electro-Optical/Infrared camera data by collaborating with optics companies to incorporate additional sensor modalities to aid UAS detection and target discrimination.
- Explore applicability of data fusion algorithms and machine learning to combine multiple data types into single threat track to reduce operator workload, uncertainty, and response time.
- Provide technical guidance on system employment for various mission sets based on legal authority and tactics, techniques, and procedures.

Notes

- Follow-on for U.S. Coast Guard (CG) Research and Development Center Project 7812: Maritime Counter Unmanned Aircraft Systems.

Sponsor: CG-MSR

Stakeholder(s): CG-711, CG-721, CG-751, LANT-3, PAC, D1, NSWC Dahlgren, AFRL, ONR, CGCYBER

RDC Research Lead:
C-UAS Research Team

CG-926 Domain Lead:
C-UAS Research Team

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start:

Please e-mail RDC-Info@uscg.mil for information concerning the Milestones and Deliverable Schedule.

Project Completion:

Maritime Unmanned System Technology (MUST)

7820

Mission Need: Persistent maritime domain awareness using AUSVs.

Objectives

- Assess potential employment options using Autonomous Underwater and Surface Vehicles (AUSV) to support U.S. Coast Guard (CG) mission areas. Using modeling and simulation techniques, assess AUSV Concept of Operations, including:
  - Effectiveness of single and multiple AUSVs; and
  - Effectiveness of AUSV and unmanned aerial system teaming.
- Inform field testing using modeling analysis results.

Notes

- Partner with the U.S. Department of Homeland Security (DHS) Science, Technology Directorate (S&T) Borders, Immigration and Maritime (BIM), U.S. Naval Research Laboratory, Naval Undersea Warfare Center, Naval Surface Warfare Center – Dahlgren Division.

Sponsor: DHS S&T BIM, CG-26	**Stakeholder(s):** CG-721, CG-MLE, CGCYBER
RDC Research Lead: Mr. Ross Vassallo	**CG-926 Domain Lead:** Mr. Scott Craig
Anticipated Transition: Knowledge Product , *Future Technology*	

Project Timeline / Key Milestones

Project Start: 1 Oct 19

In House or Contracted Modeling KDP	23 Sep 20 ✓
Vehicle Operations and Control Training	20 Jun 21 ✓
Contract for Modeling Effort Established	14 Sep 21 ✓
Model Scope and Application Software Established	Aug 22
MUST: Modeling Progress Status (Brief)	**Aug 22** ★
MUST: Model Simulation Results (Brief)	**Jul 23** ★
Support for DHS MUST Operational Testing Completed	Sep 23
Maritime Unmanned System Technology (Report)	**Nov 23** ★

Project Completion: Nov 23

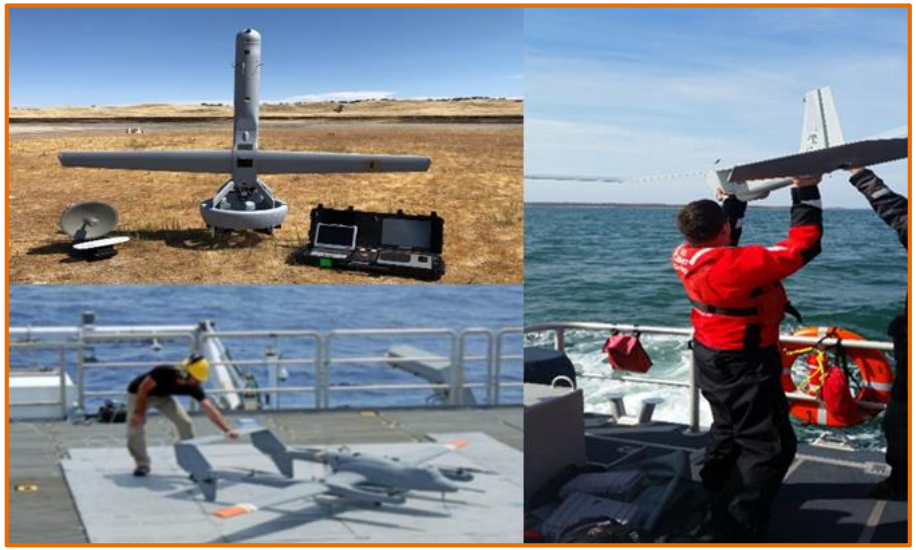
Beyond Visual Line of Sight (BVLOS) Technology for Coast Guard (CG) Unmanned Aircraft System (UAS) Operations

7691

Mission Need: BVLOS operations for CG UAS.

Objectives

- Leverage U.S. Southern Command (SOUTHCOM), Joint Inter Agency Task Force-South (JIATF-S), and Navy Research Laboratory (NRL) efforts to explore Medium Range UAS (MR-UAS) Vertical Takeoff and Landing (VTOL) operations from a CG Cutter (CGC).
- Integrate Detect and Avoid (DAA) technologies for conducting BVLOS operations [sUAS 1st].
- Conduct land and vessel based evaluations using DAA technology [sUAS 1st].
- 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.
- Conduct a land based Medium Range-UAS Search and Rescue (SAR) demonstration, followed by a Limited User Evaluation (LUE) onboard a CGC.



Notes

- Legislative requirement.
- Establish Memoranda of Understanding and Cooperative Research and Development Agreements as necessary with industry partners.
- Leverage efforts of the U.S. Southern Command (SOUTHCOM), Federal Aviation Administration, National Oceanic and Atmospheric Administration, Joint Interagency Task Force South (JIATF-S), U.S. Navy 4th Fleet and other government agencies.

Project Timeline / Key Milestones

Project Start: 13 Mar 19

MR-UAS VTOL Operations from a CGC (Brief)	**9 Nov 20 ✓ ★**
BVLOS Technologies Integrated into Small UAS (sUAS) Complete	Apr 22
Land Based BVLOS Tech Demo with sUAS Complete	Jul 22
Detect and Avoid Technologies Integration (Brief)	**Sep 22 ★**
Vessel Based BVLOS Tech Demo with sUAS Complete	Jan 23
Land / Vessel sUAS BVLOS Demonstrations (Brief)	**Mar 23 ★**
BVLOS Technology MR-UAS VTOL Integration Complete	Aug 23
BVLOS MR-UAS VTOL SAR Demonstration Complete	Nov 23
Vessel Based BVLOS MR-UAS VTOL Limited User Evaluation Complete	Dec 23
Beyond Visual Line of Sight UAS Operations (Report)	**Mar 24 ★**

Project Completion: Mar 24

Sponsor: CG-711

Stakeholder(s): CG-751, CG-931, SOUTHCOM, JIATF-S, U.S. Naval Research Laboratory, CGCYBER

RDC Research Lead: Mr. Stephen Dunn

CG-926 Domain Lead: Mr. Scott Craig

Anticipated Transition: Knowledge Product
Acquisition Milestone Support

FY21-22 Aviation Branch Support

99922122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future aviation and test and evaluation technology/systems including: manned and Unmanned Aircraft Systems (UAS), mission analysis, wide area surveillance, search and rescue, and persistent/strategic Maritime Domain Awareness (MDA).
- Maintain Branch infrastructure to support CG RDC portfolio objectives.
- Support Aviation Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding aviation technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority serving Institution students internship opportunities.

Notes

- Virtual Industry Day coordination for the Primus 700 Radar Replacement.
- Lead for Bear Trap enhanced MDA effort with District 11.
- Nexus for research and development unmanned efforts.
- Participating in CG Unmanned Systems Integrated Product Team (IPT).
- Participating in Medium Range UAS IPT and Small UAS Work Group.
- Partnered with Air Force Research Laboratory Agility Prime Electric Vertical Takeoff And Landing aircraft work.

Project Timeline / Key Milestones

Project Start: Ongoing	
CG District 11 MDA "Bear Trap" Support	1 Apr 21 ✓
Primus 700 Radar Replacement Industry Day Coordination Complete	1 Jul 21 ✓
UAS Sensor Dissemination from Mobile Communications Trailer	Aug 22
ATAK Integration of sUAS	Sep 22
Partner with SOUTCOM for BVLOS UxS Demonstration	Apr 23
Project Completion: Ongoing	

Sponsor: CG-926

Stakeholder(s): CG-41, CG-711, CG-721, CG-931, CG-SAR, ALC, DHS S&T

RDC Research Lead:
Mr. Sean Lester

CG-926 Domain Lead:
Mr. Scott Craig

Anticipated Transition: Various

Modernizing Law Enforcement Encounter Background Checks at Sea

5602

Mission Need: Real-time, relevant information to the boarding team.

Objectives

- Improve the current process for Law Enforcement personnel to enable faster and more accurate results delivered on-scene directly to the Boarding Officer by building and deploying a prototype in the field to be evaluated by Boarding Officers and Intelligence Coordination Center (ICC) Coastwatch experts.
- Ensure alignment of efforts for modernization and compatibility with the new mobile MISLE application called ENFORCE.
- Enable a modernized, "plug-in" process for the background check functionality within the new ENFORCE mobile application.

Notes

- Partner with the National Urban Security Technology Laboratory, U.S. Department of Homeland Security Criminal Investigation and Network Analysis Center of Excellence, Transportation Security Administration, and U.S. Customs and Border Protection to explore technologies being used.
- Partner with CG-MLE Biometric project team to leverage parallel technologies for a one-solution-fits-all goal.

Sponsor: CG-MLE

Stakeholder(s): CG-26, CG-25, ICC, CG-MSR, CG-721, CG-761, C5ISC, LANT/PAC-6, CGIS, CGCYBER

RDC Research Lead:
Ms. Lauren Eberly

CG-926 Domain Lead:
Ms. Holly Wendelin

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

Project Timeline / Key Milestones

Project Start: 1 Oct 20

Market Research Complete	28 May 21 ✓
Modernizing Law Enforcement Background Checks at Sea (Brief)	**8 Jul 21 ✓ ★**
Selected COA	7 Oct 21 ✓
Purchase Biometric/Document Scanner Devices	Apr 22
User Evaluation Testing Completed	May 22
Modernizing Law Enforcement Encounter Background Checks at Sea (Report)	**Aug 22 ★**

Project Completion: Aug 22

Improved CGCIS Mission Execution through Secure Mobility

1010

Mission Need: Ensure consistent CGCIS access to CG networks to defeat foreign and insider threats.

Objectives

- Support the U.S. Coast Guard Counter Intelligence Service (CGCIS) in their mission of protecting U.S. Coast Guard (CG) operations, personnel, systems, facilities and information from the intelligence activities of foreign entities and insider threats.
- Investigate secure modern tools for CGCIS to effectively combat these various threats through investigations, operations, collections, analysis, and cyber counterintelligence activities while in the field.
- Demonstrate a secure, cost effective mobile communication option for field agents who often deal with classified and or unclassified sensitive information in their daily scope of work.
- Document CGCIS desired requirements for next generation Defense Information Systems Agency (DISA) solution.

Notes

- Leverages partnerships with Naval Intelligence Warfare Center (NIWC) and DISA to demonstrate government approved and fielded secure mobility solutions which are available through DISA storefront.

Sponsor: CGCIS

Stakeholder(s): CG-25, CG-26, CG-761, CG-67, CG-68, CGCYBER

RDC Research Lead:
LT Annie Elis

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Complete Government Off-The-Shelf (GOTS) Market Research	21 Dec 21 ✓
Complete Technical Demonstration of DISA Secure Mobility Solution	Apr 22
Improved CGCIS Mission Execution through Secure Mobility (Technical Note)	**Aug 22** ★

Project Completion: Aug 22

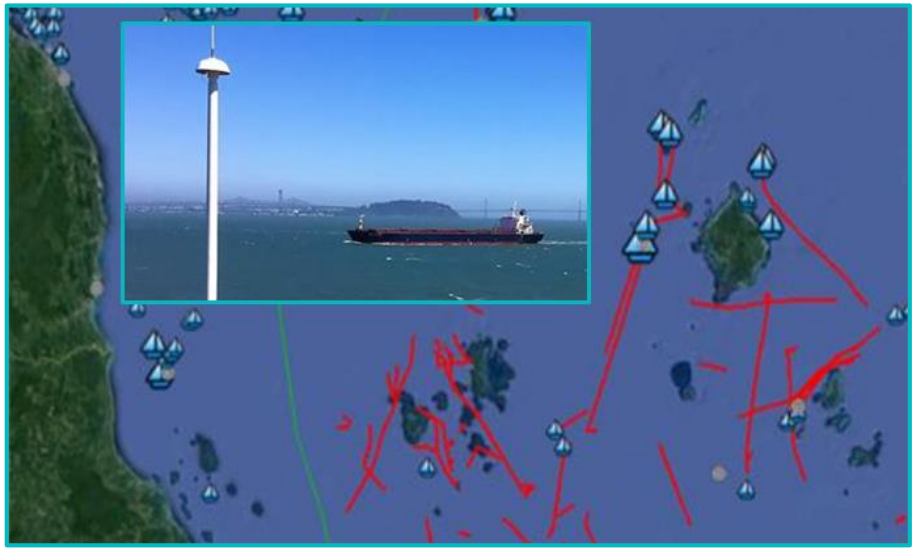
High Frequency (HF) Radar

8119

Mission Need: Enhance Maritime Domain Awareness (MDA) in the U.S. Exclusive Economic Zone (EEZ).

Objectives

- Assess High Frequency Surface Wave Radar (HFSWR) tracking and communications capabilities of existing systems with government and commercial partners.
- Evaluate HFSWR applicability to U.S. Coast Guard (CG) missions through a technology demonstration with partner organizations at an established site.
- Investigate the data fusion analysis framework for possible CG integration and transition with the Maritime Intelligence Fusion Centers (MIFC).
- Identify the locations with greatest utility and return on investment for potential fielding of HFSWR to enhance MDA within the EEZ.



Notes

- Partnership opportunities include the National Oceanic and Atmospheric Administration, Naval Postgraduate School, the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) - Borders, Immigration and Maritime (BIM), Naval Research Laboratory (NRL), U.S. Southern Command (SOUTHCOM), Joint Interagency Task Force-South (JIATF-S), and the Commander, USN 4th Fleet Science Advisor.

Sponsor: CG-761

Stakeholder(s): MIFC, CG-26/68/741/933, C5ISC, LANT/PAC-6, DHS S&T BIM, SOUTHCOM, JIATF-S

RDC Research Lead:
Mr. Sekaran Jambukesan

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 20

Completed HFSWR Capabilities Research	17 Mar 21 ✓
NRL Completed HF Data Collection, Analysis, and Report	3 Aug 21 ✓
High Frequency Radar Capabilities for MDA (Brief)	**12 Oct 21 ✓ ★**
Technology Demonstration	Aug 22
Applicability to CG Missions Identified	Oct 22
High Frequency Surface Wave Radar for CG Operations (Report & Brief)	**Jan 23 ★**

Project Completion: Jan 23

Mission-Specific Long-Range Communication Analysis

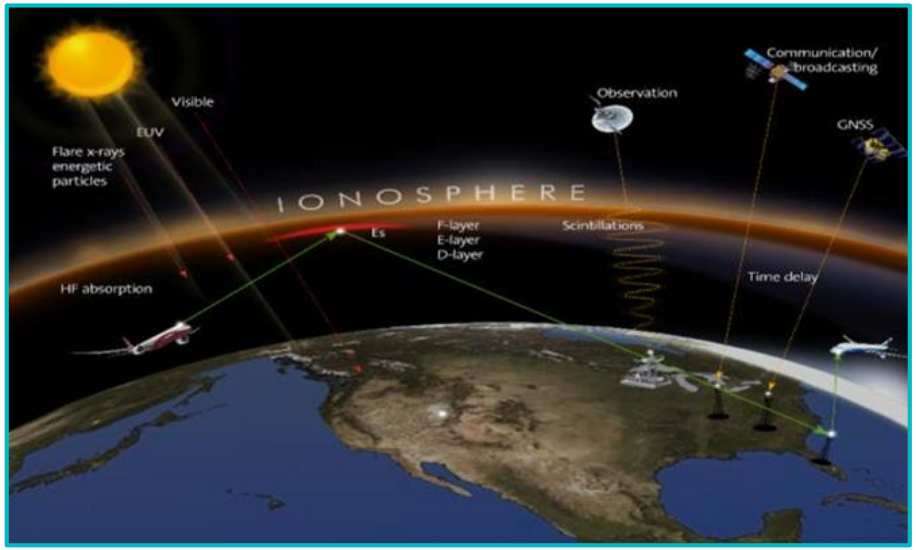
8504

Mission Need: Long-range communication options ranked for each mission set and environment.

Objectives

Determine an optimized list of long range communications (LRC) options for each U.S. Coast Guard (CG) mission in each area of operation, met with available or near term available equipment. This will be accomplished by:

- Develop a Beyond Line of Sight (BLOS) Cutter Survey and conduct site surveys in all districts for FRC and larger assets.
- Identifying baseline, new, and emerging long-range communications options to include technologies such as:
  - Low, medium, and High Frequency (HF).
  - Satellite communications.
  - 3G/4G/5G automatic link establishment (ALE).
- Developing a comprehensive matrix assessing the results of the cutter BLOS survey by mission and/or geographic area.



Notes

- Leverage CG-761-developed Capabilities Based Assessment on current state of U.S. Coast Guard long-range communications.
- Share findings with Southern Command (SOUTHCOM) and Joint Interagency Task Force-South (JIATF-S) facilities and long range communications capabilities and other potential U.S. Department of Defense research laboratories solutions as needed.
- Share findings with Naval Postgraduate School to identify long range communications collaboration opportunities.

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Complete Long Range Communications Requirements Analysis	1 Jun 21 ✓
Complete Cutter BLOS COMMS Survey Requirements	31 Jan 22 ✓
Mission-Specific Long-Range Communications Analysis (Brief)	**15 Mar 22** ✓ ★
Complete Cutter BLOS Survey	Aug 22
Complete Long-Range Communications Matrix	Oct 22
Mission-Specific Long-Range Communications Analysis (Report)	**Jan 23** ★
Project Completion: Jan 23	

Sponsor: CG-761

Stakeholder(s): CG-68/751/791, C5ISC, CGCYBER, JIATF-S, SOUTH/FORCE/COMMCOM/LANT/PAC-6

RDC Research Lead:
Mr. Mark Wiggins

CG-926 Domain Lead:
Ms. Holly Wendelin

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

Maritime Environmental Response Common Operating Picture

1009

Mission Need: Consolidate disparate data to modernize marine environmental response.

Objectives

- Leverage existing systems such as the National Oceanic and Atmospheric Administration's Environmental Response Management Application (ERMA) to create a central hubs of resources to improve response planning and operations.
- Work with the sponsor office and CGA to build a subsystem to ERMA to incorporate maritime environmental response actions and data layers.
- Connect maritime environmental response data from existing systems to the CG network to enable data fusion and overlay development.
- Collaborate with the ERMA program to create the Maritime Environmental Response (MER) Common Operating Picture (COP) to leverage existing system capabilities and create data overlays, such as chart based depictions of environmentally sensitive areas and legal or doctrinal constraints that could impact the response effort.

Notes

- This effort will also explore the iPAC system from the U.S. Fish and Wildlife services.

Sponsor: CG-MER

Stakeholder(s): CG-5R, CG-67, CG-MER, CG-68, CG-741, C5ISC, CGCYBER

RDC Research Lead:
Mr. Benjamin Berman

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Target Datasets Gathered	Jun 22
Oil Response Database Built	Aug 22
Integrate Datasets and Oil Response into OILMAP	Oct 22
Complete Initial Prototype of Dashboard	Jan 23
Demo Initial Prototype of Dashboard	Jan 23
Test Dashboard and OILMAP Integration into ERMA	Mar 23
Demo Final Dashboard Prototype	Mar 23
Maritime Environmental Response Common Operating Picture (Report)	**Sep 23** ★

Project Completion: Sep 23

Handheld Device Applications to Support Post-Storm Damage Assessments

1007

Mission Need: Accurate and timely field imagery and data from response teams.

Objectives

- Identify an efficient electronic means for field teams to quickly and accurately communicate data such as vessel damage assessments, Shoreline Cleanup Assessment and Technique forms, facility assessment forms for the Marine Transportation System Recovery Unit, Aids To Navigation verification, and other needed data.
- This effort will:
  - Assess existing mobile applications such as DAART, the Team Awareness Kit (TAK), and O365 mobile functionality.
  - Determine the feasibility of connecting data and developing custom views in Coast Guard 1 View (CG1V) and/or FirstNet dispatch console.
  - Create a Damage Assessment Go-Kit for mobile field teams to evaluate after a major storm.

Notes

- Research the U.S. Army Space and Missile Defense Command's Domestic Operations Awareness and Assessment Response Tool (DAART) suite as a potential solution.
- Consider partnerships with the National Oceanic and Atmospheric Administration (NOAA), Federal Emergency Management Agency (FEMA), and Natick Soldier Systems Center TAK lab.
- Explore possible collaboration with the Naval Postgraduate School (NPS) and Navy Expeditionary Combat Command.

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Complete Market Research	May 22
Complete Initial Prototype	Oct 22
Handheld Device Applications to Support Post-Storm Damage Assessments (Brief)	**Nov 22** ★
Complete CG1V Integration with Prototype	May 23
Complete Damage Assessment Go-Kit	Sep 23
Handheld Device Applications to Support Post-Storm Damage Assessments Go-Kit Demonstration (Video & Report)	**Nov 23** ★
Project Completion: Nov 23	

Sponsor: CG-OEM

Stakeholder(s): CG-761/741/5R/68/67, CG-FAC, CG-OEM, CG-MER, CG-NAV, C5ISC, CGCYBER

RDC Research Lead:
Mr. Robert Taylor

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Product
Fielded Prototype

FY21-22 Command, Control, Communications, Computers, Cyber, & Intelligence (C5I) Branch Support

99912122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future C5I systems, including: radio frequency communications, electronic navigation systems, software defined radios, cyber security systems, spectrum management, and sensors.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support C5I Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding C5I technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense (DOD) labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Continue to provide Extended Reality subject matter expertise and technical support for HoloLens2 devices in support of RDC ITNET Branch.
- Conduct Light Emitting Diode (LED) Electromagnetic Interference Rapid Evaluation & Analysis of Critical Technologies (REACT) effort.
- Complete a large-scale FirstNet evaluation at Sector San Francisco.
- Support Polar Communications testing for RDC and DOD Labs collaborative projects.
- Participate with C5I organizations such as the Radio Technical Commission for Maritime Services and Institute of Navigation.

Project Timeline / Key Milestones

Project Start: Ongoing	
Low Cost MDA Fusion Center	15 Dec 20 ✓
CG District 11 MDA "Bear Trap" Support	1 Apr 21 ✓
LED REACT Testing	30 Apr 21 ✓
Testing for EMC/RFI Emissions of LED Navigation Lights and Susceptibility Levels for Marine Radionavigation Receivers (REACT Report)	**30 Aug 21 ✓ ★**
FirstNet Deployment – Sector San Francisco Units	30 Sep 21 ✓
Standup RDC Communications Lab	Jun 22
FirstNet Sector Evaluation	Sep 22
Project Completion: Ongoing	

Sponsor: CG-926

Stakeholder(s): CG-2, CG-6, CG-7, CG-933, C5ISC, CGCYBER, DHS S&T

RDC Research Lead:
Ms. Amy Cutting

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Various

Freshwater In-Situ Oil Burn Research

47041

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

Objectives

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

Notes

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

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

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

RDC Research Lead: Benedette Adewale, PhD

CG-926 Domain Lead: Ms. Karin Messenger

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

Project Timeline / Key Milestones

Project Start: 1 Oct 18	
Mesoscale Freshwater Burns Complete	19 Jul 19 ✓
Large-scale Freshwater Burns Complete	25 Oct 19 ✓
Freshwater In-Situ Oil Burning (Report)	**16 Feb 21 ✓ ★**
Remote Air Monitoring Market Research Complete	17 Feb 21 ✓
Remote Air Monitoring Process Framework Complete	11 Mar 21 ✓
Test Plan for Remote Air Monitoring Complete	22 Apr 21 ✓
Air Monitoring During Freshwater ISB	28 Oct 21 ✓
Freshwater In-Situ Burning Air Monitoring (Report)	**Aug 22 ★**
Project Completion: Aug 22	

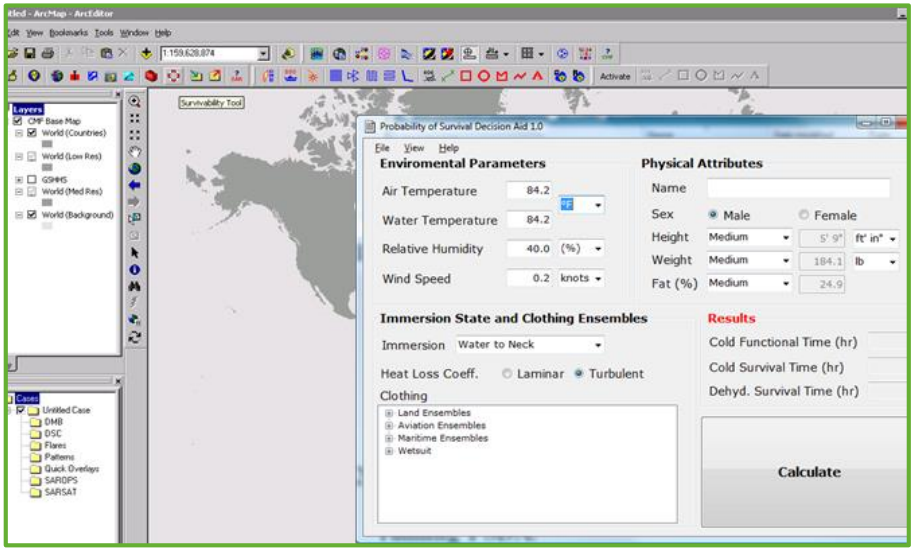
Survival Modeling, Reporting, and Statistics

1008

Mission Need: Improve SAROPS utility by incorporating better survival modeling and statistics.

Objectives

- Improve Search and Rescue survival decision tools by incorporating methods that better account for survival time in warmer water (15°C (59°F)) and incorporating survival factors beyond heat production and heat loss.
- Develop a dynamic database to validate model(s) against statistics, and permit model fine-tuning as the database grows.
- Provide the Search and Rescue program an easily-integrated survival module that allows two-way compatibility with existing Search and Rescue Optimal Planning System (SAROPS) processes.



Notes

- Carries forward U.S. Coast Guard (CG) Research and Development Center survival-related work with U.S. Department of Defense labs (John Hopkins University/Applied Physics Lab).
- Explore partnerships with National Labs and University Centers including the U.S. Naval Experimental Diving Unit (NEDU), U.S. Army Research Institute of Environmental Medicine (USARIEM), and U.S. Navy Clothing and Textile Research Facility.

Sponsor: CG-SAR

Stakeholder(s): CG-5R, CG-761, C5ISC

RDC Research Lead:
Ms. Monica Cisternelli

CG-926 Domain Lead:
Ms. Karin Messenger

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

Project Timeline / Key Milestones

Project Start: 1 Nov 17	
Investigated Requirements and Applications	30 Apr 18 ✓
Investigated State of Survival Models	6 Jul 19 ✓
Conducted Facilitated Workshop	28 Aug 19 ✓
Completed Survival Statistics Brief	16 Dec 19 ✓
Completed Key Decision Point to Progress to Model Implementation	2 Sep 20 ✓
Enhanced USCG Survival Model & Implementation (Brief)	**30 Nov 20 ✓ ★**
Complete Clothing Studies	18 Mar 22 ✓
Complete Pilot NEDU Immersion Tests	Jun 22
Complete NEDU Immersion Tests	Aug 22
Complete USARIEM Data Analysis	Oct 22
Enhanced USCG Survival Model and Implementation Guidance (Report)	**Dec 22 ★**
Project Completion: Dec 22	

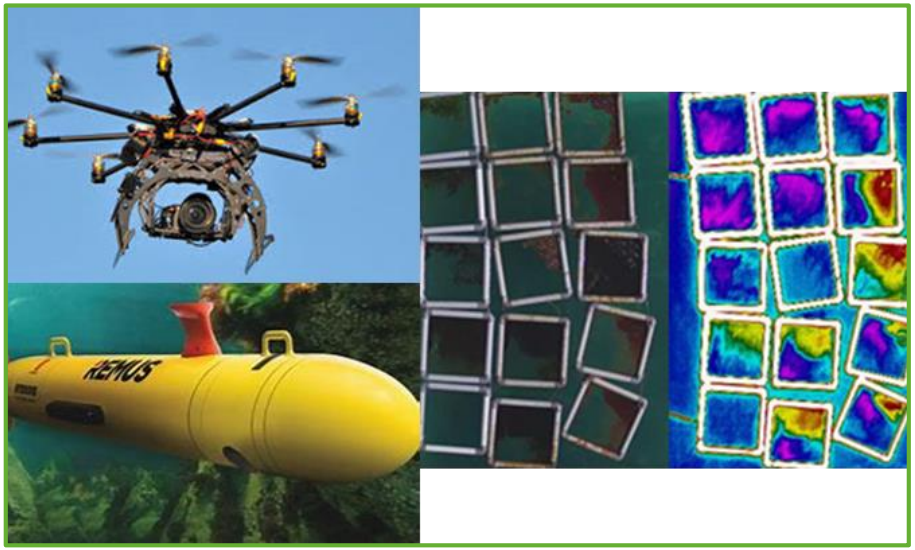
Advancing UAS and AUV Capabilities to Characterize Water Column and Surface Oil in Ice Environments

4711

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

Objectives

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



Notes

- Oil Spill Liability Trust Fund funding.
- Partnerships with the Cold Regions Research and Engineering Laboratory (CRREL), Woods Hole Oceanographic Institute (WHOI), U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) Office of University Programs (OUP), National Oceanic and Atmospheric Administration's (NOAA) Office of Response and Restoration (OR&R), Bureau of Safety and Environmental Enforcement, and U.S. Environmental Protection Agency.

Sponsor: CG-MER

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

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

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 23 Jan 20	
Interagency Reimbursable Work Agreement with NOAA Complete	3 Jun 20 ✓
Phase 1: Unmanned Aircraft System (UAS)/Autonomous Underwater Vehicle (AUV) Tests at CRREL Complete	23 Apr 21 ✓
UAS and AUV Characterization of Oil in Ice; Laboratory Results And Way Ahead (Brief)	**6 Jul 21 ✓ ★**
UAS Characterization of Oil in Ice: Volumes I and II (Report)	**7 Feb 22 ✓ ★**
Field Exercise Planning Complete	May 22
Phase 2: UAS/AUV Systems Shore-Based Field Tests	Jun 22
Phase 2: UAS/AUV Systems Vessel-Based Field Tests	Aug 22
Data Schema for Data Export Complete	Oct 22
UAS/AUV Systems Field Exercise Integration (Report)	**Mar 23 ★**
Project Completion: Mar 23	

Behavior of Diluted Bitumen (Dilbit) in Fresh Water

4204

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

Objectives

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

Notes

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

Sponsor: CG-MER, D9

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

RDC Research Lead:
Benedette Adewale, PhD

CG-926 Domain Lead:
Ms. Karin Messenger

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

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Literature Review Complete	12 Feb 21 ✓
Literature Review – Diluted Bitumen in the Fresh Water Environment (Report)	**23 Jun 21 ✓ ★**
Dilbit Test Plan Complete	30 Sep 21 ✓
CRREL Dilbit Weathering Cold Weather Test Complete	30 Nov 21 ✓
CRREL Dilbit Weathering Warm Weather Test Complete	Jul 22
CRREL Dilbit Weathering Ice-free Cold Weather Test Complete	Oct 22
Dilbit Oil Analysis Complete	Jan 23
Guidance Document - Behavior of Diluted Bitumen in the Fresh Water Environment (Report)	**Mar 23 ★**
Project Completion: Mar 23	

Private Aids to Navigation Verification Improvements

1020

Mission Need: Modernize the Auxiliary reporting system for PATON verification.

Objectives

- Automate and standardize data collection for Private Aids to Navigation (PATON).
- Research how each District performs and records PATON verification.
- Evaluate and develop potential solutions to increase efficiency and effectiveness.
- Standardize how the U.S. Coast Guard (CG) documents PATON verification.
- Transition results to the Office of Navigation (CG-NAV) for implementing a service-wide PATON verification tool.

Notes

- RDC Auxiliary Unit to coordinate national participation for project execution.
- Leverage existing, Auxiliary-developed PATON verification tools and processes.
- Capitalize on Auxiliarist information technology capability for mobile-application development.
- Partner with National Oceanic and Atmospheric Administration and United States Army Corps of Engineers.
- This is the first project in the history of the RDC led by an Auxiliary member, highlighting the enduring partnership between the two organizations.

Sponsor: CG-NAV

Stakeholder(s): CG Auxiliary, Districts, NAVCEN, CG-68

RDC Research Lead:
Mr. James Spilsbury

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Complete Market Research	30 Nov 21 ✓
Complete Defining Functional Characteristics	7 Dec 21 ✓
Key Decision Point #1 - Decision on PATON Tool	7 Dec 21 ✓
Private Aids to Navigation Improvements Project Status (Brief)	**2 Feb 22 ✓ ★**
Complete Prototype Design	Aug 22
Key Decision Point #2 - CG Approval of Design	Sep 22
Complete Testing of Prototype	Dec 22
Private Aids to Navigation Verification Improvements (Report)	**Apr 23 ★**

Project Completion: Apr 23

Emerging Pollution Response Technology Evaluation

1011

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

Objectives

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

Notes

- Oil Spill Liability Trust Fund funding.
- Partnership with BSEE.
- Possible use of Cooperative Research and Development Agreements.
- Opportunity to partner with Interagency Coordinating Committee for Oil Pollution Research (ICCOPR) members, Federal Laboratory Consortium members, and academic institutions involved in this area of research.

Sponsor: CG-MER

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

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

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 21	
Priority Technologies Identified and Determined	1 Nov 21 ✓
Request for Information (RFI) Issued	5 Jan 22 ✓
RFI Responses Received	28 Feb 22 ✓
In-house Technology Evaluation Conducted	Jun 22
Technical Evaluation Team Review of Emerging Mechanical Technologies (Brief)	**Jul 22** ★
Ohmsett Testing Complete	Oct 22
KDP: Meeting at Ohmsett with ICCOPR Members	Oct 22
Emerging Pollution Response Technology Evaluation Findings (Report)	**Jul 23** ★
Project Completion: Jul 23	

Ballast Water Management (BWM) Research and Development

4135

Mission Need: Reduce Nonindigenous Invasive Species (NIS) transport risks in U.S. waters by vessel.

Objectives

- Determine the most practical BWM practices for Laker operators to reduce the risks of transporting NIS from one region of the Great Lakes (GL) to another when they are introduced from the outside by ocean-going ships.
- Research and develop robust, science-based technical Quality Assurance (QA) protocols to validate sub-Independent Lab (IL) QA/Quality Control shipboard test programs that support BWM System (BWMS) Type Approval (TA).
- Provide a tested Ballast Water Discharge Standard (BWDS) compliance tool to the field.
- Provide robust, science-based, shipboard-test technical protocols to validate IL test programs.
- Assess CG's Ballast Water Management Regulatory Program.

Notes

- FY18-FY20 Great Lakes Restoration Initiative funding (DW-070-95926401-0), (DW-070-20000108-0), (DW-70-95953301–0).
- Collaboration with Naval Research Laboratory.
- Collaboration with Smithsonian Environmental Research Center.
- Collaboration with the U.S. Department of Transportation Maritime Administration, Canadian Department of Fisheries & Oceans, and Transport Canada.

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

Stakeholder(s): Marine Safety Center, CG-CVC, CG Inspectors

RDC Research Lead: Ms. Gail Roderick

CG-926 Domain Lead: Ms. Karin Messenger

Anticipated Transition: Knowledge Product
Standards/Regulations

Project Timeline / Key Milestones

Project Start: 1 Oct 17

BWM Alternatives for Lakers (Report)	31 Mar 20 ✓	★
IL Auditing Protocol; For Facilities Performing TA Testing of BWMS (Report)	17 Jun 20 ✓	★
Current State of BWDS Compliance Technologies (Report)	29 Jul 21 ✓	★
Assessing BWM and Invasions in the Great Lakes: Recommendation of Site Selection and Draft Protocol for Nonindigenous Species Sentinel Sites	17 Mar 22 ✓	★
Assessing BWM and Invasions in Great Lakes: Site Selection and Draft Protocol for Shipboard Plankton Sampling at BW Sentinel Sites	31 Mar 22 ✓	★
Functional Char. for BWDS Compliance Tools (Report)	Jul 22	★
Tech Guidance for Use, Maint. & Trng. of BWDS Compliance Tools (Report)	Aug 22	★
Audit Protocols for Shipboard Tests by IL (Report)	Sep 22	★
Validation of Audit Protocols for Shipboard Tests by IL (Report)	Jan 23	★
Eval. of Commercially Available BWDS Compliance Technologies (Report)	Feb 23	★
Results of Year 1 BW Sampling and Sentinel Site Survey in the GL (Report)	Sep 23	★

Project Completion: Sep 23

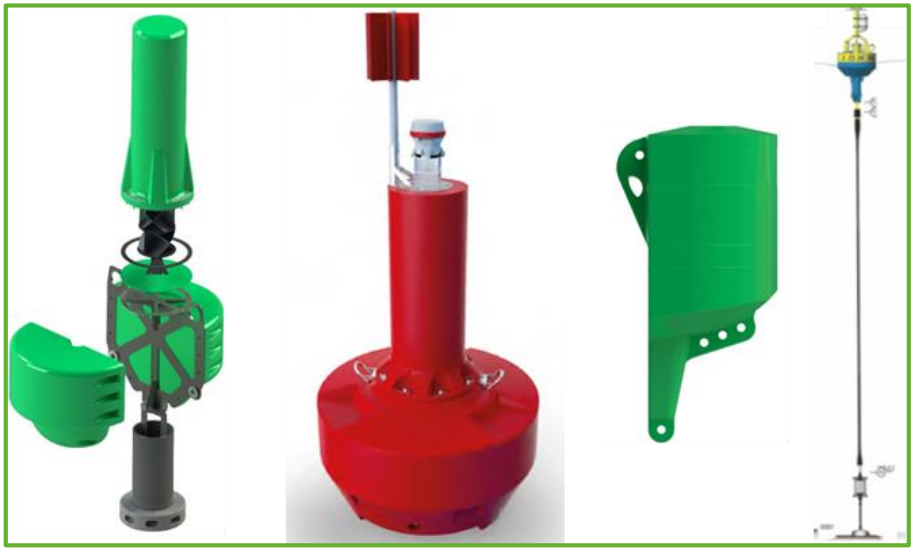
Next Generation Aids to Navigation Buoys & Alternative Moorings

2703

Mission Need: Modernize U.S. Coast Guard (CG) Aids to Navigation (AtoN) buoys and moorings.

Objectives

- Determine the world-wide state of non-ferrous, Next Generation (Next Gen) aids to navigation (AtoN) buoys.
- In conjunction with CG managers, field trial the most-promising prospects for replacing steel buoys.
- Provide CG managers technical, cost, and operational benefits (if any) to modernize buoy inventory.
- Conduct follow-up investigation of an alternative buoy-mooring system to determine CG applicability.
- Analyze buoy inventory to identify logistical and operational inefficiencies.
- Determine functional characteristics for legacy and next generation buoys.
- Develop science-based, analytical tool to aid CG managers with future inventory decisions.
- Field trial and evaluate promising inland river buoy alternatives.



Notes

- Coordinate with CG-NAV and the Data Center Optimization Initiative to involve to involve International Association of Marine Aids to Navigation and Lighthouse Authorities as partners.
- Collaborate with Naval Sea Systems Command on buoy radar cross section and detection ranges analysis.

Project Timeline / Key Milestones

Project Start: 1 Oct 19	
Complete World Wide Market Study of Buoys	31 Mar 20 ✓
Gather Feedback from Sponsor and Stakeholders	30 Jun 20 ✓
Selection Most Promising Buoys for Testing Complete	31 Aug 20 ✓
Next Gen AtoN Buoys: Market Study Report (Report)	**17 Sep 20 ✓ ★**
Draft Test Plan for Buoys and Moorings Complete	20 Oct 20 ✓
Next Generation AtoN Buoys & Alternative Moorings - Field Test Update (Brief)	**12 Aug 21 ✓ ★**
AtoN Buoy Inventory Analysis Results (Brief)	**Jul 22 ★**
Inland River Buoy Field Testing Status (Brief)	**Nov 22 ★**
Field Test for Buoys and Moorings Complete	Oct 22
New Buoy and Moorings Field Trial Summary (Report)	**Jul 23 ★**
AtoN Buoy Optimization Tool (Tool & User Guide)	**Dec 23 ★**
Project Completion: Dec 23	

Sponsor: SILC-WOPL	**Stakeholder(s):** CG-NAV, Districts (dpw)
RDC Research Lead: Mr. James Spilsbury	**CG-926 Domain Lead:** Ms. Karin Messenger
Anticipated Transition: Knowledge Product *Acquisition Milestone Support*	

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

4710

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

Objectives

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

Notes

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

Sponsor: CG-MER

Stakeholder(s): BSEE, AREA-54

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

CG-926 Domain Lead:
Ms. Karin Messenger

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 16

Feasibility Workshop Completed	21 Jun 17 ✓
Feasibility of Extending the ERSP Calculator for Nearshore and Inland Waterways (Report)	**20 Sep 17 ✓ ★**
Inland ERSP Preliminary Factors, Requirements and Conceptual Model (Report)	**14 Nov 19 ✓ ★**
Inland ERSP Operational Environment Calculator (Design Document)	**29 Jun 20 ✓ ★**
Initial Development of Inland ERSP Calculator Complete	4 Jun 21 ✓
National Academy of Sciences (NAS) Review Complete	Aug 22
NAS Response Review of Inland ERSP (White Paper)	**Dec 22 ★**
NAS Recommended ERSP Calculator Updates Complete	Dec 23
Inland Evaluation of the ERSP Calculator (Prototype & User Guide)	**Apr 24 ★**

Project Completion: Apr 24

Mass Rescue Lifesaving Appliance (MRLSA)

1205

Mission Need: Lightweight, easy to use, temporary, mass rescue survivor platform.

Objectives

- Find, promote, or develop the technology to manufacture an extremely compact, lightweight, rescue intervention device to safely keep 100+ persons out of the water for up to 24 hours.
- Transition the developmental result to the Office of Search and Rescue and capability stakeholders for implementation as a mass rescue tool.

Notes

- Partnership with Air Force Research Laboratory.
- U.S. Department of Homeland Security (DHS) Science & Technology (S&T) funded Broad Agency Announcement for prototype development.
- Investigate National Aeronautics and Space Administration or other government agency partnership.

Sponsor: CG-SAR	**Stakeholder(s):** DHS S&T, CG-711, CG-731, CG-751
RDC Research Lead: Ms. Monica Cisternelli	**CG-926 Domain Lead:** Ms. Karin Messenger
Anticipated Transition: Product *Fielded Prototype*	

Project Timeline / Key Milestones

Project Start: 1 Oct 19	
Request for Information/Technology Assessment Complete	1 Mar 20 ✓
MRLSA: Market Research Summary (Report)	**13 May 20** ✓ ★
Industry Day Webinar Complete	25 May 21 ✓
DHS Issues BAA	21 June 21 ✓
Interim Brief Complete	28 Sep 21 ✓
MRLSA: Phase 1 Consensus Results (Brief)	**30 Mar 22** ✓ ★
DHS Contract Award	Sep 22
Prototype Development Complete	Feb 24
MRLSA Phase 1 Testing and Key Decision Point (Brief)	**Jun 24** ★
Phase 2 Testing	Jul 24
Mass Rescue Lifesaving Appliance (Report)	**Sep 24** ★
Project Completion: Sep 24	

FY21-22 Environment & Waterways (E&W) Branch Support

99932122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future E&W technology, systems, and regulatory directives/policies, including: environmental protection, pollution detection/response, ballast water standards, marine and navigation safety Improvements, and search and rescue improvements.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support E&W Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding E&W technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College & University, and Minority Serving institution students internship opportunities.

Notes

- Distress Signals Policy Council & Radio Technical Commission for Maritime Services meetings and special committees.
- Ice accretion Rapid Evaluation & Analysis of Critical Technologies (REACT) Report for F/V Scandies Rose Marine Board of Investigation.
- Interagency Coordinating Committee on Oil Pollution Research (ICCOPR)
- Great Lakes Oil Spill Center of Expertise liaison.
- National Oceanic & Atmospheric Administration Response Oil Assay Work Group.
- Long Range Autonomous Underwater Vehicle training and familiarity for non-hydrocarbon detection CG missions.

Sponsor: CG-926	**Stakeholder(s):** CG-5, CG-SAR, CG-MER, CG-ENG, CG-OES, D9, D11, DHS S&T
RDC Research Lead: Mr. M. J. Lewandowski	**CG-926 Domain Lead:** Ms. Karin Messenger
Anticipated Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing	
Ice Accretion Testing at Cold Regions Research and Engineering Lab	30 Sep 21 ✓
Ice Accretion on Crab Traps (REACT Report)	**19 Jan 22 ✓ ★**
ICCOPR Quarterly Meeting	23 Mar 22 ✓
California Office of Spill Prevention and Response Technical Workshop - Detecting, Mapping & Recovering Oil at Night and in Fog	Apr 22
Long Rang Autonomous Underwater Vehicle Training (LRAUV)	Apr 22
Leeway Drift Study	Jun 22
LRAUV Under-ice Testing in AK	Jul 22
Project Completion: Ongoing	

Evaluate Network Accelerator Technology to Improve Cutter Information Technology (IT) Performance

8702

Mission Need: Hardware and software solutions to improve cutter IT performance.

Objectives

- Improve IT performance in a degraded, disconnected, and high latency environment by performing a limited user evaluation of selected equipment on an afloat unit.
- Make recommendations to sponsor and stakeholders about best means of improving cutter IT application performance to include IP Video Compression on CG Communications Networks.

Notes

- Establish Cooperative Research and Development Agreement with Industry for commercial technology testing onboard USCG Cutters.

Completed

Sponsor: CG-68

Stakeholder(s): CG-761, C5ISC, CG-67, CGCYBER

RDC Research Lead:
Mr. David Cote

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Acquisition Milestone Support

Project Timeline / Key Milestones

Project Start: 1 Oct 19

Review of CG Previous/Current Efforts Complete	31 Dec 19 ✓
Evaluation of Network Accelerator Technology Complete	28 Feb 20 ✓
Limited User Evaluation of Selected Equipment Complete	18 Nov 20 ✓
Network Accelerator Tech Evaluation (Brief)	**29 Dec 20 ✓ ★**
Investigation of Best Practices for Application Software Complete	14 May 21 ✓
Improve Cutter IT Application Performance: Results and Recommendations (Report)	**30 Nov 21 ✓ ★**

Project Completion: 30 Nov 21

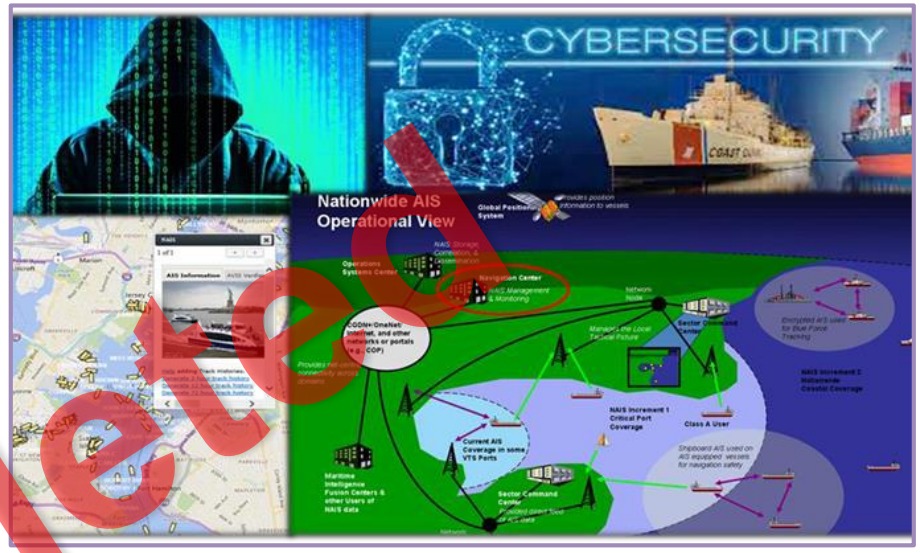
Automatic Identification System (AIS) Cyber Security

8701

Mission Need: Improve mariner safety by hardening the AIS against cyber attacks.

Objectives

- Recommend AIS data message authentication methods based on existing national and international cryptography research.
- Apply previous AIS signal bit-level range extension research to address cybersecurity through signal verification of radio frequency information (AIS 2.0).
- Demonstrate machine learning methods using Nationwide AIS data for cyber monitoring and alerting.



Notes

- Leveraging U.S. Coast Guard (CG) Research and Development Center Project 2218: Countering GPS Interference, Project 6211: Next Generation Arctic Navigational Safety Information System, and Project 7401: Machine Learning Platforms to Improve Coast Guard Tools.
- Leverage the U.S. Department of Homeland Security Homeland Security Systems Engineering and Development Institute/MITRE for machine learning analysis.

Sponsor: CG-761

Stakeholder(s): CG-68, CGCYBER, C5ISC, CG-NAV, ICC, MIFC LANT/PAC, CGA

RDC Research Lead:
Ms. Anita Trombino

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Standards/Regulations

Project Timeline / Key Milestones

Project Start: 1 Oct 19

Complete International Encryption Methods Research	30 Jun 20 ✓
AIS Data Authentication (Brief)	**10 Nov 20 ✓ ★**
High-level Operational Requirements to be Used to Drive Development Complete	22 Jan 21 ✓
Machine Learning and Other Algorithms Briefing	22 Feb 21 ✓
AIS Machine Learning (Brief & Demonstration)	**16 Nov 21 ✓ ★**
AIS Cyber Security (Report)	**12 Jan 22 ✓ ★**

Project Completion: 12 Jan 22

Radio Frequency (RF) Communications in a Cloud Environment

8503

Mission Need: RF communications capabilities as virtualized services in a cloud environment.

Objectives

- Satisfy existing RF communications requirements by leveraging U.S. Coast Guard (CG) network infrastructure along with CG One View (CG1V) and approved cloud access points.
- Investigate the cloud service, architecture, and implementation that provides the best solution for replacing existing RF communications components in the Rescue 21 (R21) system.
- Replace existing backend server components currently deployed at R21 Remote Fixed Facilities and Sector Command Centers with cloud-based capabilities and perform system demonstration (Phase 1).
- Replace existing R21 user console with cloud-based web accessible interface and perform system demonstration (Phase 2).
- Assess operational improvements and make NextGen R21 recommendations.

Notes

- Technical design and execution with the CG Command, Control, Communications, Computers, Cyber and Intelligence Service Center (C5ISC) Communications Systems Product Line.
- Leverage Cooperative Research and Development Agreement (CRADA) with industry.
- Leverages prior CG Research and Development Center cloud environment research.
- Coordinate with CG-68 for CG cloud pilot.

Completed

Sponsor: CG-761	**Stakeholder(s):** CG-68, CG-67, CG-741, CG-SAR, C5ISC, CGCYBER
RDC Research Lead: Ms. Anita Trombino	**CG-926 Domain Lead:** Ms. Holly Wendelin
Anticipated Transition: Product *Fielded Prototype*	

Project Timeline / Key Milestones

Project Start: 12 Feb 20	
CRADA Established	21 Jan 20 ✓
System Architecture Design Complete	27 Mar 20 ✓
Cloud Environment Established	22 Jun 20 ✓
Phase 1 R21 Cloud Prototype Deployed & Connected	16 Jan 21 ✓
Phase 1 Testing Complete	2 Apr 21 ✓
RF Comms Cloud Suitability Phase 1 (Brief)	**17 May 21 ✓ ★**
Phase 2 User Interface to CG1V Developed & Deployed	30 Sep 21 ✓
Phase 2 Testing Complete	30 Nov 21 ✓
RF Comms Cloud Suitability (Report)	**7 Mar 22 ✓ ★**
Project Completion: 7 Mar 22	

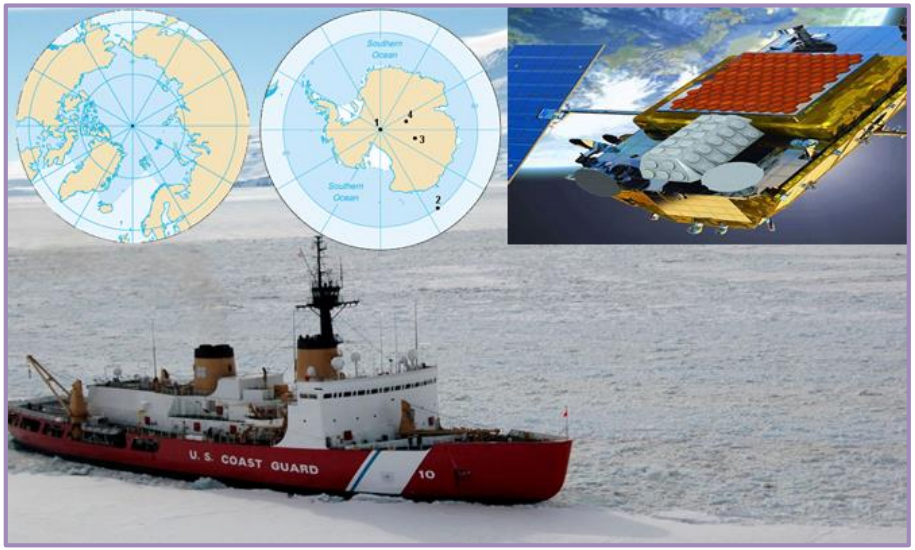
High Latitude Underway Connectivity

8705

Mission Need: Provide network connectivity to Cutters operating at high latitudes.

Objectives

- Influence the desired minimum connectivity functional characteristics by analyzing previous U.S. Coast Guard (CG) Research and Development Center (RDC) arctic communications and cutter connectivity projects within last 10 years.
- Influence the desired minimum connectivity functional characteristics by analyzing prior U.S. Department of Defense (DoD) High Latitude (Hi-Lat) research projects within last 10 years, including U.S. Navy (USN) and North Atlantic Treaty Organization Combined Joint Operations from the Sea.
- Build and test a Hi-Lat cutter connectivity test bed.
- Deploy a prototype solution and perform a limited user evaluation and report on system capabilities for best in class determination.



Notes

- Leverage CG RDC Projects 6208: Arctic Communications Technology Assessments, 8702: Evaluate Network Accelerator Technology to Improve Cutter Information Technology Performance, and 7759: Evaluation of Potential CG Use of CubeSats.
- Partner with the U.S. Department of Homeland Security Science and Technology Directorate Office of University Programs; USN Stratospheric Community of Interest; and Command, Control, Communications, Computers, Cyber, and Intelligence Service Center (C5ISC) Deployed Connectivity Section.
- Align with C5ISC SATCOM procurement.
- Link with DoD Lab Sync Arctic Comms effort.

Sponsor: CG-761

Stakeholder(s): CG-67, CG-68, CG-751, CG-762, LANT/PAC-6, C5ISC, ALC, CGCYBER

RDC Research Lead:
Mr. Jon Turban, P.E.

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 20

Review of Previous Projects and Research Complete	18 Mar 21 ✓
High Latitude Satellite Systems Market Research Complete	18 Mar 21 ✓
High Latitude Underway Connectivity – Status Update (Brief)	**12 Aug 21 ✓ ★**
Limited User Evaluation Complete	Sep 22
High Latitude Underway Connectivity (Report)	**Sep 22 ★**

Project Completion: Sep 22

Evaluation and Testing of VHF Data Exchange System (VDES) Impacts on the Automatic Identification System (AIS)

8703

Mission Need: Determine VDES benefits and path to implementation to support CG operations.

Objectives

- Understand the capabilities and limitations of VDES.
- Identify steps for U.S. Coast Guard (CG) Implementation of VDES.
- Identify steps to shift CG tactical data transmissions from AIS channels to VDES application specific message channels.
- Evaluate VDES capabilities to disseminate various types of Maritime Safety Information (MSI).
- Understand the requirements for CG shore-side management of VDES.

Notes

- Work closely with the Canadian Coast Guard; Electronics and Information Services, Quebec; U.S. Army Corps of Engineers, Engineer Research & Development Center.
- Leverage prior CG Research and Development Center work completed concerning options and impacts for VDES and AIS.

Project Timeline / Key Milestones

Project Start: 1 Oct 19

Technology Roadmap Investigation Complete	30 Sep 20 ✓
Very High Frequency Data Exchange System (VDES) Technology Roadmap (Report)	**27 Jan 20 ✓ ★**
Test Plan-Equipment Integration- Lab Test Complete	5 Mar 21 ✓
Phase 1 Field Trials – VDES Evaluation of CG Tactical Data Transmission	1 Oct 21 ✓
Sensitive but Unclassified Tactical Information Exchange and Display System Using VHF Data Exchange System (Report)	**13 Dec 21 ✓ ★**
Phase 2 Field Trials – VDES Evaluation of the Dissemination of MSI	Nov 22
VHF Data Exchange System Field Trial (Report & Brief)	**Mar 23 ★**

Project Completion: Mar 23

Sponsor: CG-761

Stakeholder(s): CG-67, CG-68, CG-933, CG-NAV, NAVCEN, C5ISC, CGCYBER

RDC Research Lead: LCDR John Forster

CG-926 Domain Lead: Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Future Technology

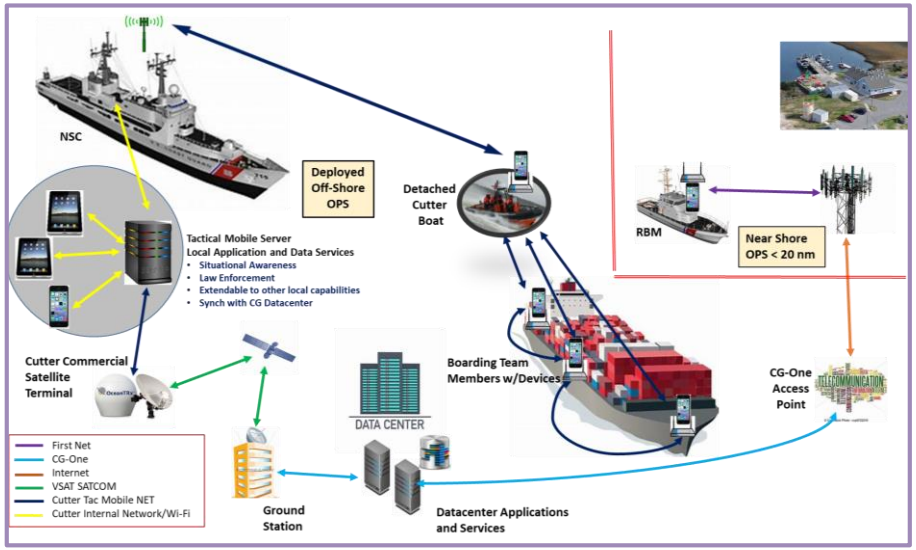
Operational Mobile Technology Architecture

8704

Mission Need: Improve DSF and Cutter boarding team safety, security, and mission efficiency.

Objectives

- Define protected, standards based mobile architectures to interface with U.S. Coast Guard (CG) Maritime and Avionic Systems.
- Phase 1:
  - Distill Deployable Specialized Forces (DSF) and Boarding Team (BT) requirements with sponsors/stakeholders.
  - Apply market research of COTS and GOTS Tactical Mobile Network technology architectures to identify best in class ranking of technology for fast CG integration and provide decision brief to key players.
- Phase 2:
  - Conduct Limited User Evaluation of best technology architectures and follow-up with Tactical Mobile Technology Evaluation to sponsor/stakeholders.
  - Deliver best in class solution architecture roadmap options to sponsor/stakeholders.
  - Deliver Improved DSF/Cutter BT Efficiency Report to key decision makers to drive CG wide change.
  - Examine use of LiDAR, Hazard Warning, and Biometrics Technology by BT members and how technology is integrated into Tactical Comm's Toolkit.



Notes

- Partner with the Air Force Institute of Technology (AFIT) to leverage systems engineering modeling capability.
- Research U.S. Navy, Special Forces and U.S. Department of Homeland Security (DHS) components tactical mobile communications architectures.
- Interview CG BT/Law Enforcement Detachment, U.S. Department of Defense, U.S. Department of Justice, DHS, and BT policy makers to identify functional characteristics in an ideal and an acceptable scenario.
- Potential collaboration with the Naval Post Graduate School (NPS) Initial Research Estimate Form (IREF) compressed video request.

Sponsor: CG-761

Stakeholder(s): CG-67/68/721/751/932, CG-MLE, LANT, PAC, C5ISC, CGCYBER, TACLETS, NPS, AFIT

RDC Research Lead:
Mr. David Cote

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Interviews w/CG Cutter BTs and Policy Makers Completed	23 Dec 20 ✓
Tactical Mobile COTS/GOTS Tech Evaluation Completed	31 Mar 21 ✓
Operational Mobile Technology Architecture Market Research (Brief)	**18 Aug 21** ✓ ★
Selected MANET/LTE Technology Limited User Evaluation Completed	Aug 22
Tactical Mobile Technology Evaluation (Brief)	**Oct 22** ★
Tactical Team Enhancement Tools (LiDAR, Hazard Warning, Biometrics, BT Toolkit) Evaluations Completed	Dec 22
Tactical Team Enhanced Toolkit/Tools Evaluation (Brief)	**Mar 23** ★
Improve Deployable Specialized Forces and Cutter Boarding Team Efficiency (Report)	**Jul 23** ★
Project Completion: Jul 23	

Internet Protocol (IP) Video Compression across CG Communication Networks

1012

Mission Need: Hardware and software solutions to facilitate real-time video transmission.

Objectives

- Research available technologies to provide the U.S. Coast Guard (CG) fleet the ability to broadcast real-time video to increase operational capabilities, improve decision making and tactical planning, enhance common operating picture, and provide reliable evidence building for drug interdiction and law enforcement cases.
- Perform a limited user evaluation of selected equipment on an afloat unit to assess commercially available IP video compression equipment on a degraded, disconnected, and high latency CG communications environment.
- Develop recommendations for cutter IT architecture to support sponsor and key stakeholders concerning best means of improving cutter IT architecture to support IP video compression on CG communications networks.

Notes

- Establish Cooperative Research and Development Agreement with Industry for commercial technology testing onboard CG Cutters.
- Research U.S. Navy, Special Forces and U.S. Department of Homeland Security components IP video compression architectures.
- Interview CG Boarding Team (BT)/Law Enforcement Detachment, U.S. Department of Defense, U.S. Department of Justice, U.S. Department of Homeland Security, and BT policy makers to identify functional characteristics in an ideal and an acceptable scenario.

Sponsor: CG-761

Stakeholder(s): CG-25/721/741/751/68/67, C5ISC, TACLETs, CGCYBER, MLE-A, AREAs

RDC Research Lead:
Mr. David Cote

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Acquisition Milestone Support

Project Timeline / Key Milestones

Project Start: 1 Oct 21

CG Previous/Current Technical Efforts Reviewed	31 Dec 21 ✓
Market Research of Video Compression Technology Completed	28 Feb 22 ✓
Initial Video Compression Functional Characteristics Documented	Apr 22
Limited User Evaluation of Selected Video Technology Completed	Oct 22
Video Compression Technology Evaluation Results (Brief)	**Dec 22** ★
Video Compression Functional Characteristics Validated	Feb 23
Best Practices and Deployment Architectures Identified	Apr 23
IP Video Compression across CG Communication Networks (Report)	**Jul 23** ★

Project Completion: Jul 23

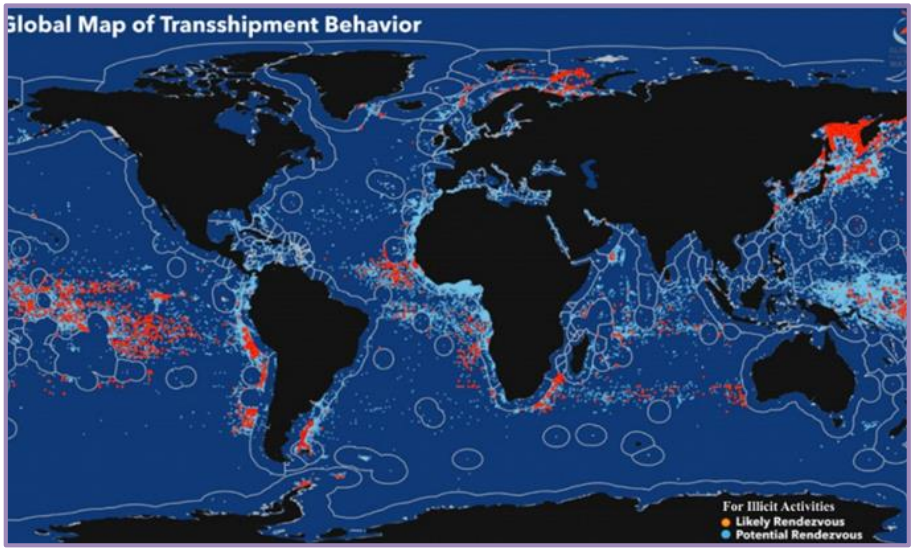
Geospatial Cloud Analytics Integration with CG1V for IUU Fishing Detection

1006

Mission Need: Detect and display IUU fishing activity to support Maritime Law Enforcement operations.

Objectives

- Determine requirements for Illegal, Unreported and Unregulated (IUU) Fishing Activity detection and display.
- Determine existing IUU Fishing detection and display capabilities.
- Identify gaps between IUU Fishing requirements and capabilities.
- Develop mitigation strategies for identified gaps. Include the following areas:
  - Defense Advanced Research Projects Agency (DARPA) Geospatial Cloud Analytics (GCA) platform.
  - Coast Guard One View (CG1V) geographic display.
  - Global Fishing Watch (GFW) solutions.
  - Environmental Services Research Institute (Esri) solutions.



Notes

- Previous RDC IUU work has been accomplished with GFW. This project will leverage that effort as much as possible.
- Identify key players in the DARPA GCA, CG1V and CG-MLE areas to obtain required subject matter expertise in these areas.
- Possible collaboration with the Intel Coordination Center (ICC) and U.S. Coast Guard Maritime Intelligence Fusion Center Pacific (MIFC PAC) and U.S. Guard Maritime Intelligence Fusion Center Atlantic (MIFC LANT).

Sponsor: CG-MLE

Stakeholder(s): CG-2, CG-68, PACAREA, MIFC LANT, MIFC PAC, ICC, D14, D17, CGCYBER

RDC Research Lead:
Mr. Jack Cline

CG-926 Domain Lead:
Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 21

IUU Requirements Determined	Dec 22
IUU Fishing Detection Capabilities Assessment Complete	Jan 23
IUU Fishing Activity Capability Gaps Determined	Apr 23
IUU Mitigation Strategies Development Complete	Jun 23
The Use of Geospatial Cloud Analytics and CG1View to Detect and Display IUU Fishing Activity (Brief)	**Nov 23** ★
The Use of Geospatial Cloud Analytics and CG1View to Detect and Display IUU Fishing Activity (Report)	**Dec 23** ★

Project Completion: Dec 23

Extended Reality (XR) Capabilities for Coast Guard Mission Support

8107

Mission Need: Improve efficiency and effectiveness of maintenance and training across the CG.

Objectives

- Enhance the U.S. Coast Guard's (CG) ability to train personnel and perform maintenance on CG assets by identifying maintenance, training, tools, processes, and procedures used by military and industry that will:
  - 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 the sponsor to generate requirements and successfully implement extended reality capabilities throughout the CG to improve the performance of mission support services.

Notes

- Includes partnerships with Naval Sea Systems Command Portsmouth Naval Shipyard, Microsoft Technology Center Boston, 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.

Sponsor: FORCECOM

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

RDC Research Lead: Mr. Jack Cline

CG-926 Domain Lead: Ms. Holly Wendelin

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 30 Nov 17

Market Research/Technology Assessment (Brief)	**19 Dec 18 ✓ ★**
HoloLens 2 Upgrade Completed	3 Sep 20 ✓
87' WPB Augmented Reality Maintenance Prototype	18 Sep 19 ✓
Aviation Augmented Reality Maintenance Prototype	2 Feb 21 ✓
Limited User Evaluation - Surface Community (Brief)	**20 Apr 21 ✓ ★**
Marine Inspection XR Training Prototype Delivered	31 Jan 22 ✓
Limited User Evaluation - Training Community (Brief)	**Jun 22 ★**
Limited User Evaluation - Aviation Community (Brief)	**Aug 22 ★**
Limited User Evaluation - Operational Training (Brief)	**Oct 23 ★**
Mission Support XR Roadmap Complete	Nov 23
XR Capabilities for CG Mission Support (Report & Brief)	**May 24 ★**

Project Completion: May 24

FY21-22 IT & Networks (ITNET) Branch Support

99982122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Build U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge/understanding of innovative Information Technology, Networked Systems & Cyber Tools, including: CG mobility, software prototyping, cloud computing, software defined networks, mixed reality, telecommunications, space based systems, and cyber security systems.
- Evaluate efficient information storage, management and knowledge tech.
- Support ITNET Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding ITNET technologies.
- Establish robust relationships with CG sponsors/stakeholders and external U.S. DoD labs, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.
- Build lean application evaluation platform to provide effective recommendations to Program Managers and Product Line Managers.

Notes

- Continue to plan and execute RDC infrastructure improvements that will benefit CG: P-LAN, audio/visual updates, Hi-Latitude communications lab, Light-Fidelity test lab, Team Awareness Kit hosting, U.S. Coast Guard Command, Control, Communications, Computers, Cyber, Intelligence Service Center (C5ISC) Cutter Lab mockup, computer forensics/cyber test bed.
- Continue FirstNet Mission-Critical Push to Talk (MCPTT) evaluation.
- Member of Maritime Security Regimes Working Group (WG), TRIDENT Warrior WG, Arctic Communications WG, and Information Warfare Science & Engineering WG.

Sponsor: CG-926	**Stakeholder(s):** CG-2, CG-6, CG-7, C5ISC, CGCYBER, DHS S&T
RDC Research Lead: Mr. Rob Riley	**CG-926 Domain Lead:** Ms. Holly Wendelin
Anticipated Transition: Various	

Project Timeline / Key Milestones

Project Start: Ongoing

FirstNet MCPTT Hardware Test Bed	30 Apr 21 ✓
Hi-Latitude Communications Equipment Testing	20 Nov 21 ✓
FirstNet Deployment Effort (w/ C5I Branch)	May 22

Project Completion: Ongoing

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

9204

Mission Need: Targeted CBM for higher asset availability and reduced life cycle costs.

Objectives

- Implement condition-based and predictive maintenance activities within the surface and aviation communities by researching and documenting significant opportunities for using leading indicators and readily available system information, including the following system characteristics: interfaces, data structure, data analysis, and data display that support a data driven system.
- Develop demonstration case studies using predictive maintenance with U.S. Coast Guard (CG) data to provide recommendations for systems and steps required to accommodate desired functional characteristics of a data driven system.

Notes

- Partner with the CG Surface Forces Logistics Center (SFLC) and Aviation Logistics Center (ALC) to make recommendations.
- Partner with U.S. Naval Academy (USNA), U.S. Department of Defense Joint Artificial Intelligence Center (JAIC), U.S. Navy's Naval Air System Command and Naval Sea Systems Command, and U.S. Army Combat Capabilities Development Command Aviation & Missile Center.
- Potential collaboration with the CT National Guard.

Sponsor: CG-45, CG-41

Stakeholder(s): SFLC, ALC

RDC Research Lead:
Ms. Christine Hansen

CG-926 Domain Lead:
Dr. David Wiesenhahn

Anticipated Transition: Knowledge Product
Acquisition Milestone Support

Project Timeline / Key Milestones

Project Start: 1 Apr 19	
Surface Asset Maintenance Characteristics Reviewed	1 Apr 19 ✓
Surface CBM Market Research Initiated	29 Oct 19 ✓
Academic Partnership Engagement Initiated	1 Dec 19 ✓
CBM for CG Asset Product Lines (Brief)	**14 Feb 20 ✓ ★**
Aviation Asset Maintenance Characteristics Reviewed	15 Feb 20 ✓
Aviation CBM Market Research Initiated	1 Oct 20 ✓
CBM for CG Asset Product Lines: Update Brief (Brief)	**7 Oct 21 ✓ ★**
DoD H-60 CBM and PMx Benchmarking	Jun 22
USNA NSC Data Analysis	Jun 22
JAIC PMx Representation	Jun 22
CBM for CG Asset Product Lines Summary Report (Report)	**Sep 22 ★**
Project Completion: Sep 22	

Incorporating Sensor Performance in SAROPS

7937

Mission Need: Time and cost effective methodology to incorporate sensor capabilities in SAROPS.

Objectives

- Determine sensitivity of the Search and Rescue Optimal Planning System (SAROPS) search metrics to 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.

Notes

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

Sponsor: CG-SAR

Stakeholder(s): LANT-3, PAC-3, FORCECOM

RDC Research Lead:
Ms. Grace Python

CG-926 Domain Lead:
Dr. David Wiesenhahn

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

Project Timeline / Key Milestones

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)	**15 Dec 19 ✓ ★**
Key Decision Point	16 Dec 19 ✓
Sensitivity Analysis & Underlying Assumption Investigation Complete	30 Jun 21 ✓
Methods to Develop Sensor-Specific Data Research Complete	24 Jan 22 ✓
Incorporating Sensor Performance in SAROPS (Brief)	**1 Feb 22 ✓ ★**
Prototype Tool for Incorporating Sensor Performance in SAROPS (Prototype)	**Aug 22 ★**
Incorporating Sensor Performance in SAROPS (Report)	**Nov 22 ★**
Project Completion: Nov 22	

Applications of Robotic Process Automation

7402

Mission Need: Repeatable process automation to enable operational and mission support efficiencies.

Objectives

- Provide an understanding of the current state of Robotic Process Automation (RPA).
- Identify challenges to acquiring and implementing RPA solutions.
- Investigate specific use-cases of RPA.
- Identify requirements for sustainment of RPA after development.

Notes

- Leverage existing U.S. Coast Guard (CG) Research and Development Center Project 7401: Machine Learning Platforms to Improve Coast Guard Tools.
- Coordinate with the Joint Artificial Intelligence Center, CG Finance Center (FINCEN), and the Department of Homeland Security RPA Working Group.
- Potential partnership with Naval Postgraduate School.

Sponsor: CG-67

Stakeholder(s): CG-62, CG-86, CG-68, CG-761, CG-1B3, CG-82, CG-4, FORCECOM, FINCEN

RDC Research Lead:
Dr. Devon Gunter

CG-926 Domain Lead:
Dr. David Wiesenhahn

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

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Identification of RPA Candidate Criteria/Method Completed	20 Jan 21 ✓
FINCEN Effort/Progress Research, Literature Review Completed	29 Jan 21 ✓
Identification of RPA Prototype Use-case Completed	30 Apr 21 ✓
Applications of Robotic Process Automation: Use-case Selection (Brief)	**17 May 21 ✓ ★**
Prototype Development and Evaluation Completed	Dec 22
Applications of Robotic Process Automation (Report)	**Feb 23 ★**
Project Completion: Feb 23	

Cognitive Training for High Risk Operators

8206

Mission Need: Improve cognitive skills and decision-making in high-risk operations.

Objectives

- Research objective measurements that demonstrate the influence of selected cognitive training program(s) on training environment evaluations.
- Develop a research framework for collecting empirical evidence of performance improvement in the training environment.
- Develop understanding of impact cognitive training programs have on trainees' performance.
- Develop recommendations for one or more cognitive training programs for evaluation in an operational setting.

Notes

- Potential collaboration with Blue Technology Center of Expertise, Naval Health Research Center in San Diego, CG Auxiliary, DoD Special Operations, U.S. Air Force 711th Human Performance Wing, U.S. Army Combat Capabilities Development Command, and Army Research Laboratory – Adelphi.

Sponsor: CG-721

Stakeholder(s): FORCECOM, MLEA, SMTC, CG-1, MSRT/MSSTs, DoD Spe. Ops, NUSTL, LE/DSF Cmty's

RDC Research Lead:
Dr. Jared Peterson

CG-926 Domain Lead:
Dr. David Wiesenhahn

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

Project Timeline / Key Milestones

Project Start: 30 Nov 20	
Researched Objective Measures	31 Mar 21 ✓
Experimental Design and Cognitive Training Market Research Selection (Brief)	**25 Jan 22 ✓ ★**
Awarded Contract Training Program	Aug 22
Pre-Training Assessment Completed	Oct 22
Cognitive Training Programs Completed	Jan 23
Post-Training Assessment Completed	Jan 23
Cognitive Training Influence on Cognitive Skills and Decision-Making (Report)	**Aug 23 ★**
Project Completion: Aug 23	

Verify International Maritime Organization (IMO) Polar Code Survival Time Requirement

1021

Mission Need: Improve long-term polar SAR and Mass Rescue Operations contingency planning.

Objectives

- Use data analysis, and modeling/simulation approaches to investigate the IMO Polar Code survival time; provide recommendations for updates to CG-SAR.
- Estimate expected polar rescue time using past remote rescue operations and changes in polar traffic density.
- Produce a robust data set through mining data sources for remote/polar transits and remote rescue operations for use in mathematical modeling.
- Use the findings to conduct an analysis to evaluate and inform international standards and contingency planning.

Notes

- Conduct a consolidated data analysis of past remote rescue operation as captured in systems such as Automatic Identification System, Long-Range Identification & Tracking, and Automated Mutual-Assistance Vessel Rescue.
- Explore partnership opportunities with international organizations including Canadian Search and Rescue (SAR), Finnish Border Guard, IMO, U. Washington Polar Science Center, U. of the Arctic consortium, U.S. Geological Survey historic arctic rescue data, Arctic Council, RAND, Denmark, & Greenland.
- Leverage past and ongoing RDC efforts relating to polar and SAR operations.

Sponsor: CG-SAR

Stakeholder(s): D17, Center for Arctic Study and Policy, DHS ADAC, AREAs

RDC Research Lead:
Ms. Christine Mahoney

CG-926 Domain Lead:
Dr. David Wiesenhahn

Anticipated Transition: Knowledge Product
Standards/Regulations

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Research Past Findings from International Efforts Complete	31 Dec 21 ✓
Discover and Access Data Sources Complete	1 Apr 22 ✓
Data Analysis Complete	Sep 22
Verify IMO Polar Code Survival Time Requirement (Brief)	**Nov 22** ★
Model Development Complete	Jun 23
Verify IMO Polar Code Survival Time Requirement (Report)	**Sep 23** ★

Project Completion: Sep 23

Artificial Intelligence/Machine Learning (AI/ML) for Computer Imagery and Sensor Data

1003

Mission Need: Develop, deploy, and sustain artificial intelligence in support of CG missions.

Objectives

To maintain efficiency and improve mission performance, the CG must capitalize on new sensor data sources and technologies such as artificial intelligence and machine learning. To realize the benefits, the CG must:

- Understand the algorithms, software, platform, and service infrastructures available from Department of Homeland Security (DHS), Department of Defense (DoD), National Geospatial-Intelligence Agency (NGA), and other Federal partners for Artificial Intelligence development, deployment, and sustainment.
- Understand the hardware, network, edge, and cloud computing infrastructures in the CG and from Federal partners for AI deployment and operations to support the "edge to watchstander pipeline."
- Examine how imagery and other sensor data can be used in real time to support operators and in post-analysis to support analysts.

Notes

- Track and report on federal partner and commercial AI models and methods in sensor fusion, maritime domain awareness, and pattern of life.
- Track and report on what other DoD, DHS, NGA partners are using and building for their physical and networking AI infrastructure.
- Follow Small Business Innovation Research-Other Agency Technology Solutions, Naval Postgraduate School, U.S. Navy, Joint Artificial Intelligence Center, Air Force Institute of Technology, CT National Guard, National Security Innovation Network, DHS Center for Excellence – Arizona State University, and Intelligence Coordination Center.

Sponsor: CG-2

Stakeholder(s): CG-741, CG-62, CG-MLE, Areas, Districts, CGCYBER

RDC Research Lead:
LT David Kent

CG-926 Domain Lead:
Dr. David Wiesenhahn

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 21		
Understand the Current State of CG Edge Sensors	Apr 22	
Explore Development Platforms	Aug 22	
Understand State of Edge Sensor Networking	Sep 22	
AI/ML for Computer Imagery and Sensor Data – Progress Update 1 (Brief)	**Oct 22**	★
Identify and Explore Fusion Platforms	Apr 23	
Explore Deployment Platforms	May 23	
AI/ML for Computer Imagery and Sensor Data – Progress Update 2 (Brief)	**Aug 23**	★
Understand How Data are Pipelined to AI	Sep 23	
Understand and Explore AI to Watchstander Cueing	Mar 24	
Explore Sustainment Platform Services	Mar 24	
AI/ML for Computer Imagery and Sensor Data (Report)	**Aug 24**	★
Project Completion: Aug 24		

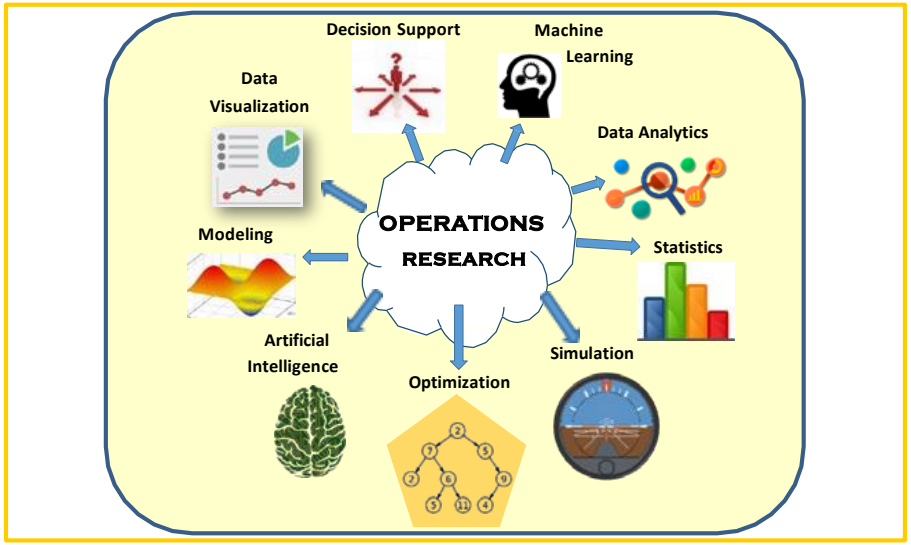
FY21-22 Modeling, Simulation, & Analysis (MSA) Branch Support

99972122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain competency and technical knowledge in understanding present and future Operations Research (OR)/Data Analytics (DA) tools and techniques including: modeling & simulation, data analytics, Artificial Intelligence (AI) & Machine Learning (ML), process automation, risk analysis, and human factors.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support MSA Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding use and application of AI/ML and OR/DA technologies and techniques.
- Foster continued relationships with CG sponsors/stakeholders and external Department of Defense labs, Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and other government agency/academic partners.
- Provide service academy, Historically Black Colleges and Universities, and Minority Serving Institutions students internship opportunities.



Notes

- Represent CG on Joint Artificial Intelligence Center (JAIC) Service Lab AI Research and Development Subcommittee; JAIC Predictive Maintenance Subcommittee; and Tri-Service Lab Commander's Sync Data Analytics Working Group.
- Member of CG-7 Unmanned Systems Integrated Product Team (AI Subcommittee); CG OR/DA Working Group, CG Data Readiness Task Force Advisory Group, CG Modeling & Simulation Advisory Council, and RDC Institutional Review Board.

Sponsor: CG-926

Stakeholder(s): CG-2/6/7/9, CG-MLE, CG-SAR, CG-OEM, CG-5PW, CG-INV, CG-NAV, DCO-X, DHS S&T

RDC Research Lead:
CDR Daniel Sweigart

CG-926 Domain Lead:
Dr. David Wiesenhahn

Anticipated Transition: Various

Project Timeline / Key Milestones

Project Start: Ongoing

Project Evergreen (2030) Participation	26 Feb 21 ✓
Low Cost Maritime Domain Awareness – Ongoing Support	18 Mar 21 ✓
Quarterly DISPOCO Meeting (Quant Subcommittee)	15 Mar 21 ✓
CG District 11 MDA "Bear Trap" Support	1 Apr 21 ✓
Navigation Safety Risk Assessment Follow Up/Alpha Test	28 May 21 ✓
Host U.S. Naval Academy Cadet Summer Intern	17 Aug 21 ✓
Blockchain Use-Case Exploration	10 Sep 21 ✓
Blockchain & Distributed Ledger Technology (REACT Rpt)	**1 Mar 22 ✓ ★**
Post-Completion Report Analytics	Apr 22
Natural Language Processing Analysis of Unstructured Search and Rescue Narratives (CGA Partnership)	TBD
Utility Billing Automation RFI	TBD

Project Completion: Ongoing

Cold Spray Restoration of Vessel and Aircraft Components

9205

Mission Need: Cold spray restoration of vessel and aircraft components to support mission readiness.

Objectives

- Document state-of-the-market cold spray restoration.
- Document the state of current joint service and commercial capabilities and research.
- Identify cold spray data sources for technical decision making.
- Develop a decision support tool to identify cold spray restoration candidate parts.
- Develop use case scenarios for cold spray application.

Notes

- Identify value-added opportunities for cold spray research.
- Partner with CG's Additive Manufacturing Working Group.
- Leverage research from the Army Research Laboratory, Ellsworth Air Force Base, Naval Sea Systems Command, Naval Air Systems Command, Naval Postgraduate School Sea Land Air Military Research Initiative, and Penn State University.
- Partner with the Joint Service Cold Spray Working Group, Naval Research Lab and other Lab-Sync partners.

Sponsor: CG-41

Stakeholder(s): CG-45, CG-711, SFLC, ALC

RDC Research Lead:
LT Kristopher Thornburg

CG-926 Domain Lead:
LT Steve Hager

Anticipated Transition: Knowledge Product
Future Technology

Project Timeline / Key Milestones

Project Start: 1 Oct 20

Visit to Department of Defense (DoD) and Commercial Cold Spray Facilities	21 Apr 21 ✓
Identify Cold Spray Limitations and Advantages	22 Dec 21 ✓
Develop Cold Spray Decision Support Tool	17 Feb 22 ✓
Develop Use Case Scenarios For Cold Spray Application	17 Feb 22 ✓
Cold Spray Restoration of Vessel and Aircraft Components (Report & Prototype)	**Apr 22** ★

Project Completion: Apr 22

Drug and Explosives Detection Technologies

5807

Mission Need: Improved accuracy and reliability in multifunction chemical detection.

Objectives

- Deliver decision support information regarding state-of-the-market multifunction chemical detectors for U.S. Coast Guard (CG) operation in maritime environments.
- Deliver decision support information regarding Tactics, Techniques, and Procedure (TTP) opportunities to improve accuracy, reliability, and usability of drug and explosives detection technologies.

Notes

- Collaborating with Countering Weapons of Mass Destruction Office, U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) Strategic Sourcing Initiative, National Urban Security Technology Laboratory, Transportation Security Laboratory, Transportation Security Administration, and U.S. Customs and Border Protection.
- Leverages past CG Research and Development Project 5802: Maritime Trace Narcotic Identification/Verification.

Sponsor: CG-721	**Stakeholder(s):** DSF, NSF, CG-MLE, DHS S&T, CG-1B3, FORCECOM
RDC Research Lead: Ms. D. J. Hastings	**CG-926 Domain Lead:** LT Steve Hager
Anticipated Transition: Knowledge Product *Influence Tactics, Techniques, & Procedures*	

Project Timeline / Key Milestones

Project Start: 1 Oct 19

Handheld Illicit Drug – Explosive Trace Detector (HID-ETD) Technical Evaluation CG Feedback Submitted	21 Apr 20 ✓
DHS System Assessment and Validation for Emergency Responders (SAVER) Detector Analysis Started	30 Jun 20 ✓
Compile Current HID-ETD Progress with SAVER Information to Complete Summary Deliverable	29 Oct 21 ✓
Drug and Explosives Detection Technologies Summary (Brief to Include TTP Recommendations)	**Jun 22** ★

Project Completion: Jun 22

Enhanced Rotary Wing Night Vision Goggle (NVG) Searches

1202

Mission Need: Improved NVG/augmented lighting to support SAR and LE missions.

Objectives

- Deliver decision support information regarding Tactics, Techniques, and Procedures (TTP) opportunities to enhance rotary wing NVG searches for both Search and Rescue (SAR) and Law Enforcement (LE) missions by performing and documenting results of a Limited User Evaluation (LUE) for enhanced rotary wing NVG searches. Research focus will primarily be on augmented lighting sources and their ability to improve existing NVG technologies.
- Investigate mitigation strategies for backlight and ambient light effects for coxswains using NVGs.

Notes

- Explore collaboration opportunities with Air Force Research Laboratory, Naval Research Laboratory, Army Research Laboratory (Adelphi Laboratory Center) and Army Combat Capabilities Development Command C5ISR Center Night Vision and Electronic Sensors Directorate.

Project Timeline / Key Milestones

Project Start: 1 Oct 20	
Commercial/Military Lab NVG & Lighting Advancements Investigated	14 May 21 ✓
Technologies Investigated	23 Jul 21 ✓
Enhanced Rotary Wing (RW) Night Vision Goggle (NVG) Searches (Brief)	**9 Sep 21** ✓
Decision Point on Proceeding to RW LUE	8 Dec 21 ✓
Evaluate Coxswain NVG Lighting Mitigation Strategies	Jun 22
RW Augmented Lighting & Coxswain Lighting Mitigation Investigation (Report)	**Sep 22** ★
Project Completion: Sep 22	

Sponsor: CG-SAR

Stakeholder(s): CG-1B3, CG-711, CG-761, CG-41, ALC, ATC, LANT, PAC, FORCECOM, CG-731

RDC Research Lead:
Mr. Mike Coleman

CG-926 Domain Lead:
LT Steve Hager

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

Counter Unmanned Underwater Vehicle (C-UUV) Technology

5922

Mission Need: Improved detection, tracking, classification, and deterrence of underwater threats.

Objectives

- Deliver decision support information regarding improved C-UUV capabilities for detection, tracking, classification, and deterring underwater threats by performing and documenting results of Limited User Evaluation for C-UUV capabilities.

Notes

- Building on past U.S. Coast Guard Research and Development Center anti-swimmer work.
- Coordinating with U.S. Naval Undersea Warfare Center - Newport, U.S. Naval Information Warfare Center, and U.S. Indo-Pacific Command.

Sponsor: CG-721	**Stakeholder(s):** CG-45, CG-731, CG-761, AREA-3, CGCYBER
RDC Research Lead: C-UUV Research Team	**CG-926 Domain Lead:** C-UUV Research Team
Anticipated Transition: Knowledge Product *Future Technology*	

Project Timeline / Key Milestones

Project Start:

Please e-mail RDC-Info@uscg.mil for information concerning the Milestones and Deliverable Schedule.

Project Completion:

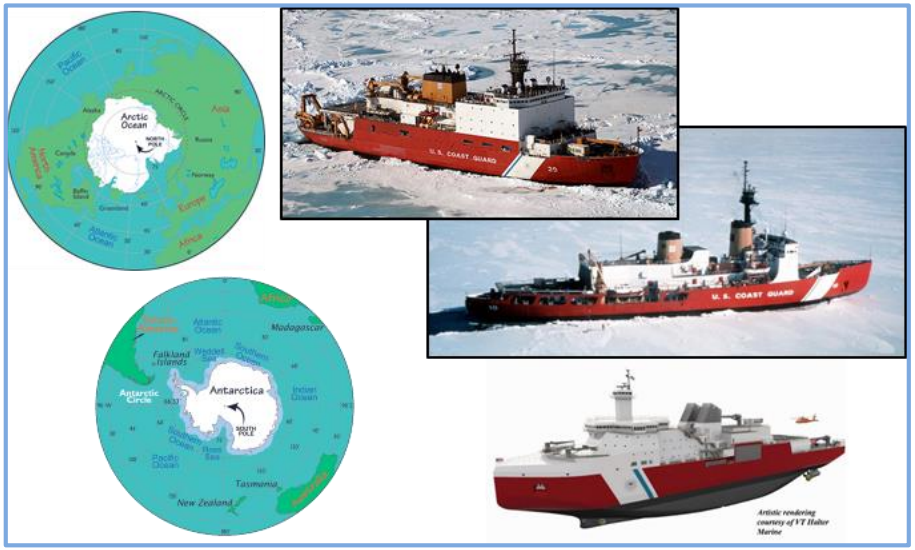
Polar Regions Technology Evaluation 2021 - 2022

62103

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

Objectives

- Provide support to projects which develop capability improvements in the execution of U.S. Coast Guard (CG) missions in Polar Regions.
- Cultivate joint efforts and interagency cooperation between government sectors and civilian entities.
- Evaluate emerging technologies to enhance CG operations in Polar Regions.



Notes

- Anticipate partnerships with the Bureau of Safety and Environmental Enforcement, U.S. Department of Homeland Security Office of University Programs, U.S. Department of Defense Labs, U.S. Northern Command, National Labs, Office of Naval Research Science Advisor in Prague for communications capabilities, Naval Research Laboratory, and the National Science Foundation U.S. Antarctic Program (McMurdo Station).

Sponsor: CG-751	**Stakeholder(s):** CG-5PW, CG-761, PAC-3, LANT-5, D17
RDC Research Lead: Ms. Shalane Regan	**CG-926 Domain Lead:** Ms. Karin Messenger
Anticipated Transition: Knowledge Product *Future Technology*	

Project Timeline / Key Milestones

Project Start: 1 Oct 20

Partners/Technologies/Test Plans Identified (FY21)	30 Jul 21 ✓
FY21 Research Efforts/Partners Solicited	30 Jul 21 ✓
Tests/Demonstrations Complete (FY21)	20 Nov 21 ✓
Partners/Technologies/Test Plans Identified (FY22)	Apr 22
Polar Technology Evaluation FY21 (Application Note)	**May 22** ★
FY22 Research Efforts/Partners Solicited	May 22
Tests/Demonstrations Complete (FY22)	Oct 22
Polar Technology Evaluation FY22 (Application Note)	**Mar 23** ★

Project Completion: Mar 23

Bromine-Free Water Purification System

5507

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

Objectives

- Deliver decision support information regarding effective utilization of bromine-free water purification systems for National Security Cutters, Fast Response Cutters (FRC), and Operational Patrol Cutters (OPC).

Notes

- Legislative requirement.
- Collaborating with the U.S. Army Engineer Research and Development Center Construction Engineering Research Laboratory; Naval Surface Warfare Center – Carderock Division, Corona Division, Crane Division, Philadelphia Division; and U.S. Naval Research Laboratory.

Sponsor: Surface Force Logistics Center (SFLC)

Stakeholder(s): CG-45, SFLC-LRE

RDC Research Lead: Ms. D. J. Hastings

CG-926 Domain Lead: LT Steve Hager

Anticipated Transition: Product
Pending Acquisition

Project Timeline / Key Milestones

Project Start: 27 Jul 19

Bromine-Free Water Purification Partners Identified and Pilot Study Started (Phase 1)	19 Jun 20 ✓
Bromine-Free Water Purification System Pilot Study (Brief) (Phase 1)	**9 Jul 20** ✓ ★
Begin CG Compatibility Review of Bromine-Free Systems on FRC and OPC with NSWC Carderock (Phase 2)	8 Sep 21 ✓
Bromine-Free Water Purification System Summary: Phase I (Report)	**Jul 22** ★
Bromine-Free Systems Integration Feasibility Study (Phase 2)	Sep 23
Bromine-Free Water Purification System Summary: Phase II (Report)	**Dec 23** ★

Project Completion: Dec 23

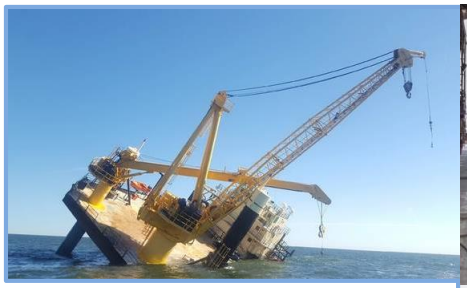
Improve Liftboat Stability Standards

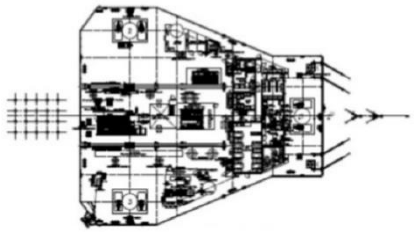
1024

Mission Need: Mitigate stability-related hazards to liftboats/operators.

Objectives

- Conduct "Non-Ship Shape Vessel Stability Requirements" study.
  - Investigate current CFR, ABS, and CG Liftboat Stability Standards and Regulations.
  - Analyze hull design and construction variations through different stability calculation methods.
  - Investigate potential disparities in wind heeling moments as a results of unrealistic shape factors.
  - Develop mitigation strategies tailored to Liftboat classifications.
- Support classification and regulation revision process as appropriate.





Notes

- Leverage Sponsor activities to conduct "Non-Ship Shape Vessel Stability Requirements" study.
- Leverage current American Bureau of Shipping guidance for building and classing Liftboats.
- Leverage the National Academies of Sciences, Engineering, and Medicine resources.
- Leverage State Maritime Academies.

Sponsor: CG-ENG

Stakeholder(s): CG-5P/SAR/INV, D7/D8, CGA, CG Outer Continental Shelf National COE, CG Marine Safety Center

RDC Research Lead:
LT Dean Gilbert

CG-926 Domain Lead:
LT Steve Hager

Anticipated Transition: Knowledge Product
Standards/Regulations

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Liftboat Observation at D8	11 Mar 22 ✓
Liftboat Stability Standards Risk Matrix and Recommendations (Brief)	**May 23** ★
Stability Analysis and Testing Complete	Aug 23
Developed/Revised Liftboat Regulation Changes	Dec 23
Liftboat Stability Standards Classifications and Recommendations (Report & Brief)	**Feb 24** ★

Project Completion: Feb 24

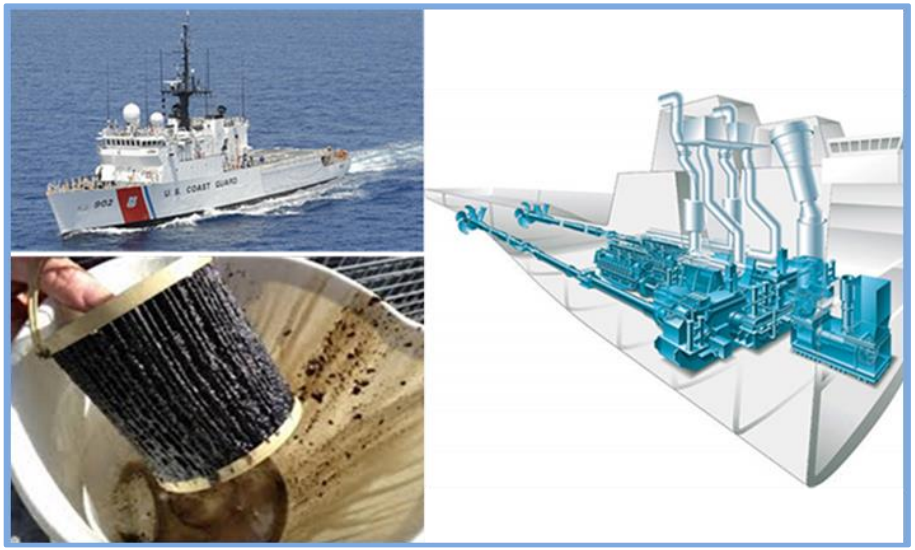
Engine Combustion Enhancement Technology

1002

Mission Need: Enhance propulsion efficiency to improve engine performance and reduce pollution.

Objectives

- Query the U.S. Navy (USN) and other organizations to leverage possible solutions for enhancing combustion efficiency in diesel fuel for energy/propulsion.
- Identify quantitative parameters for testing the efficacy of using new fuel additive, combustion enhancement products, and piston retrofits.
- Perform field evaluations of available commercial technology with the goal of countering incomplete combustion to improve fuel efficiency, reducing pollution, and reduce maintenance costs.
- Assess cost and benefits for technology based on test results.
- Report results on product performance and provide recommendations.
- Evaluate technologies on a engine representative of a U.S. Coast Guard (CG) asset.



Notes

- Partner with the USN Expeditionary Combat Command, Navy Seabees, U.S. Army Combat Capabilities Development Command, Cal Maritime, Federal Laboratory Consortium, DOE National Renewable Energy Laboratory, and NATO Centre for Maritime Research and Experimentation - La Spezia.
- Leverage CG Academy and U.S. Naval Academy research on biocide additives.
- Explore collaboration with the U.S. Army Transportation Command (Ft. Eustis) to conduct joint testing.
- Technologies could also be applicable to gasoline and aviation fuel.
- Possible use of Cooperative Research & Development Agreements (CRADA).

Sponsor: CG-46

Stakeholder(s): CG-45, Surface Forces Logistics Center, CGA, CG-47D

RDC Research Lead:
Mr. Derek Meier

CG-926 Domain Lead:
LT Steve Hager

Anticipated Transition: Product
Fielded Prototype

Project Timeline / Key Milestones

Project Start: 1 Oct 21

Engine Combustion Enhancement Technology: Down Selected Technology for Evaluation (Brief)	**Dec 22**	★
Initiated CRADA and Federal Laboratory Testing	Jul 23	
Cooperative Research & Development Agreement and Federal Laboratory Test Results (Brief)	**Apr 24**	★
Engine Combustion Enhancement Technology (Report)	**May 25**	★

Project Completion: May 25

FY21-22 Surface Branch Support

99942122

Mission Need: Maintain competency/knowledge; provide rapid response; and external liaison.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future surface asset technology and systems including: unmanned surface & sub-surface systems; boarding team tools; compel compliance; law enforcement; Chemical, Biological, Radiological, Nuclear, and Explosives countermeasures; alternative energy; and polar region capabilities.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support Surface Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding surface technologies.
- Foster continued relationships with CG sponsors/stakeholders and external U.S. Department of Defense labs, U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T) and other government agency/academic partners.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Complete corrosion control and monitoring evaluation.
- Explore unmanned surface vessel collision avoidance autonomy.
- RDC Arctic/Polar Coordinator and Representative to U.S. Arctic Research Commission.

Sponsor: CG-926

Stakeholder(s): CG-43, CG-45, CG-5PW, CG-721, CG-731, CG-751, CG-932, SFLC, CGD17, DHS S&T

RDC Research Lead: Mr. Evan Gross

CG-926 Domain Lead: LT Steve Hager

Anticipated Transition: Various

Project Timeline / Key Milestones

Project Start: Ongoing

Rough Bar Illumination (REACT Report)	**24 May 21 ✓ ★**
CG-HALLTS Field Support	25 Jun 21 ✓
Fluidized Bed Coating of Watertight Doors (Application Note)	**Apr 22 ★**
Cutter-based USV Launch and Recovery Evaluation	Sep 22
UAS-USV Cooperative Mission Execution Demonstration	Nov 22

Project Completion: Ongoing

Science & Technology Innovation Center (CG-STIC) Tasks

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

CG-STIC Funding Type: DHS S&T	**RDC Research Lead:** LCDR Anderson Ogg	**CG-926 Domain Lead:** Ms. Minh-Thu Phan

STIC Note Title	Objective	Office Supported	Due/ Delivery Date
Diesel Outboard Engines	*Long term user evaluation to support single-fuel concept which will reduce cost due to efficient infrastructure by eliminating duplicate framework.*	CG-731	5 Oct 21 ✓
Window Treatments	*Identify COTS solutions to address pilot house window obstructions due to fogging and icing under adverse environmental conditions.*	CG-731,741,751	May 22
Laser Corrosion Removal	*Improve maintenance on boats and aircraft by using proven laser technology for corrosion removal.*	SFLC ESD	Jun 22
Trillium Ball	*Evaluate sensors to support data generation and imagining for Law Enforcement and Search and Rescue missions.*	CG-711	Jun 22
Drone Mapping	*Provide Maritime Domain Awareness for disaster recovery/aerial inspections.*	CG-711, CEU	Jun 22
3D Metal Printing	*Work towards overcoming obsolescence and supply chain shortages for various metal parts; work is for all CG communities, but focused on surface and aviation.*	ALC, CGA, CG-4	Jul 22
Inland Brush Cutter	*Improve Aids to Navigation mission execution and reduce injuries and crew downtime from poison ivy and snake bites.*	D-8	Jul 22

Science & Technology Innovation Center (CG-STIC) Tasks (Cont'd)

CG-STIC Funding Type: DHS S&T	**RDC Research Lead:** LCDR Anderson Ogg	**CG-926 Domain Lead:** Ms. Minh-Thu Phan

STIC Note Title	Objective	Office Supported	Due/ Delivery Date
Noise Attenuation	*Validate efficacy of hearing protection solutions.*	CG 11, HSWL	Jan 23
Marking of Adrift/Abandoned Vessels	*Evaluate unambiguous marking to avoid duplicate launches on same vessel.*	D-13 SAR	Jan 23
Vessel Monitoring with RFID	*Use RFID technology to assist with vessel movements, tracking, and access control.*	COTP	Jan 23
Safety of Burning Vessels at Sea	*Investigate inherently safe options for at sea burning.*	CG-721	Jan 23
Wearable Sensors	*Apply technology of medical monitoring devices.*	MSRT	Jan 23

FY21-22 Science & Technology Innovation Center (STIC) Branch Support

99952122

Mission Need: Increase unity, share knowledge, build innovation culture, and transition technology.

Objectives

- Maintain U.S. Coast Guard (CG) Research and Development Center (RDC) competency and technical knowledge in understanding present and future technology to support CG mission execution.
- Maintain a collaborative relationship between the CG's Research, Development, Test and Evaluation Program Office and the U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T) to share and advance technologies that will be mutually beneficial to both parties.
- Provide Tactics, Techniques and Procedures for use in development of requirements for new technology evaluations and transitions.
- Maintain Branch infrastructure to support RDC portfolio objectives.
- Support Strategic Project Portfolio Alignment and CG DCO/DCMS Research Priorities.
- Provide expert input to CG stakeholders regarding advanced technologies.
- Provide service academy, Historically Black College or University, and Minority Serving Institution students internship opportunities.

Notes

- Align with DHS S&T Integrated Project Team gaps and CG Idea Submission Review input.
- Support Bear Trap enhanced Maritime Domain Awareness (MDA) effort with District 11.
- Support RDC tasks as requested.
- Collaborate with the CG RDC Environment & Waterways branch to prototype Intelligence, Surveillance, and Reconnaissance Buoy with sensors for MDA.

Sponsor: CG-926

Stakeholder(s): DHS S&T, Various

RDC Research Lead: Mr. Timothy Hughes

CG-926 Domain Lead: Ms. Minh-Thu Phan

Anticipated Transition: Various

Project Timeline / Key Milestones

Project Start: Ongoing

Low Profile Drone Vessel Analysis (REACT Report)	**19 Mar 21 ✓ ★**
CG District 11 MDA "Bear Trap" Support	1 Apr 21 ✓
FY21 Support	30 Sep 21 ✓
Technology Readiness Assessment for the Waterways Commerce Cutter Acquisition Program: Supplemental Addition to Include the WLI Variant (Report)	**24 Nov 21 ✓ ★**
Analysis of Adrift Vessel near Redondo Beach	21 Dec 21 ✓
AIS Beacons for Punt Boats (STIC Note)	**28 Mar 22 ✓ ★**
FY22 Support	Sep 22

Project Completion: Ongoing