Acquisition Directorate

Research & Development Center

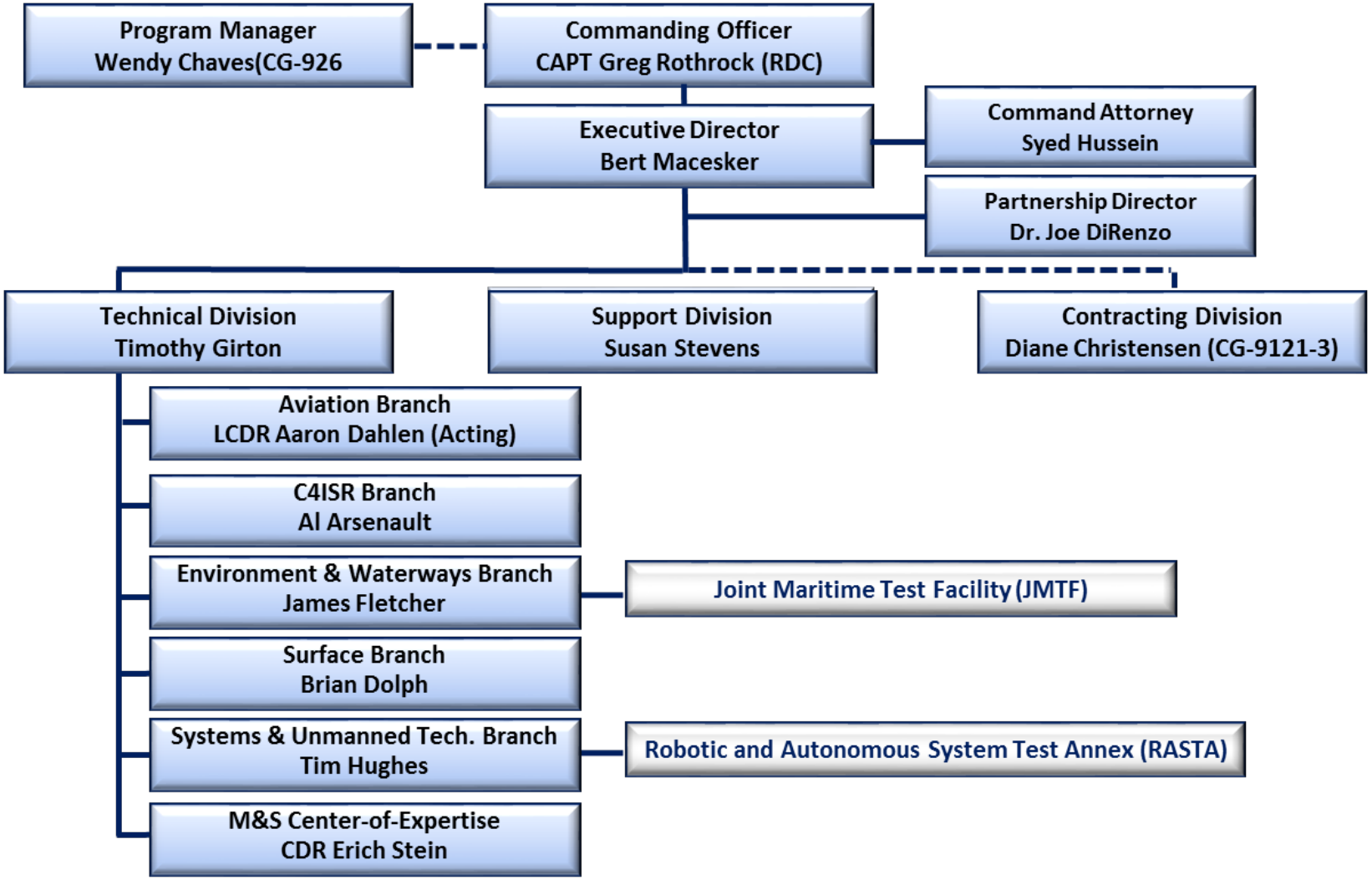
RDC Arctic Initiatives Overview

DoD Arctic S&T Synchronization Workshop (May 2018)

Presentation Agenda

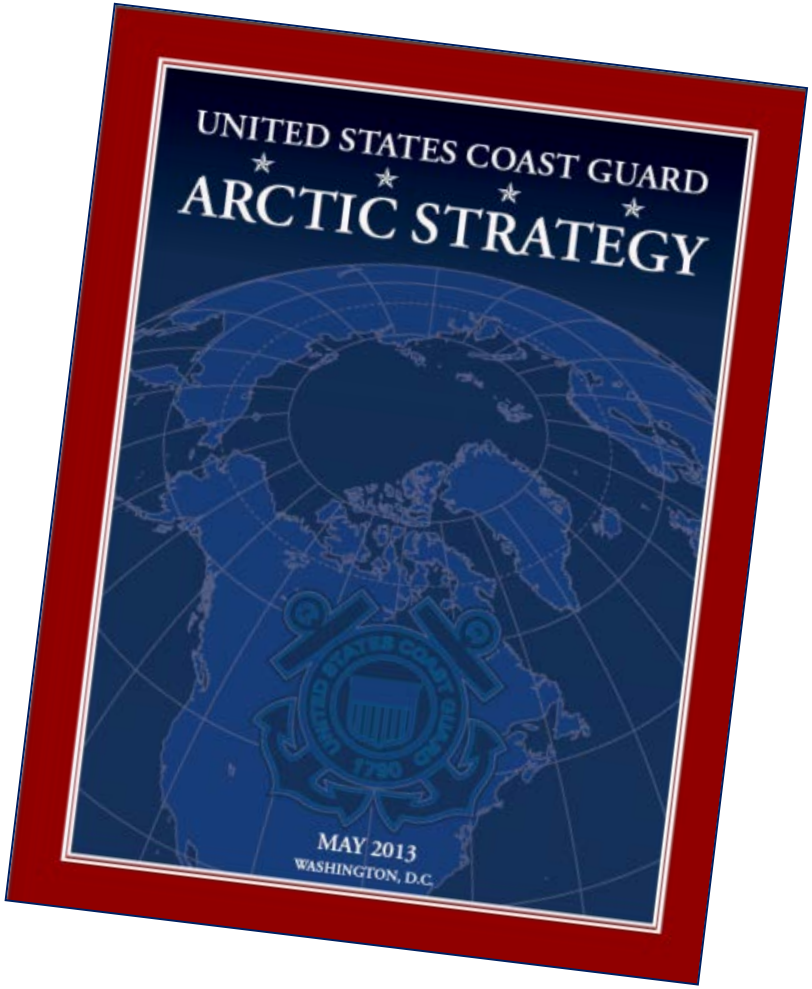
- RDC Organization
- CG Arctic Strategy
- Partnerships/Research Team
- Arctic RDC Initiatives (2008-2018)
- Future Collaboration/Partnerships

USCG RDC Organization



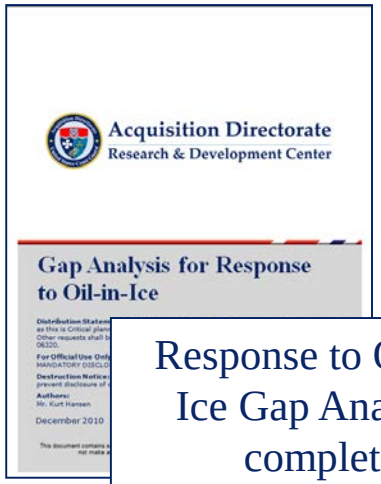
USCG Arctic Strategy – MAY 2014

- **Improving Awareness**
- **Modernizing Governance**
- **Broadening Partnerships**



RDC Arctic Initiatives 2008-2012

Arctic Operations Summary Report (4170) complete



Response to Oil-in-Ice Gap Analysis complete

Arctic Craft market research complete

Anti-Icing Investigation (6507) commissioned

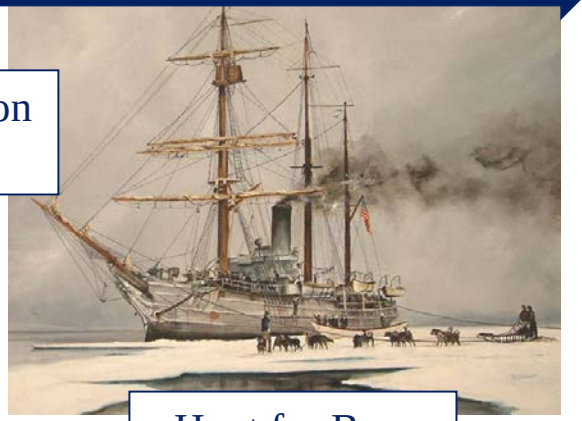
2008 **2012**

Arctic Strategic Investment Team Workshops

Response to Oil-in-Ice (4701) project commissioned

Arctic Craft Investigation (6204) commissioned

1st Great Lakes Oil Recovery Exercise



Hunt for Bear

RDC Arctic Initiatives 2012-2013

2nd Great Lakes Oil-in-Ice Tech Demo from CGC HOLLYHOCK

2012 → **2013**

Arctic Shield 2012 Oil-in-Ice Tech Demo from CGC SYCAMORE

Arctic Craft Tech Demo in Barrow, AK

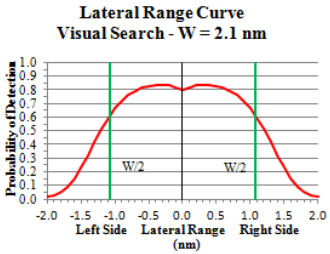
RDC Arctic Initiatives 2013-2014

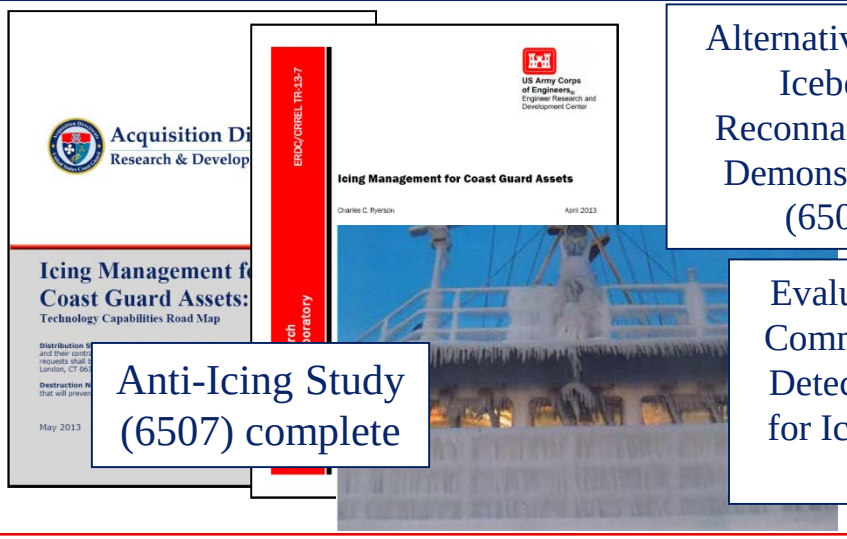
3rd and final Great Lakes Oil-in-Ice Tech Demos from CGC HOLLYHOCK

Arctic Shield 2013 Oil-in-Ice Joint Tech Demos from CGC HEALY

2013 → **2014**

Search Objects on Ice Testing



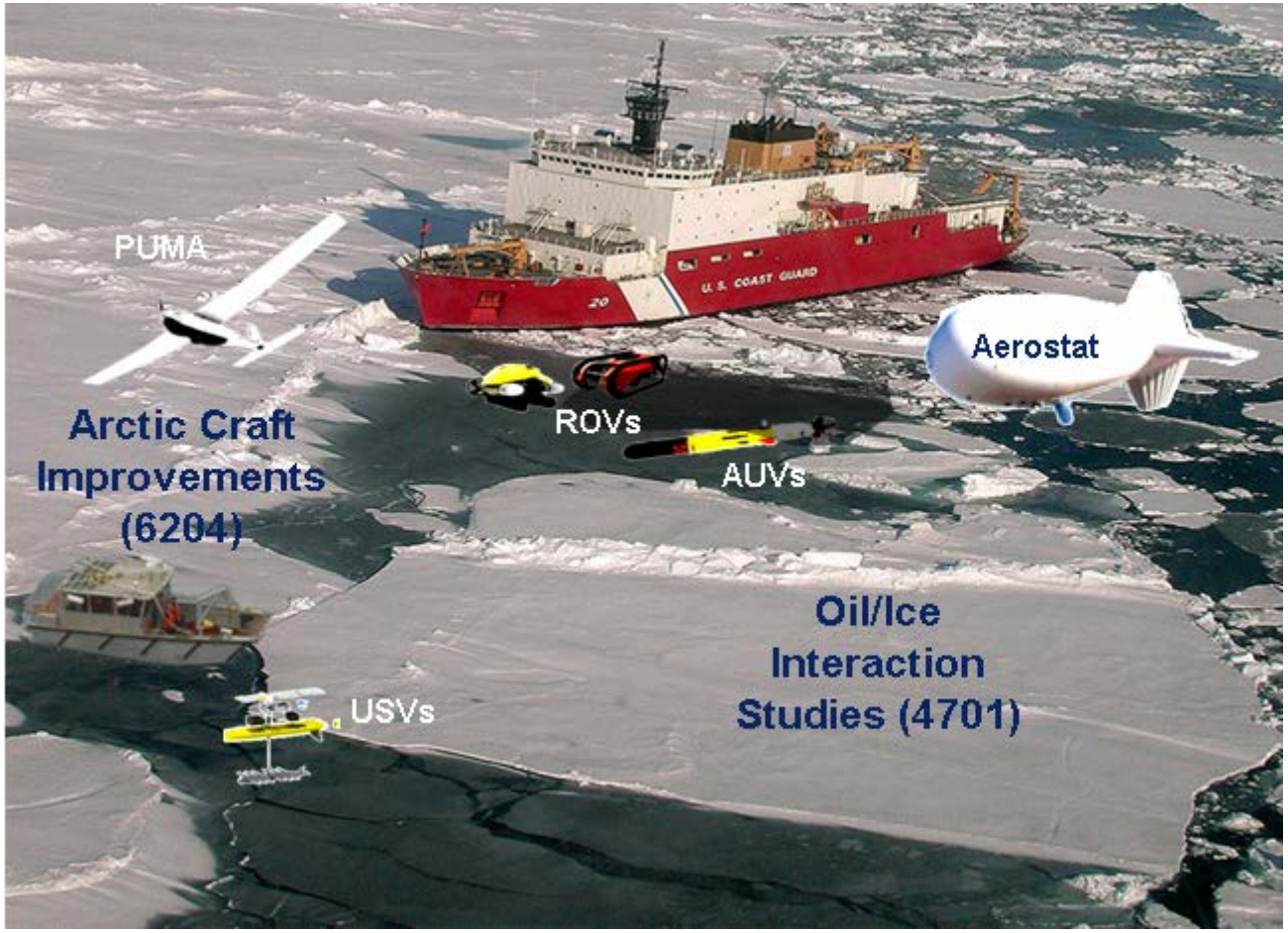


Anti-Icing Study (6507) complete

Alternative Asset Iceberg Reconnaissance Demonstration (6502)

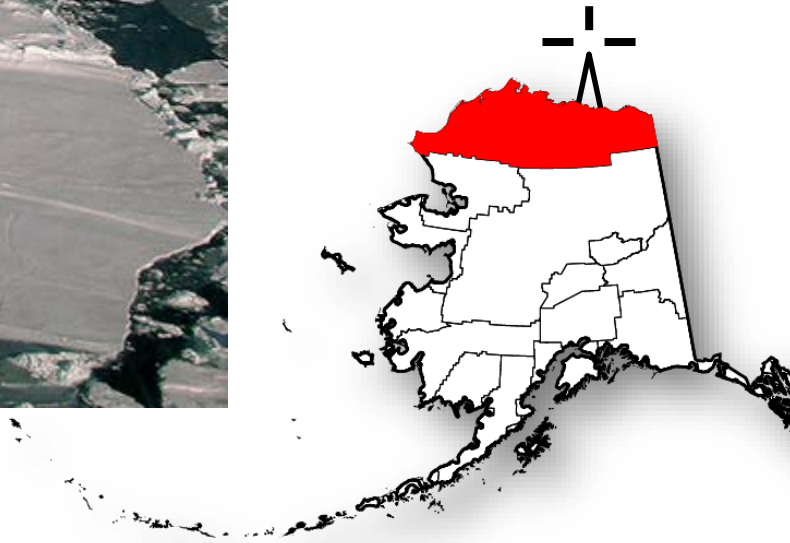
Evaluate Navigation, Communications, and Detection Equipment for Ice Rescue Teams (1204)

Arctic Shield '14: Tech Demos



Next Generation Nav Safety Info (6211)

Communications Testing (6208)



Arctic Shield '14: Tech Demos

Comms Testing (6208)

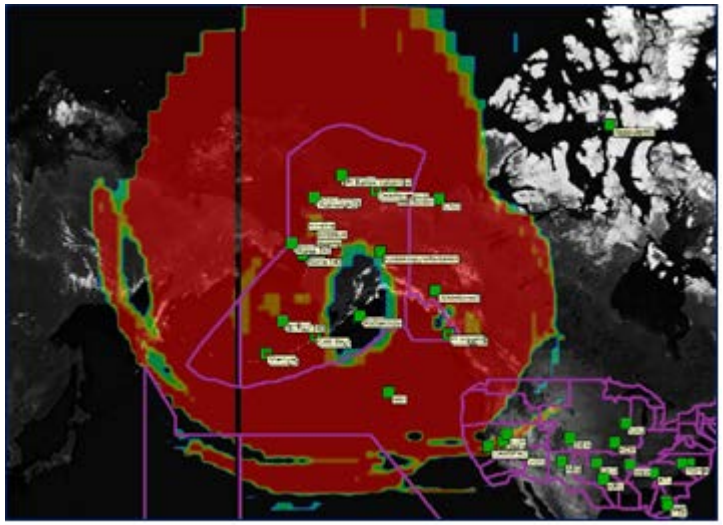
- Validate Comms Models
- VHF, UHF, HF, and DoD's MUOS Satellite Coverage Evaluation

Next Generation Arctic Navigation Safety Info (6211)

- Transmit AIS, Nav, & Wx Data

Arctic Craft (6204)

- Assess Cutter Boat Modifications



Arctic Shield '14: Tech Demos

Oil/Ice Interaction (4701)

- Collect Surface and Water Column Oil Movement Data with Respect to Ice
- Demonstrate 48 Hour Simulated Oil Spill Monitoring Capability
- Provide On-Scene Weather

PUMA (7804)

- Demonstrate deck landings
- Demonstrate 48 Hour Simulated Oil Spill Tracking Capability

Arctic Shield '14: Tech Demos

UAS - Scan Eagle (7804)

- Shore Launch to Shipboard Operator Control

AUVs - REMUS/GAVIA (7808)

- View Oil From Beneath Ice Assessment

ROVs (9994)

- Comparative ROV Testing (diver replacement tools)

USV - Wave Glider (7808)

- Persistent Surveillance Tool Assessment

RDC Arctic Initiatives 2015-2018

ATE 2015
ScanEagle launched and recovered at the DOE's ARM Mobile Facility in Oliktok Point.

ATE 2017
AV Puma AE being launched from CGC Healy.

2015 → **2018**

ATE 2016
Used Tropo Scatter and Inflatable Internet antenna

ATE 2018
UAS and AUV Demonstration

Arctic Technology Evaluation 2015

SAR Exercise (SAREX)

Multiple UAS Opevals

Underway UAS Net Captures

Arctic COMMS evaluations

NOAA Buoy deployments

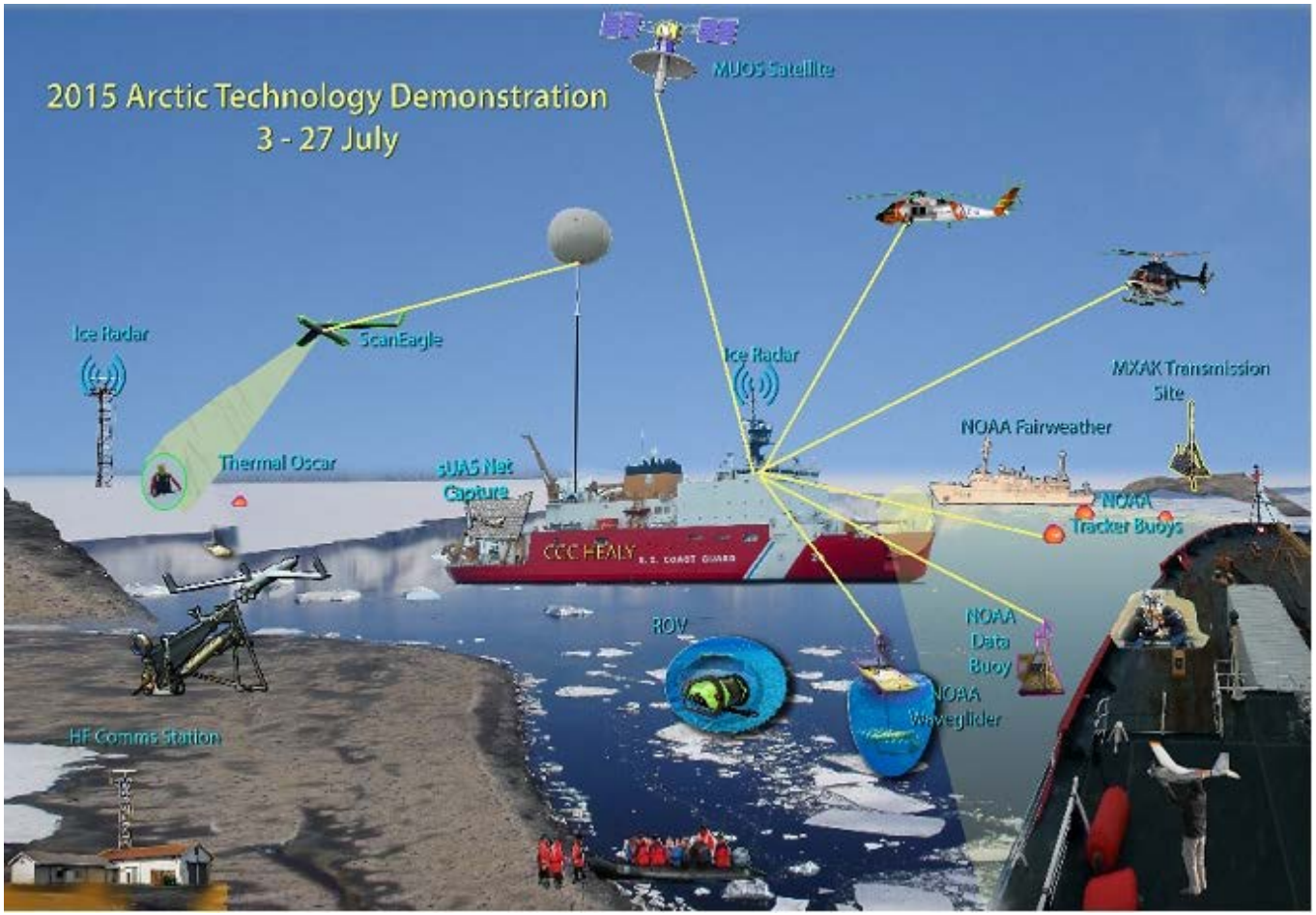
NOAA & SPAWAR
Unmanned Surface Vehicles

Ice tracking (ADAC)

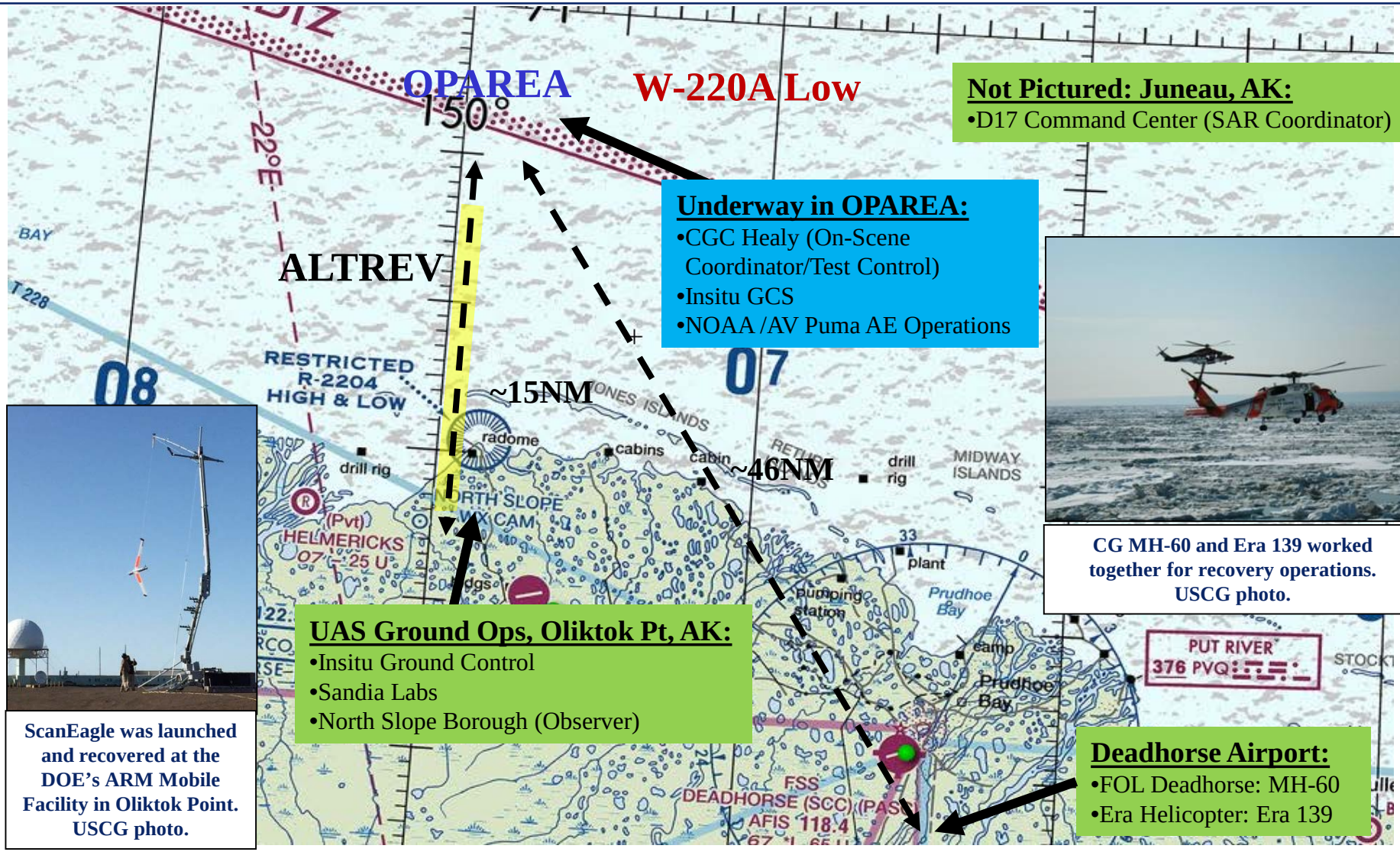
Oil Sniffers (ADAC)

Boat shore transfer evaluation

Anti Icing systems testing
(NASA/NOAA)



SAREX – UAS Pitch-N-Catch 2015



Not Pictured: Juneau, AK:
- D17 Command Center (SAR Coordinator)

Underway in OPAREA:
- CGC Healy (On-Scene Coordinator/Test Control)
- Insitu GCS
- NOAA /AV Puma AE Operations

CG MH-60 and Era 139 worked together for recovery operations. USCG photo.

ScanEagle was launched and recovered at the DOE's ARM Mobile Facility in Oliktok Point. USCG photo.

UAS Ground Ops, Oliktok Pt, AK:
- Insitu Ground Control
- Sandia Labs
- North Slope Borough (Observer)

Deadhorse Airport:
- FOL Deadhorse: MH-60
- Era Helicopter: Era 139

Arctic Chinook Communications 2016

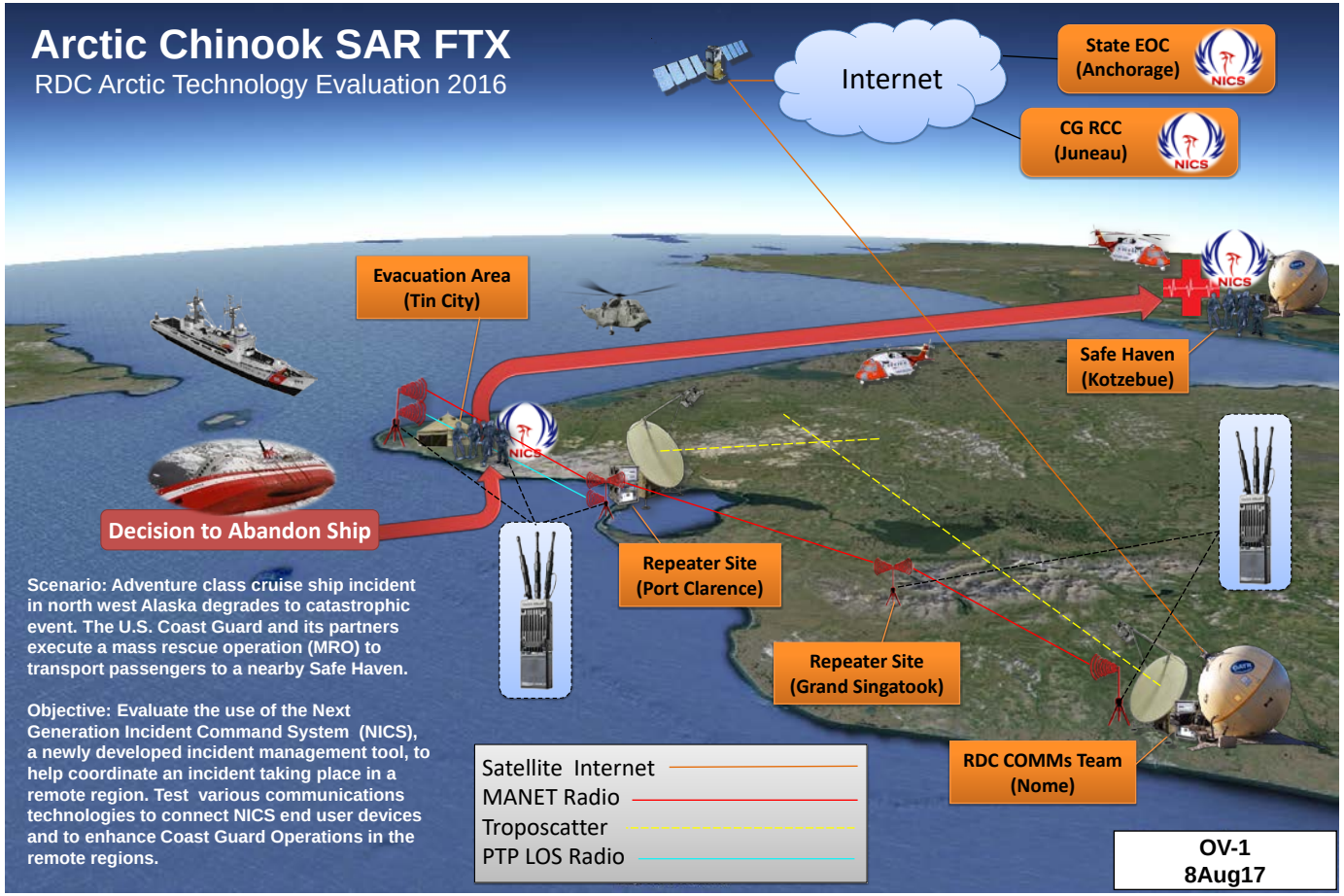
Remote Response Sight communications.

Local Data/Pictures/Video Transmitted to Alternate Comms Hub and Response Command Centers.

Troposcatter Over Mountain Ranges.

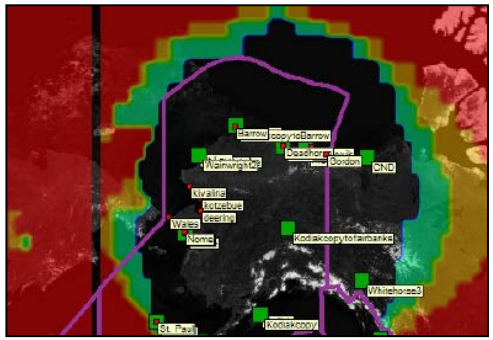
Inflatable Internet Connection in Nome.

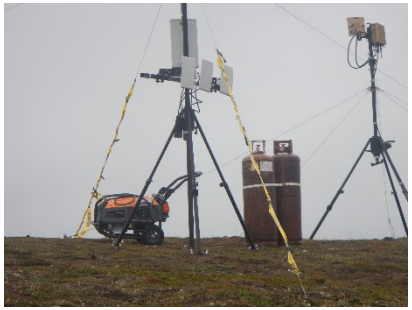
Data Feed to National Incident Command System in Anchorage and Juneau.



Communications Support 2016

- Preliminary Testing with D17 Communications Team and Communications Station Kodiak
- Collected Underway HF Data to Assess Model Accuracy
- Assess Distributed Tactical Communications System (DTCS) distributed nets (“netted iridium”)
- Utilized MPU5 MANET
- Used Tropo Scatter
- Inflatable Internet Antenna





Arctic Technology Evaluation 2017

Support F/V Destination Sinking Marine Investigation

CG Diver Reintroduction on HEALY Since 2009 and Memorial.

Electric Beach boat trials.

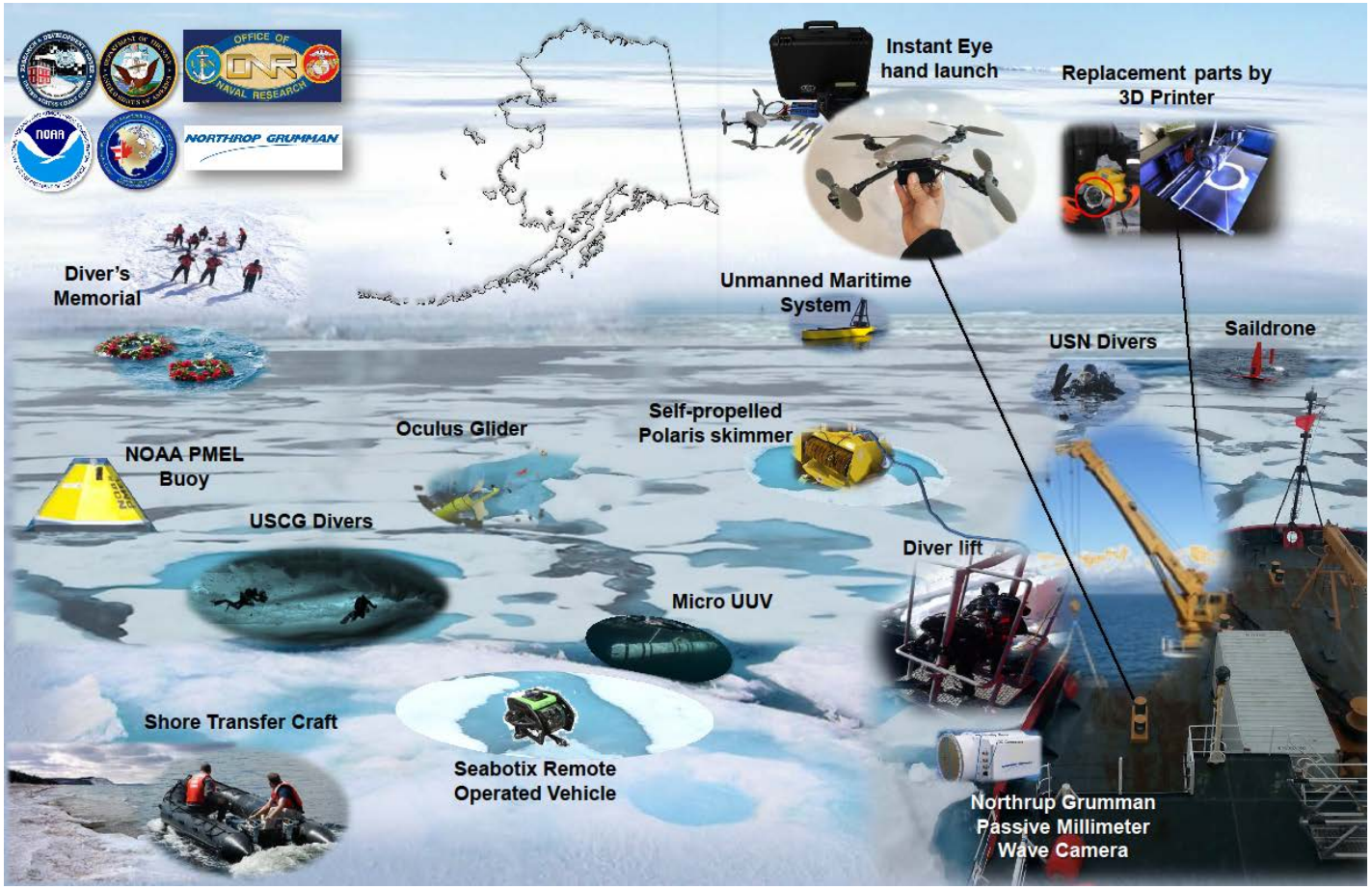
Micro UUV trials.

NOAA Slocum Glider launches.

NOAA buoy deployments and recoveries.

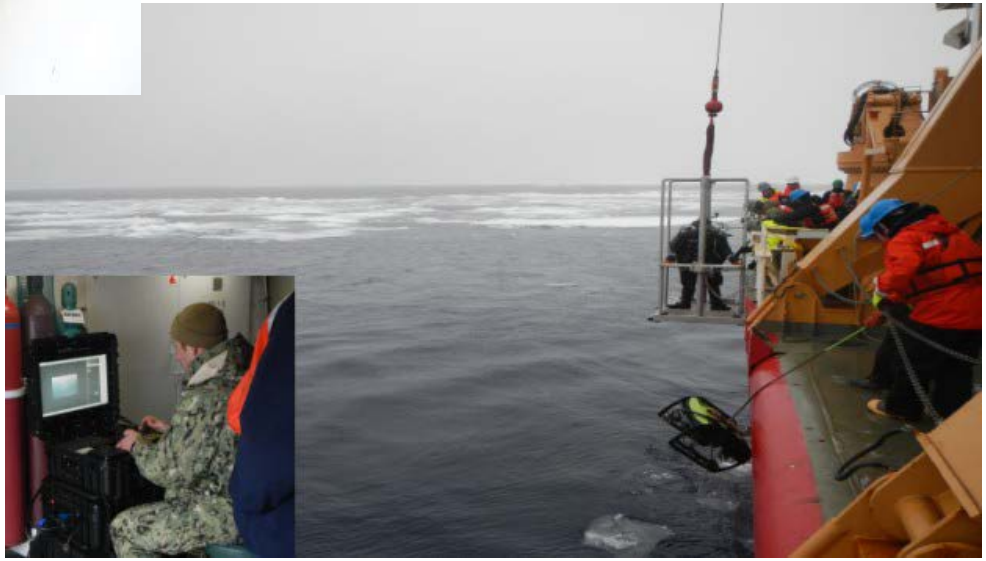
Passive Millimeter Wave Camera trial.

Self Propelled In Ice oil skimmer trials.



CG Divers Embarked on HEALY

Dive chamber manned by U.S. Navy divers on site to support Coast Guard dive operations.

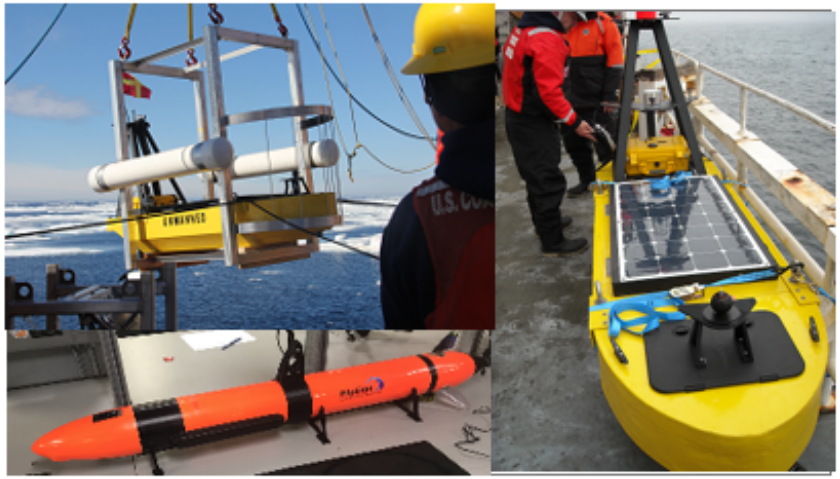


ROV launch with the shipboard deployment of divers. The ROV operator located out of the weather was an extra set of eyes to assist diver safety.

Arctic Technology Evaluation 2018

Project Objectives:

- Based on previous years' demonstrations and evaluations, continue to support projects that will develop capability improvements in the execution of Coast Guard missions in the Arctic.
- Continue to nurture joint efforts and interagency cooperation between government sectors and civilian entities on the North Slope and abroad.
- Facilitate and provide support to other Arctic projects, including Department of Homeland Security (DHS) Science & Technology (S&T) Office of University Programs (OUP), in accomplishing their testing objectives.
- Continue to monitor technology progression.



Key Milestone / Deliverable Schedule:

Project Start	30 Nov 17 ✓
Identify Available Assets for Testing	7 Mar 18 ✓
Test Plan Finalized	Jun 18
Conduct Technology Evaluations	Aug 18
★ **Arctic Technology After Action Report 2018**	**Dec 18**
Project End	Dec 18

Sponsor: CG-5PW
Stakeholder(s): D17, PAC-5, LANT,

Project #: 62101

Expected Benefit: Influence Mission Support efficiencies

Notes:
- Project will leverage other organizations with Arctic interests/efforts to the maximum extent possible.
- Follow on to 6210 - 2012/2013/2014/2015/2016 and 2017 efforts.
- Supports the Coast Guard Arctic Strategy.
- Partner with CG-DCO-X for engagement with Arctic Evergreen project.
- Collaborate with DHS S&T OUP for principle investigator engagement.

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

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

Arctic Collaboration / Partnerships

Future Collaboration / Partnerships

Arctic Strategy Implementation

- Work with various Coast Guard program offices to perform R&D elements of respective tasks

Arctic Communications

Partnerships/Collaboration

Arctic Navigation

Unmanned Maritime Vehicles for CG Missions Assessment

- Continue to assess unmanned systems for their utility to enhance Coast Guard missions in the Arctic

CGC HEALY: A Great Crew and Platform

- Multiple Technology Evaluations Simultaneously
- Highly Skilled Crew
- Superior Onboard Science Network System
- Extensive Laboratory Spaces

Thank You!

Mr. Brian L. Dolph
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Intranet: https://cgportal2.uscg.mil/units/cg9/2/6/rdc/Pages/Home.aspx