2014 Arctic Collaborative Workshop
A Shared Arctic Environment

NORAD and USNORTHCOM Strategy, Policy and Plans

Table of Contents

Executive Summary

The North American Aerospace Defense Command (NORAD) and United States Northern Command (USNORTHCOM) co-sponsored the 2014 Arctic Collaborative Workshop (ACW), "A Shared Arctic Environment" in cooperation with Joint Task Force Alaska and the University of Alaska Fairbanks (UAF). Seventy-nine people representing five countries and thirty-seven organizations participated at UAF's International Arctic Research Center from April 15-17, 2014. The five nations included representatives from Denmark, the Netherlands, Norway, the U.S. and Canada. In addition to the sponsors and traditional U.S. Department of Defense (DOD) organizations, other partners attending included the U.S. Coast Guard (USCG), State of Alaska, Shell Oil, Alaska Clean Seas, Crowley Marine and Polar Services. The University of Alaska President, General (retired) Pat Gamble; UAF Vice Chancellors Mike Safraga and Mark Myers along with Professor Craig Dorman, (retired Rear Admiral) also participated in the event. A complete list of participants is available from NORAD and USNORTHCOM on the 2014 Arctic Collaborative Workshop Compact Disk.

On day one, Brigadier General Guy Hamel, Royal Canadian Air Force, Deputy Director of NORAD and USNORTHCOM Strategy, Policy and Plans welcomed the participants on behalf of General Jacoby, the Commander of NORAD and USNORTHCOM, stating: "You are leaders in this effort, keep pushing the envelope!" Alaska Lieutenant Governor Mead Treadwell delivered the keynote address, in which he stressed: "We need to go to the Arctic with purpose, and we need to deserve to be there." The Lieutenant Governor also discussed how Arctic security affects the entire country and why it should be a national priority. On a local level, key insights into the Alaskan native culture, communities, governance structures and industry's capabilities were provided by Reggie Joule, Northwest Arctic Borough mayor, Mr. Nagruk Harcharek of UMIAQ, LLC; and Ms. Marin Kuizenga representing Polar Services. In the afternoon, a facilitated scenario discussing a Chinese diesel submarine stuck in the sea ice near the Canada – U.S. (CANUS) border encouraged conversations on response authorities, capabilities and challenges.

The morning of day two offered multiple briefings on Arctic operations and research from a variety of U.S. Government organizations and federally funded research and development firms. NORAD Deputy Commander Lieutenant General Alain Parent kicked off the afternoon with a speech centered on the Arctic as a "unique domain." He outlined the uncommon operational capability requirements needed there, and offered details on planned improvements. Lieutenant General Parent concluded by highlighting the roles of the Arctic Council, Northern Chiefs of Defense, USNORTHCOM, and the bi-national model followed by NORAD. The afternoon included a facilitated scenario on environmental response to a foundering oil tanker in the Bering Strait and maritime interception operations in the Northwest Passage.

Day three offered an international perspective of Arctic operations and preparedness, which included briefings on Norwegian Arctic capabilities, Denmark's Arctic activities, the Canadian Joint Operations Command and the Munk Gordon Arctic Security Program. The conference wrapped up with a final facilitated scenario involving a satellite crash near the CANUS border.

Significant Conclusions

Each day uncovered strengths and deficiencies related to U.S. government response operations in the Arctic. The following opportunities represent the greatest return on nonmaterial and material investments to improve the efficiency and sufficiency of Arctic response performance concerns:

- Identifying all activities that occur in or near the Bering Strait would significantly enhance awareness of Arctic activities
- Sensors on tactical response assets need improvements to counter the extreme environment; for undersea surveillance; and to identify and track uncooperative, dark, or small platforms
- Continued U.S. cooperation and leadership endeavors will significantly improve collaboration, understanding and influence with U.S. European Command (USEUCOM) and other Arctic partners across federal, state, local, and tribal organizations
- The Arctic domain needs enterprise-wide corporate management
    - Specific deficiencies in Arctic capabilities integration and comprehensiveness stem from the sprawling and disaggregated nature of the Arctic enterprise
    - A fusion center approach to information collection and sharing with distributed hubs would enhance awareness and response capabilities and ease partners' integration
    - The inability to regularly bring multiple organizations together hinders the alignment of efforts and inhibits Arctic capability development in support of the U.S. Arctic strategy
- Limited U.S. Naval presence in the Arctic creates significant capability gaps for DOD Arctic maritime mission area requirements
    - The USCG planned 2014 force laydown may require additional risk mitigation
    - U.S. Naval training and exercises for Arctic operations should begin
- An ocean-going tug capability in Alaska would significantly reduce the risk associated with increased oil tanker traffic near the Alaska shore
    - Oil tanker traffic through the Bering Strait could dramatically increase in the coming decade
    - After several accidents involving Russian vessels, Norway created a national oceangoing tug fleet to keep foundering vessels from their shores and reduce risk of environmental disaster

Background

The North American Aerospace Defense Command (NORAD) and United States Northern Command (USNORTHCOM) co-sponsored the biennial 2014 Arctic Collaborative Workshop (ACW) with the University of Alaska Fairbanks (UAF) in cooperation with Joint Task Force Alaska (JTF-AK). The ACW was held April 15-17, 2014 at UAF's International Arctic Research Center.

The agenda was designed to facilitate a better understanding of the Arctic through:

- Better descriptions of the conditions, challenges and gaps (performance concerns) when operating in the Arctic
- Validation of an earlier list of assessment findings and translation into a core set of implementation recommendations (material and nonmaterial) for Arctic maritime mission area requirements
- Improved networks and institutional structures to enable partnerships and streamline interoperability issues encountered among partners

The main goals of the ACW were to facilitate information exchange among diverse experts, increase understanding of the Arctic as the environment continues to warm, and recognize the effect diminishing ice will have on Arctic activities including response (operations & logistics) to events. Additional goals were to examine the consequences of current capability gaps, existing and potential partnerships, and potential solutions to performance concerns.

Each morning, technical and cultural briefings led to spirited plenary and sidebar discussions that provided the framework for the more methodical facilitated scenario based dialogue in the afternoon. Overall, the scenario-based discussions examined:

- Arctic safety, security and defense mission responsibilities
- Addressed events in terms of awareness, accountability, capabilities, and partnering
- Mission accomplishment in the context of local to national collaborative response
- Expectations of fellow Arctic nations, interagency, and commercial partners' regarding U.S. Government (USG) response including the Department of Defense (DOD)

Day One: Alaska Partnerships, Environmental Response, and Search and Rescue

Overview. The first day's theme was centered on Alaska partnerships. UAF, industry and the mayor of the Northwest Arctic Borough, Reggie Joule, provided informational briefings followed by Alaska Lieutenant Governor Mead Treadwell's keynote address. UAF managed the afternoon's scenario-based discussion that involved a submarine un-located for more than 60 days until it became stuck in the Beaufort Sea ice near the Canada – U.S. (CANUS) maritime border. Facilitated discussions led to the rescue or recovery of the submarine crew, environmental response and DOD actions preceding the exploitation of the submarine's technology.

Informational Briefings – Alaska Partnerships

ACW participants received eleven Arctic-oriented briefings from the UAF International Arctic Research Center, commercial industry and Alaskan government. Each presentation related to Arctic research, operations, partnerships, environmental response, and search and rescue (SAR). A short description of each topic follows. (The briefing slides are available from NORAD and USNORTHCOM on the 2014 Arctic Collaborative Workshop Compact Disk.)

UAF Arctic Research. Vice Chancellor Dr. Mark Myers

- UAF research has important ties to communities north of the Arctic Circle
- Distant and sparse Arctic is very challenging for all organizations
- One of the challenges is to better understand how environmental changes are interrelated
- Importance of collaborating between local and international partners to achieve a better understanding of the Arctic future
- Must be able to respond to short notice change (e.g. volcano, earthquakes)
- Knowledge dissemination is key to developing a "Common Operating Picture" (COP) of sorts
- Low density of people in North American Arctic means a reliance on locals for response to events

UAF Geophysical Institute. Dr. Bob McCoy – Research & Operations

- Institute created by congress for "geophysical research concerning the arctic regions"
- Research groups: Volcanology, Seismology, Snow, Ice & Permafrost, Tectonics and Sedimentation, Atmospheric Science, Remote Sensing, Space Physics and Aeronomy
- Operational Programs: Tracks 52 active volcanoes in Alaska
- Volcanic ash clouds are an environmental concern that can hamper Arctic air travel
- Geo-location of events is possible using infrasound
- Conducting over the horizon radar experiments
- Supported Nome fuel crisis with sea ices samples, Unmanned Air Systems (UAS) remote sensing and glacier information for recovery of C-124 aircraft

UAF Unmanned Air Systems Integration. Mr. Marty Rogers

- Diverse program for UAS
- Based in the thirteen-year-old Poker Flats rocket range
- Usually only fly during daylight hours
- Infrared (IR) capabilities: monitored leaks in the pipeline, counted sea lions, supported mountain rescues and wild land firefighting efforts
- Portable radars available to assist with airspace management
- Federal Aviation Administration (FAA) designated UAF as a national UAS test site

UAF Satellite Programs. Mr. Tom Heinrichs

- Provide baseline mapping, geospatial data and real-time awareness updates
- Commercial data also available; needs assessed for application
- Arctic operations require special technologies
- Sea ice imagery available and helpful when ships are operating
- Satellite imagery readiness requires people and time to stay prepared

Arctic Common Operating Pictures and Arctic Collaborative Environment. Mr. Dayne Broderson

- Data access is critical
- Common standards and common layers contribute significantly to a common picture
    - Common reference display becoming more popular as a potential solution
    - Many organizations have individual displays; integrated display is better
    - Connectivity of Internet and computers determines success of cloud based common displays
- Provided a technical demonstration of National Aeronautics and Space Administration's (NASA) Arctic Collaborative Environment

UAF Center for the Study of Security, Hazards, Response and Preparedness. Mr. Cam Carlson

- Training next generation of emergency managers, responders, and policy makers to Improve resilience should a disaster occur
- Create knowledge that reduces uncertainty in decision-making
- Provide prominent education and research opportunities
- Work with Arctic domain security organizations to inform policy and decision-making

Crowley Marine. Mr. Geoff Baker

- Majority of operations involve fuel sales in Alaska since 1953 – now over 200 vessels
- Provide fully contained response barges for petroleum spills
    - Worked the Exxon Valdez spill cleanup
    - Barges perfect for the very shallow Chukchi Sea and Beaufort Sea
    - Tugs move the barges
- Specially designed ships with double hulls to operate in the ice
- Freezing spray limiting factor for Arctic operations
- Villages lack traditional ports – barges pull right up on shore or onto ice for delivery
- Working on a self-contained concept barge to allow 100 people to respond to an event for thirty days – designed to serve as a command center

Arctic Slope Regional Corporation (ASRC). Mr. Erik Nordberg

- Extreme environment training and testing in support of Arctic special operations
- ASRC trains Special Forces for extreme weather operations
- Special forces learn from the local population about unconventional warfare situations and survival skills
- Test Personal Protection Equipment about three times a year
- Patagonia type gear was good for recreation, but insufficient for Arctic special operations
- Test Command, Control, Communications, Computers and Intelligence (C4I) and multispectral systems by dropping several hundred people into various villages and supporting them from 200+ miles away

Polar Field Services. Ms. Marin Kuizenga

- Partner with CH2M Hill and Stanford research group
- Support the National Science Foundation (NSF) and polar research operations
- Provides logistics services to "boots on the ground" including field camps, facility support, care and feeding, communication and transportation services
- Routinely provide services to Thule, Greenland, Peterson Air Force Base and the Summit Station with the Air National Guard mission in Greenland
- "To be successful in the Arctic it takes collaboration – with people."

UMIAQ Science. Mr. Nagruk Harcharek

- Established in 2006 in Barrow, Alaska to meet growing logistical support service demands of resource development activities
- Support NSF, Office of Naval Research, NASA and private universities
- Provide strategic planning and administration of permitting for Alaska oil and gas projects
- Demonstrated expertise and success in securing regulatory approvals for Outer Continental Shelf, National Petroleum Reserve - Alaska, and State of Alaska oil and gas lease activities
- Labor services include translators, temporary bear guards, ice guides, traditional knowledge, translators and outreach to villages and natives
- New services include support for Bureau of Land Management, FAA, USCG port calls and a Barrow, Alaska port call for a Swedish Coast Guard Cutter
- A maximum of 80 hotel beds in Barrow, Alaska in 2014

Alaska Clean Seas (ACS). Mr. Barkley Lloyd

- Non-profit industry funded cooperative oil spill response organization (OSRO) established 35 years ago (all designated major OSROs cooperate in a global response network)
    - More than 90 full time employees in Deadhorse, Alaska
    - Trains others for environmental response operations - oil spill cleanup using incident command system and unified command structure
    - Approximately 500 volunteer members from operations across the field
    - Focus on hazardous spills on or near the North Slope of Alaska
    - Response on the Alaskan North Slope requires eight to ten hours of travel time to Barrow, Alaska or eighteen hours to the Canadian border
    - In terms of oil spill response operational risk, Unimak Pass in the Aleutian Islands has many more oil tanker vessels and higher risk
    - Tactical focus is on getting oil out of the environment - governmental borders do not matter
    - ACS does not maintain dispersant response capability
- Commercial companies pay for clean up through the Oil Spill Liability Trust Fund
- USCG, ACS and the North Slope Borough will usually lead environmental response in northern Alaska
- Environmental incident reconnaissance and initial assessment are very important
- Funding development of an unmanned underwater vessel to assist in environmental cleanups

Keynote Address - Alaska Lieutenant Governor Mead Treadwell

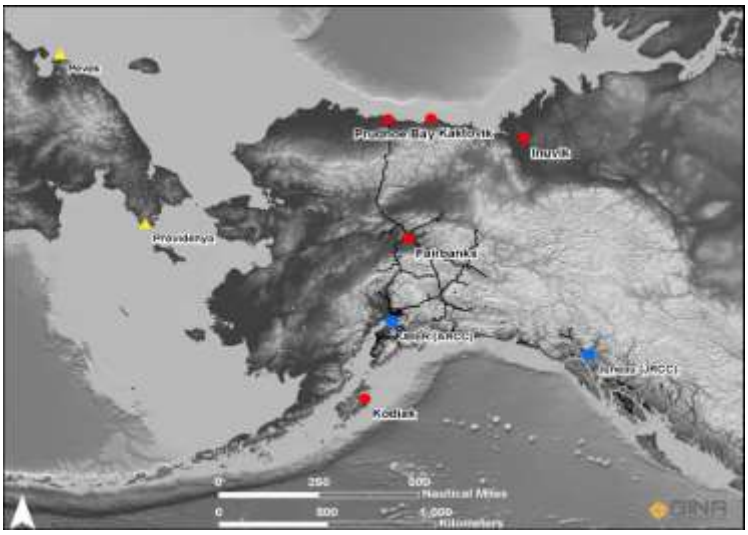
- "We need to go to the Arctic with a purpose, and we need to deserve to be there."
- Arctic security should be a national priority due to:
    - Energy development, shipping opportunities and safety
    - Changes in climate and fisheries (need to assess and mitigate)
    - Territorial claims, attaining land access and promoting military cooperation
- Our security needs are: keeping the oil flowing, maintaining food security (fish stocks) and promoting jobs
- Notable important capability gaps are infrastructure, icebreakers, ports, a comprehensive vessel tracking system and reliable communications
    - Where should the deep-water ports be?
    - Vessel traffic scheme in the Bering Strait is essential
- Major policy imperatives for Alaska and the nation are: safety at sea, international cooperation, attracting investment, exercises and developing infrastructure
    - Russia was first in Arctic claims submission to the UN Commission on the Limits of the Continental Shelf
    - “We need to find a way to stay engaged with Russia”

Northwest Arctic Borough. Mayor Reggie Joule

- Located in Kotzebue, AK - People of the land - eleven native communities
- The majority of the 18,000 people in Alaska living above the Arctic Circle are indigenous
- Communities depend on resources for sustenance
- Commended former President Bush's Arctic Policy of "Security, stewardship, international cooperation, consultation, and collaboration with indigenous populations"
- "Get ready… It takes too much time to get ready"
- "Non-renewable resources are a gift and a responsibility"
- "Change is being driven by profits"
- Do not overlook local capabilities

Day One Scenario: Submarine Rescue

Purpose: compare and contrast Eurasian and North American Arctic operating environments and assess current capabilities against the gaps included in the 2012 DOD and Department of Homeland Security (DHS) Arctic Capability Advocacy Working Group White Paper. The four gap categories were:



- Reliable Communications
- Maritime Domain Awareness
- Sufficient Infrastructure
- Presence

Scenario: In late October, a diesel submarine becomes stranded in the ice in international waters fourteen miles from the Canadian and U.S. border. The submarine was undetected until it surfaced into the ice. The detection of the stranded submarine prompted a U.S. Maritime Operational Threat Response (MOTR) conference call and a similar Maritime Emergency Response Protocol (MERP) conference call in Canada. The immediate needs were to assemble a team to attempt a rescue for the survival of the crew, prevent loss of fuel or other hazardous materials and secure the submarine for potential national exploitation. Capability needs were explored under differing environmental factors and conditions. UAF provided expertise to answer questions related to satellites, radar, sea ice dynamics and characteristics, weather, ocean currents, volcanic activities and ash cloud modeling. Also examined were procedures for operations, SAR, partner cooperation, environmental clean-up and logistics.

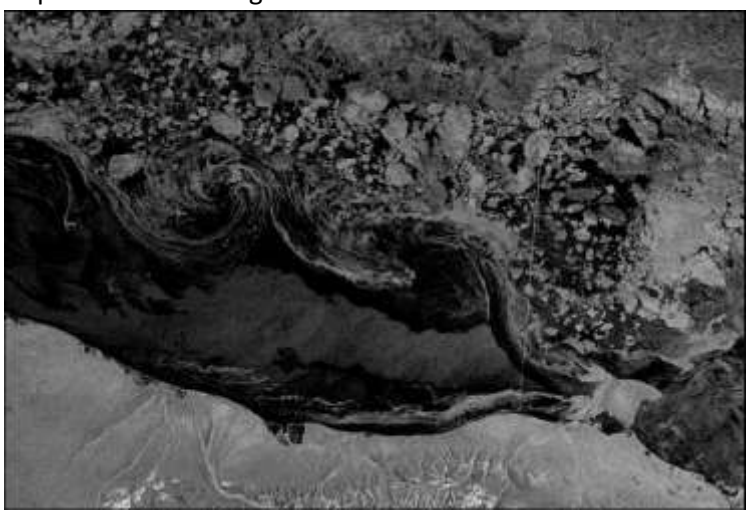
Scenario facilitators tried to limit discussion to only reach and sustain submarine survivors. Workshop participants repeatedly discussed attempts to rescue the crew, stabilize the submarine and technology exploitation. The following are noteworthy details from the scenario discussions:

Sea Ice Conditions

Arctic sea ice data is imprecise. During the fall season, responders expected land-fast ice out to about 20 meters of water depth. The thickness was about 0.5 meters or less, but expanded and blew in from offshore. New ice did not support personnel or equipment. During this time, ice floes from offshore were likely to be small and unable to support people and equipment. A multi-year ice floe moved in and provided a platform. Developing ice was thin. Freezing air temperatures, near freezing water temperatures and high winds limited aircraft and vessel operations. Responders encountered 0-100% ice coverage from "grease" ice to multi-year ice greater than one meter thick in the area of the submarine crew rescue. The land-fast ice cover expanded rapidly throughout this time of year. Bottom line: sea ice concentration varies significant during the fall season.

Sea Ice Dynamics

Relatively high wind speeds caused sea ice currents of 0.5-1.0 knots. These currents generally followed the shoreline, but flow direction did change. Ice floes travelled at speeds influenced by wind, waves, and could cause immediate fractures, breakup or erosion of large floes due to collisions.



Crew Rescue

If the crew wanted rescue, they were transported using snow skids, float skids or hovering helicopters and taken to Prudhoe Bay or Fairbanks for processing. Some helicopters used air-refueling capabilities. The State of Alaska's role was limited in international waters. Very little support infrastructure existed near Kaktovik. The authority to conduct a SAR operation existed with the first responders, which was complicated by customs and immigration issues. If the crew moved ashore, the State of Alaska and federal immigration would get involved; limiting factors were services, hotels and food. Wildlife such as bears could also be a factor requiring bear guards. It was logistically questionable to evacuate people from a sound submarine to the shore. If adequate life support was in place, it did not make sense to pull people from the submarine until necessary for rescue. C-130 aircraft landed at Kaktovik or Tukyuktok to transport injured or endangered crewmembers to better facilities. Immediate crew rescue occurred if there was no power on the submarine or if it was scuttled. The injured crewmembers could initially move to firm ice, if any existed. Ice was better than a sinking submarine. Rescue aircraft would be traveling north of Anchorage, but if a volcanic eruption were to affect the flight route, they would need to circumnavigate ash plumes to avoid accidents and damage to the aircraft.

International Response

Canada opened their closest hub and activated a communications suite with other equipment before the submarine and icepack drifted into its waters. Joint Task Force North (JTFN) talked to JTF-AK, NORAD

and USNORTHCOM. The event headquarters moved to Inuvik, Northwest Territory. Canada built an interagency team with Royal Canadian Mounted Police (RCMP) and Public Safety Canada for the submarine sailors coming ashore. "Feet dry" versus "feet damp" made a difference in U.S. immigration policy. Canada's Department of Foreign Affairs, Trade and Development (DFATD), and Department of State (DOS) were involved from the outset during the MOTR and MERP calls.

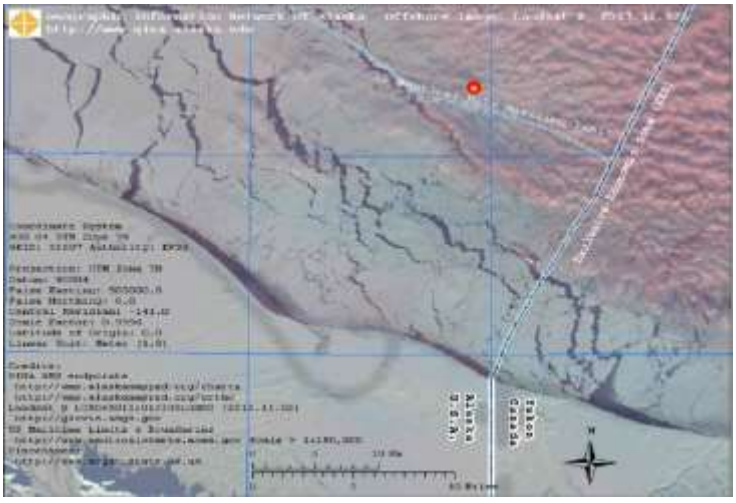
Other Arctic nations publicly offered to send an icebreaker to keep the submarine from scuttling intentionally. After the crewmembers' rescue or recovery, the U.S. did not accept international help and sent the submarine back to China in pieces. During the last SAR exercise, European participants rescued and evacuated people, provided medical attention, and when able; registered them with police in Greenland. In Norway, helicopters took off from Coast Guard ships and landed at medical facilities in Russia. International coordination is the key to efficiency and information sharing at strategic levels.

Information Management

Several people thought of information management and also the restrictions thereof. Others believed it was best to report the facts to the media without interference. The media response competed for limited rescue scene resources.

Alaska Perspective

In Alaska, there was notable discomfort with federal government intervention and a strong belief existed that Alaska and the Arctic were misunderstood in Washington, DC. If there were a hundred people that needed rescue then there would be two hundred people sent from DC to handle them. The Rescue Coordination Center (RCC) and the State of Alaska kept the number of rescuers at the shore at a minimum. Fairbanks or Anchorage needed to adopt the Canadian hub concept. There were no roads on the Canadian side of the border and there may not be roads on the U.S. side either. The incompletely frozen tundra may not allow travel in October. After rescue from the submarine, the State of Alaska used their resources to assist the evacuation of survivors and provided medical treatment. Airlifts were needed to keep the people moving. The local communities provided what they had to save lives. No useful infrastructure existed on the western side of North Slope. The local population was hardy and willing to help, but they needed to receive assistance to resupply food and resources for their depleted winter stockpiles. In 10-15 years, activities in the North American Arctic might occur year round. There was not a consensus on how that would change preparations for response to Arctic events.



Submarine Removal

There was a great need for surveillance that initially detected the submarine, tracked other vessels and shared location information with other organizations. Ideally, the response force went forward as a cohesive unit and was formed ahead of time. The

response force in this case began with local natives observing and reporting the distressed submarine. The Law of the Sea requires assistance for a vessel in obvious distress. Once discovered, there were a large number of satellite and national assets available to track the submarine. DHS offered the use of UAS.

Ice Data

There was a need to support submarine towing operations and navigation without regular navigation charts or information on the best way through the ice.

Eurasian Arctic Comparison

The Eurasian Arctic has significantly better capability and capacity of infrastructure resources when compared to the North American Arctic. These greater resources were believed to be present because there were longer ice-free seasons and significantly greater populations along the Eurasian Arctic shores. Ice surveys, ice data, ice experts, and icebreakers were more abundant and routinely available for a successful response in a similar Eurasian Arctic event. Europeans have satellite products for ice thickness information. The United Kingdom has small quadcopters that can detect temperature variations in the Arctic Ocean.

Command and Control Resources

Command and control was different for cases that had the federal government, the State or other countries in the lead. It may take many communities to rescue the submarine; nevertheless they can add capabilities and value.

SCENARIO DISCUSSION IN TERMS OF: AWARENESS, ACCOUNTABILITY, CAPABILITIES, PARTNERING

Strength: Response forces. Other strengths:

- Since this was a major, "national" issue, U.S. national force capabilities were made available to ensure smooth operations
- DOS handles "voluntary contributions" from other countries
- USCG had the lead in the event; RCC in Anchorage and other DOD will be in support
    - Adequate ability to move people to Fairbanks or Anchorage as soon as possible with C-130 aircraft from Barrow to Anchorage and helicopters from Kaktovik to Barrow
    - U.S. Army Alaska could provide parachute jumpers and are able to land helicopters near the submarine
- State and local governments - North Slope Borough indigenous people provide needed sustenance and bear guards
- Commercial based operations on the North Slope area - Crowley Marine has hovercraft not used during shouldering season that could have been used during this event
- UAF environmental products can enable a better understanding of extreme Arctic conditions
- Iridium works as a primary or secondary Arctic communications system

Weaknesses: Ice forecasting and awareness. Other weaknesses:

- Ice data is imprecise
    - General misunderstanding that frazzle sea ice has the consistency of quicksand and does not support any weight
    - Base of operations was initially located on the shore nearest to the submarine, but as the ice flow and submarine moved, the base needed to move as well
- Detection and monitoring were accomplished via national means
- Tactical asset sensors may be unreliable
- Need for infrared equipment due to limited daylight hours
- Communications above seventy degrees north are unreliable
    - Communication networks were inadequate for mass rescue operations
    - Although some satellite communications were available, there were insufficient satellite communications and surface relays for communications
    - UAF experts stated there are Global Positioning System issues and degradation in the Arctic
- Seams between the RCC and federal U.S. and Canadian response forces
- All organizations will have to collaborate and decide who will be in charge initially and throughout event
- Logistical impediments of time, distance and lack of support infrastructure in certain areas
- Inadequate capacity of U.S. icebreaking - USCGC Healy was in Antarctica
- There were no diesel sub drivers in the U.S. that could drive the submarine to safety
- Rotary aircraft, lighter than air aircraft, and some unmanned sensor systems may operate at less than optimal levels
- Kaktovik has very few medical resources (as with many other northern Alaska communities)
- Redundancy needed for tugs or icebreakers for self-rescue
- There is a minimal towing capacity for large vessels

Other factors impacting operations:

- Aircraft and flying hours were restricted by weather during that time of year
- Ocean currents could cause the submarine to drift several miles a day between jurisdictions
- Very thin ice thickness limited the assets available for an effective rescue
- Volcanic ash plumes could prove to be restrictive to communications
- Polar bears are abundant and a threat to rescuers and survivors

Deficiency: Comprehension of Arctic remoteness of Arctic events. Other deficiencies:

- Limited capacity of food, fuel and shelters for deployment and preparatory allocation to responders and survivors
- Lack of a Memorandum of Understanding for logistics support for land-based collaboration in an emergent event
- How do the logistics and supply chain get set up and who decides what goes forward?
- More icebreakers make this scenario much easier
- Need for more locally based persistent surveillance
- Assured communications availability
- Arctic Council SAR agreement only obligates action if the crew cooperates with their rescue
- Plans do not exist for what to do with 100 foreign members of the military
- No plan to restrict number of media members on isolated North American Arctic coast

Opportunity: Most prevalent - partnering with other countries. Other opportunities:

- Russian communication satellites could be used for Arctic SAR
- Russia volunteered to send an icebreaker; Chinese Snow Dragon was en route
- Iridium satellite phones are somewhat more reliable; new Iridium networks will offer increased bandwidth
- Canadian Arctic Major Air Disaster (MAJAID) kit can support up to 100 people for 30 days
- Prepositioned U.S. supplies similar to the proposed Canadian hub system would provide additional resources and quicker response times during isolated events
- Norway exercises annually with the Russians in a Barents Sea rescue
- The Netherlands strong suits are C4I and infrastructure
- Denmark held an international SAR Exercise (2013) off the coast of Greenland with over 1000 participants
- Review State of Alaska plan to support events on the Northeast and Northwest shores of Alaska

Day Two: U.S. Partnerships, Environmental Protection, Awareness, and Response

Overview. The second day's theme was centered on U.S. partnerships. DOD, DHS and the Cold Region Research and Engineering Lab (CRREL) provided informational briefings followed by NORAD Deputy Commander, Lieutenant General Alain Parent's keynote address. NORAD and USNORTHCOM facilitated the afternoon's scenario-based discussion that involved a rogue Russian ship captain un-located until it was reported near the CANUS maritime border. Facilitated discussions examined the recovery of a foundering oil tanker and led to the interception of the rogue vessel.

Informational Briefings - U.S. Strategic and Research Efforts

ACW participants received ten briefings by representatives from U.S. maritime services, DOD strategic organizations, federal government agencies and research organizations. Each presentation related to Arctic research, environmental response, maritime interception operations and partnerships. A short

description of each topic follows. (The briefing slides are available from NORAD and USNORTHCOM on the 2014 Arctic Collaborative Workshop Compact Disk.)

United States Coast Guard: The Arctic Planner from USCG District 17, Mr. James Robinson, provided a briefing on USCG capabilities and plans for the Arctic. He said the USCG Arctic Strategy was based on three pillars: improving awareness, modernizing governance, and broadening partnerships. The USCG exercise Arctic Shield 2014 will be typical of contemporary USCG summer Arctic activity but also reflect a shift in focus from Barrow to the Bering Strait. Surface presence will include continuous icebreaker coverage and major cutter presence north of the Bering Strait for forty-five days during August through October. A buoy tender will also cruise the Bering Sea waters. Aviation coverage would include forward deployment of C-130Hs to Eielson Air Force Base in Alaska and a forward deployed helicopter (H-60) presence near Alaska's North Slope.

United States Navy. CDR Ronald Piret's briefing focused on two major areas, the USN's climate projections and the future role of the Navy in the Arctic. USN climatological estimates are reaching near certainty that the Arctic waters will become accessible by 2025 or perhaps earlier. The USN has not operated in the Arctic routinely for decades, but has a roadmap to begin to train and exercise surface ships in this domain with the goal of a sustained "presence" by 2030.

Executive Agent for Maritime Domain Awareness (MDA). The Deputy Director of the DOD Executive Agent for MDA, Mr. Joseph Milligan provided a discussion of MDA in the Arctic. MDA is not only about sensors—sensors are necessary, but not sufficient to obtain MDA. MDA is really about collaboration, information sharing, and information fusion among a wide-range of international, territorial, state, local, and commercial partners. Building frameworks and exchange standards are keys to information sharing success. Information fusion and knowledge development contribute to awareness products that are exchanged among partners.

United States European Command. CAPT Edward Westfall, spoke about the organizational characteristic that defines the Arctic as the large number of seams that come together at the top of the world. In this region soft security—cooperation and sharing among partners, occupies a significant position beside hard security—armed conflict, military resources and installations. Both aspects of security are enhanced by exercises. Two points raised, but not necessarily resolved in the discussion were the use of NATO as a coordinating function between the eight Arctic nations and the impact of ice receding more rapidly from the Russian Northern Sea Route than the North American Arctic and the Northwest Passage.

Federal Emergency Management Agency (FEMA). Mr. David Kang from FEMA stressed the local focus of his agency in this region. FEMA plans are integrated down to the village and local level. The use of the phrase "whole-of-community" vice the more common "whole-of-government" reflected this orientation. FEMA participates in state and local emergency exercises at least quarterly.

Deputy Commander of the North American Aerospace Defense Command. Lieutenant General Alain J. Parent, Royal Canadian Air Force, delivered the keynote address, calling the Arctic a "unique domain." He outlined the distinctive capability requirements needed to operate there and offered details on planned improvements. Safety, security and defense are the matrix for participation. Lieutenant General Parent concluded by highlighting the roles of the Arctic Council, Northern Chiefs of Defense, and the bi-national model followed by NORAD and USNORTHCOM.

National Oceanographic Atmospheric Administration (NOAA). Ms. Amy Holman represented NOAA and addressed the many scientific projects that NOAA sponsors in the Arctic. A key takeaway was the fact that NOAA has a significant presence in this geographic area and should, at the very least, be contacted to see if they could make any contributions in an environmental, security or defense situation.

Office of the Under Secretary of Defense (Operational Energy). In the context of the energy resources of the Arctic, Mr. Troy Warshel made the linkage between assured access to energy supplies and national security. He stressed that the ability to wisely develop Arctic energy resources is directly related to DOD operational capabilities.

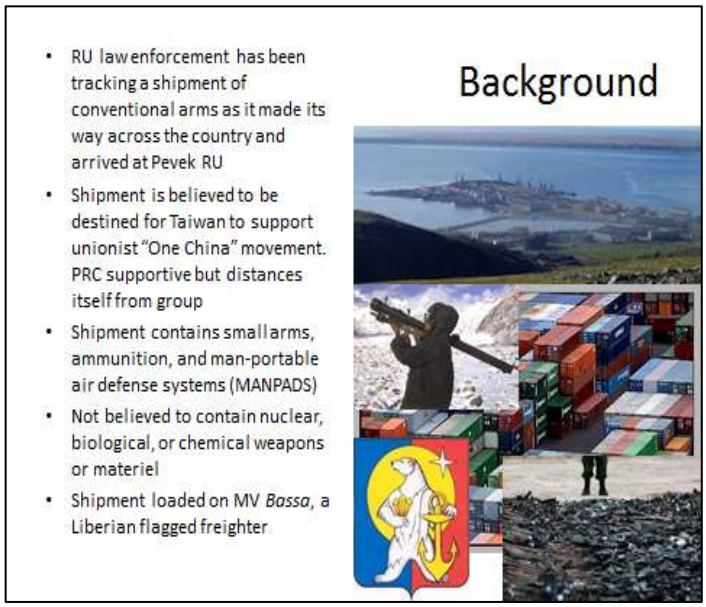
Rand Corporation. Dr. Abbie Tingstadt provided an overview of Rand projects providing empirical analysis to support policy development of the Arctic domain. Rand offers a wide variety of intellectual capital, including modeling, which can be used to assist senior leader decision processes.

Cold Region Research and Engineering Labs (CRREL). Mr. Kevin Bjella discussed the impact CRREL has had in the Arctic region for over 50 years. A US Army Corps of Engineers organization, CRREL considers a wide range of Arctic environmental issues, specializing in the understanding of permafrost and its implications on construction.

Day Two Scenario: Rogue Ship Captain

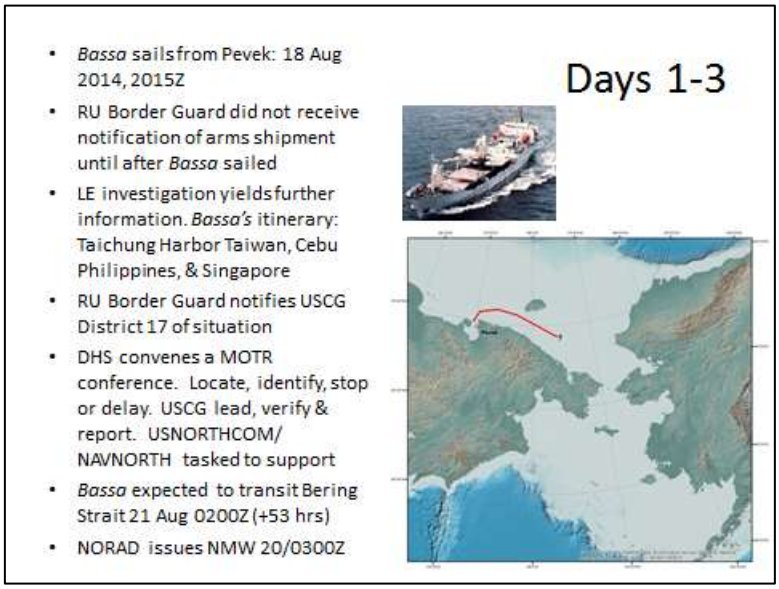
The goals for this scenario included the examination of responsibilities, authorities, capabilities and partnering. Participants discussed and evaluated:

- Arctic awareness
- Environmental response
- Maritime interception operations
- Partnership collaboration
- U.S. Naval responsibility in a potential Arctic maritime response event



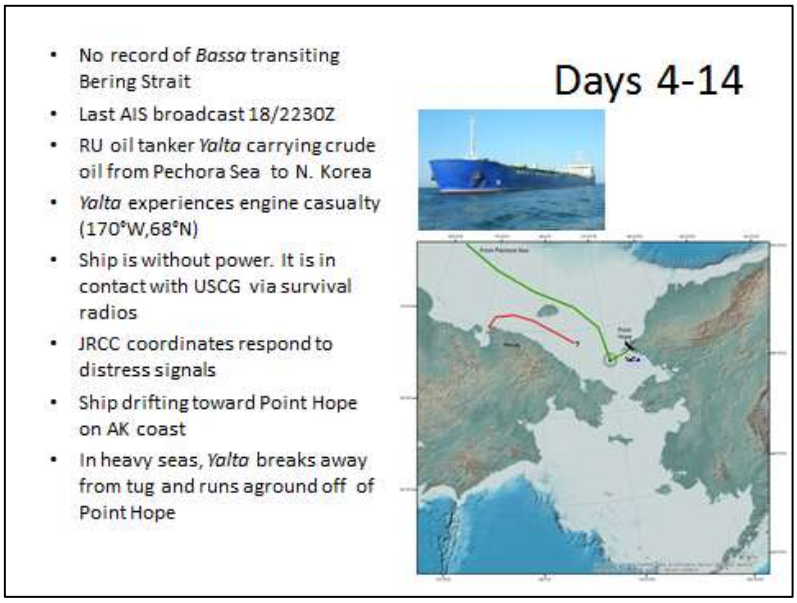
Background. Conventional arms shipment to opposition groups in Taiwan and possible nation-state sponsorship of a potentially illicit arms shipment enabled extensive discussion of the goals. Selecting a group that advocates the forceful overthrow of a

legitimate government and the inclusion of man-portable air defense systems created a level of concern that led to the exploration of DHS and DOD responsibilities. Exclusion of nuclear, biological, or chemical weapons or materiel steered the discussion away from being exclusively a special operations response issue. The approach stimulated discussion regarding the effectiveness of current maritime response efforts in the Arctic region.

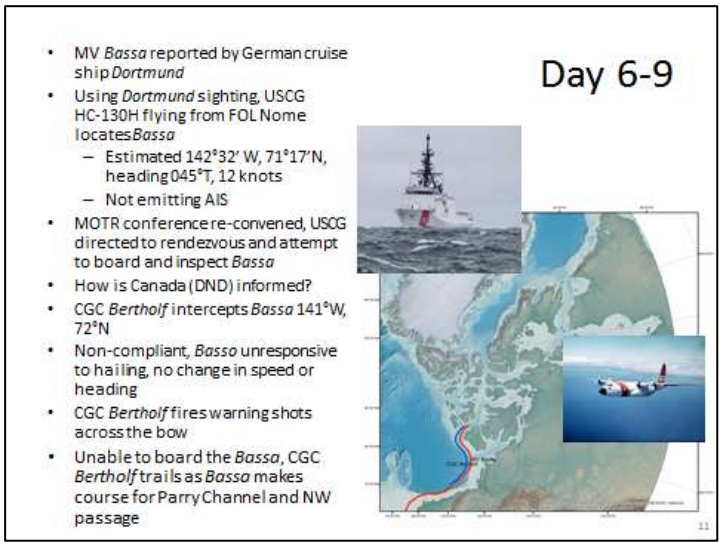


Days 1-3 explored the issues of awareness, authorities, capabilities, and partnering north of the Bering Strait in the Chukchi Sea. The port of embarkation for the arms shipment was Siberia, which placed the MV Bassa on the Northern Sea Route in an area adjacent to the North American Arctic. The pros and cons of the Automatic Information System (AIS) and its limits were discussed. The participants also described the informal, undocumented, yet regular communications that occur between USCG District Seventeen and Russia's Border Guard. How awareness was created and maintained and potential awareness gaps were discussed. Lastly, the period ended with a talk about the MOTR and MERP conference calls and the NORAD Maritime Warning (NMW) mission.

Days 4-14. Participants were asked to place pursuing the MV Bassa on hold during scenario days 4-14 while they dealt with a drifting oil tanker that had foundered off the coast of Point Hope, AK. An older, single hulled, Russian oil tanker, the Yalta, carried crude oil from the Pechora Sea to N. Korea when it experienced an engine casualty at the confluence of the East Siberian and Bering currents. The ship began to drift northeast, threatening the Alaskan coast. The RCC in Juneau, AK initially coordinated assistance to the vessel. During towing operations, the vessel broke away from its tug and ran aground near Point Hope.

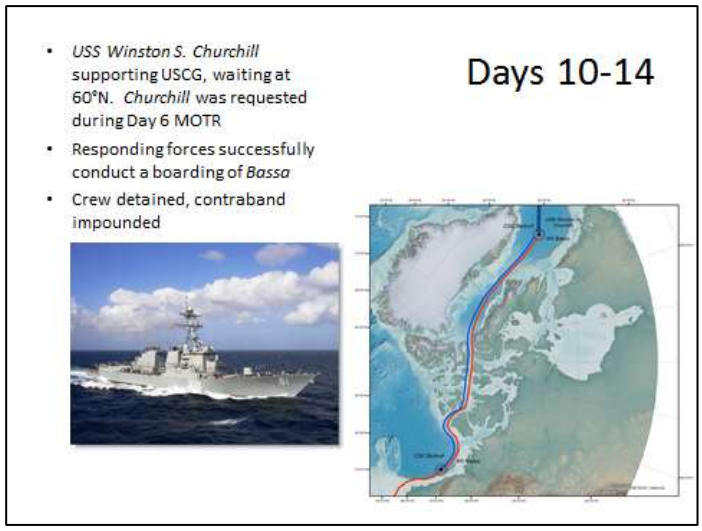


Days 6-9. Returning to the rogue vessel for scenario days six through nine, a German cruise ship was turned off its course for an unknown ship, in contradiction to international right-of-way rules. The MV *Dortmund* reported the incident to company headquarters, which in turn communicated with the USCG. After lengthy investigation, the *Bassa* was located at 142°32' W, 71°17'N, making its way toward the Northwest Passage at 12 knots.



Subsequently, DHS reconvened the MOTR conference and ordered the USCGC *Bertholf* to intercept, board, and inspect the *Bassa*. The purpose of the U.S. MOTR conference call was to determine the best U.S. national outcome. Canada held a similar MERP conference call, which conferred with the U.S. as the *Bertholf* intercepted the *Bassa* at 141°W, the maritime demarcation between the U. S. and Canada. The *Bassa* was non-compliant and uncooperative with the *Bertholf's* hailing, and although a warning shot was fired across the bow, the *Bassa* remained unresponsive. The *Bassa* continued on its course toward the Parry Channel and the Northwest Passage.

Days 10-14. As the *Bassa* and *Bertholf* crossed into Canadian waters, Transport Canada convened another MERP conference call and declared the vessel hostile. Canada did not have any forces permanently stationed in the Northwest Passage, but would have used unspecified surface vessels operating out of Resolute Bay that might be capable of assisting the USCG. Additionally, in the summer season the Danish Coast Guard would have several vessels stationed on the western coast of Greenland.



On scenario day 14, the *USS Winston S. Churchill* met the *Bassa* at 60°N. The *Churchill* was dispatched from an exercise in the Atlantic Ocean during the MOTR call on scenario day six. The *USS Winston S. Churchill* was unable to conduct a boarding of the *Bassa*. The *Bertholf* and *Churchill* provided support of a response force that successfully boarded the *Bassa*. The crew was detained and the contraband weapons were impounded.

SCENARIO DISCUSSION IN TERMS OF: AWARENESS, ACCOUNTABILITY, CAPABILITIES, PARTNERING

Strengths: coordination between organizations and voluntary commitment to exchange information. Other strengths:

- Good working relationships with Russian Border Guard permitted the exchange of maritime safety and law enforcement information between the U.S. and Russia
- Shore stations and satellites (sometimes referred to as Space-based AIS) received AIS signals to update MDA
- MDA was enhanced using the Long-Range Identification and Tracking (LRIT) system, a satellite-based tracking system similar but separate from AIS
- NORAD, the Canadians employed in the NORAD and USNORTHCOM Command Center, and the NMW Message were proven mechanisms for information sharing between the two national defense establishments
- A strong opinion existed that all Arctic nations are committed to working together in matters of sovereignty and security
- The USCG, the Royal Canadian Navy, and the Danish Coast Guard all had a seasonal presence in their national ports and territorial waterways (Dutch Harbor, Resolute Harbor, and Thule respectively)
- In spite of the lack of agreement on the status of the Northwest Passage (i.e., an international strait or territorial waters) or the lack of an agreement on the area along the CANUS Arctic Ocean borders, senior Canadian participants reported a high level of cooperation between the sea services of the two countries
- There was no question that *Bertholf* would be permitted to pursue through the Northwest Passage
- The Alaska Army National Guard H-60 aircrews maintain over-water qualification, enhancing their capabilities in this scenario
- U.S. DOD and Danish forces had the ability to conduct an opposed boarding
- Canadian and US Maritime response efforts were closely mirrored within national MOTR and MERP conferences to determine the best possible national outcomes
- Maritime emergency response appeared to be well coordinated through the RCC in Juneau
- Nome Harbormaster stated that towing equipment was in storage and ready for use in his port
- Crowley Marine said it could have performed towing with tugs that move fuel barges along the Chuckchi coast on a day-in-day-out basis
- An Alaska (state-owned) towing tools package is prepositioned in Dutch Harbor for barges

Weakness: inadequate preparation or available resources for a naval response to Arctic events. Other weaknesses:

- Although it kept the scenario moving, it was unlikely that the *Dortmund* would report the *Bassa* because of limited awareness
- Classification of the NMW message prevented the widest dissemination between partner national law enforcement agencies

- No formal vessel traffic system governs the Bering Strait
- Minimal maritime domain awareness west of the U.S. and Russian maritime boundary
- Connectivity with the Russian Border Guard was personality driven and not represented in any government-to-government agreement making it vulnerable to interruption or failure
- USCG District 17 did not have forces permanently assigned and designated to operate north of the Bering Strait
- USCG operates seasonally north of the Bering Strait (e.g., exercise Arctic Shield 2014)
- USCG exercise deployments are frequently tied to commercial activity in the Beaufort Sea (e.g., 2012 was a very big exercise year due to a large commercial oil exploration effort that summer)
- Northwest coast of Alaska (Chuckchi Sea, the Northwest Arctic Borough) has far fewer resources of all types including towing and spill cleanup than on the north coast (Beaufort Sea)
- Tugs did not reach the distressed oil tanker before breaking up on the Alaska shore
- No USG owned, contracted tugs, or skimming resources north of Valdez (Gulf of Alaska)
- Law enforcement agencies' interactions between USCG (in their Title 14 role), RCMP, and Danish Coast Guard appeared to be limited and informal at best
- USCG would not notify commercial vessels that they were looking for the *Bassa* because the "Be on the lookout for…" (BOLO) was classified as Law Enforcement Sensitive (LES)
- USN had limited ability to conduct maritime security operations including presence, freedom of navigation, deterrence or keeping sea lines of communication open
- Inadequate USN capabilities effectively limited USNORTHCOM's ability to provide presence or provide comprehensive Homeland Defense in the Arctic region
- USN had inadequate formal training or equipment to operate north of Arctic Circle or north of the Bering Strait
- Inadequate formal communication protocols for maritime response security or defense events among the partner Arctic nations

Deficiencies: lack of central enterprise-wide and strategic management for the Arctic region. Other deficiencies:

- Absence of National Security Council-level agreements for interagency cooperation
- Lack of governance structure at the US Policy Coordination Committee level for strategic Arctic interagency corporate management and support functions
- Misunderstood interagency funding mechanisms for interdepartmental investment or Arctic CANUS endeavors to build awareness across multiple domains
- LES and security classifications are barriers to information sharing that could be resolved at the policy, non-materiel level
- Lack of formal mechanisms to involve Arctic partners (exception of Canada) provided adversaries an opportunity to exploit deficient communication processes
- Greenland (Denmark) was not included as a member of the North American Arctic even though the environmental conditions and geographic location suggested they would fit better in the USNORTHCOM AOR

- Current personnel and system capabilities are not trained or exercised under extreme Arctic cold weather conditions
- A greater opening of the Northern Sea Route (currently seasonal) and the Northwest Passage (currently for a few weeks) will lead to increased traffic in the Beaufort, Bering, and Chukchi Seas
    - From 2008 to 2011 Bering Strait transits jumped from 220 to 410
    - Increased traffic would naturally lead to increased emergency incidents with potential environmental consequences
- Organizations with responsibility to prevent an environmental disaster are taking a "wait and see" approach to event response
    - Accident prevention included a large portion of good luck
    - For prevention to be effective, additional resourcing is needed
- Limited icebreaker, ice hardened hulls, sensors, communications, logistics, weapons systems, air platforms capabilities for Arctic operations

Major Opportunity: application of capabilities available in other parts of the world to the Arctic region. Other opportunities:

- An identification system in the Bering Strait for all activities (vessels, cargo, crew, support infrastructure) in the air, on the sea, and under the sea surface represents a large return on minimal investment to gain awareness of Arctic activities through a strategic chokepoint
- Lack of formal communication protocols among the Arctic nations presented an opportunity for improvement
- A question was raised about using NATO as the conduit to cross Area of Responsibility (AOR) boundaries (USNORTHCOM and USEUCOM) as well as to overcome national seams
- Crowley Marine had tugs and oil spill cleanup platforms in development that could have provided an effective, non-governmental option to fill this need. Crowley is assessing the business case for this shipbuilding initiative.
- Safety rescue and clean-up events will occur and should be resourced to maximize effectiveness at lowest acceptable risk
- High mobility of specialized boarding resources could argue for pooling these resources to provide an allied response capability and avoid unecessary duplication

Day Three: International Partnerships, Environmental Protection, and Logistics

Overview. The third day's theme was centered on international partnerships. Norway, Denmark and Canada provided informational briefings. A Canadian NORAD and USNORTHCOM Science and Technology staff member facilitated the afternoon's scenario-based discussion that involved a satellite near the CANUS border. Facilitated discussions examined the recovery of the satellite debris and led to a major environmental cleanup.

Informational Briefings - International Partnerships

ACW participants received four briefings by representatives from international organizations covering Arctic-oriented topics related to international partnerships, environmental protection, infrastructure and logistics. A short description of each topic follows. (The briefing slides are available from NORAD and USNORTHCOM on the 2014 Arctic Collaborative Workshop Compact Disk).

Acute Pollution and Possible Actions in Norway. Mr. Jonny Didriksen from the Norwegian Defense Headquarters stressed the differences in the Eurasian Arctic from the North American Arctic. The Norwegian Sea is never ice-covered and the Norwegian shoreline is heavily populated with good infrastructure. Oil tanker traffic out of Russia caused increased pollution along the Norwegian coast until Norway responded with permanent ocean-going tugs throughout Norway, owned and run by the national government. The Norwegian Coastal Administration is responsible for safety and security events. Norwegian armed forces are investing in new equipment designed specifically for the Arctic environment.

Kingdom of Denmark. Colonel Peter Boysen spoke primarily about Greenland. Greenland has self-rule not home-rule. Danish defense forces patrol Greenland at sea, in the air, and on land with dog sleds in the north. They operate a new Joint Arctic Command and Joint Rescue Coordination Center in Nuuk (beginning October 2014). Denmark conducts several annual exercises including increased maritime activity, resource competition and nation-state threats. Denmark is conducting an analysis of the Danish Ministry of Defense future missions and tasks in the Arctic. The results of the analysis will be expressed in specific recommendations of possible future Ministry of Defense capabilities in the Arctic.

Canadian Reflections on Emergency Preparedness: From the Local to the Circumpolar. Ms. Vanessa Gastaldo from the Walter and Duncan Gordon Foundation discussed climate adaptation. Arctic residents feel a responsibility to respond to emergencies and the call for SAR assistance. Public education campaigns must be reflective of northern realities in order to resonate with northern audiences. Gastaldo also discussed supporting resilience and the need to recognize the impact of strengthening communication and transportation infrastructure for the development of healthy communities and emergency preparedness.

Canadian Joint Operations Command (CJOC). Lieutenant Colonel Jean-Marc Doucet explained that CJOC anticipates and conducts Canadian Armed Forces operations, and develops, generates and integrates joint force capabilities for operations. He also described how the Canadian Northern Operations Hub plan for Arctic response was being developed and its integration with JTF-AK. Doucet concluded that the Canadian Armed Forces with federal and regional partners would succeed in Arctic emergency response and operations today while enhancing their abilities to anticipate, posture, and prepare for the future.

Day Three Scenario: Satellite Crash

The scenario objective was to examine intergovernmental and intra-governmental, state, tribal and local collaboration in the resolution of a common environmental crisis caused by a satellite crash on the CANUS border. To accomplish this objective, requirements were identified for levels of awareness between partners. The awareness and information sharing capability requirements needed for

collaboration with various partners were determined. Additionally, the appropriate responsibilities and authorities governing actions and the relevant agreements, statutes, and regulations (formal & informal) in the Arctic were identified.

Part One - Prior to the Crash: The overall assignment was to be prepared to find, secure, contain, and recover what remained of the satellite. Additionally, there was a need to minimize the damage effects caused by the crash and clean-up of the crash area(s). The predicted crash location was a 70,000 square mile swath across the Alaska – Yukon Territory (CANUS) border. The scenario was also used to refine the actions needed to prevent potential exploitation of classified material or systems remaining onboard the satellite that would necessitate a national mission force response. Satellite hazardous fuel or materials created a broad area for response requirements. This allowed the exploration of the local first responders' environmental cleanup and response capabilities as well as collaboration with state and federal partners.

The scenario identified responsible organizations, responsibilities and issues for resolution. While it was not intended that the problem would be solved within the limited time available, the group discussed major issues and relevant capability shortfalls that inhibited successful emergency response. Examples included identification and validation of civil-military and interagency communication, coordination and interoperability requirements. Additional capabilities were assessed that were designed to provide situational awareness, enhance communications, hazardous material response and possible international support for the Arctic region.

Part Two – Orbit Decay: On 18 Sep 2028, the European Space Agency (ESA) launched a 3000 kg satellite with undisclosed registry information. NATO assessed that this was a reconnaissance satellite, though it was unknown if it was a national or commercially owned satellite. After several weeks of observation, it was confirmed that the satellite had been launched into a Sun-synchronous orbit with an orbital inclination of approximately 65 degrees. On 15 Oct 2028, ESA determined that it could no longer control the satellite. After significant troubleshooting efforts, on 31 Oct 2028 the ESA determined that it could no longer communicate with the satellite and on 13 Nov 2028 the satellite's orbit began to decay. Further analysis suggested that based on orbital decay, the satellite would likely crash in the next 90-110 days, although the exact crash date, time and location was impossible to predict.

After mounting pressure by international community, ESA advised that the satellite's nation of origin is Country X, but not whether it is nationally or corporately owned. Country X informed the international

community that the satellite used Hydrazine, contained in two one cubic metre fuel cells, as its main propellant. It outlined some of the dangers of contamination should either of its two tanks not be incinerated during re-entry into the earths' atmosphere.

Part Three - The Crash: On 23 Feb 2029, the satellite crashed somewhere between eastern Alaska and northwest Canada. Though the exact position of the crash had not been initially determined, the debris field could be anywhere along a line extending from Kodiak Island, AK through Cordova, AK to Dawson, YK in a 700 x 100 mile swath. There was no confirmation by the Canadian Space Operations Center, Canadian Space Agency or NASA whether the satellite's hydrazine fuel tanks were incinerated upon re-entry. Of particular concern were the population centers of Cordova, AK (population 2270); Northway, AK (population 80); and Dawson, YK (population 1350). There were no reports concerning any injuries, property damage or debris landing in or near the communities. Both the governments of Canada and the U.S. raised concerns over Hydrazine contamination of the Wrangell-St Elias and Tetlin National Wildlife Refuges in Alaska and Kluane National Park in the Yukon.

SCENARIO DISCUSSION IN TERMS OF: AWARENESS, ACCOUNTABILITY, CAPABILITIES, PARTNERING

Strengths: space situational awareness and tracking space objects upon re-entry. Other strengths:

- Commercial satellite owner would notify someone, presumably USG, regarding loss of contact with the satellite
- Multiple sensors detected Satellite debris impact locations
- Routine crises communication networks were established; U.S. Space Command would notify all federal players that the event was occurring
- Multiple U.S. agencies have the potential capabilities to lead response
    - NASA lead with FEMA support as well as the Department of Interior, DOS, NOAA, and U.S. Strategic Command (USSTRATCOM) providing federal support
    - Lead would shift through time as phases of rescue, recovery and cleanup occur
    - Initially, NASA was lead, FEMA in support
    - DHS, Environmental Protection Agency (EPA), Bureau of Land Management, DOS, FAA, and NORAD could all have a lead in the event
    - Using the 2003 re-entry of the space shuttle "Columbia" disaster as an example, NASA was lead with satellite owner(s) held liable

    - NASA has plans in place for this and significant modeling and prediction capability
- The EPA would be interested if there were hazardous materials onboard
- NOAA suggested they should be notified for weather and radar service
- FAA would clear the airspace of civilian aircraft
- USNORTHCOM has three quick reaction force companies and a civil support team for chemical, biological or radiological materials detection and disposal located in the state of Alaska
- If classified, then a national response force declares a National Defense Area and asks the local government for permission to provide assistance
- State of Alaska and local government asked for federal assistance
    - With a declared disaster, unified coordinating group and federal coordinating officer are assigned
    - FEMA's Emergency Support Function 10 provides for a coordinated Federal response to actual or potential oil, hazardous substances, pollutants, and contaminants
- Alaska Division of Homeland Security and Emergency Management conduct emergency planning
- Alaska Department of Natural Resources has experienced "go-to" people for clean-up
- The satellite owner(s) were responsible for cleanup
- Existing CANUS Combined Assistance Plan (CAP) for consequence management
- Emergency Management Assistance Compact (EMAC) between Canada and the U.S.
- CJOC gathered data for defense support
- Canadian military would be supporting the Yukon Territory along with JTFN
- Canadian lead would be Public Safety Canada (a DHS equivalent) - Canadian Rangers would lead

Weakness: lack of experience cleaning up satellite debris. Other weaknesses:

- Low certainty of predicting where satellite debris will land
- Initial response ad hoc until precise location and material onboard were known
- No clear agency in charge - situational dependent based on degree of impact
- Canada would notify CJOC and JTFN, but military would not be the lead agency
- Canadian capabilities would be a bit more limited compared to the U.S.
- DOS would officially have been involved - function purely informational
- Debris path was right across a major river, possible contamination, but no plan to mitigate
- No standing requirement exists to show ability to clean up satellite crash damages before launching a new satellite
- Property damage or injuries may not be reported quickly
- Because of remote location and cost to cleanup, FEMA may conduct a risk assessment to determine if scalable cleanup is viable

Deficiencies: planning and resourcing for a satellite crash clean-up. Other deficiencies:

- Contact with satellite materials may be lethal
    - Information and warnings were not broadcast to all locals
    - No easy way to contact all the people that live off the grid
- Inability to control negative reporting through the media

- Incorrect or inaccurate information could create or reinforce barriers to assistance
- Multiple lines of communications need to be balanced to ensure efficient recovery
- Information flow and communications were part of the ad hoc surge function to respond
- Little discussion of Canadian capabilities even though the crash occurred across CANUS border
- No formal coordination mechanism to plan for pre-event response nor a need to have a plan in place for every contingency
- No discussion of debris crashing into the pipeline
    - It would cost millions to shut down the pipeline
    - Possibly cheaper to clean spills forever
    - Pipeline has automatic leak detection capabilities
- Space Liability Convention allows nations to hold other nations liable for damage caused by space objects they launch
- Some events fall outside routine responsibilities and accountabilities silos

Opportunities: training, preparation and exercise for satellite crash clean-up. Other opportunities:

- Security of the crash site was a collaborative effort
- Engagement with mass media to communicate the correct information was key
- Citizen expectations are that government will respond right away
- Sensors:
    - Unmanned sensors could be used to pinpoint locations
    - NOAA provides atmospheric dynamics and possible infrasound tools (detected Russian meteor) to provide location data - could use Fairbanks radar if it was asked
    - UAF has seismic capability (Alaska Earthquake Information Center) to locate crash sites
    - USSTRATCOM capable of locating flying objects. Ballistic missile defense tracking systems could potentially provide locations
- JTF-AK supported and started short term planning while working with the interagency and JTFN
- JTFN and JTF-AK augmented first responder manpower
- JTF-AK started an, “if you see something, report it” campaign to turn every person into a sensor
- 2003 reentry of the space shuttle “Columbia” disaster was used as an example
- Citizen communications established through community public service announcements to warn about debris and possible contaminants without causing a panic
- State of Alaska reached out to Department of Natural Resources, could also ask for contracted, commercial companies to clean up the debris
- Locals had the most experience operating in remote locations including bear guard
- Canadian Rangers and Special Forces mobilized to secure crash sites
- Talk of using the Canadian Space Agency, but unsure of their capabilities
- Exercise, exercise, exercise

Significant Observations and Findings

AWARENESS

- Access to data is critical
- A common reference display was a potential solution
- Common standards and common layers would contribute significantly to an improved COP
- Many organizations had individual displays; an integrated display would be better
- COP and situational awareness were incomplete and slow to update
- Information requirements were not well known
- Need infrared sensors when operating in non-summer seasons
- Inadequate routine, persistent subsurface sensors
- Local people discovered sub from diesel exhaust
- Inadequate environmental awareness
    - Bad weather affected flight hours 40% of the time
    - Volcanic ash plumes from Alaskan volcanoes could reach the North Slope and affect air travel
- Insufficient ice forecasting
    - Ice was unstable and variable
    - Equipment or personnel may not be able to land near the event location
- North American Arctic much more difficult; capability needs are far greater than Eurasian Arctic

ACCOUNTABILITY

- A governance structure at the National Security Council Policy Coordination Committee level could be accountable for Arctic interagency management and support functions
- Sustainment negotiated by the Rescue Coordination Center for shelter, food, water, clothing, and medical supplies
- Need a U.S. standard definition for "Arctic capable" when developing certification requirements
- The CANUS CAP planned for crises, but it is not exercised often enough (e.g. Exercise Nanook)
- Synchronization of planning – State EOC has multiple plans synched with federal DSCA
- International NC Playbook Arctic Annex needs to be developed and synched with State and Federal plans
- U.S., Canada, Denmark and Norway completed Arctic exercises, but lessons learned are not in one place for reference
- Canadians have a database of defense capabilities; U.S. does not have an updated or complete listing of Arctic capabilities
- Lack of existing and difficulty in developing public-private partnerships
- In general, academic research capabilities were neither clearly understood nor readily available to the Arctic operational community
- Future meetings of the global Arctic operational community should include non-traditional organizations

- Many Federal organizations lacked an understanding of what locals provide, when local responders do not have enough bandwidth, or how to weave local capabilities with government response
- Defense communications in the North American Arctic between Russia, U.S., Canada and Greenland (Denmark) were insufficient for effective operations
- Between Canada, U.S. and Greenland, the most effective communications used existing NATO processes and systems
- Exercises and response to safety, security and defense events in the North American Arctic would be enhanced by including Greenland in the USNORTHCOM AOR

CAPABILITIES and PARTNERING

- Oil spill response on the west coast of Alaska was limited compared to the North Slope
- Commercial assets were available but not funded
- Inadequate infrastructure support on the North Slope for large numbers of people and equipment
- The USN was not committed to surface ship operations north of the Arctic Circle
- In the first few days, first responders and locals were strong and innovated exceptionally well
- Federal help arrived several days after the event occurred
- Needed compatible radios for local responders' communications
- Austere environmental conditions in the Arctic fostered a hardy attitude in local populations that embraced both a high level of cooperation and dependence on non-hierarchical interagency and commercial networks
- The hardy, self-sufficient attitude was effective in responding to challenges yet hampered the development of formal coordination procedures and allocation of responsibilities
- Native Alaskans may have up to nine coexisting, overlapping governing structures that had responsibilities during an event. Interactions for event response were misunderstood.
- First responders needed bear guards the locals could provide, but they were not asked
- Crowley had hovercraft that could be manned and underway within a few hours
- Hovercraft were available if the ice ridges were less than one meter
- Inadequate capability to keep the submarine from scuttling and for towing submarine to a port
- Inadequate icebreaking capabilities
- A reluctance to use foreign aid because those vessels were military assets

Conclusion

The ACW is a biennial venue that allows an international group to examine Arctic related challenges. The 2014 event consisted of a scenario-based facilitated discussion to address specific issues preceded by a series of relevant briefings each morning. There were four primary focus areas: awareness, responsibilities and authorities, capabilities to respond, and partner nation contributions to solutions.

Embedding defense and security experts with academics and local Alaskans created an improved and nuanced understanding of the Arctic. The varied insights will be helpful in refining NORAD and

USNORTHCOM's roles in the Arctic and determining potential opportunities for the commands to partner for resourcing and regional security.

This forum also highlighted distinctive international aspects of the region, which require increased USNORTHCOM and USEUCOM cooperation for Arctic engagement, refined plans for the unique Arctic environment, and improved Unified Command Plan responsibilities.

UAF and the Fairbanks, Alaska area provided the stimuli and venues for personal insights into Arctic conditions, helping to debunk some popular regional misconceptions. Attendees endorsed the ACW to continue as a fully supported N-NC biennial training and exercise event.